

09

**Annual Report 2009**  
Results and activities



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# Enova now and onwards





# Exciting times ahead

Every year, Enova distributes significant funding to projects which are to result in more effective, environmentally friendly energy solutions in Norway. 2009 represented an important step in the right direction, but there are many unsolved challenges. We face exciting times ahead, and Enova is prepared to take on important new tasks in continued close cooperation with the market.

In January 2009, Enova received nearly MNOK 1200 in additional funding from the Government's economic stimulus package in response to the financial crisis. The funds were distributed and put to work in the heating, wind power and industry areas. An extraordinary program for improving energy efficiency in public buildings was also established, with the aim of contributing to bolster activity in the Norwegian construction industry while simultaneously enhancing energy efficiency in public buildings. We received many good project applications. However the applications for funding in total far exceeded the budget at our disposal.

#### Billions to wind power

Enova allocated MNOK 1 100 in July 2009 to the development of wind power projects which could yield 660 GWh of renewable power production. This is the largest allocation ever made to the development of wind power in Norway, and will take domestic wind power production to the next level. Despite record government funding, the wind power sector faces a challenging period. The transition to a green certificate market with Sweden must be implemented with maximum efficiency, so that activity is maintained. The 2010 fiscal budget states that Enova's wind power target of 3 TWh will not be met by the end of 2010.

#### Climate and Copenhagen

Enova was present in Copenhagen during the UN Climate Summit. The purpose of our attendance was to demonstrate that we are part of the solution to the climate challenges. More specifically, our focus was on two main messages communicated in our own events as well as through the media:

- The importance of energy efficiency being by far the cheapest and fastest measure.
- Power surpluses, with subsequent lower prices, reduce the motivation to invest. At the same time, export of renewable power production could be part of the climate solution.

#### Much remains to be done

An important part of the Storting's (the Norwegian Parliament's) motivation for establishing Enova was to set up a policy instrument that could both think and act from a long-term perspective. The Storting's reasoning was based on the recognition that the work to bring about the desired energy restructuring requires focus over several Storting periods, in many fiscal budgets, and throughout changing Norwegian government constellations.

Our work is long-term, but our ambition is to deliver daily improvements, both as regards national results and our own activities. In this context, we are pleased with the confidence that has been shown us, both through larger allocation frameworks and increased interest from the general public.

There is large potential in every area. The interest shown in the stimulus package for energy efficiency in public buildings proved that there is a veritable queue of good projects in this area. Studies of the potential to be found in the industry sector have revealed that we have plenty of work to get down to. The heating sector has reached an important milestone, while simultaneously establishing new goals to reach for. We see increasing interest on the part of Norwegian households for implementing good measures. By developing technology and markets, and promoting a lasting change in behaviour, we can trigger a great number of large and small projects in line with our objective.

The really significant climate effects will come when entire market sectors switch to more efficient energy solutions and increased use of renewable energy. Among the efforts Enova will prioritise in 2010 is a strong focus on the construction industry, where we pledge to have a very busy year in close cooperation with an active sector.

#### More work – more cooperation

Our task is to trigger an environmentally friendly change of the energy market. We do this by providing resources so that more investments in energy efficiency measures and new renewable energy production become profitable in business or private terms.

This remains challenging. Therefore, I can promise my colleagues plenty of hard work ahead, in combination with even more cooperation with the surrounding stakeholders. I welcome dialogue on overall policy instrument packages and national strategies, both within the existing areas that Enova operates and connected areas – a dialogue which emphasises innovation. This is how we can develop our policy instruments and programs to provide maximum predictability and consistency. Only then can we help provide the security that triggers investments and measures that will yield sustainable energy solutions for the future.

*Nils Kristian Nakstad*  
Nils Kristian Nakstad  
Chief Executive Officer



# A part of the climate solution

Enova's objective is to promote environmentally friendly restructuring of energy end-use and energy production in order to reinforce security of supply and reduce greenhouse gas emissions. This requires a long-term commitment to developing markets for efficient, environmentally friendly energy solutions.



At the end of 2009, Enova had a contractual energy result of nearly 13.8 TWh for measures that contribute to environmentally friendly restructuring of energy end-use and energy production. This is equivalent to an annual reduction of CO<sub>2</sub> emissions by approximately 4.6 million tonnes.<sup>2</sup>

1 Source: "Energy scenario analyses Enova-Ife". Analysis conducted by Ife – Institute for Energy Technology, commissioned by Enova (2009). Calculation based on methodology presented in the EU's Renewables Directive.  
 2 See chapter on Enova's Climate Impact, in this report's last section.  
 3 Source: <http://www.miljostatus.no/Tema/Klima/Klimanorge/Kilder-til-utslipp>  
 4 Source: Statistics Norway, Norwegian Pollution Control Authority (2009). Preliminary figures.

Without energy efficiency measures and a change in end-use patterns, Norway's energy end-use will increase in the long run. Norway's total share of renewable energy within stationary end-use and transportation is just over 60 per cent.<sup>1</sup>

Today, hydropower ensures that Norway's electricity end-use is based almost entirely on renewables, while this is not the case for the non-electric energy end-use. Extracting the potential from profitable energy efficiency measures should be an important strategy for increasing the share of renewables. Furthermore, the use of bioenergy and the development of new renewable power production facilities can give substantial contributions to increasing the share.

The EU's Renewables Directive sets a target of 20 per cent energy from renewable sources by 2020, as well as a 20 per cent reduction of CO<sub>2</sub> emissions and a 20 per cent increase in energy efficiency by the same date. Norway will do its part to help achieve these goals, and we expect Norway to enter into negotiations with a high level of ambition. Enova will take part in the efforts to meet Norway's obligations.

Norway must reduce its national emissions of greenhouse gases, and can also contribute to reducing emissions beyond its own borders. Norway possesses a wealth of energy resources, and we have the knowledge and the financial resources to develop progressive technology solutions. All in all, this results in good opportunities for exporting climate-friendly energy and technology to other countries.

In its joint political platform, Soria Moria II, the Government stated that Norway's role as a petroleum producer must be compatible with the ambition of leading the way in environmental and climate policies. The Government called for a stronger commitment to renewable energy and pledged to present a plan for strengthening these efforts further. The Government points to Enova as the most important tool for supporting renewable energy and energy efficiency.

## Changing attitudes and developing markets and technology

Enova aims to be a driving force to promote lasting change in the markets for renewable energy and efficient energy end-use. Based on studies charting potentials and forecasts up to 2020 and 2050, Enova has drawn up some main outlines for its long-term work:

- Reduce the demand for energy in buildings. Promoting buildings of passive house standard is an important step, while sustainable energy behaviour is a necessity.
- Make energy efficiency a competitive advantage for the industry.
- Make renewable heating a competitive and preferred alternative.
- Trigger the substantial potential for renewable energy production, also offshore.

To achieve this, Enova must work with a structured, long-term perspective. Enova's policy instruments will target three main areas, all of which are necessary if we are to achieve lasting change in the market:

- Technological development – the solutions must be identified and progressive energy solutions must be introduced to the market through technological development, innovation and demonstration.
- Changing energy behaviour – there must be a demand for the solutions.
- Increase the willingness to pay extra for the good energy solutions through information, knowledge and expertise.
- Market development – create efficient markets for the progressive energy solutions by stimulating demand and reducing risk and uncertainty.

The most important policy instruments in Enova's toolbox are financing and advisory services. Active use of these instruments will break down the barriers impeding technological development, market development and the change in energy behaviour, thereby triggering the substantial potential found within efficient energy end-use, renewable energy production and heat production.

Our challenge is to create predictability in the use of policy instruments and to exploit the interaction between the policy instruments used by Enova and other stakeholders in the best

way possible. There must be a clear connection between the basic aims of the programs and the measures Enova offers.

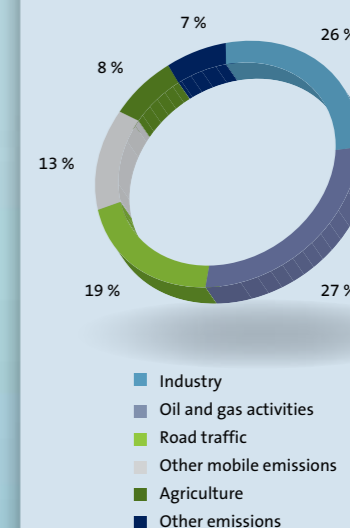
Achieving lasting market changes is an ambitious task. Therefore, it is important that the programs and the measures we initiate actually have an impact in the market.

We will continue to measure results at a project level. Programs that contribute to market change will be continued and developed. We must stay conscious of what the programs are intended to achieve in the market; and keep in mind that what really helps is not the overall sum of individual projects, but achieving lasting market change.

**Norway's greenhouse gas emissions**  
 Total emissions of greenhouse gases in Norway increased by more than eight per cent from 1990 to 2008, with the strongest growth in the mid-1990s. However, our greenhouse gas emissions are still 7.4 per cent above the level of Norway's commitment under the Kyoto protocol.<sup>3</sup>

Norway's commitment under the Kyoto protocol is to not increase our greenhouse gas emissions by more than one per cent compared with 1990. The Storting has resolved to exceed the Kyoto commitment by 10 per cent.

Greenhouse gas emissions in 2008<sup>4</sup>  
 (53.8 million tonnes of CO<sub>2</sub>-eq in total)



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# Enova's market units



# Technology support for larger projects

## Barriers, goals and visions

With its support for demonstration projects, Enova will contribute to verify and qualify new and more cost-effective technology for renewable energy production and energy efficiency. Projects where new technology is demonstrated under realistic operating conditions contribute to highlight the opportunities and potential that lies in new technological solutions. Insufficient knowledge regarding opportunities and challenges constitutes a critical barrier for the application of new technology.

## Activities in 2009 and expectations for the future

2009 saw a decline in both the number of applications received and projects supported. In spite of this, the overall funding awarded in 2009 was approximately equal to 2008. This is explained



### Osmotic power plant

In November, Statkraft opened the world's first osmotic power plant at Tofte in Hurum outside Oslo.

partly by larger individual projects in 2009, which among others included support for geothermal heat production, an innovative silicone production process and a tidal power project. New technology is attracting increased interest from industry, and sizable new projects are expected in both industry and renewable power production in 2010.

## Most important events in 2009

Renewable marine power production received considerable attention during 2009. In February we launched a targeted commitment with a dedicated program for marine renewable power production. Two tidal power projects received support through this new program during the year. Kinetic Energy will test a new tidal power plant in co-operation with Hafslund, and Hydra Tidal is currently building its tidal power plant which will be placed in Gimsøystrømmen.

In the autumn of 2009, two Enova supported projects were completed:



### Energreen

Energreen AS received support for carrying out full-scale pilot testing for extracting electrical power from pressure differentials in liquid flowing through pipes, typically in water reservoirs.

Statoil's floating wind turbine (Hywind) and Statkraft's osmotic power plant. Both projects represent demonstration of technology where Norwegian actors are world leading.

## Support programs

The New technology division provides support through three different programs:

The program "Innovative energy solutions" is aimed at verifying new technology and targets technology suppliers, manufacturers and end-users of these products.

The program "Introduction of new technology" is targeted towards bigger projects. The goal is to demonstrate and introduce new energy technologies to the market. The program supports projects aimed to qualify new technologies in way of energy results and operational experience. The program targets enterprises with deliveries to the Norwegian energy market as energy suppliers, as well as large energy consumers.

For a number of years, Enova has been supporting the development of new technology for renewable marine power production, from floating wind turbines and osmotic power plants, to wave power and tidal power projects. These projects have in the past received support through the program Introduction of new technology. However experience gained indicates that offshore renewable energy production has certain specific characteristics that require separate policy instruments. Therefore, a separate program, targeting all forms of renewable marine power production, was launched in February 2009.

## Market movements and trends

The total amount of applications for new demonstration projects is lower than Enova would like. Turmoil in the financial markets and the economy in general has led to increased challenges in allocating finance for new demonstration projects. The trend we see in the interest for the various support programs in Enova coincides with the market's willingness to invest, which was on the rise towards the end of the year. Offshore wind is an area of increasing interest and in 2010 we expect a particular focus on possible Norwegian demonstration projects.

## Strategies and ambitions

Enova has ambitions of gradually increasing support for verification and qualification of new technology and new solutions in the energy market. This will be an important part of our future activity.



Kjell Olav Skjølsvik  
Head of the New technology unit

## In short:

### What milestones were achieved in 2009?

The launching of a targeted commitment towards renewable marine power production was an important milestone in relation to developing the technology linked to this area.

### What posed the biggest challenge in 2009?

Turmoil in the financial markets and the economy in general have led to increased challenges in allocating finance for new demonstration projects.

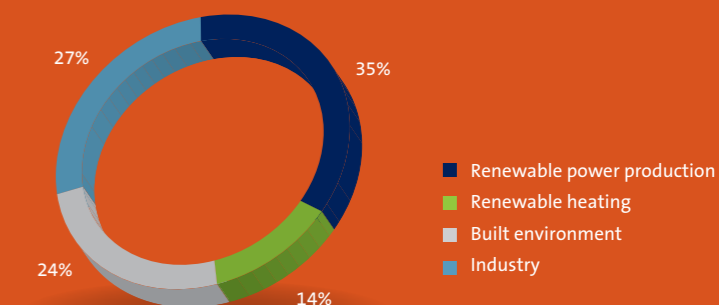
### What has been most gratifying for you, as head of the unit, in 2009?

The realisation of Hywind and the osmotic power plant at Tofte were important highlights.

### What ambitions do you have for the future?

As we move forward, the challenges will be to further develop the teamwork between the private and public sector in order to trigger seed capital for demonstration projects. Demonstration is important in order to generate knowledge and qualification of new solutions while representing long-term investments for the parties involved. This is an area Enova will work actively to develop in 2010.

## Projects within the New technology unit – distributed by sector (based on number of applications approved 2002–2009)



## FACTS 2009

Number of applications received: 19

Number of applications approved: 6

Funds allocated: MNOK 88

Contractual results:  
32 GWh in 2009  
84 GWh in total (2001–2009)

# 75 per cent of Norway's municipalities have received support for making energy and climate plans

## Barriers, goals and visions

The objective of Enova's Municipality unit is to help Norwegian municipalities draw up good energy and climate plans. The plans are intended to be a strategic foundation and a good tool for implementing specific projects within energy efficiency measures in the municipalities' own buildings, developing passive house standards for new buildings, heating plans and awareness work within the municipalities. Through its support program "Municipal Energy and Climate Planning", Enova has helped fund energy and climate planning, and assisted in mapping energy efficiency projects and heating projects in the municipalities.

## Most important events in 2009

The energy and climate plans are intended to be an aid in achieving concrete action. As part of this work, energy and climate seminars were held in the winter of 2009 in seven counties, in which a total of 109 municipalities took part. The focus was on the process from plan to action, with primary emphasis on projects within energy efficiency and conversion in municipal buildings and facilities, district heating and small heating plants.



### Bærum municipality

Bærum municipality is building Norway's first passive house kindergarten on Storøya, with an energy demand of just 66 kWh per square metre.

In the winter of 2009, Enova received additional funding from the Government's economic stimulus package. Measures targeting public buildings were an important commitment area for Enova's extraordinary programs, and this topic was therefore a focus point in the seminars. 73 per cent of the participating municipalities identified energy efficiency measures and applied to Enova for extraordinary support in the wake of the seminars.

In June, Enova and the Norwegian Association of Local and Regional Authorities (KS) launched the web portal [www.norskeklimakommuner.no](http://www.norskeklimakommuner.no). The portal is part of the cooperation between Enova and KS, and provides an overview of the status of the energy and climate planning work in the municipalities. The portal also features news articles and energy stories highlighting good examples of successful measures. Each municipality has its own page on the portal with information about its adopted energy and climate plan, as well as information about projects that have been carried out in the municipality.



### Kristiansand municipality

Energy advisor Rune Rosseland in Kristiansand municipality plans to reduce energy end-use in the municipal's buildings by 20 per cent in 2010. Since 2006, the municipality has already saved more than MNOK 5 and has reduced CO<sub>2</sub> emissions by 1 400 tonnes.

In connection with the Copenhagen climate summit in December, Enova conducted a seminar for the 13 cities that participate in the Cities of the Future project, with a total of 27 participants from all of the cities. Topics presented at the seminar included passive houses, energy efficiency and operation of municipal buildings.

## Support programs

The Municipal Energy and Climate Planning program consists of three sub-programs: "Support for energy and climate planning", "Pre-project support for energy efficiency in buildings" and "Pre-project support for heating". Municipalities and counties make up the target group.

Enova can provide funding for up to 50 per cent of the project costs for each of the sub-programs, limited to NOK 100 000. Each municipality can obtain support for each of the three sub-programs once per municipality.

The Government issued state planning guidelines in September which mandate the inclusion of climate and energy in all comprehensive municipal plans. As a consequence, Enova will phase out its plan subsidies during the course of 2010.

In 2010, emphasis will be placed on motivating municipalities that have set ambitious energy and climate goals to put these ideas into action. With the enthusiasm and willingness to make an effort we have seen from many municipalities in their climate work, it is important for Enova to continue to support and advise municipalities in the most efficient way possible.

## Market movements and trends

Interest in energy and climate work in the municipalities has remained high

in 2009. In addition to a large volume of applications for the municipal energy and climate program, the response to the Government's extraordinary stimulus package was substantial. A total of 166 applications comprising more than 650 buildings received funding commitments under the extraordinary building program.

## Strategies and ambitions

The municipalities will play a key role in the work to achieve an environmentally friendly energy restructuring of Norway in the years to come. Enova will continue to contribute to increased knowledge and expertise in the municipalities as regards prioritising energy and climate measures. Greater focus and activity will be aimed at ambitious municipalities that lead by example within Enova's market areas.

## FACTS 2009

Number of municipalities that have submitted applications for the sub-programs:

- 106 energy and climate plans
- 20 pre-projects for buildings
- 11 pre-projects for heating

Municipalities that received support for their energy and climate plans:  
130 municipalities

Funds allocated: MNOK 19

### Other key figures

- (for Norway's 430 municipalities):
- 116 municipalities have an approved, politically sanctioned plan
  - 232 municipalities have resolved to prepare an energy and climate plan, and many have submitted their plans for consultation
  - Only 82 municipalities have unknown status, or have not yet decided to prepare a plan

## In short:

### What milestones were achieved in 2009?

75 per cent of all Norwegian municipalities have now applied to Enova for support for developing their energy and climate plans. In 2009, 97 municipalities applied for such support. Enova and KS (the Norwegian Association of Local and Regional Authorities) launched a comprehensive web portal which united all Norwegian climate municipalities on the web. The portal provides an overview of completed energy and climate plans, and it constitutes a policy instrument designed to stimulate new energy and climate measures in the municipalities.

### What posed the biggest challenge in 2009?

The biggest challenge is to motivate the municipalities to maintain their focus, so that energy plans are actually turned into actions.

