



POLISH AND NORWEGIAN CITIES
together for climate and energy



Situation of Norwegian municipalities in terms of energy efficiency and RES use Diagnosis

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1. Objective

This document sums up facts on energy and greenhouse gas emissions, and related activities within Norwegian municipalities. The legal and economic framework for local authorities' planning and measures is presented, including funding sources, guidance and available data. Most municipalities now have passed related plans. Experience from this work is presented, including driving forces and barriers for obtaining results.

The aim of this "diagnosis" is to analyse and describe current situation of Norwegian local-self-governments in terms of energy efficiency and use of renewable energy sources (RES). The analysis includes:

- level of energy awareness of Norwegian municipalities;
- state of sustainable energy management in municipalities, as well as important aspects of the process;
- major barriers and challenges faced by municipalities striving to achieve their local energy targets;
- drivers for energy efficiency and RES use on the local level, as well as external factors supporting this process;
- needs of municipalities in terms of sustainable energy planning and management;
- Norwegian experiences and good practices that could be potentially transferred to Poland.

This Norwegian diagnosis will be complemented by the diagnosis of the situation of Polish self-governments, and together they will be a basis for future activities foreseen within the project. This will include:

- finding out which Norwegian experiences, solutions and good practices could be useful in the Polish context, as a base for dissemination in Poland;
- development of ideas for innovative projects inspired by Norwegian experience, which will be submitted for the open contest by Polish municipalities;
- development of mechanisms and tools enabling efficient dialogue and exchange of experience between Polish and Norwegian entities, as a basis for future joint initiatives.

Diagnosis of the situation of Polish municipalities is developed by PNEC in cooperation with ZMP. KS develops the equivalent diagnosis for Norway, with contribution from Civitas consultants.

The Norwegian analysis is based on experience from KS' own activities regarding sustainable energy planning and energy management on local level. In addition, the analysis relies on experience facilitating planning processes in municipalities and on county level, evaluations of climate & energy plans and experience from the national programme "[Cities of the Future](#)".



2. Framework

2.1 European cooperation

The Agreement on the European Economic Area, which entered into force on 1 January 1994, brings together the EU Member States and the three EEA EFTA States - Iceland, Liechtenstein and Norway - in a single market, referred to as the "Internal Market".

The EEA Agreement provides for the inclusion of EU legislation covering the four freedoms - the free movement of goods, services, persons and capital - throughout the EU/EEA. In addition, the Agreement covers cooperation in other important areas such as research and development, education, social policy, environment, consumer protection, tourism and culture. The Agreement guarantees equal rights and obligations within the Internal Market for citizens and economic operators in the EEA.

Norway participates fully in the internal energy market, and EU energy legislation is important for Norway both as an exporter of energy and as a cooperating partner on renewable energy. Norway emphasizes close cooperation with the EU on environmental policy, particularly in the area of climate change and pollution. Regarding European energy policy, the European climate and energy framework sets three key targets for 2030: a binding target to cut greenhouse gas emissions by at least 40% (compared with 1990 levels); a minimum share of renewable energy of 27%, and at least 27% improvement in energy efficiency.

Norwegian municipalities therefore face much of the same European framework for climate and end energy policy as their Polish counterparts. The Norwegian Association of Local and Regional Authorities (KS) is the only employers' association and interest organisation for municipalities, counties and local public enterprises in Norway. All of the 428 Norwegian municipalities and 19 counties are members, as well as approx. 500 public enterprises. Both on national and European level KS plays an important role representing its members, including energy policy.

2.2 National climate & energy policy

Norway has committed to the same target as the EU, of at least 40% reduction of greenhouse gas emissions by 2030. Through the EEA agreement, Norway is already part of the Emission Trading System (ETS), which covers

about half of the country's emissions. European cooperation also includes the non-ETS sectors. A well-functioning, integrated energy market is seen as the most important factor for security of energy supply in Europe and at the core of an effective climate policy. Further development of the EEA agreement is seen as a potentially important instrument here.

The way we produce and use energy globally is responsible for two-thirds of the world's greenhouse gas emissions. Actions in the energy sector can make or break efforts to achieve agreed climate targets. The energy sector must therefore be a key contributor.

Norway introduced a carbon tax in 1991. As of today, more than 80% of the country's emissions are covered either by the ETS, or subject to the carbon tax. Putting a price on carbon encourages the development of climate-friendly technology without the government "picking winners". The government will encourage innovation and enterprise through predictable regulation and framework conditions.

During the last couple of years, Norway has experienced a massive growth in the market for electric cars. Here, government incentives have made Norway an important testing ground for the car industry.

Hydropower was the basis of the industrialization in Norway long before anyone spoke of a "green shift". With more than a hundred years' experience, Norway today has the World's highest per capita hydropower production, and is ranked as number one in Europe and number six in the world in absolute terms. With a target of raising the renewable share in the energy mix to 67.5%, Norway continues developing hydropower and other renewable energy sources.

New and extended interconnectors between Norway and the EU will also support use of renewable energy in other European countries. In an average year, production of 135 Terawatt hours gives Norway a power surplus, making the country a net exporter of clean energy to Europe. On the other hand, in dry years Norway benefits from importing energy from neighbouring countries.

Norway has supplied Europe with natural gas since the late 1970s, when the first pipeline to Germany was put into operation. Large remaining gas resources and efficient infrastructure helps the Continent meeting climate and energy goals. Gas has far lower CO₂ emissions than coal, and can, along with hydropower play an important role in providing flexibility, security and back-up capacity for renewable energy.

Following up the COP21 agreement from Paris, the Norwegian government will support international cooperation that include emission commitments for all countries with large and increasing emissions.

2.3 Energy situation

Norwegian municipalities including their inhabitants and businesses will normally have access to (in European standards) low priced energy for all their needs. Many local authorities are even energy producers and/or benefit from taxation/agreements related to local hydropower production.

Stationary energy use is mainly based on electricity and renewable sources. Oil based boilers will be forbidden from 2020. Except Svalbard (in the Arctic), coal is practically not in use, neither for heating nor for electricity production. Although electric vehicles are widely introduced, heavily taxed fossil fuels still dominate mobile energy use. Figure 1 illustrates total energy balance. Greenhouse gas emissions in Figure 2.