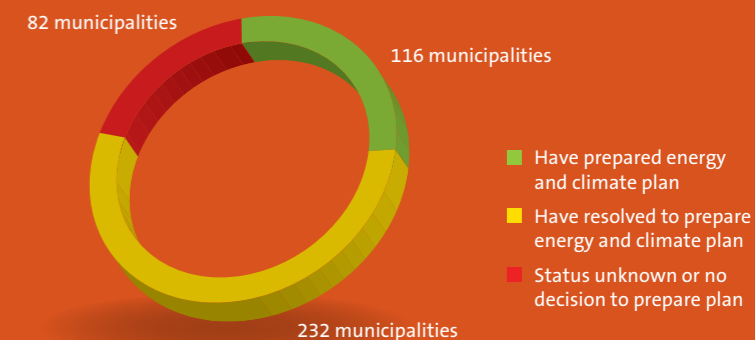
### What has been most gratifying for you, as head of the unit, in 2009?

It's gratifying to see how Enova, through its support programs, advice and seminars, has contributed to helping so many municipalities get started on their energy and climate planning work. At the same time, the huge volume of applications for Enova's extraordinary support program for buildings shows that many municipalities are ready to take action.

### What ambitions do you have for the future?

One ambition is to set up passive building projects in all of the 13 Cities of the Future, at the least, as well as establishing role models for energy efficiency in existing buildings. We will do this by targeting Enova's policy instruments towards ambitious municipalities.

## Status of energy and climate plans in the municipalities:



Kjersti Gjervan  
Head of the Municipality unit



# Focus on efficient energy end-use in households

## Barriers, goals and visions

Many Norwegian households do not reflect over the climate effects of their lifestyle and energy use. Enova's Household unit works to bring about a long-term market transformation for household energy end-use. Our ambition is that the Norwegian households of the future will discover the benefits of the smart and easy energy solutions – both in terms of cost, comfort and our common climate. We want households to demand homes with low heating needs, and to choose energy efficient technologies in their everyday lives. We want Norwegian consumers to have a heightened awareness of their energy end-use and thus lead them to avoid wasteful energy habits. We should rely less on electric heating of our homes and focus more on a sustainable use of renewable energy sources.

## Activities in 2009 and expectations for the future

The Household unit achieves energy results mainly through influencing knowledge and preferences in energy behaviour. The activities that sort under the children's program the Rainmakers, Enova's free advice service Ask Enova, the magazine Sfære (in English: Sphere), the website [www.enova.no/hjemme](http://www.enova.no/hjemme) and exhibits at trade fairs, are all intended to achieve this effect. All of these areas have experienced good activity levels in 2009. In terms of measurable effects, "Enova Recommends" has contributed to energy efficient triple glazed windows achieving a market share of about 30 per cent in the retrofitting market. The subsidy program for households has granted more than MNOK 33 for investments

in new heating technology.<sup>1</sup>

In 2009, total investments supported by this program surpassed MNOK 1 000.

## Most important events in 2009

A complaint was filed with the EFTA Surveillance Authority (ESA) concerning the subsidy program for households, citing that it distorted competition in relation to certain heating technologies that are not included under the program. ESA's decision was that the subsidy scheme is legal. This is an important decision for Enova, as the scheme is a key policy instrument for introducing new, energy-related technologies and services in the Norwegian market. During 2009, Enova Recommends was expanded to include low-energy windows and insulation of existing homes. The main idea behind Enova Recommends is to promote the best energy products in the most mature product categories on the market. The measures target both the supply side and the households. In the autumn of 2009, a new website for households was launched, [www.enova.no/hjemme](http://www.enova.no/hjemme), and a thorough visual update of product guides and brochures was implemented.

The Rainmakers who took part in this year's Vennergidag (in English: Energy Friends Day) in Fredrikstad – more than 6 000 in number – made the event one of the most successful in Rainmaker history. Along with the stage show featuring the Norwegian artists Alexander Rybak, Samsaya and Stian Barsnes Simonsen, the kids could choose from among 32 different activities linked to renewable energy and energy efficiency. This Energy Friends Day was an unmitigated success, both educational, exciting and fun.

## Programs and activities

The most relevant market programs in this unit are the subsidy program for households and Enova Recommends. The subsidy program is intended to help households choose new, less familiar energy-related technologies. Enova Recommends aims to boost market development of the most energy efficient products in an established, mature market. Enova's advice service "Ask Enova" provides free energy advice via phone and web, and works closely with the two other programs. The service also provides non-biased energy advice across the entire spectrum of energy end-use. These programs are supplemented by a number of policy instruments within communication, designed to spread knowledge and raise awareness regarding energy use. The Rainmakers are firmly established as Enova's program for children, youth and the schools. Sfære (Sphere), a magazine published by Enova, is distributed to a large target group among Norwegian households. Enova also interfaces with home improvement exhibitions all over the country, as well as through our website, product guides and other publications.



**Insulating traditional farmhouses**

*Old, draughty windows, sparse insulation, four kids, one tenant and an astronomical electric bill. Enova visited the Nossum farm in Levanger and offered good advice on how to weatherise the traditional old farm buildings.*

<sup>1</sup> The subsidy program for households receives earmark funding in the fiscal budget, i.e. not the Energy Fund.

## Market movements and trends

In spite of the economic uncertainty that marked 2009, our activities delivered good numbers. The number of inquiries to Ask Enova grew by 35 per cent. A survey shows that two out of three people feel that they receive useful energy advice from Enova. The subsidy scheme has contributed to the development of heat pump solutions for water-borne heating systems, and has led an increasing number of consumers to choose this alternative for their heating needs. Ask Enova has also triggered substantial interest on the supplier side, particularly for low-energy windows.

Sfære (Sphere), Enova's popular free magazine, is distributed to nearly 450 000 households. The main challenge for the future is to attract even more readers, and motivate them to take action.

Enova experienced quite a lot of positive publicity in 2009, both for Enova in general and for the topic of energy efficiency. The fact that our message is reinforced by opinion makers in the public debate is a necessary part of our long-term work.

## Strategies and ambitions

The focus on efficient energy end-use will be followed up as we continue our work. A coordination with the Built environment unit's passive house strategy is central in this work. In 2010, we will develop new meeting forums for our market through workshops, conferences and focus groups. Our ongoing work to develop methods for documenting results in this area will also be continued and reinforced.



**Even Bjørnstad**  
Head of the Household unit

## In short:

### What milestones were achieved in 2009?

Thanks to Enova Recommends, we achieved a minor but nevertheless important breakthrough for low-energy windows in the retrofitting market. Receiving confirmation that the subsidy program for households does not violate EEA rules for government subsidies and therefore can be continued as planned, was another important milestone.

### What posed the biggest challenge in 2009?

The greatest challenge lies in continuously refining a good and effective portfolio of policy instruments that can seed progressive energy behaviour in the households.

### What has been most gratifying for you, as head of the unit, in 2009?

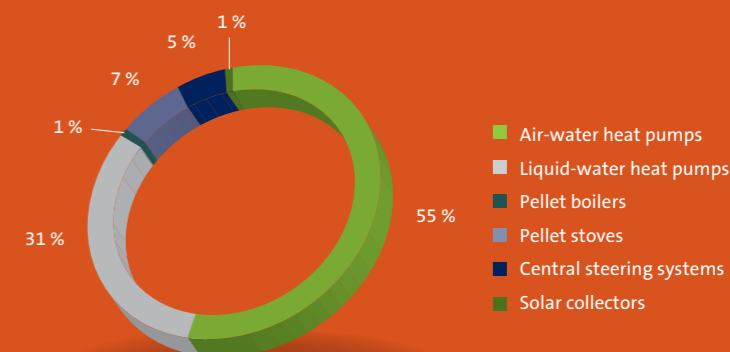
It is gratifying to note that concepts such as "reduced need for energy" and "energy efficiency" have achieved a substantially more positive spin in the public debate.

### What ambitions do you have for the future?

Our ambition is to enhance understanding of the importance of choosing smart and progressive energy solutions that are easily adaptable.

## Household subsidies distributed by technology:

Percentage distribution of disbursements under the subsidy program for households by various technologies.





# Increase in the number of buildings supported for implementing energy measures

## Barriers, goals and visions

Buildings account for 40 per cent of the stationary energy end-use in Norway. The barriers that prevent significant reduction in energy end-use are related to the fact that the owners of the buildings are often not the ones paying the energy bill. Other barriers include the level of knowledge of energy efficiency measures among building owners, and lacking construction and retrofitting expertise in the construction sector to ensure energy performance that exceeds regulatory requirements. Enova will contribute to ensure that as many buildings as possible achieve energy performance with a passive building standard. The target is for all new construction and retrofitting to be based on the passive building standard by 2020.

## Energy result in 2009 and expectations for the future

Through its ordinary program, Enova has granted MNOK 118 in funding distributed among 60 projects that have generated 229 GWh. Under this program, Enova has supported 15



### Myhreenga borettslag

Myhreenga Borettslag (housing cooperative) at Skedsmokorset outside Oslo is renovating its 168 apartments so that heating demand is reduced by an impressive 90 per cent. The estimated reduction in total energy end-use is 70 per cent.

prototype projects<sup>1</sup> where the energy end-use is just one-half of the prevailing practice in the market. Through the extraordinary stimulus program targeting public buildings, a total of 166 projects received MNOK 421 in support. The goal of this program was rapid implementation of measures to support employment in the construction industry. Therefore, energy result requirements were lower than under ordinary programs. In 2010, we will redouble our focus on projects aimed at achieving the passive building standard, and a revision of the programs will yield a larger store of projects that will help trigger the potential found in the building sector.

## Most important events in 2009

The Built environment unit has implemented a strategy process leading to a significant, ambitious goal to ensure that all new construction and retrofitting activities achieve the passive building standard by 2020. This will be reflected in a new program structure already in 2010.

Enova participates in the Low-energy Program, a partnership between the state and the construction industry. In 2009, the program conducted course and training activities to better equip



### The Møller Group

In spite of a decline in automobile sales, the Møller Group invested in energy efficiency measures in the Group's buildings, covering a total of 240 000 square metres. The Møller Group expects to save 7.5 GWh.

the construction sector to deal with the more rigorous technical energy requirements that took effect from August 2009. The stimulus package for public buildings was developed as part of the Government's jobs effort. Funds were allocated in 2009 and the projects will be followed up throughout 2010.

## Support programs

In keeping with a sharper focus on passive buildings, changes will be implemented in the building sector programs in 2010. The programs will target two main groups, one of which includes innovators who want to build passive houses or renovate existing buildings to the passive house standard. The other group includes those who want to build or renovate to achieve the low-energy standard. The innovators are an important target group, both in relation to new construction and retrofitting. This is where the passive building concept will first take shape in the form of concrete projects, and this is where expertise will be developed. To receive funding under this program, the entire building must satisfy the requirements for passive building or low-energy standard. The other part of the market will include those who work on measures within existing buildings, where support is given for individual measures. In this case, there are no requirements for the entire building, but an increased volume of passive houses and low-energy components will contribute to the desirable market restructuring. Enova's team of advisors will also offer their assistance in the early phase of prototype projects.

## Market movements and trends

2009 was characterised by the extraordinary program targeting public buildings, under which we received more than 500 applications requesting funding of more than MNOK 6 000. The program was based on standardized support rates and energy results linked

to individual measures per building. The market responded enthusiastically to the simplified application process, which illustrates the enormous potential for energy reduction measures in public buildings.

The energy requirements set out in building regulations were intensified. The Energy Label scheme for buildings will be introduced from 2010, which will mean added attention to Enova's programs. We want to utilize the synergy entailed in these types of programs. The market trend shows increasing awareness of passive buildings, both residential and commercial.

## Strategies and ambitions

The programs will have a sharper focus on passive buildings as a strategic direction during the course of 2010. This means that all projects must have ambitions that are significantly better than the requirements in the building regulations. The projects must contribute to market development towards more buildings with minimum energy end-use, either at the building level or the component level.

## FACTS 2009

Number of applications received:  
638

Number of applications approved:  
225

Funds allocated:  
MNOK 538

Contractual results:  
303 GWh in 2009  
2 555 GWh in total (2001–2009)



Håvard Solem  
Head of the Built environment unit

## In short:

### What milestones were achieved in 2009?

Buildings with an energy demand at passive house level represents Enova's main strategy in the Built environment unit. The strategic work results in straight-forward programs designed to trigger the potential found in Norwegian buildings.

### What posed the biggest challenge in 2009?

The "Stimulus package Buildings 2009" for public buildings was a new program that necessitated planning, implementation and follow-up, in addition to the ordinary building programs and tasks.

### What has been most gratifying for you, as head of the unit, in 2009?

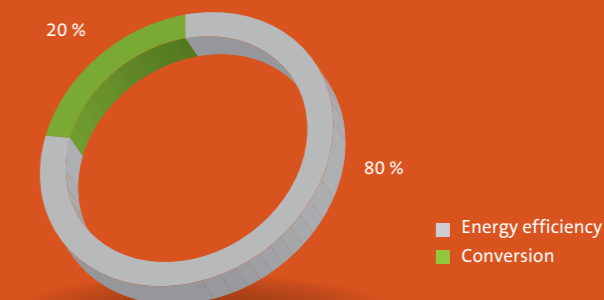
I am happy that the passive house concept has been established as the strategic direction for the entire Department of Energy efficiency, so that all of the department's policy instruments can be viewed in a single context.

### What ambitions do you have for the future?

We wish to contribute to a rapid realisation of the passive house standard as the building code level, and assist the construction sector in becoming the main contributor to solving society's energy and climate challenges.

## Distribution of energy results in 2009:

(based on contractual energy results from funding commitments within ordinary programs)



<sup>1</sup> Three of the prototype projects were supported under the "Stimulus package Buildings 2009" program.

# Increased interest in the industry market

## Barriers, goals and visions

Enova's objective is to contribute to help Norwegian industry realise its potential within energy efficiency and restructuring, and thus become the most energy efficient industry in the world.

The Norwegian industrial community is composed of a large number of companies with very different activities and production, with varying challenges linked to different branches and areas. Overall energy end-use within industry and mining has levelled off, but energy costs rise each year. For the industry sector, controlling energy end-use will be an important contribution to competitiveness and continued existence. There is a huge potential for energy efficiency and conversion to renewable energy in Norwegian industry, and Enova will contribute to breaking down the barriers that are slowing or stopping these efforts.

## Energy result in 2009 and expectations for the future

In 2009, the energy result from Enova's contracts with the industry amounted to 1.25 TWh. This is the biggest result



### Climate-friendly smelting plants

Ferrosilicon producer Finnjord AS in Troms county aims to be the world's most climate friendly smeltery. The energy saved, which will amount to about 224 GWh, is equivalent to the energy end-use of 8 400 single-family dwellings. Finnjord AS will also deliver 125 GWh of process heat to other enterprises in the field of bioenergy production.

ever for the Industry unit, and with this, the total contractual result vis-à-vis the industry amounts to 4.4 TWh since Enova was founded. In total, more than MNOK 1 100 has been allocated in support for the industry's projects, of which nearly MNOK 600 were allocated in 2009. The interest in Enova's industrial activities has been high throughout the year, and we expect continued access to good projects. The industry's market situation will nevertheless be a determining factor for the extent to which this potential can be extracted.

## Most important events in 2009

At the beginning of 2009, Enova's expectations were low as regards what could possibly be achieved vis-à-vis the industry, but the extraordinary funds in the Government's stimulus package meant that Enova could tailor its support to better meet the industry's needs. This has in turn contributed to Enova's contracts with the industry in 2009 breaking all previous records.

Enova conducted two extensive studies in 2009 in order to chart how we can support and reinforce our efforts vis-à-vis the industry. The study of the waste heat potential concluded that there is a total of nearly 20 TWh of waste heat



### Nidar reduces energy use

Robert Hjeltnad leads the maintenance department at Nidar in Trondheim. Since 2005, the sweets factory has cut energy end-use by 5 GWh, which equals the average energy demand of 250 homes.

with temperatures above 25°C available from Norwegian industry. Exploiting this potential poses a challenge, and we see a need for both technological development and infrastructure reinforcement.

The study of the energy efficiency potential in industry reveals considerable profitable potential. The study also analyses the barriers that prevent realisation of these measures.

In November, the Industry conference attracted nearly 200 participants. This is an important meeting place where both the industry and skilled advisors can have an informal dialogue. The Industry conference contributes to strengthened relations to our markets and to building networks between different sectors and players.

## Support programs

Enova has had one program aimed at the industry throughout 2009: Energy end-use – Industry. Through this program, Enova contributes with investment support for covering up to 20 per cent of the extra costs that accrue when implementing projects in the fields of energy efficiency, energy recovery/waste heat exploitation and conversion to renewable energy in the industry. Enova's industry program was established in 2005, and covers projects with energy results greater than 0.5 GWh. As a result of the stimulus package, 2009 saw a change in the requirements relating to percentage of support and energy yield: Up to 40 per cent support was allowed, and the average energy dividend has been more than 2 kWh/NOK, compared with the previous nearly 4 kWh/NOK. In 2010, we will further reinforce the programs towards Norwegian industry.

## Market movements and trends

Interest in the market has been robust in 2009. We have contracted some very large projects, as well as many medium-sized projects. Of the contractual result in 2009, 106 GWh is attributed to efficiency measures in the energy-intensive industry, and 164 GWh to energy efficiency measures in less energy-intensive industry. There has been a particularly strong presence by the food industry this year. More than 363 GWh relates to conversion from oil to renewable energy, while 617 GWh is linked to energy recovery/waste heat exploitation.

## Strategies and ambitions

In 2010, we will continue to work on strengthening strategies and commitments vis-à-vis Norwegian industry. The study of the potential for energy efficiency measures in the industry is an important initiative. We will also examine how Enova's comprehensive spectrum of measures can best serve our users.

## FACTS 2009

Number of applications received:  
44

Number of applications approved:  
43 applications, of which 4 were additional grants to existing projects under the stimulus package.

Total amount of support granted:  
MNOK 580

Contractual results:  
1 250 GWh in 2009  
4 357 GWh in total (2001–2009)

## In short:

### What milestones were achieved in 2009?

We surpassed MNOK 1 000 in total support to the industry, 4 TWh in contractual energy results, and carried out two new studies of potentials. In addition, nearly 200 people participated at the industry conference in November.

### What posed the biggest challenge in 2009?

Low energy prices created a greater than expected need for support, which has put pressure on our limits as regards energy dividend. We have also seen some sluggishness in the industry's decision processes in the past year, which means that it takes longer before projects are initiated.

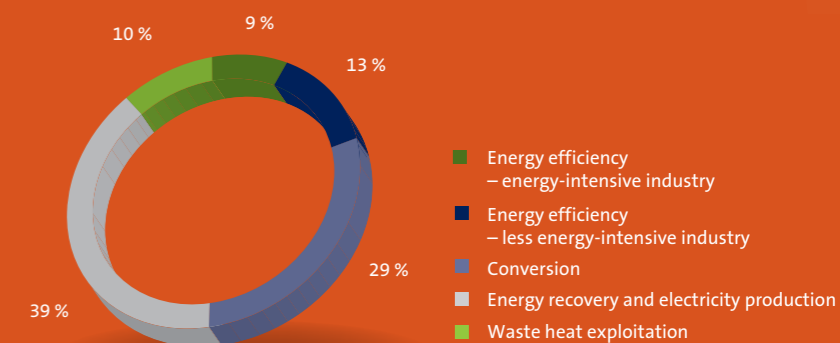
### What has been most gratifying for you, as head of the unit, in 2009?

I was happy to see that we brought the biggest projects so far into our portfolio, and thus achieved unprecedented attention for the services we offer. The study of potentials in the sector has also helped us create a whole new enthusiasm among the companies and organisations that have been involved in this work.

### What ambitions do you have for the future?

Using the potentials studies as a basis, we will strengthen our efforts vis-à-vis industry, both through a clearer commitment to heating and through a simpler program for smaller enterprises. We will contribute to making energy management a natural element in the management structure of all companies.

## Distribution of energy results in 2009:



Marit Sandbakk  
Head of the Industry unit



# 4 TWh renewable heating contracted

## Barriers, goals and visions

Enova has the ambition that renewable energy shall be the preferred source for heating in buildings and industry. This applies also for buildings with low demand for heating. To realise this, costs must be reduced in order to make renewable heat more competitive compared to electricity, oil and gas. Renewable heat is provided by sources such as bioenergy, heat pumps, solar and waste heat. Enova contributes to facilitating greater dissemination of renewable heat by supporting the development of district heating and small heating plants all across Norway.

## Energy result in 2009 and expectations for the future

A contractual renewable energy result of 993 GWh in 2009 represents a historically high level. About 90 per cent of this result comes in the form of district heating. During 2009, investment support was given to establish 24 new plants and expand 29 existing plants. These projects will in total deliver 1063 GWh of heating, out of which the renewable energy deliveries amount to 844 GWh.

In 2009, four larger towns currently lacking district heating have received funding for the development of such. This leaves just one more town to go

until all of Norway's 20 largest towns have district heating based on renewable energy sources. Suppliers of district heating are expected to further develop their existing plants, while we also expect that new district heating systems will be established to an increasing degree in smaller communities. This, combined with more distributed small heating plants, will contribute to fewer oil boilers in operation, and less use of electricity for heating.

## Most important events in 2009

The Government's stimulus package provided additional funds of MNOK 347 for the Renewable heating unit, which has contributed to the start-up of significantly more heating projects than would otherwise have been the case. In addition to triggering investments in several small heating plants and district heating projects with funds from the stimulus package, the Renewable heating unit also introduced a support program aimed at converting 100% electric heating systems to renewable water-borne heating. There was considerable interest in this program, particularly on the part of the municipalities. In 2009, a targeted commitment was also carried out in the field of biogas production. This program contributed

to facilitating increased biogas production in Fredrikstad, and ensured that future district heating in Moss can be based on biogas.

## Support programs

Enova has four programs for supporting renewable heating projects. The program for "New district heating" supports the establishment of new district heating, while the program for "District heating infrastructure" contributes to the expansion of existing district heating facilities. Only minor changes have been made to the district heating programs since the beginning of 2008. The program for small heating plants aims at implementing renewable heating of buildings where district heating is a less likely option. To a greater extent than the district heating programs, the program for small heating plants is subject to continuous evaluation and adaptation. As a result of the stimulus package, the potential funding amount per kWh was doubled in 2009, and an adjustment towards a lower funding amount per kWh must be expected in 2010. The support for biogas production support will be continued in 2010 and 2011.

## Market movements and trends

While Norway's largest cities are in the process of expanding their district heating plants to cover increasingly larger areas, district heating is also advancing in smaller communities. Bioenergy is the dominant energy source, and has in recent years accounted for 55 – 70 per cent of the contractual volume of renewable energy. Energy recovery from waste is another important source of heat supply. The demand for heat pumps, particularly geothermal heat pumps, showed a dramatic upswing compared to previous years. Although heat pumps have been particularly popular for providing heat

to single or smaller groups of buildings, several district heating projects have also been built on the basis of heat pumps in 2009.

Biogas production is a field that has seen little testing and application in Norway. Enova received few applications to the biogas program in 2009, and the interest in biogas is expected to increase in the years to come.

## Strategies and ambitions

Enova recognises the need to develop the entire value chain for renewable heating. To achieve this it is important to establish a sustainable heating market that can deliver the goods and services needed. In addition to profitability in the actual supply, the sector faces price and availability challenges on the fuel side. Enova continuously monitors and analyses the biofuel market, and will among other things conduct a scenario analysis of the pellets market in 2010. Costs associated with water-borne heating systems in buildings are also higher in Norway than in comparable countries, and Enova wants to contribute to improved skills and stimulate to the development of simpler, less costly systems.

## FACTS 2009

Number of applications received:  
482

Number of applications approved:  
337

Funds allocated:  
MNOK 782

Contractual results:  
993 GWh renewable heating in 2009  
4 117 GWh renewable heating in total  
(2001–2009)



**Follo fjernvarme** (district heating)  
Follo Fjernvarme's pellet-fired heating plant in Ski will eventually become part of a major district heating grid in Ski.



**Oplandske Bioenergi's wood chip-fired bio-plant**  
Oplandske Bioenergi's wood chip-fired bio-plant in Bagn delivers heat to municipal users in Sør-Aurdal municipality.



**Helle Grønlid**  
Head of the Renewable heating unit

## In short:

### What milestones were achieved in 2009?

Enova has achieved the target of 4 TWh of contractual renewable heating. The Renewable heating unit's programs have contributed with more than 4 TWh. In addition to that, significant heating results have been achieved through Enova's programs in the Industry and Built environment units.

### What posed the biggest challenge in 2009?

Low and falling power prices throughout the year enhanced competition for the renewable heating industry compared to the alternatives. This resulted in a greater need for support for the projects in 2009, compared to 2008.

### What has been most gratifying for you, as head of the unit, in 2009?

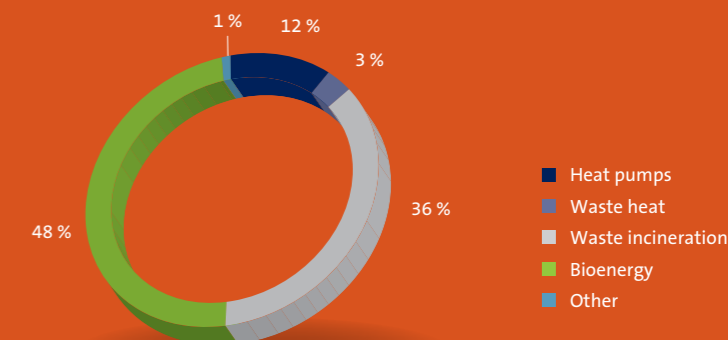
The fact that Enova, through the stimulus package, was able to contribute to triggering the development of renewable heating to an even greater extent than previously, and maintain the investment level in the sector, in spite of the economic downturn.

### What ambitions do you have for the future?

Contribute to a functioning heating market and a sustainable heating sector that can realise the considerable potential that exists for renewable heating.

## Energy result distributed by energy source

Renewable energy supply from renewable heating, distributed by energy source (2001–2009)



# 450 GWh of new wind power supported

## Barriers, goals and visions

Enova believes that increased development of renewable power production in Norway is an important contribution towards solving our global climate challenges. The Norwegian natural resources potential in this area is substantial, both onshore and offshore. Norway ought also have what it takes to develop robust, cost-effective products in renewable power production, that can be used both on the Norwegian and global markets. Enova believes that this will eventually give a good foundation for projects such as large-scale development of wind power in Norway, and that Norway could become a major exporter of renewable power production to Europe in the future.

Profitability is the main barrier for increased development of wind power. The difference between the market price for electricity and production costs for a wind farm is currently



### Hundhammerfjellet wind farm

Hundhammerfjellet wind farm on Nærøy in Nord-Trøndelag county consists of 17 wind turbines, developed in several stages since 1998. The wind farm has functioned as a technology demonstration facility for new technology adapted to Norwegian conditions. In 2009, NTE received funding for a new turbine to replace an older test turbine.

between 0.2 and 0.3 NOK/kWh. Technological development and reduced investment costs, combined with greater knowledge and experience in the operation of wind power parks in Norway will be key factors in making Norwegian wind power commercially viable over the long term.

## Energy result in 2009 and expectations for the future

In the most recent round of applications, Enova supported four projects with funding totaling MNOK 1 100. These projects have an expected production of about 450 GWh in total and represent the largest funding ever granted by Enova. To date, Enova has provided a total of approximately MNOK 1 500 in funding for 14 Norwegian wind power projects, which will have an anticipated annual production of about 1.6 TWh in total. Enova will conduct a new round of applications in 2010.

## Most important events in 2009

The record-high funding granted in 2009 represents an important contribution towards the further development of the wind power market in Norway. To ensure that this development continues, it is important that projects are actually implemented. More experience with development and operation is essential if we are to exploit our wind resources more efficiently in the future.

Another important event for the Norwegian renewable power production market in 2009 was the agreement with Sweden regarding the establishment of a common green certificate market. This certificate market will make a positive contribution towards developing renewable power production in Norway by providing more predictable framework

conditions for the players. In 2009, Enova commissioned TNS Gallup to conduct a survey of the public opinion on wind power in municipalities where wind power is already established or planned. The survey revealed that first-hand experience with wind power in the community contributes to a positive opinion among the local residents. Of the respondents, 34 per cent said that they have a more positive opinion of wind power after the wind turbines were erected. This positive attitude is an important advantage towards establishing more wind power.

## Support programs

Enova's 2009 wind power program was a continuation of the 2008 program; and the program will also be continued in 2010 without significant changes. The criteria for applying for support is that the wind power project has secured a final licence and access to sufficient grid capacity. For projects that do not require a licence, all of the consents and approvals required under the (Norwegian) Planning and Building Act must be in place, and it must be possible to connect the projects to the electrical grid. The 2010 application round, announced in November, also allowed applications for support for stand-alone wind turbines.

## Market movements and trends

Enova has noted a great deal of interest in the wind power program, which is regarded as an important policy instrument to promote increased production of land-based wind power in Norway. The sector has been waiting for the wind power program to be replaced by a more long-term, permanent support system. The planned certificate market with Sweden beginning in 2012 will help facilitate this. As more wind power

projects are planned and implemented in Norway, Enova believes that the policy instruments to promote increased development should be on a purely commercial basis. Replacement of the wind power program by a commercial green certificate market is an important step in the further development of the Norwegian renewable power production market.

## Strategies and ambitions

In the years to come, the Renewable power production unit in Enova will primarily focus on development of marine renewable power production in Norway. Close cooperation with the industry is essential for the best possible development of this market. Major offshore wind power developments are already planned in Europe, with the participation of a number of Norwegian players. Enova believes that this provides a unique opportunity for Norway to develop and test products in the international market, which can subsequently be used in a future offshore and onshore wind power market in Norway.

## FACTS 2009

Number of applications received:  
12 applications, of which 10 were for funding allocations in 2009.

Number of applications approved:  
4 applications

Funds allocated:  
MNOK 1 068

Contractual results:  
453 GWh in 2009  
1 605 GWh in total (2001–2009)



Espen Borgir Christophersen  
Head of the Renewable power  
production unit

## In short:

### What milestones were reached in 2009?

In 2009, the funding granted by Enova to renewable power production in Norway was an all time high, pledging investment support totalling nearly MNOK 1 100 to four wind power projects.

### What posed the biggest challenge in 2009?

The biggest challenge was the global financial crisis, falling power prices and substantially greater uncertainty for the market players.

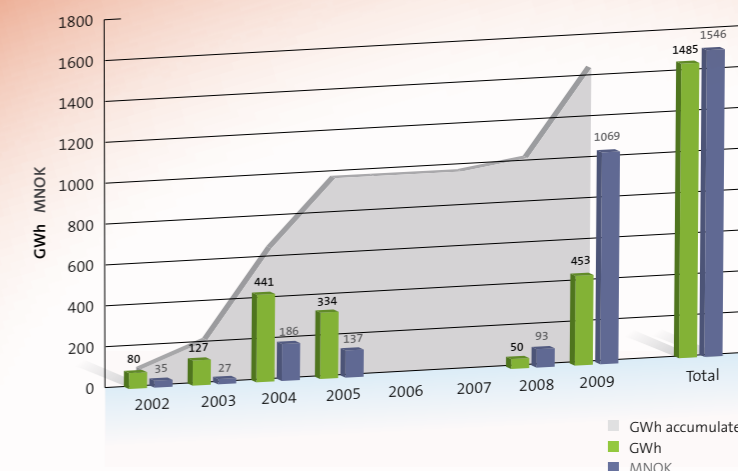
### What has been most gratifying for you, as head of the unit, in 2009?

The fact that Norwegian land-based wind power emerged as a cheaper environmental technology in 2009 than was the case in 2008. Investment costs for wind power are reduced, and it appears that this trend will continue.

### What ambitions do you have for the future?

To ensure further development of the Norwegian market for onshore wind power. At the same time, we have to develop the programs we offer for renewable power production in general, adapted to a future green certificate market.

## Energy results and support for wind power 2002–2009





# Marked increase in public awareness of Enova

## Barriers, goals and visions

The Department of Communication and public relations coordinates the company's public relations work and is responsible for both internal and external communication, marketing and publicity and public affairs. Targeted, effective communication should inspire individuals and enterprises to make responsible changes and highlight the potential and opportunities for environmentally friendly restructuring of energy end-use and energy production. Low awareness of Enova constitutes a barrier in relation to these efforts. Key objectives are therefore to increase awareness and reinforce Enova's reputation and profile as an energy and climate policy instrument. The work done by the department should support the company's paramount goals.

## Activities in 2009 and expectations for the future

The TNS Gallup analysis institute carried out two awareness and profile surveys in 2009, both of which showed a marked growth in unprompted knowledge of Enova in the general population. In December 2009, 29 per cent of those asked said that they were aware of Enova, which is up from 25 per cent in May 2009 and from 17 per cent in May 2008. Enova expects

awareness of the company to continue to grow in the years to come. An important communications goal is to increase unprompted knowledge to 45 per cent by the end of 2013. Another ambition is to significantly bolster awareness of Enova, and to enhance our reputation.

## Most important events in 2009

The communications campaign "Snu strømmen!" (in English: "Reverse the Current!") was launched in January, with the primary message of more efficient energy end-use year-round being communicated through television commercials, ads, media contact, various arrangements and events. Enova was also included in the Government's stimulus package in response to the financial crisis, which entailed communication challenges linked to a great amount of attention in the media, not least the number of applications and funding awards. Small heating plants and municipal building projects received particular attention.

The Norwegian commitment to renewables and the future market for green certificates figured prominently in the news last summer, accompanied by a rousing media debate up to the parliamentary elections. Enova's main role here was to provide factual information, including frequent quotes

from Enova's expert staff. At the start of the heating season, Enova kicked off a PR focus on thermography in buildings and the municipalities' energy end-use. There were major articles in both the national and regional media, which supported the message broadcast in larger campaigns in paid media channels.

Enova was in attendance in Copenhagen during the climate negotiations (COP15), with activities including a course for Norwegian journalists in cooperation with Cicero (climate research centre) regarding relevant energy and climate issues. The objective was to communicate that Enova's activities are part of the solution to the climate challenges.

## Activities

Enova reorganised its communications activities in the spring of 2009, establishing a new staff unit with special responsibility for communication and public relations. The work in the new department is led by a chief communication officer, accompanied by dedicated resources in the areas of marketing/profiling, press contact, public affairs and internal communication. The department places great emphasis on delivering communications solutions that include all profes-

sional disciplines, in a project-based collaboration with Enova's market-oriented units. The department is responsible for and works closely with Ask Enova, part of Enova's nationwide information and advisory service.

## Market movements and trends

Enova has experienced greater interest in its activities in 2009. Market analyses and measurements provide the enterprise with a good overview of developments in various market segments and target groups, and we can on this basis evaluate the impact of various communications measures. News monitoring of the Norwegian media in 2009 reveals an impressive 6 700 articles or features about Enova, which is more than double the number in the previous year. Ask Enova recorded nearly 40 000 inquiries in 2009, about 40 per cent more than in 2008.

In TNS Gallup's Climate Barometer 2009, Enova was listed as the Norwegian organization with the highest credibility as regards pledges and strategies for limiting greenhouse gas emissions. Enova earned a top score, along with the environmental organisations, when respondents were asked about the work being done to limit emissions.

## Strategies and ambitions

Enova has revised its communications strategy, based on the enterprise's business strategy for 2010–2013. This entails a clear ambition for the enterprise's communications work to assume a more important position – "A clearer, more significant Enova". Coordinated, consistent communications work is important when promoting an environmentally friendly restructuring of energy end-use and renewable energy production.



Bård Bjerkaker  
Chief Communication Officer

## In short:

### What milestones were reached in 2009?

We marketed Enova's task in connection with the Government's economic stimulus package in a way that yielded an impressive response. Awareness of Enova showed marked growth.

### What posed the biggest challenge in 2009?

The biggest challenge was handling the massive rush and activity in connection with the stimulus package and the unprecedented budget funds available. Enova received a very large number of inquiries and applications as a result of a successful campaign, and the media was very interested.

### What has been most gratifying for you, as head of the department, in 2009?

The growing recognition of Enova as a driving force for environmentally friendly energy restructuring in Norway, and that we had such a distinct presence at the climate negotiations in Copenhagen. We also facilitated better coordination and more uniform communication efforts by establishing a dedicated Department of Communication and public relations.

### What ambitions do you have for the future?

Continuing to build Enova's reputation 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 prominent driving force in the work to promote environmentally friendly energy restructuring in Norway.



"Snu strømmen!" (in English: "Reverse the Current!")

Christmas tree lights are turned off in Norway's largest cities, kicking off the campaign



COP15

Enova was an active participant in Copenhagen.



Unveiling HyWind

Substantial media interest in wind in 2009.

## International activities

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 raises our level of knowledge and enables application of best practice in selecting national policy instruments and objectives. Participation in international arenas also makes it possible for Enova and Norway to present our first-hand experience to others and, moreover, to have an impact on expert energy development.

Enova's international activities encompass a number of areas, including participation in the work associated with the International Energy Agency (IEA), the EU program «Intelligent Energy Europe» (IEE II), the «European Energy Network» (EnR), the «European council for energy efficiency» (ecee) and the Nordic research project «Nordic Energy Perspectives» (NEP).

Enova's involvement in IEA largely takes place through participation in several of the agency's programs; «Implementing Agreements» (IAs). Enova contributes to influencing the focus and priorities in the work that is done, and also has access to energy data in the form of analyses and reports. This can have a significant impact on the choices we make in terms of national energy policy instruments and technology commitments. By prioritising this commitment, Norway can take an early lead in implementing effective policy instruments, by initiating technological measures that have been proven effective in other countries.

### IEE II

Since 2003, Enova has managed the EU's non-technological program Intelligent Energy Europe on behalf of the Ministry of Petroleum and Energy (MPE). Starting from 2007, the program was added as one of three sub-programs under the Competitiveness and Innovation Framework Programme (CIP), and thus entered its second period, which runs to 2013. The purpose of the program is to remove or reduce cultural, institutional, economic, social and legal barriers that impede and limit energy efficiency and use of renewable energy. This supports the EU's objectives regarding reliability of supply, sustainable development and competitiveness.

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

In relation to the EU's work program, it was indicated in 2009 that the announcement would open the door for «Market Replication Projects» in cooperation with the European Investment Bank, EIB. The scheme (ELENA) was announced in December with a limited budget, scheduled to increase in 2010. ELENA primarily targets realisation of investment projects in the public sector.

### Applications for support

Enova covers up to 25 per cent of the Norwegian partner's share of the project, while the EU covers 75 per cent. Norwegian partners could in 2009 also apply for up to NOK 50 000 towards the framing of project proposals.

Eight applications for pre-project support were received in 2009. Two of the proposed projects did not meet the program criteria. The total funding allocated amounted to NOK 280 000.

Fourteen applications were received for national co-funding. Four proposals did not meet the program criteria. Total funding granted amounted to approximately MNOK 5.1.

A total of 24 projects with Norwegian partners were received for review. Of these, seven proposals are engaged in contract negotiations, while two are on the back-up list. None of these projects has a Norwegian coordinator. This yields a success rate of 7/24, or 29 per cent, which is good compared with the average (59/372, or 16 per cent) for applications in general. However, the new outcome is lower than in previous years when Norway has regularly been among the two or three best nations, measured per capita.

## Natural gas

*On assignment from the Ministry of Petroleum and Energy (MPE), Enova has entered into agreements with developers of transmission and storage facilities for natural gas. This program is organised according to the guidelines that apply to Public Service Obligations (PSO). No new contracts were signed in 2009, and the budgeted funds will therefore be transferred to 2010.*

According to the MPE's regulations for managing the program and the terms in the fiscal budget, Enova's goal is to facilitate increased domestic use of natural gas. Conversion from heavier fuels in industry, shipping and transport are prioritised market areas. As part of this assignment, Enova has developed a general model for designing terminal and storage facilities for Liquefied Natural Gas (LNG).

In 2009, Enova received offers from four bidders. The number of projects was lower than in previous years, and the expected gas deliveries were also lower in the respective facilities. This could be linked to the financial crisis and lower activity in Norwegian industry. The financial framework for 2009 was approx. MNOK 30. Enova initiated negotiations with one of the bidders with the intention of signing an agreement. However, the bidder was unable to establish a gas delivery contract with the relevant customers, and therefore no new contracts were signed in 2009.

Saga Fjordbase completed construction of its LNG facility at Fjordbase in Florø in 2009. Delivery of LNG to the supply fleet is underway, and the project was completed according to plan.

During 2009, Naturgass Møre built an LNG terminal and storage facility in Bingsa near Ålesund. At the beginning of 2010, some work remains before the facility can be put into operation. The original plan called for construction of the facility at Vedde in Sula municipality.

Enova has participated in the development of LNG facilities at Herøya, Lista, Høyanger, Florø, Ålesund and Mosjøen. Enova also has a financial commitment to the facilities under development and construction in Østfold county, and at Tjeldbergodden and on Melkøya

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# Results and activities



## Enova's main goals

The agreement between the Ministry of Petroleum and Energy and Enova regarding the management of resources from the Energy Fund during the period from June 1<sup>st</sup> 2008 to December 31<sup>st</sup> 2011 states six main goals for Enova. Enova's annual result report describes and summarizes on these.

### Main goal 1: More efficient energy end-use

The main objective of Enova's programs within the Built environment and Industry units is improved energy efficiency. In 2009, support was granted to a total of 264 projects within the Built environment and Industry unit, with a total expected energy result of 1553 GWh. The largest single project was an energy recovery project with a contracted energy result of 349 GWh.

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

The background for this main goal is both to increase reliability of power supply by reducing demand, and reducing the direct emissions of greenhouse gases by converting from fossil to renewable energy sources. Overall, Enova has provided support for projects aimed at conversion to renewable water-borne heating in buildings and to bio-boilers in industrial applications equivalent to about 1 400 GWh in 2009.<sup>1</sup>

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

Ever since Enova was established, it has had specific stated targets for increased production of renewable power and improved access to renewable water-borne heating. While the renewable power production target has proven elusive with the frame-work available to Enova, the renewable heating target for 2011 has already been reached. From 2001 through the end of 2009, Enova has supported heating projects with a total energy result of more than 5 TWh within the Renewable heating, Industry and Built environment units.

### 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 special program aimed at demonstration of new technology. In 2009, a new program was also set up for marine power production, and this program 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 technology and efficient and environmentally friendly solutions in the fields of energy production and energy efficiency.

### Main goal 5: Functional markets for efficient and environmentally friendly energy solutions.

One of the main challenges is to make the efficient, environmentally friendly solutions 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 boost demand through subsidy schemes and general support programs which, over time, reduce costs and make the good solutions more competitive. Another measure involves making consumers more aware of the good solutions already available in the market through services such as Enova's advisory phone and chat service "Ask Enova".

### Main goal 6: More general awareness of the possibilities for using efficient, environmentally friendly energy solutions

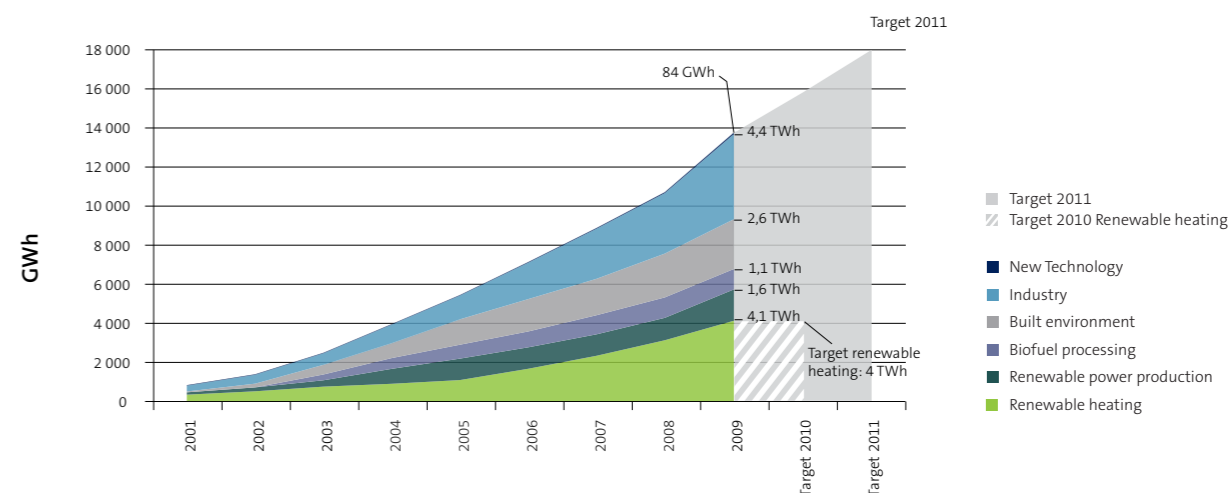
Enova's measures aimed at increasing awareness of efficient and environmentally friendly energy solutions are very broad-based, from the programs aimed at tomorrow's decision-makers through the Rainmakers, including the Energy Match and Energy Friends Day, to analyses and studies of the potential for utilising waste heat in industry. Enova works in a systematic and focused manner on communications efforts in media contact, public affairs and community relations, marketing and profiling. Media campaigns are run to reinforce elements from these commitment areas. Ask Enova, Enova Recommends and the Sfære magazine are important measures. Our role is to provide advice, increase awareness of climate-friendly solutions, point out opportunities and trigger action.

<sup>1</sup> Includes contractual energy results for new and expanded district heating, small heating plants and conversion from oil and electricity to renewable heating in the Built environment, Heating and Industry units.

## Targets and results

Under the agreement with the Ministry of Petroleum and Energy, Enova has an overarching energy target of 18 TWh by the end of 2011. At the end of 2009, Enova had an overall energy result of nearly 13.8 TWh for the 2001–2009 period. This energy result represents the total of contracted and final reported projects. A contractual energy result is the expected energy result when a project is adopted. This must be considered to be a best estimate, which is revised when the actual project period is complete (final report). Figure 1 shows the development in accumulated energy results since 2001, distributed by units. The graph shows a positive curve for total energy results in 2009, with most market areas achieving record energy results compared with previous years. The graph also shows that Enova is on track towards achieving the goal of 18 TWh in 2011.

FIGURE 1: Energy results and targets



The figure shows accumulated contractual energy results in the individual market units, measured against the energy target for 2011.<sup>1</sup>

In addition to the overarching energy target, a technology-specific target of 4 TWh has been set as regards increased access to water-borne heating from renewable sources, heat pumps and waste heat by 2010. This target was surpassed in 2009. The overall result is more than 5 TWh of renewable heat, if we sum up all the heating projects in Enova's portfolio across units.

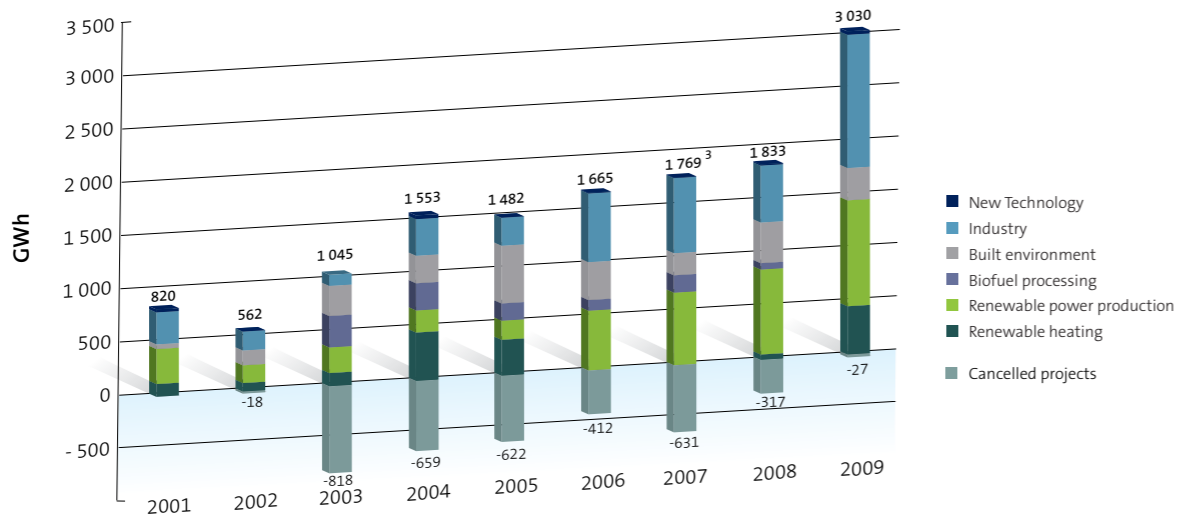
New contracts were signed in 2009 for projects yielding a total energy result of 3 057 GWh. Of these, nearly 27 GWh were cancelled in 2009, bringing the net energy result for new signed contracts in 2009 to 3 030 GWh. This is 41 per cent higher compared with 2008, and represents the highest energy result ever achieved by Enova within a single year. The increase can largely be attributed to the increase in available funds as a consequence of the Government's stimulus package<sup>2</sup>. Generally speaking, the stimulus package had a substantial impact on Enova's activities throughout the year, both as regards activities, program development and management, cost-effectiveness, as well as on the composition of portfolios within the various units as regards energy yield and project size. This will be discussed in more detail later in this report.

Which units contribute the most to the energy results varies from year to year, ref. Figure 2. Several units reported record high results, while there is a bigger difference in the average energy result per project between the individual units this year. For example, the Industry unit has an increased average energy result per project in 2009, while the opposite was true for the Renewable heating unit and the Built environment unit. This can mainly be ascribed to the special programs associated with the stimulus package, which were aimed at applicants with smaller projects.

<sup>1</sup> Enova's management of the Energy Fund is governed under an agreement with the Ministry of Petroleum and Energy. The agreement stipulates result targets and work targets for the period 1 June 2008 to 31 December 2011.

<sup>2</sup> As part of the follow-up of the Storting Proposition No. 37 (2008–2009) «On amendments to the 2009 fiscal budget to stimulate employment» and the Storting's resolution, the Government decided to make an extraordinary transfer of 1 190 MNOK to the Energy Fund. This is referred to as the stimulus package in the report, which is the subject of special comment in a separate sub-chapter in this report. The results are otherwise systematically included in the overall reporting.

FIGURE 2: Contractual energy results



The figure shows contractual energy results from contracts signed during the period from 2001 to 2009, allocated to 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 also corrected to reflect changes in the energy result in projects that have submitted final reports.

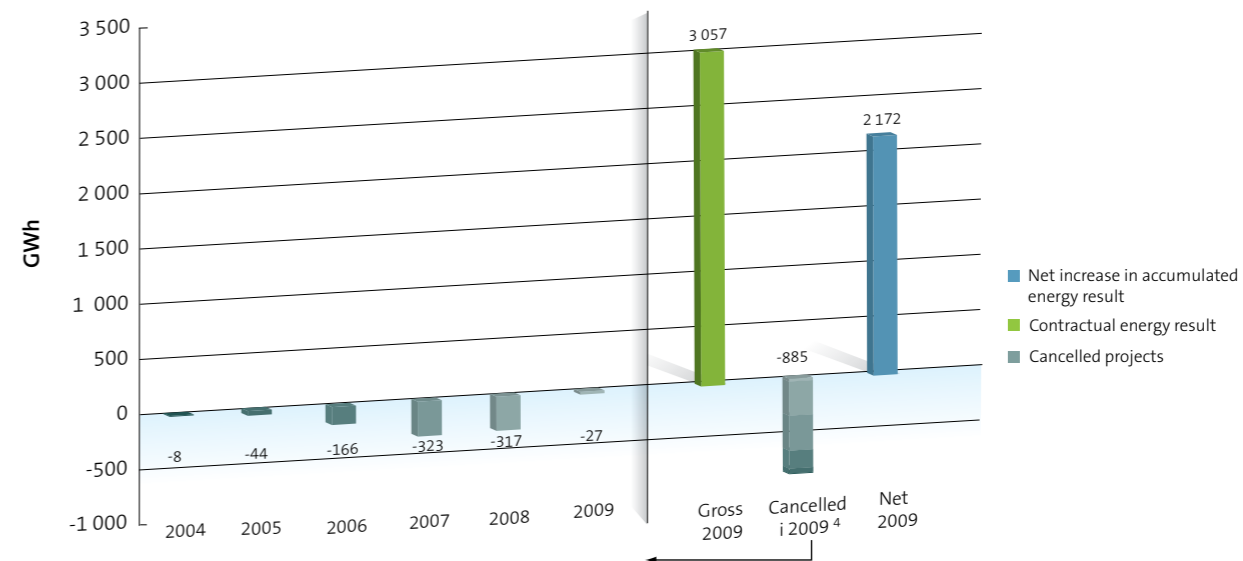
The Industry unit contributed the largest interim result in 2009, with a total of 1 250 GWh. This represents an increase of as much as 133 per cent compared with the energy results from this unit last year, and accounts for 41 per cent of Enova's total net energy result for 2009.

The Renewable heating unit also posted a record high energy result in 2009, amounting to 993 GWh, which is 18 per cent higher than last year's result. In the Renewable power production unit, contracts were signed for four wind power projects representing 453 GWh. This matches the annual record set previously in this unit.

As regards the Built environment unit, the composition of the project portfolio in 2009 was quite different compared to previous years. The special program targeting public buildings, established in connection with the stimulus package, meant that funding in 2009 was allocated to many projects, with relatively low energy yield per contract and per NOK of support. All in all, the contractual energy result for the unit was 303 GWh, which is 29 per cent lower than for 2008, in spite of the fact that more than five times as many projects received funding compared with 2008.

During 2009, new contracts were signed for a total contractual energy result of 3 057 GWh. During the same year, signed contracts equivalent to 885 GWh were cancelled, which yields a net increase in contractual energy results of 2 172 GWh from 2008 to 2009. Cancelled contracts are deducted from the energy result for the year when the contract was originally signed. Figure 3 shows how negative energy results as a consequence of cancelled contracts in 2009 are distributed as negative results retroactively, as well as gross and net energy results for the current year.

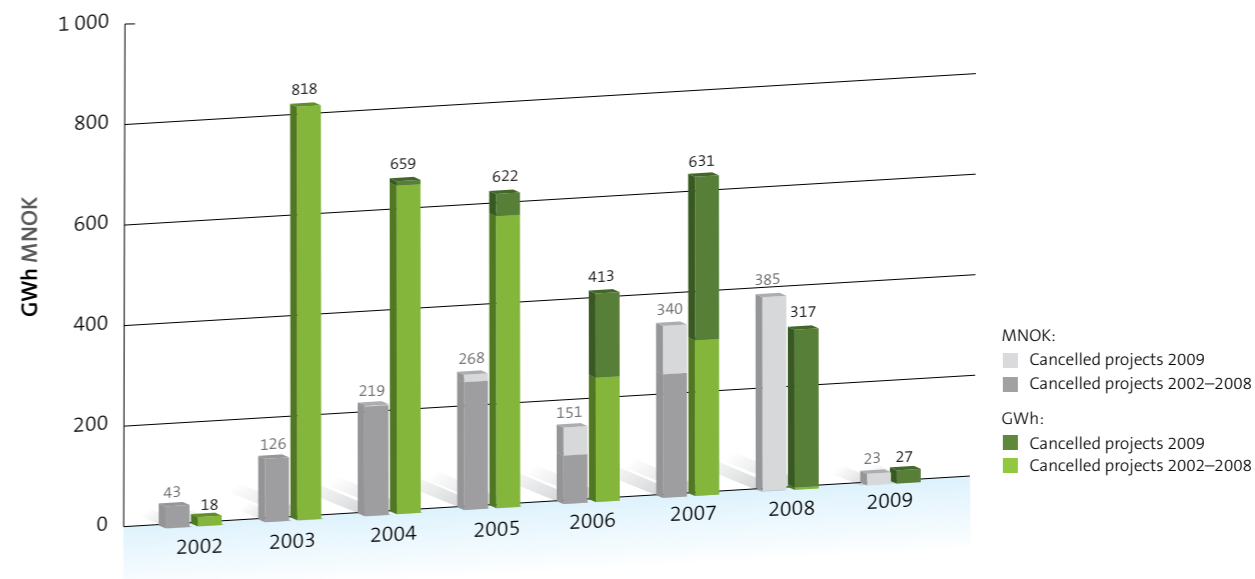
FIGURE 3: Energy result 2009 (gross and net) and cancellations distributed by contractual year



The figure shows a comparison of the gross contractual energy result in 2009, the cancelled energy result occurring due to cancelled projects in 2009, 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.

While the number of new contracts signed depends on the framework available and Enova's efforts, Enova has little impact on the number of cancelled and suspended projects after it has issued a funding commitment. The total deduction in energy results as a consequence of cancellations reported in 2009 was larger than Enova has experienced in previous years. To some extent, this can be attributed to the uncertainty in the financial market, with a tighter economy and less willingness to take risks in general. This has caused some projects to be put on hold or cancelled. It is also important to emphasise Enova's requirements: that the support it provides must trigger the implementation of projects that would not otherwise have been carried out, while at the same time requiring that the projects must be cost-effective. It is therefore only to be expected that a certain percentage of the projects receive support which is marginally inadequate, and that such projects are thus cancelled.

FIGURE 4: Cancelled projects



The figure shows the development in lost energy results and associated returned funds linked to suspended and cancelled projects, allocated to the year of original contract signing. Cancellations reported during 2009 are highlighted.<sup>5</sup>

<sup>3</sup> Accumulated figures include results from the Household unit this year (10 GWh)

<sup>4</sup> Cancellations divided by year of original contract.

<sup>5</sup> The figure shows GWh and MNOK for all cancelled projects. This can also include revisions of projects that result in changed energy targets and thus different funding amounts. Therefore, the figures are not directly comparable from year to year.



Table 1 shows contractual energy results, as well as contractual energy results corrected for the final reported energy results from completed projects. At the end of 2009, about 37 per cent of the projects supported by Enova were completed, equivalent to 5.1 TWh. Final reports were received for more than 1 TWh in 2009, which is more than double the number finalised in 2008.

When projects are initiated and disbursement of funding from Enova has begun, the risk of a project being cancelled is considered to be substantially lowered. About 75 per cent of the total contractual energy results are associated with projects that have either submitted final reports, or have been initiated and disbursement of funding has begun. Similarly, as regards projects that received funding prior to 2007, more than 97 per cent of the energy results have been finalized or are associated with projects that are under way.

TABLE 1: Energy results distributed by unit and year

Unit / Market area	2001–2005 <sup>6</sup>	2006	2007	2008	2009	Contractual	Contractual, corrected for final reported result
	GWh	GWh	GWh	GWh	GWh	GWh	GWh
Wind power	1 115	-	-	50	453	1 617	1 605
Renewable heating	1 120	560	680	797	993	4 150	4 117
Biofuel processing	713	100	163	60	-	1 035	1 050
Built environment	1 265	355	207	381	303	2 511	2 555
Industry	1 186 <sup>7</sup>	644	704	534	1 250	4 318	4 357
New technology	65	7	5	11	32	119	84
Households	-	-	10	-	-	10	10
<b>Contractual</b>	<b>5 462</b>	<b>1 666</b>	<b>1 770</b>	<b>1 833</b>	<b>3 030</b>	<b>13 761</b>	<b>-</b>
<b>Contractual, corrected for final reported results for completed projects</b>	<b>5 451</b>	<b>1 696</b>	<b>1 760</b>	<b>1 840</b>	<b>3 030</b>	<b>-</b>	<b>13 777</b>

The table shows the contractual energy result in GWh distributed by unit and year, both before and after correction for final reported energy results in completed projects.<sup>8</sup>

Table 1 also shows that, at an aggregate level, there is very little deviation between the expected energy result when the contract was signed (contractual) and when the project is completed (final reported). This indicates that the projects are largely carried out as planned, as regards energy result. In those cases where projects are substantially changed during the project period, the project is subject to a re-evaluation by Enova. In such cases it may be relevant to cancel the original project and submit an application for the "new", revised project.

<sup>6</sup> The projects from 2001 were supported by The Norwegian Resources and Energy Directorate (NVE), and have since been followed up by Enova. The agreement between Enova and the Ministry of Petroleum and Energy stipulates that Enova can tally the results from the projects. In 2002, Enova commissioned an external report that assessed the energy results for 2001 according to the guidelines that apply to Enova's projects. This work was carried out by Econ and Stavanger revisjon. These projects will not be subject to further review by Enova, and they are therefore counted with the final reported results, although the projects are not registered as having final reports in Enova's database in the same way as for the projects supported by Enova.

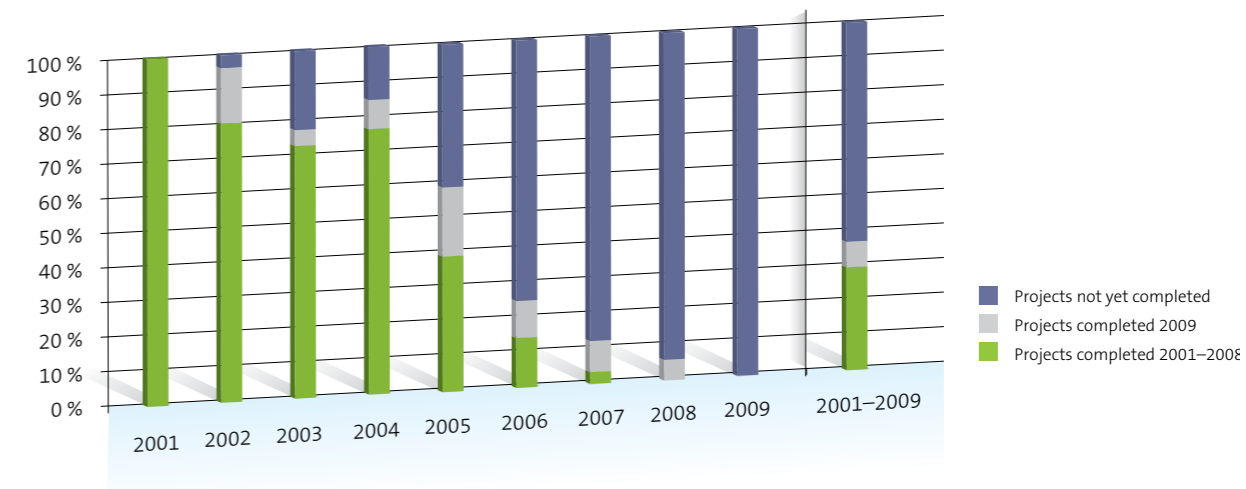
<sup>7</sup> Of this, 152 GWh relates to industry projects not formalised in the form of contracts

<sup>8</sup> The year refers to the year a project is contracted, and does not necessarily indicate when the project results will be realised in the form of kWh.

- Due to rounding, the total sums will not necessarily concur with the total for the respective year.

- 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 2008.

FIGURE 5: Percentage of completed projects (final reports received)



The figure shows the percentage of completed projects (final reports received) at the end of 2009 according to the year when the contract was signed. The percentage relating to final reports registered in 2009 is explicitly highlighted.<sup>9</sup>

Figure 5 shows, as expected, that the percentage of completed projects increases as the projects age. For most projects, some time elapses from when Enova and the project owner enter into contract and until an investment decision is made and the project is initiated. During this period, there is a risk that the project's content, cost and result will change, as compared with the basis used in the application. In some cases, projects could be postponed or cancelled. Enova's support shall and will be a triggering factor for other financing. At the same time, it is important that we do not unnecessarily tie up funds in "sleeping" or "dead" projects. Therefore, Enova actively follows up projects in relation to the agreed progress and completion in order to release tied up funds that can support new activity. However, the duration of the project period could extend over several years for some projects.

We emphasise that the percentage of projects with final reports will also be affected by cancellations. Cancellations will reduce the number of active projects (the total) during specific years, and the percentage of completed projects will increase regardless of whether or not new projects submit final reports.

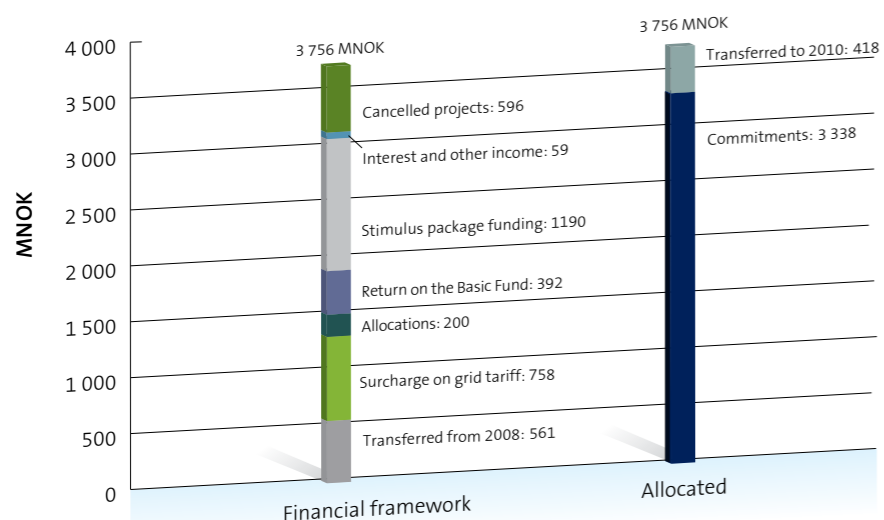
<sup>9</sup> The year refers to the year a project is contracted, and does not necessarily indicate when the project results will be realised in the form of kWh.

- The results from the NVE projects in 2001 are included in this figure. These projects are included in Enova's project database in the same manner as for subsequent projects.

# Management of funds

In 2009, Enova had MNOK 3 756 in funding at its disposal. MNOK 1 190 of this amount was related to the extraordinary funding through the stimulus package<sup>1</sup>. The surcharge on the grid tariff is still the main source of income for the Energy Fund, amounting to a contribution of MNOK 758 in 2009. The Energy Fund received the return on the Basic Fund for renewable energy and energy efficiency amounting to MNOK 392 this year.

FIGURE 6: Financial framework for the Energy Fund in 2009



In 2009, funds equivalent to MNOK 561 were also transferred from the previous year, and funds equivalent to MNOK 596 were released and returned to the Energy Fund as a result of cancellations throughout the year. The opportunity provided by the Energy Fund to transfer unused funds to subsequent years gives Enova the flexibility to exploit market trends, such as falling costs of measures, and thus generate higher energy results over time.

Since Enova disburses the support in arrears as a percentage of the project's accrued costs, the funds granted to projects that eventually get cancelled have not actually been disbursed, and can therefore be made available for new projects. Figure 6 illustrates the components of the financial framework.

Table 2 shows the allocation of resources from the Energy Fund and contractual energy results at the end of 2009, distributed by unit and year. The basis for this table is the year when the allocation of the funds was made, not the year the financial framework was awarded. Therefore, the value will change to reflect cancellations and transfers of funds between years.

The number of applications was extremely high compared with all previous years in Enova's history, with more than three times as many applications submitted for decision compared with the previous year. The main reason is the large number of applications for the extraordinary programs set up under the stimulus package. About 1 350 applications were received during 2009, of which more than 1 100 applications were processed and submitted for final approval or rejection. The difference between the number of received and processed applications is largely due to the fact that some applications are either withdrawn by the applicant prior to processing as a consequence of changes in plans, lack of financing, or the application does not fulfill the application criteria. In many cases, the applications also undergo a processing phase in which Enova contributes with advice to enhance the project's quality and yield. In these cases the application is withdrawn, and is worked on further until a new application can be submitted.

<sup>1</sup> The Norwegian Government's extraordinary transfer of MNOK 1 190 to the Energy Fund, referred to as the stimulus package, is described in more detail in a separate section of this report.

TABLE 2: Aggregate energy results and allocations 2001–2009

Unit / Market area	2001		2002		2003		2004		2005		2006		2007		2008		2009		Total <sup>2</sup>	
	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK
Wind power	-	-	80	35	127	27	441	186	334	137	-	-	-	-	50	93	453	1 068	1 485	1 546
Renewable heating	-	-	173	49	239	31	147	75	191	69	581	296	668	293	797	418	993	790	3 789	2 022
Biofuel processing	-	-	-	-	298	7	255	14	162	6	100	4	167	5	67	3	-	-	1 050	39
Built environment	-	-	148	47	276	54	271	68	538	119	359	107	207	79	381	144	303	546	2 483	1 166
Industry	-	-	157	20	136	16	360	57	268	39	648	128	703	173	534	145	1 250	580	4 057	1 158
New technology	-	-	1	19	-	-	0	9	1	2	8	7	5	72	11	52	32	90	56	251
Households	-	-	-	-	-	-	-	-	-	-	-	21	10	25	-	27	-	48	10	121
Children and youth	-	-	-	-	-	12	-	12	-	14	-	15	-	21	-	32	-	14	-	120
Municipalities	-	-	-	-	-	-	-	-	-	2	-	6	-	6	-	16	-	22	-	52
Training	-	-	-	10	27	16	-	6	-	2	-	0	-	-	-	-	-	-	27	35
Information and communication	-	-	-	113	-	40	-	26	-	47	-	19	-	22	-	45	-	26	-	339
International activity	-	-	-	7	-	7	-	7	-	13	-	13	-	7	-	13	-	13	-	74
Analysis	-	-	-	7	-	7	-	6	-	6	-	9	-	13	-	10	-	10	-	68
Administration	-	-	-	42	-	36	-	41	-	45	-	47	-	61	-	75	-	100	-	447
Other support	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	7
NVE contracts (2001)	820	392	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	820
<b>Total</b>	<b>820</b>	<b>392</b>	<b>559</b>	<b>350</b>	<b>1 103</b>	<b>253</b>	<b>1 474</b>	<b>505</b>	<b>1 495</b>	<b>503</b>	<b>1 696</b>	<b>672</b>	<b>1 760</b>	<b>776</b>	<b>1 840</b>	<b>1 070</b>	<b>3 030</b>	<b>3 315</b>	<b>13 777</b>	<b>7 837</b>

The table shows aggregate energy results and allocation of funds from the Energy Fund 2001–2009, corrected for cancelled and final reported projects as of December 31<sup>st</sup> 2009.<sup>3</sup>

Of the processed applications, 69 per cent, or 776 projects, received commitments of support. Nearly 300 of these were projects approved under the Energy Fund, with no funds from the stimulus package. There is considerable variation in the number of processed applications between the various units. Under the ordinary programs, the Built environment and Renewable heating units stand out in 2009 as regards the number of applications. If the stimulus package is included, applications within the two above mentioned units account for a total of 72 per cent of all approved applications in 2009. Apart from the stimulus package, the Built environment and Renewable heating units account for a total of about 39 per cent of the projects that were granted support in 2009.

TABLE 3: The Energy Fund 2009 - overview of application processing activities

Unit / Market area	No. of applications received	No. of applications processed	No. of projects supported	Contractual support <sup>3</sup>	Contractual energy result
	No.	No.	No.	MNOK	GWh
Wind power	12 <sup>4</sup>	7	4	1 068	453
Renewable heating	482	396	337	782	993
Built environment	638	482	225	538	303
Industry	44	44	39	580	1 250
New technology	19	13	6	88	32
Municipality	128	154	149	19	-
International activities	23	22	16	5	-
<b>Total</b>	<b>1 346</b>	<b>1 118</b>	<b>776</b>	<b>3 081</b>	<b>3 030</b>

The table shows an overview of the number of applications received, processed (i.e. submitted for final approval or rejection) and supported, total funds awarded within programs accepting applications and the associated energy results in 2009.

<sup>2</sup> NVE (The Norwegian Resources and Energy Directorate) results from 2001 are not included on the unit level.

<sup>3</sup> Total funds applied per unit. This includes costs for both support and advisory services within the program management. Indicated support amount is adjusted to reflect cancelled projects.

<sup>4</sup> The number relates to applications received within rounds of applications in the current and subsequent year.



# Funding levels

Enova's support for 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 programs within all sectors, as well as the fact that the program's character and target groups change over time.

A comparison of funding level per contractual kWh over time within the same area (similar projects) provides information on the development in support level needed to trigger a specific annual capacity of energy production or energy efficiency. The projects within the various market areas have very different qualities with regard to e.g. project lifetime, i.e. how long the projects will deliver the energy results. The calculated funding level does not reflect how effective the allocation of the funds between the areas is, if the lifetime is not taken into consideration.

TABLE 4: Funding levels

	Lifetime	2002–2005		2006 <sup>1</sup>		2007		2008		2009		2002–2009	
		Divided by annual contractual result	Lifetime-adjusted	Divided by annual contractual result	Lifetime-adjusted	Divided by annual contractual result	Lifetime-adjusted	Divided by annual contractual result	Lifetime-adjusted	Divided by annual contractual result	Lifetime-adjusted	Divided by annual contractual result	Lifetime-adjusted
		øre/kWh		øre/kWh		øre/kWh		øre/kWh		øre/kWh		øre/kWh	
Wind power	20 years	39	<b>1,9</b>	-	-	-	-	185	<b>9,3</b>	236	<b>11,8</b>	103	<b>5,2</b>
Heating	20 years	28	<b>1,4</b>	53	<b>2,6</b>	43	<b>2,2</b>	52	<b>2,6</b>	80	<b>4,0</b>	53	<b>2,6</b>
Energy end-use	10 years	20	<b>2,0</b>	24	<b>2,4</b>	28	<b>2,8</b>	32	<b>3,2</b>	73	<b>7,3</b>	36	<b>3,6</b>
<b>Total</b>	<b>Weighted</b>	<b>27</b>	<b>1,9</b>	<b>34</b>	<b>2,5</b>	<b>34</b>	<b>2,5</b>	<b>45</b>	<b>3,1</b>	<b>100</b>	<b>6,9</b>	<b>50</b>	<b>3,5</b>

The table shows funding level – both by annual contractual result, as well as support distributed over the total energy result measured over the lifetime. The results are corrected for cancelled projects.<sup>2</sup>

By correcting for the projects' lifetime, the energy results are normalized so that the costs between projects within different market areas become comparable. In the table above, we can see that the funding level in relation to the energy results over the projects lifetime is considerably higher in 2009 than in the previous years, with 6.9 øre/kWh when adjusted for lifetime. This is due in part to the fact that the measures implemented as part of the Government's stimulus package received a substantially higher level of funding than Enova's normal funding level.<sup>3</sup> The stimulus package is particularly evident in the increased support level for measures targeting energy end-use. The heating projects still have the lowest funding level with 4 øre/kWh adjusted for lifetime, and wind power projects have the greatest need for support with 11.8 øre/kWh adjusted for lifetime. The development in funding levels is illustrated in Figure 7.

<sup>1</sup> Beginning in 2006, relevant training costs are included in the respective areas. This could entail a higher cost level from this year on.

<sup>2</sup> The year refers to the year a project is contracted, and does not necessarily indicate when the project results will be realised in the form of kWh.

Lifetime is based on an estimated average lifetime for the projects in Enova's portfolio.

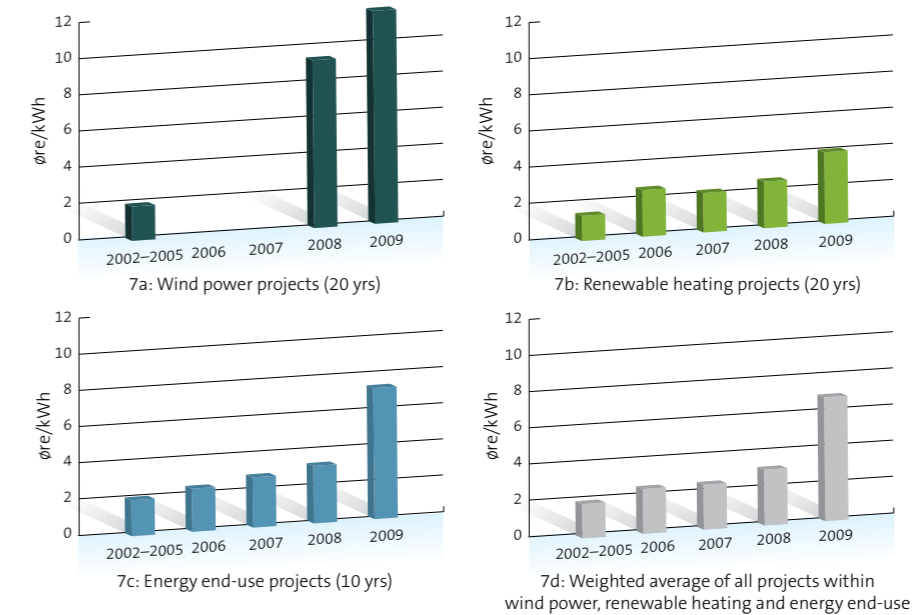
The lifetime-adjusted support amount per kWh is estimated by distributing the total support to an area by allocating the contractual energy result multiplied by the lifetime. The average support amount is weighted by energy result per area. The effect of the support on the projects' cash flow will depend on variables such as the discount factor, and this is not taken into consideration here.

In 2009, a wind power project contracted in 2008 was cancelled, which means that some of the values in this table have been significantly adjusted in relation to last year's report for wind power.

Norwegian currency: 1 øre = 0,01 NOK

<sup>3</sup> The stimulus package is discussed in more detail in a separate section of the report.

FIGURE 7: Development in funding level, adjusted for the project's lifetime



The figure shows the development in funding level over time, measured over the project's average lifetime in øre/kWh within the market areas of wind power, heating and energy end-use, as well as overall for all supported projects (weighted average).

Both the estimated support per contractual kWh and support per kWh over the project's lifetime are based on the individual projects. In order to give a correct assessment of the cost-effectiveness between the areas, an assessment must be made of the overall effect of the support over time. This includes both direct and indirect effects of the programs (dispersion effects). In the years to come, Enova will work methodically to evaluate the aggregate effect of our programs and activities.

It is emphasised 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.

# Climate impact

It is Enova's objective to contribute to reduce greenhouse gas emissions. More efficient energy use is good for the climate as it can help us reducing the use of fossil energy sources. In the same manner, a positive climate effect can be achieved by basing energy production on renewable energy sources, since this can replace the use of fossil energy sources.

Enova's work utilises both of these approaches. Some of the projects Enova supports lead to direct emission reductions by reducing the use of fossil fuel. Reducing electricity use or increasing the production of electricity based on renewable energy sources can have an indirect climate effect as it gradually makes it possible to phase out electricity produced from fossil energy sources.

The climate effects are apparent through estimated reductions in annual oil consumption and estimated reductions in annual emissions of CO<sub>2</sub>. The impact on oil consumption will differ among the various programs. The percentage of the energy result that yields oil reductions is highest within the Renewable heating unit. The heating projects replace heating from both oil, electricity and other types of energy. Customers may already have different alternatives for heating, which means that oil consumption will vary from year to year. In order to gauge the effect on oil consumption, we estimate that about half of the contractual energy result from the Renewable heating unit will replace oil. Projects within the Industry unit and the Built environment unit target both heating and electricity-specific end-use. The reduction in oil consumption will consistently be less within these units. We have seen that each kWh of energy result from the Industry unit leads to an estimated reduction in oil consumption of between 30 and 40 per cent. Projects within the Built environment unit are considered to yield a proportionately smaller reduction in oil consumption, slightly more than 10 per cent on average.

Table 5 indicates estimated reductions in annual oil consumption in Norway as a result of projects supported by Enova. For the 2001 to 2009 period, support was granted to projects that in total are expected to reduce oil consumption by about 359 000 tonnes. In 2009, Enova supported projects which are expected to reduce oil consumption by a total of about 86 300 tonnes. This is a robust increase from previous years, which can largely be attributed to a greater oil-related effect from the Industry unit.

**TABLE 5: Reduction in annual oil consumption**

Reduction in annual oil consumption	2007	2008	2009	2001–2009
	tonnes	tonnes	tonnes	tonnes
<b>Tonnes of oil, in total</b>	<b>61 333</b>	<b>47 046</b>	<b>86 297</b>	<b>358 977</b>

The table shows the reduction in annual oil consumption as a result of Enova's projects.<sup>1</sup>

The climate effect of Enova's projects is very 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. Table 6 illustrates this in that the anticipated reduction in annual CO<sub>2</sub> emissions varies from 0.7 to 12.1 million tonnes in total for the projects receiving support during the period from 2001–2009, depending on which assumptions are used as a basis for the estimate.

If we assume that the energy result substitutes for electricity produced from gas and that the energy result from the Renewable heating, Built environment and Industry unit is distributed between 40 per cent from oil and 60 per cent from electricity, then the effect of the projects supported by Enova is estimated at an annual reduction of 4.6 million tonnes of CO<sub>2</sub>. If the energy result substitutes for electricity produced equivalent to a European mix, then the effect amounts to 6.7 million tonnes of CO<sub>2</sub>.

1 • The years refer to when a project is contracted, and does not indicate when the results of the project could be realised in the form of reduced oil consumption.  
• The estimated reduced oil consumption is based on an efficiency rate of 85 per cent.

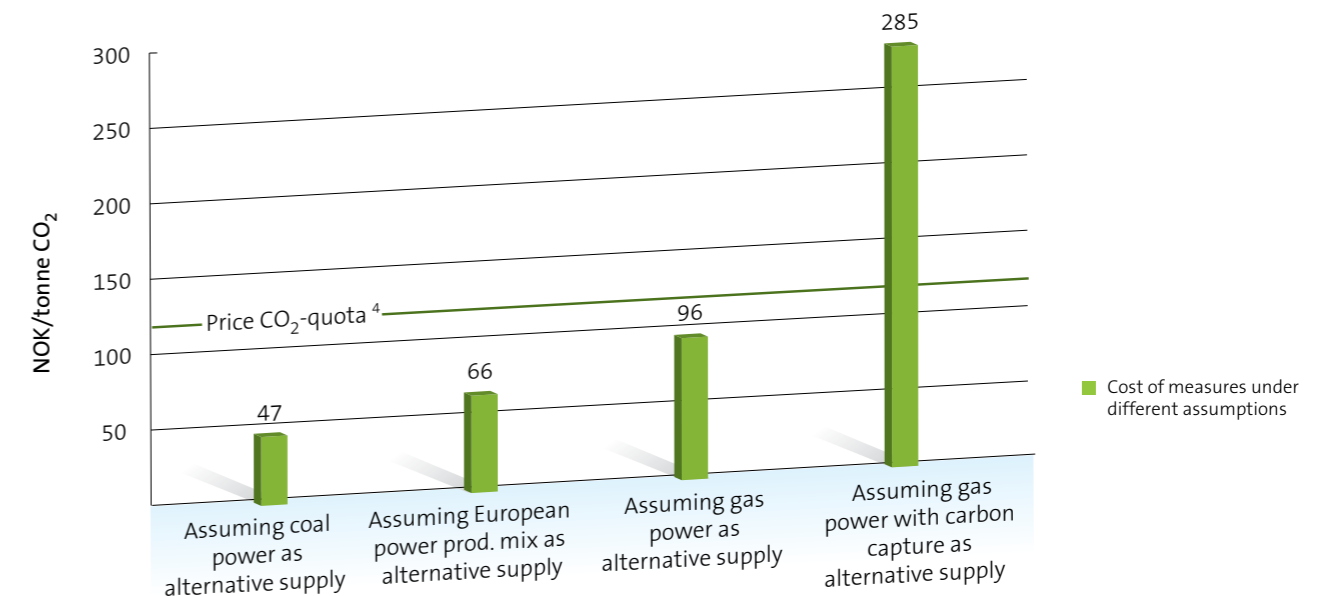
**TABLE 6: Illustration of climate effect measured in CO<sub>2</sub> reduction**

Supported projects	2009	2001–2009		
Energy results from the Renewable heating, Built environment and Industry unit if assumed replacing: <sup>2</sup>	40% oil and 60% electricity	Electricity only	40% oil and 60% electricity	Oil only
	million tonnes	million tonnes	million tonnes	million tonnes
<i>Electricity mix</i>				
Coal power production	2,3	12,1	9,5	5,5
European mix (NS-EN 15603:2008)	1,6	7,9	6,7	5,0
Gas power production	1,1	4,7	<b>4,6</b>	4,5
Gas power production with carbon capture	0,5	0,7	2,0	4,0

The table shows the reduction in annual emissions of CO<sub>2</sub> as a result of Enova's projects.<sup>3</sup>

Taking basis in the average funding level for Enova's projects and the estimated reduction of CO<sub>2</sub> emissions, this is equivalent to a cost of measures of NOK 96 per tonne of CO<sub>2</sub>, if we assume alternative power supply based to be based on gas power production without carbon capture. The costs of measures using other assumptions for alternative power supply are shown in Figure 8. In comparison, the CO<sub>2</sub> quota price at the end of January/beginning of February 2010 in the EU's emissions trading market was around NOK 115–120 per tonne of CO<sub>2</sub> for emissions in December 2012<sup>4</sup>.

**FIGURE 8: Cost of measures for reduced CO<sub>2</sub> emissions**



The figure shows the cost of measures for reduced CO<sub>2</sub> emissions resulting from Enova's projects in the period 2001–2009.<sup>5</sup>

2 Results from other units included in these estimates are assumed to replace electricity only.  
3 • The breakdown of 40 per cent 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 realised in the form of reduced oil consumption.  
• The calculations assume an emissions coefficient for gas power equal to 367 kg CO<sub>2</sub>/MWh. The source is «National Climate Measures Analysis» (Norwegian) (Civitas 2005). Emissions from gas power plants with carbon capture are assumed to be 15 per cent of the emissions from conventional gas power plants. This emissions percentage is obtained from the US Department of Energy. For emissions from oil based facilities, an average of 355 kg CO<sub>2</sub>/MWh is used. This is an average of oil use 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 is presumably equal to 617 kg CO<sub>2</sub>/MWh. The source is Standards Norway NS-EN 15603:2008.  
4 Source: Reuters EcoWin, average price level for CO<sub>2</sub> quotas (EUA Dec 2012), traded on NordPool and ICE in January/February 2010.  
5 The results depend on the preconditions for alternative supply of electricity production. The calculation is based on the indicated reduction in CO<sub>2</sub> from Enova's projects and the lifetime-adjusted funding level for Enova's projects.



# Results per market unit <sup>1</sup>

TABLE 7: Contractual energy results and funds allocated to wind power

Contractual			
	GWh	MNOK allocated	MNOK disbursed
2002	80	35	35
2003	124	27	27
2004	454	186	186
2005	337	137	137
2006	-	-	-
2007	-	-	-
2008	50	93	15
2009	453	1 068	-
<b>Original contractual</b>	<b>1 617<sup>2</sup></b>	<b>1 546</b>	<b>400</b>
<b>Corrected for final reporting</b>	<b>1 605</b>	<b>-</b>	<b>-</b>

TABLE 8: Contractual energy results in the form of renewable heat supply and funds allocated within the Renewable heating unit

Contractual			
	GWh	MNOK allocated	MNOK disbursed
2002	166	49	49
2003	240	31	27
2004	207	75	57
2005	179	69	53
2006	560	296	219
2007	680	293	152
2008	797	418	103
2009	993 <sup>3</sup>	790	25
<b>Original contractual</b>	<b>4 150<sup>4</sup></b>	<b>2 022</b>	<b>686</b>
<b>Corrected for final reporting</b>	<b>4 117</b>	<b>-</b>	<b>-</b>

TABLE 9: Results and funds distributed between the programs within the Renewable heating unit <sup>5</sup>

Program	2002		2003		2004		2005		2006		2007		2008		2009		Total	
	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK	GWh	MNOK
Heating	173	49	239	31	147	75	191	69	581	296	668	293	-	-	-	-	1 998	813
Biogas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48	24	48	24
District heating Infrastructure	-	-	-	-	-	-	-	-	-	-	-	-	206	122	444	269	650	391
Small heating plants	-	-	-	-	-	-	-	-	-	-	-	-	63	31	66	65	129	95
District heating new establishment	-	-	-	-	-	-	-	-	-	-	-	-	528	266	405	286	933	551
Conversion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	146	30	146
<b>Total</b>	<b>173</b>	<b>49</b>	<b>239</b>	<b>31</b>	<b>147</b>	<b>75</b>	<b>191</b>	<b>69</b>	<b>581</b>	<b>296</b>	<b>668</b>	<b>293</b>	<b>797</b>	<b>418</b>	<b>993</b>	<b>790</b>	<b>3 789</b>	<b>2 022</b>

<sup>1</sup> The NOK amounts in Tables 7, 8, 9, 10, 11, 12 and 13 are corrected for any adjustments after final reporting of the projects. The year refers to the year a project is contracted, and does not necessarily indicate when the project results will be realised in the form of kWh.

<sup>2</sup> This includes 120 GWh from NVE's projects from 2001.

<sup>3</sup> Under the agreement with the MPE regarding management of the resources in the Energy Fund, as regards district heating projects, both the total developed district heating capacity and the renewable heating delivered shall be reported. During 2009, support was granted to 24 new district heating facilities and 29 expansions of existing facilities. These have an overall capacity of 1 063 GWh, with renewable energy deliveries of 844 GWh.

<sup>4</sup> This includes 328 GWh from NVE's projects from 2001.

<sup>5</sup> • The Renewable heating unit changed its program structure in 2008, with segmentation into more individual programs. Therefore starting in 2008, the results are divided among these programs.  
• Does not include NVE projects from 2001.

TABLE 10: Contractual energy results and funds allocated to biofuel processing

Contractual			
	GWh	MNOK allocated	MNOK disbursed
2002	-	-	-
2003	318	7	3
2004	255	14	14
2005	162	6	6
2006	100	4	4
2007	163	5	4
2008	60	3	3
2009	-	-	-
<b>Original contractual</b>	<b>1 059</b>	<b>39</b>	<b>34</b>
<b>Corrected for final reporting</b>	<b>1 050</b>	<b>-</b>	<b>-</b>

TABLE 11: Contractual energy results and funds allocated within the Built environment unit

Contractual			
	GWh	MNOK allocated	MNOK disbursed
2002	139	47	45
2003	259	58	53
2004	258	69	47
2005	541	123	69
2006	355	122	37
2007	207	126	8
2008	381	159	7
2009	303	538	7
<b>Original contractual</b>	<b>2 488<sup>6</sup></b>	<b>1 242</b>	<b>273</b>
<b>Corrected for final reporting</b>	<b>2 555</b>	<b>-</b>	<b>-</b>

TABLE 12: Contractual energy results and funds allocated within the Industry unit

Contractual			
	GWh	MNOK allocated	MNOK disbursed
2002	177	20	20
2003	104	16	16
2004	343	57	54
2005	262	39	30
2006	644	128	74
2007	704	173	59
2008	534	145	9
2009	1 250	580	19
<b>Original contractual</b>	<b>4 318<sup>7</sup></b>	<b>1 158</b>	<b>281</b>
<b>Corrected for final reporting</b>	<b>4 357</b>	<b>-</b>	<b>-</b>

<sup>6</sup> This includes 44 GWh from NVE's projects from 2001.

<sup>7</sup> This includes 300 GWh from NVE's projects from 2001.

TABLE 13: Contractual energy results and funds allocated within the New technology unit

Contractual			
	GWh	MNOK allocated	MNOK disbursed
2002	1	19	19
2003		-	
2004	35	9	8
2005	1	2	2
2006	7	7	6
2007	5	72	58
2008	11	52	8
2009	32	90	7
<b>Original contractual</b>	<b>119<sup>8</sup></b>	<b>251</b>	<b>108</b>
<b>Corrected for final reporting</b>	<b>84</b>	<b>-</b>	<b>-</b>

<sup>8</sup> This includes 28 GWh from NVE's projects from 2001.

## Other results and activities

Information and advisory services constitute important parts of the market work carried out in all of Enova's units. The Household unit is an example of a unit where information and advice forms a central activity. However, this is also a prioritized and essential task in those areas where results can be measured directly in the form of contractual energy results.

Enova offers nationwide information and advisory services, with both short and long-term goals. In the work to develop and adapt services to the market, it is important to establish appropriate goals and good indicators that can provide continuous feedback on the need for adjustments. This is one of Enova's focus areas, which we are diligently working to reinforce. As part of this work, ambitious activity goals were proposed at the beginning of 2009 in the Household unit's action plan. These formed the goals for the activities in the areas shown below. The activity goals and results are compiled in Table 14.

TABLE 14: Activity goals and achievements - the Household unit

Activity	Performance indicator	2008		2009		Comment - deviation
		Activity goal	Result	Activity goal	Result	
Ask Enova – 800 49 003	No. of inquiries	40 000	28 578	40 000	38 460	Several campaigns and substantial interest in Enova's policy instruments helped ensure that we nearly reached this ambitious goal for our phone and chat service.
Logistics service	No. of distributions	200 000	1 154 682	200 000	965 308	The Sfære magazine (two editions) was a key factor in the very good result
Trade fairs/exhibitions	No. of visitors	200 000	185 255	200 000	186 584	Slightly lower attendance at 21 home improvement exhibitions around the country, as well as the Bygg Reis Deg (new construction) fair at Lillestrøm.
The subsidy program for households	No. of subsidies disbursed	6 000	3 317	n/a	3 637	No targets set due to the ongoing evaluation by ESA.

The table shows activity goals and results in 2008–2009 for selected activities. Comments are provided for deviations from 2009 goals.

Enova carries out extensive market and information work aimed at Norwegian municipalities. Table 15 shows the application activity triggered after consultation, advice and seminar activity in 2009. The application activity outside of plan applications was largely characterised by the Government's extraordinary stimulus package for this year.

TABLE 15: Activity goals and achievement - the Municipality unit

Activity	Performance indicator	Activity goal	Result	Comment - deviation
Energy and climate planning	Accumulated no. of municipalities that have applied to Enova for planning support	80 %	75 %	High number of applications in 2009. An R&D from The Norwegian Association of Local and Regional Authorities (KS) shows that 80% of all municipalities are in the process of or have made decisions to draw up plans.
Energy and efficiency measures and conversion in municipal buildings	No. of participating municipalities at energy and climate seminars that initiate energy efficiency/conversion projects, either as pre-projects or investment support	50 %	70 %	Enormous response to the "Stimulus package Buildings 2009" program led to a positive deviation.
Studies of heating projects	No. of participating municipalities at energy and climate seminars that study potential heating projects and seek support for pre-projects, LES or investment support	20 %	17 %	Slightly lower than target, most applied for the conversion program through the "Stimulus package Heating 2009" program.

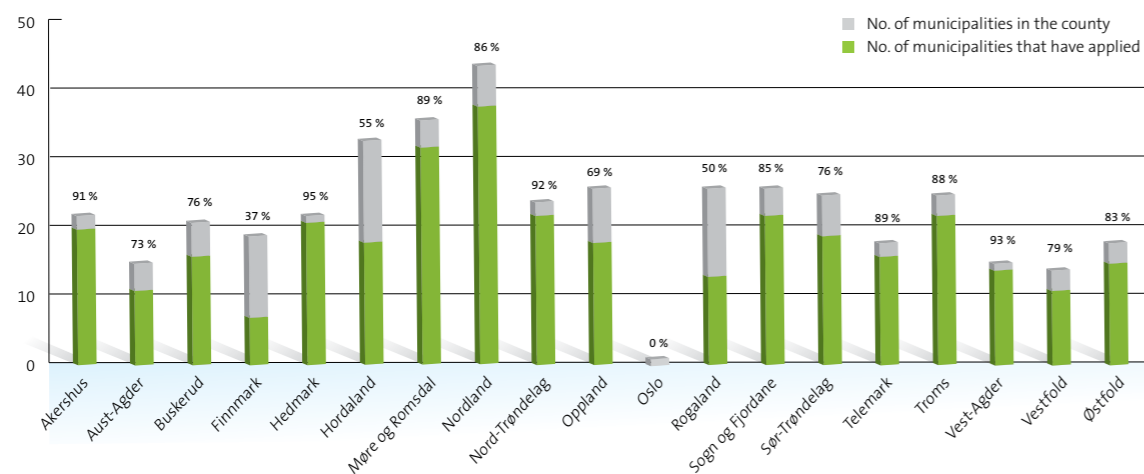
The table shows activity goals and results in 2009 within the Municipality unit. Comments are provided for deviations from goals.



TABLE 16: Activities within the Household unit

	2003	2004	2005	2006	2007	2008	2009
Distributed material [no.]	n/a	124 000	137 156	262 000	218 410	149 026	107 383
Visitors at exhibitions [no.]	40 000	250 000	250 000	160 000	250 000	170 374	150 080
Hits per day, www.enova.no/hjemme [no.]	n/a	n/a	n/a	n/a	1 260	2 489	2 975
Campaigns [no.]	3	4	4	2 <sup>1</sup>	2 <sup>1</sup>	2 <sup>1</sup>	4 <sup>1</sup>
No. of applications Subsidy program for households [no.]	n/a	n/a	n/a	15 238	5 956	8 684	7 960
Disbursed projects Subsidy program for households [no.]	n/a	n/a	n/a	-	4 692	3 317	3 637
No. of school children at the Rain-makers' "Energy Friends Day" [no.]	n/a	4 000 Oslo	4 000 Trondheim	4 500 Bergen	3 500 Kristiansand	5 500 Stavanger	6 000 Fredrikstad
Audience per broadcast - the Energy Match (NRK1) [no.]	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

FIGURE 9: No. of municipalities that have applied for support for their energy and climate plans, by county, 2005–2009



The figure shows the number of municipalities that have applied for support through the program "Municipal Energy and Climate Planning" during the period 2005–2009, and the percentage this constitutes out of the total number of municipalities in the county.

TABLE 17: Activities within the Department of Communication and public relations

	2003	2004	2005	2006	2007	2008	2009
Articles about Enova	n/a	675	657	2 463	2 971	2 815	5 870
Campaigns	3	4	4	4	4	3	6
Ask Enova inquiries	55 500	35 000	22 000	33 000	26 635	28 578	38 460
Press releases	n/a	n/a	23	26	23	27	71

<sup>1</sup> Figures for the Household unit only

TABLE 18: Approved applications for pre-project support within international activities

Applicant	Project name	Allocated
		NOK
NEPAS	Roll Out – SEC BENCH II	40 000
NEPAS	3-NITY training scheme for multiplying success in local authorities	40 000
Oslo municipality, Road and Transport Authority	ESOLI – ENØK prosjekt	50 000
Stavanger municipality urban environment and development	Involving Citizens in Local Sustainable Energy Projects	50 000
KanEnergi AS	Small scale RE in passive houses	50 000
MEMETIX AS	Mobilizing European Citizens for Sustainable Housing	50 000

TABLE 19: Approved applications for national co-funding within international activities

Applicant	Project name	Allocated
		NOK
SINTEF	GO LOW	400 000
SINTEF Energy Research	Smart Metering and Informative Billing	375 000
Stavanger Municipality	Involving Citizens in Local Sustainable Energy Projects across Europe	692 750
Institute for Energy Research	Monitoring of EU and national energy efficiency targets – ODYSSEE-MURE	160 000
New Energy Performance AS	Preparation for Large Scale Roll-Out of Municipal Benchmarking – SEC BENCH II	550 000
New Energy Performance	3-NITRAIN	330 000
Norsk Enøk og Energi AS	Teacher Training for Learning about Energy (TITLE)	700 000
KanEnergi AS	Renewable energy in passive houses	720 290
MEMETIX AS	Mobilizing European Citizens for Sustainable Housing	750 000
Oslo Municipality Road and Transport Authority	ESOLI – ENØK prosjekt	447 500

TABLE 20: Allocated funds - Natural gas, within the area of infrastructure

Year	Capacity <sup>1)</sup> GWh	Contractual <sup>2)</sup> GWh	Allocated MNOK
2004	685	405	29
2005	680	545	24
2006	400	175	10
2007	770	770	40
2008	1 500	1 500	45
2009	-	-	-
<b>Original contractual</b>	<b>4 035</b>	<b>3 395</b>	<b>148</b>
<b>Corrected for final reporting</b>	<b>4 035</b>	<b>-</b>	<b>-</b>

The table shows contractual energy results and funds allocated during the period 2004–2009 within the support scheme for natural gas infrastructure. Funds for this scheme are allocated via the fiscal budget, and are not part of the Energy Fund.<sup>3</sup>

<sup>1</sup> By capacity is meant the facility's normal technical capacity.

<sup>2</sup> By contractual is meant the expected annual gas sale five years after operation commences.

<sup>3</sup> The figures are corrected for cancellations and final reported results.

# Management of the stimulus package funds

## Background and framework

As part of the follow-up of Storting Proposition No. 37 (2008–2009) «On amendments to the 2009 fiscal budget to stimulate employment », the Government decided to make an extraordinary transfer in 2009 of MNOK 1 190 to the Energy Fund.

The award letter from the Ministry of Petroleum and Energy stipulates the following general guidelines for management of the Stimulus Package Funds:

- Stimulate production and employment to moderate unemployment
- Rapid implementation
- Reach the most vulnerable parts of the job market
- Contribute to a better environment and improved public infrastructure
- Reinforce ability to change, expertise, and renewal

The following conditions were specified for the extraordinary resources allocated to the Energy Fund:

- Rapid implementation
- Prioritise the areas best suited for increased activity in today's market
- Consider raising the funding levels within the framework of the ESA guidelines

## Enova's dispositions

### Framework and guidelines

In connection with the extraordinary allocation, a decision was made to define two new earmarked "stimulus programs" particularly aimed at public buildings and facilities:

1. «Stimulus package Buildings 2009» within the Built environment unit
2. «Stimulus package Heating 2009» for conversion of heating plants in buildings

Furthermore, in line with the guidelines from the Ministry, the funding levels were raised within existing units and programs with the aim of significantly increasing the number of projects and associated activity. The following units and programs were prioritised in the stimulus package:

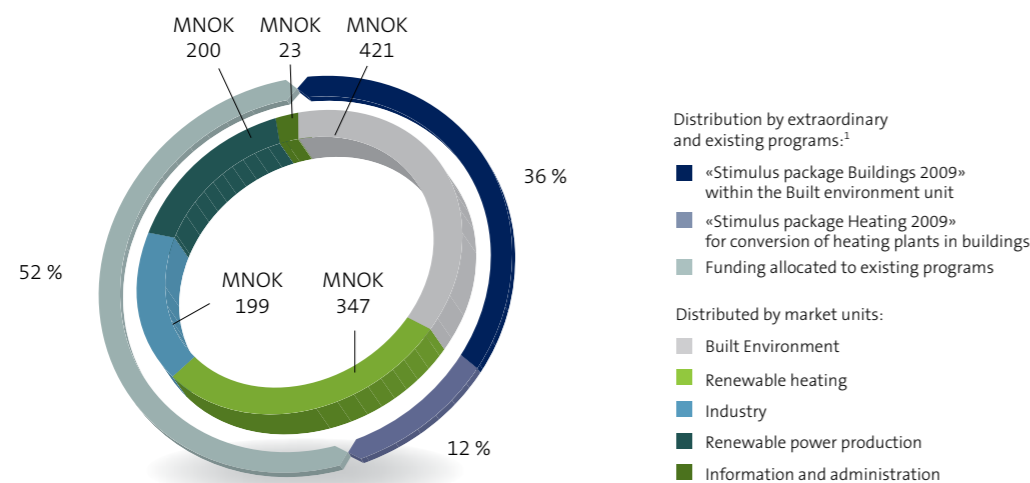
**Renewable heating unit** – program for:

- Small heating plants
- District heating infrastructure
- District heating new establishment

**Industry unit** – Main program "Energy end-use - Industry"

**Renewable power production unit** – Program for wind power production

FIGURE 10: Stimulus package – Contractual support per unit [MNOK]



1 The funds for information and administration are excluded here in the calculation of percentage distribution between new and existing programs.

The employment effect has not been subject to evaluation in Enova's processing of applications, while the start-up date (rapid effect) has been emphasised when qualifying projects for stimulus package funding.

Enova received the funds in February and, in line with the desire for rapid processing, the first rounds of applications under the relevant programs were announced as early as in March 2009.

## Implementation and results

The management of the stimulus funds represented a substantial part of Enova's activities in 2009. The following key figures provide an indication of the scope:

- Stimulus package share of disposable funds: 35.8 per cent
- Stimulus package share of no. of approved commitments: 61.7 per cent
- Stimulus package share of contractual energy results: 25.8 per cent

Enova believes there is reason to be satisfied with the way the stimulus package work was carried out. Some extra resources were allocated to administration, but the work was largely performed using the established organisation and staff. This required substantial additional efforts and flexibility on the part of Enova's staff.

The key figures in Table 21 show that the energy result requirements were significantly lowered for the stimulus package funds. The average support per kWh for activities without stimulus funds was NOK 0.92 in 2009 (including administration and activities not yielding results), while the funding level for the stimulus package projects averaged NOK 1.40. As such, this has contributed to a decline in the cost-effectiveness of Enova's project portfolio.

TABLE 21: Activity overview – stimulus package

Program	Unit	No. of applications		Allocation stimulus package		Contractual energy result		
		received	processed	MNOK	% of stimulus funds	GWh	% of energy result	
		No.	No.	% of supported projects				
<i>Extraordinary stimulus package programs</i>								
Stimulus package Buildings 2009	Built environment	551	166	35 %	421	35 %	73	9 %
Stimulus package Heating 2009	Renewable heating	224	192	40 %	146	12 %	30	4 %
<b>Total stimulus package programs</b>		<b>775</b>	<b>358</b>	<b>75 %</b>	<b>567</b>	<b>48 %</b>	<b>103</b>	<b>13 %</b>
<i>Existing programs – Increased funding level</i>								
Small heating plants	Renewable heating		86	18 %	62	5 %	62	8 %
District heating infrastructure	Renewable heating		13	3 %	86	7 %	113	15 %
District heating new establishment	Renewable heating		12	3 %	53	4 %	78	10 %
Energy end-use - Industry	Industry		5	1 %	199	17 %	349	45 %
Wind power production	Renewable power production		1	0 %	200	17 %	76	10 %
<b>Total existing programs</b>			<b>117</b>	<b>25 %</b>	<b>600</b>	<b>50 %</b>	<b>679</b>	<b>87 %</b>
Information & market communication	Communication and public relations				13	1 %	0	
Administration	Administration				10	1 %	0	
<b>Total for the stimulus package</b>			<b>475</b>	<b>100 %</b>	<b>1 190</b>	<b>100 %</b>	<b>782</b>	<b>100 %</b>

The table shows an overview of activities related to the stimulus package - 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 funds allocated within the stimulus package and associated energy results in 2009.

Table 21 shows the allocation of stimulus funds to the specific units and programs. 48 per cent of the funds went to the specially designed programs, while 50 per cent were allocated to the established programs, and two per cent to administration and information. The energy result was particularly low in the first program category, which only contributed with 13 per cent of the total energy results from the stimulus package.

It has not been the intention, nor has it been possible, for Enova to evaluate and report on the employment effects from our share of the stimulus funds. In line with the guidelines given in the MPE's award letter, a third-party evaluation of the employment effects will be carried out and submitted during the first quarter of 2010.



# Governance

## Framework and guidelines

Enova's assignment is to manage 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 utilisation of the Fund's resources. The annual award letter expands on and supplements the terms.

Enova is to manage the resources in the Energy Fund in such a way that the goals are achieved and mandatory tasks are carried out with optimal cost-effectiveness. Award of the support funds shall take place in accordance with objective and transparent criteria. Management and internal control shall take place in accordance with the rules for financial management in the government, including the exercise of prudent control over the processing of applications and award of funds, and also that the recipient of subsidies fulfills contractual conditions and performance goals. The support granted must also be within the framework of the government subsidy rules established as a consequence of the EEA agreement.

Enova's portfolio of projects is extensive and constantly growing. A reporting system has been established to ensure that the reported data for all projects and activities is reliable. Each year, Enova submits a result and activity report to the MPE explaining how the resources from the Energy Fund have been utilised, as well as a status report in relation to the agreed goals.

## Management and control

### From pioneer to established public steward

Great emphasis has been placed on cost-effective administration of the Energy Fund. In line with the growing trust placed in Enova as manager, both our financial frameworks and tasks have been expanded. Our project portfolio is growing rapidly and the work to follow up projects from previous years with disbursements and result reporting demands more resources. In addition to regular case processing, advice and analysis tasks make up a large part of our activities.

Enova has grown in 2009, both in activity and number of employees. In addition to the ordinary funds, Enova managed MNOK 1 190 in stimulus funds. This represented an important task where, not least, the required speed of processing has been very demanding. The number of new funding commitments in 2009 was nearly tripled compared with the previous year, from 290 to 776.<sup>1</sup>

In spite of considerably higher activity, important steps have been taken in 2009 to further develop the enterprise's management and internal control systems. Enova is now progressing from the pioneer phase into a more robust organisation equipped to appear as a good and responsible public steward.

### Development of the organisation and management model

Concrete steps have been taken in 2009 to adapt and further develop internal governance so that it supports the enterprise's strategic direction. In our revised vision and values, we place great emphasis on further reinforcing support for our strategies in all parts of the organisation. The leader advancement program and crystallising of our management philosophy, together with a revised plan for dividing work between the management and the board, has led to a change in our organisation's structure and management model. This means a clearer delegation of responsibility and authority throughout the organisation.

### Risk management

Targeted risk management and good internal control are important in order for Enova to achieve its goals. Increased attention is being paid to the importance of continuous improvement and prevention of undesirable incidents. During 2009, measures were implemented to establish more systematic risk management. The main principle is that risk shall be handled as close as possible to where the risk occurs. Therefore, line management is responsible for identifying and following up risk, and for ensuring that applicable frameworks and guidelines are followed.

To assist in the process of identifying, measuring and following up risk factors, Enova has employed a simple reporting module, which is included as part of the Enova management information toolkit.

<sup>1</sup> Includes commitments within international activities.

## Management information tools

Safe, precise navigation requires good management tools. How well Enova achieves its goals in general is connected with concrete target figures in TWh. Not all parts of the enterprise are easily measured in terms of TWh. Neither is this single focal point adequate for ensuring good governance. In 2009, we have therefore continued to develop and improve our management toolkit using balanced management by objectives.

We have developed a 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 organisation/working environment. Each organisational department and unit have their own scorecards with specific objective parameters along with some general ones which are aggregated from underlying units. The measurement parameters are primarily based on automatic data capture from existing management tools.

This management by objectives model is web-based and is used as a management tool. This is facilitated by the fact that the scorecards for the individual units also include risk reporting as well as reporting and follow-up of the 3–5 most important activities (projects in connection with enterprise development/improvement) within the unit.

### New support system for procurement and contract management

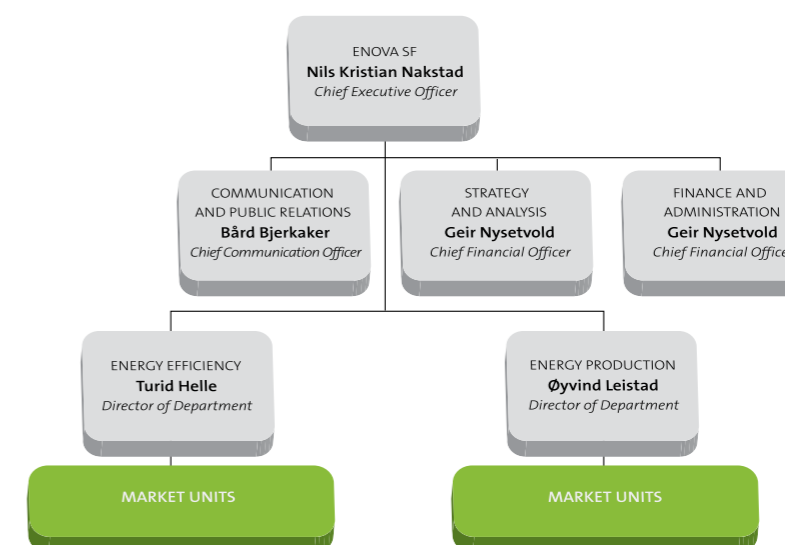
Enova is in the process of implementing a new support system for procurements and contract management. The intention is to contribute to economic and quality gains through better procurement processes, closer follow-up of suppliers and better management of contracts. The system also provides a foundation for improving the efficiency of internal work processes.

### Processing system

In 2009, a new web-based system was put into service for applications and application processing, as well as reporting and requests for disbursement. The work on implementation of the system and routines will be completed in 2010.

### HSE and organisational development

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 2009, we have undertaken systematic organisational development, with particular focus on our organisational structure, roles and distribution of responsibilities, as well as efficient internal interaction. By focusing on our values: Clear, Responsible, Inspiring and striving for Market proximity also in our HSE and personnel management, we continually develop in order to be a modern, inclusive and inspiring workplace.



# Projects supported in 2009

FIGURE 11: Contractual energy result and commitment – by county

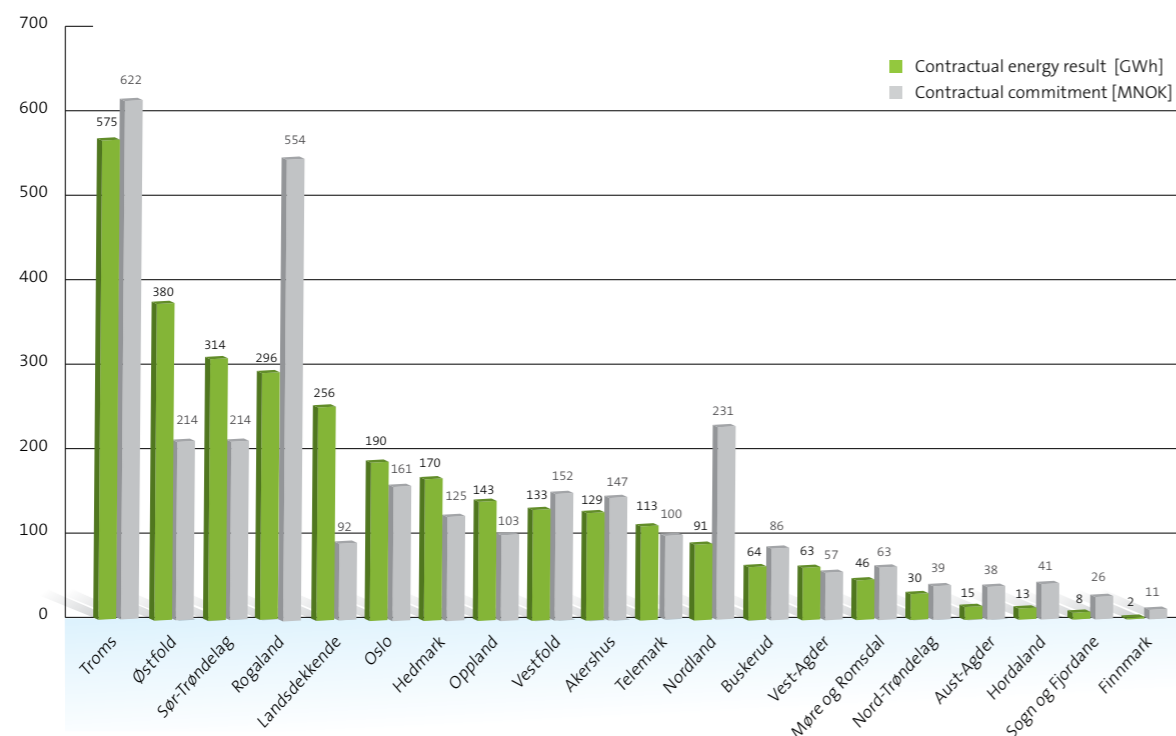
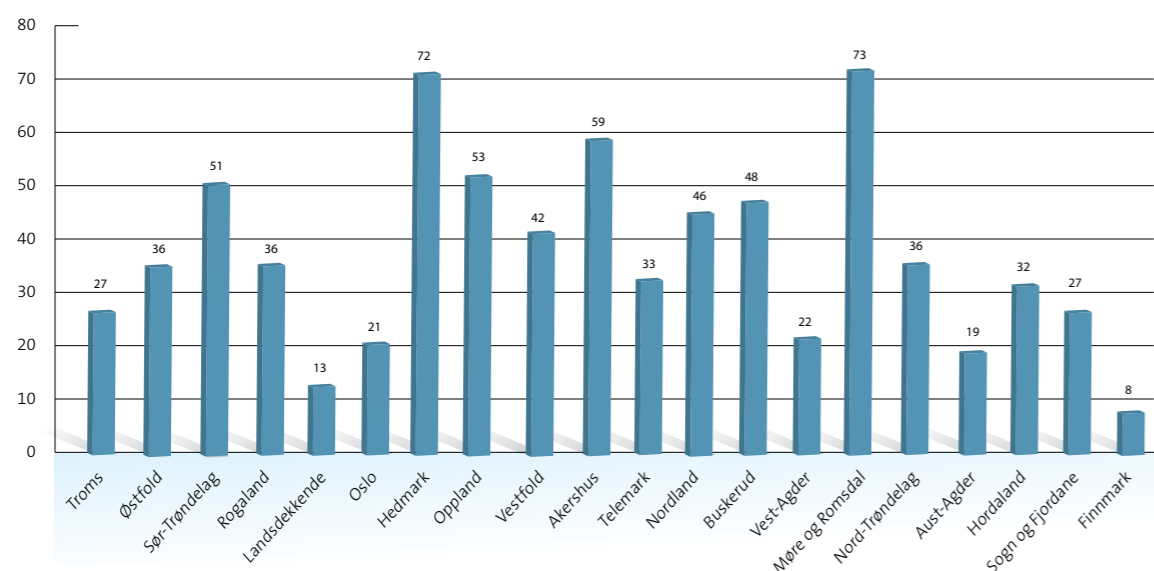


FIGURE 12: Number of projects supported in 2009 – by county



1 A project list giving a complete overview of projects granted support in 2009 under the Energy Fund can be downloaded from Enova's website at [www.enova.no](http://www.enova.no). The list is an amendment to the Norwegian edition of the result report, and is not translated into English.

TABLE 22: Top 10 in 2009 – Highest support per project

SID <sup>2</sup>	Project description	Applicant	Support	Energy result
			NOK	kWh
09/1084	Høg-Jæren Energipark (wind farm)	Jæren Energi AS	511 600 000	231 924 000
09/1088	Fakken wind farm	Troms Kraft Produksjon AS	346 400 000	138 000 000
09/1087	Nygårdsfjellet wind farm Phase II	Nordkraft Vind AS	200 100 000	76 130 000
09/208	Finnfjord AS energy recovery	Finnfjord AS	175 000 000	349 000 000
09/921	Bio-fuelled 60 MW combined power and heating plant at Borregaard – BIL 60 MW CHP (BCHP)	Hafslund Miljøenergi AS	150 000 000	300 000 000
09/579	Investment in an energy recovery facility at the Elkem silicon works at Thamshavn	Elkem Hovedkontor	90 000 000	180 000 000
09/971	District heating in Tønsberg	Skagerak Varme AS	58 400 000	69 318 000
09/1197	District heating at Tromsøya (Skattøra, Breivika, Stakkevollvegen, Sentrum, Langnes/Håpet)	Troms Kraft Varme AS	39 500 000	75 500 000
09/28	District heating development in Skien	Skien Fjernvarme AS	36 000 000	58 840 000
08/839	Facility for energy from waste at Dalborgmarka (waste incineration plant)	Gjøvik Energi AS	33 000 000	101 200 000

TABLE 23: Top 10 in 2009 – Highest energy result per project

SID <sup>2</sup>	Project description	Applicant	Support	Energy result
			NOK	kWh
09/208	Finnfjord AS energy recovery	Finnfjord AS	175 000 000	349 000 000
09/921	Bio-fuelled 60 MW combined power and heating plant at Borregaard – BIL 60 MW CHP (BCHP)	Hafslund Miljøenergi AS	150 000 000	300 000 000
09/1084	Høg-Jæren Energipark (wind farm)	Jæren Energi AS	511 600 000	231 924 000
09/579	Investment in an energy recovery facility at the Elkem silicon works at Thamshavn	Elkem Hovedkontor	90 000 000	180 000 000
09/1088	Fakken wind farm	Troms Kraft Produksjon AS	346 400 000	138 000 000
08/839	Facility for energy from waste Dalborgmarka (waste incineration plant)	Gjøvik Energi AS	33 000 000	101 200 000
09/1087	Nygårdsfjellet wind farm Phase II	Nordkraft Vind AS	200 100 000	76 130 000
09/1197	District heating at Tromsøya (Skattøra, Breivika, Stakkevollvegen, Sentrum, Langnes/Håpet)	Troms Kraft Varme AS	39 500 000	75 500 000
09/845	Expansion of district heating in six areas in Oslo	Hafslund Fjernvarme AS	30 000 000	72 200 000
09/1113	Portfolio application – Alcoa Norway	Alcoa Norway ANS	25 000 000	71 120 000

2 Case ID (SID) is a unique identification number which is assigned to each individual application that is submitted to Enova.



# Terminology

## Contractual energy result

Funding awarded to projects is linked to an expected energy result, which is part of the contractual basis between the recipient and Enova. Failure to achieve the contractual result gives ground for a corresponding reduction of funding. The contractual energy result is the energy result the parties expect to realize, as determined on the contract date.

## Cost-effectiveness

One of the purposes of establishing Enova was to bring about a more cost-effective commitment to renewable energy and efficient energy end-use. Enova prioritises projects according to the required funding in relation to the energy result (NOK/kWh), given the project's lifetime and the goals set forth in the agreement with the MPE. The projects that apply for support from Enova are evaluated in a three-step process. The first step is an assessment of the technical energy merits of the project, while the second is an assessment of the project economy and need for funding. Finally, Enova's costs related to the project (the support amount) are weighed against the energy result (kWh). Projects that do not deliver an adequate energy result in relation to the funding will not succeed in the competition for funds.

## 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 July 1<sup>st</sup> 2004, this surcharge has been 0.01 NOK/kWh, which amounts to a total of approx. MNOK 760 per year. 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 was supplemented by MNOK 10 000 in the fiscal budget for 2007, and by MNOK 10 000 in the fiscal budget for 2009. In the fiscal budget for 2010, an additional MNOK 5 000 has been allocated. The objectives which have been set for Enova are based on the assumption that the Basic Fund will be further supplemented by MNOK 5 000 in 2012. In 2009, the Energy Fund was supplemented with the yield from the Basic Fund in an amount totalling MNOK 392. The Energy Fund is also supplemented with 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 June 29<sup>th</sup> 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 June 1<sup>st</sup> 2008 – December 31<sup>st</sup> 2011. The Ministry of Petroleum and Energy (MPE) determines the by-laws for the Energy Fund.

## Energy restructuring

The contract between the MPE and Enova stipulates use of the Energy Fund to promote environmentally friendly restructuring of energy end-use and production. This means that Enova's job is to enact measures aimed at making energy end-use less dependent on a single source of energy, as well as to promote switching of energy sources from non-renewables to renewables.

## Energy results

One of the main objectives of the Energy Fund is to contribute to energy results, either through reduced energy use or more environmentally friendly energy production. This is an important part of Enova's agreement with the MPE. Two different terms are used in this report to describe energy results: contractual and realized.

## ESA

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

## Free-rider

Enova defines free-riders as those who receive support for projects that the recipient would have implemented in any event, e.g. cases where the support of the Energy Fund was not needed to trigger the project. See also the definition of triggering effect.

## Final reported energy result

All projects with energy results submit final reports on the completion date for the project. The final reported energy result is an updated forecast for realized results upon completion of the project. Enova evaluates the energy results reported by the projects to determine whether they are reasonable.

## Indirect effects

While the contractual energy result is a direct consequence of the support provided by Enova, the ripple effects are the spin-off effects of this support. Ripple effects may fall under many different categories, such as additional investments that become profitable as a result of the initial project, market changes towards reduced costs, etc.

## Indicator

An indicator is a method of quantifying something that is difficult to measure directly. In an energy efficiency context, indicators are often linked to intensity factors that drive the need for energy, such as kWh per m<sup>2</sup>, kWh per refrigerator per year, kWh per tonne of steel manufactured, etc. Other types of indicators can include market shares for new, energy efficient solutions, the percentage of renewable energy, etc.

## Lifetime

An important consideration in connection with new production of energy and reduced energy end-use is how long the results will be beneficial. In this context, we can differentiate between technical lifetime and economic lifetime. Technical lifetime relates to how long the equipment can remain in operation with normal maintenance, while economic lifetime is linked to how much time will pass before it is more profitable to replace the equipment with new and improved technology. Enova uses economic lifetime as its basis, which is also reflected in Enova's investment analysis. Not only is project lifetime an important parameter when evaluating the need for support, it also indicates how long the benefits from the energy result provided by the project will last. The project lifetime multiplied by annual energy result (years\*kWh) indicates the project's total lifetime energy result. Similarly, the lifetime energy cost can be calculated using the following equation NOK/(year\*kWh).

## Passive buildings

Passive buildings are buildings which require very little energy for heating. This is achieved by reducing the 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. A Norwegian standard is under preparation for passive buildings, adapted to Norwegian climatic conditions and building methods.

## Program

Enova has elected to organise its activities in the form of programs. A program is a policy instrument aimed at one or more specific target groups, with firm application deadlines and criteria. This arrangement has been chosen to direct the use of policy instruments and to facilitate prioritization between projects that are relatively similar.

## Program Coordinator

Enova outsources some of the initial application processing to free up internal capacity and ensure timely processing. These external resources are referred to as Enova's program coordinators.

## Realized result

In contrast to the contractual result and the final reported energy result, the realized energy result is not based on expectations, nor is it an estimate as such. The realized energy result is based on a review/audit of the energy results actually achieved by the projects. In practice, it can be difficult to quantify realized results, and the challenges presented may differ between energy production and energy end-use. There may be significant time gaps between completion of the projects and reporting of the realized results.

## Other renewable energy

For the purposes of this publication, other renewable energy means renewable energy other than wind power or thermal energy.

## Renewable energy

Enova's definition of renewable energy is based on the definition used in the EU's directive on the promotion of use of energy from renewable sources (2001/77/EC). The directive defines renewable energy as renewable, non-fossil energy sources (wind, solar, geothermal, wave, tidal, hydro-power, biomass, landfill gas, sewage treatment plant gas and biogases). Biomass is further defined as biodegradable fractions of products, waste and residues from agriculture (including vegetal and animal substances), forestry and related industries, as well as the biodegradable fractions of industrial and municipal waste.

## Triggering effect

As a steward of public funds, it is important for Enova to ensure that the funds it controls are employed in the best way possible. This principle is also confirmed in the agreement between Enova and the MPE. Subsidies provided by the Energy Fund are to contribute to ensuring realisation of projects that would not otherwise have been implemented. Enova's allocation of funds is intended to trigger projects that contribute to reduced energy end-use or increased energy production. Projects that have low costs per produced or reduced kWh will often be profitable without assistance, and should therefore not receive support from the Energy Fund. The support is also considered to have a triggering effect if it accelerates the implementation of a project, or if the scope of the project is expanded beyond what would otherwise have been the case.

## Consultation submissions and publications prepared in 2009

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

The EU directive to promote the use of renewable energy (the Renewables Directive)

The MPE proposal for a new ocean energy act

The MPE proposal for amendments to the energy act

The Ministry of Local Government and Regional Development (KRD) proposal for new requirements relating to energy supply in the technical regulations for the Planning and Building Act

The Ministry of Consumer Affairs and Government Administration hearing on the communication policies of the Norwegian state

The Ministry of the Environment proposal for state guidelines for climate and energy planning in the municipalities

The Norwegian Water Resources and Energy Administration (NVE) regulations on energy efficiency in buildings

The NVE proposal for amendment of the Control Regulations  
– construction contribution and joint metering

The NVE proposal for amendment of Chap. 15 in the Control Regulations  
– interruptible consumption

The NVE proposal for amendment of the Regulations of March 11<sup>th</sup> 1999, No. 301 relating to measurement, settling of accounts, etc., Section 4-2 relating to the pricing of imbalances

Standard Norway's criteria for low-energy and passive buildings – Residential buildings

The Norwegian Agricultural Authority proposal for amendments to the Regulations relating to business and environmental measures in the forestry sector

### Reports, studies and other publications:

Enova's industrial activities and results from 2008  
Enova (2009)

Potential for energy efficiency gains in Norwegian land-based industry  
McKinsey & Company for Enova (2009)

Utilisation of waste heat from Norwegian industry – a study of the potential  
Norsk Energi and NEPAS for Enova, (2009)

The 2008 results from Industry network reporting  
NEPAS for Enova (2009)

Scenarios for stationary energy end-use and –supply towards 2020 and 2050  
Econ Pöyry for Enova (2009)

Energy scenario analyses Enova-IFE. Scenarios for stationary energy end-use and –supply towards 2020 and 2050  
Institute for Energy Technology (IFE) for Enova (2009)

Expertise in systems for water-borne heating in buildings  
Multiconsult for Enova (2009)

Criteria for passive buildings and low-energy buildings – non-residential buildings  
Sintef for Enova (2009)

The Sfære magazine, Nos. 1 and 2  
Enova (2009)

Enova's results and activity report 2008  
- in Norwegian and English edition  
Enova (2009)

#### Household brochures

- Energy conservation for holiday cottage owners
  - Energy conservation for row house dwellers
  - Energy conservation for those who live in flats
  - Energy conservation for those who live in a newer dwelling
  - Energy conservation for those who live in an older dwelling
- Enova (2009)

#### Buyer's guides

- Air tightness inspection and thermography
  - Insulation
  - Solar collectors
  - Ventilation
  - Energy efficient windows
  - Heating regulation installations
  - Energy efficient lighting
  - Household appliances and electronics
  - Pellet stoves
  - Pellet boilers
  - Wood stoves
  - Air-water heat pumps
  - Air-air heat pumps
  - Water-water heat pumps
- Enova (2009)

## Enova – a driving force for future energy solutions

- Owned by the Norwegian Ministry of Petroleum and Energy
- Manages the Energy Fund
  - Budget 2009: MNOK 2 125, in addition to extraordinary stimulus package funds of MNOK 1 190
  - Anticipates that budget will gradually increase in years to come
  - Budget 2010: approx. MNOK 2 530
- Established in 2001
- Located in Trondheim, Norway
- 52 employees

### Primary objective

Promote long-term, environmentally friendly restructuring of energy consumption and energy production

### Performance targets

- 18 TWh of added renewable energy production and energy conserved by the end of 2011
- Working target: 40 TWh by 2020

More information about Enova may be obtained by visiting our website at: **www.enova.no** or by contacting our telephone/web-based help line: “Enova Svarer” (“Ask Enova”): tel. **800 49 003** e-mail: **svarer@enova.no**

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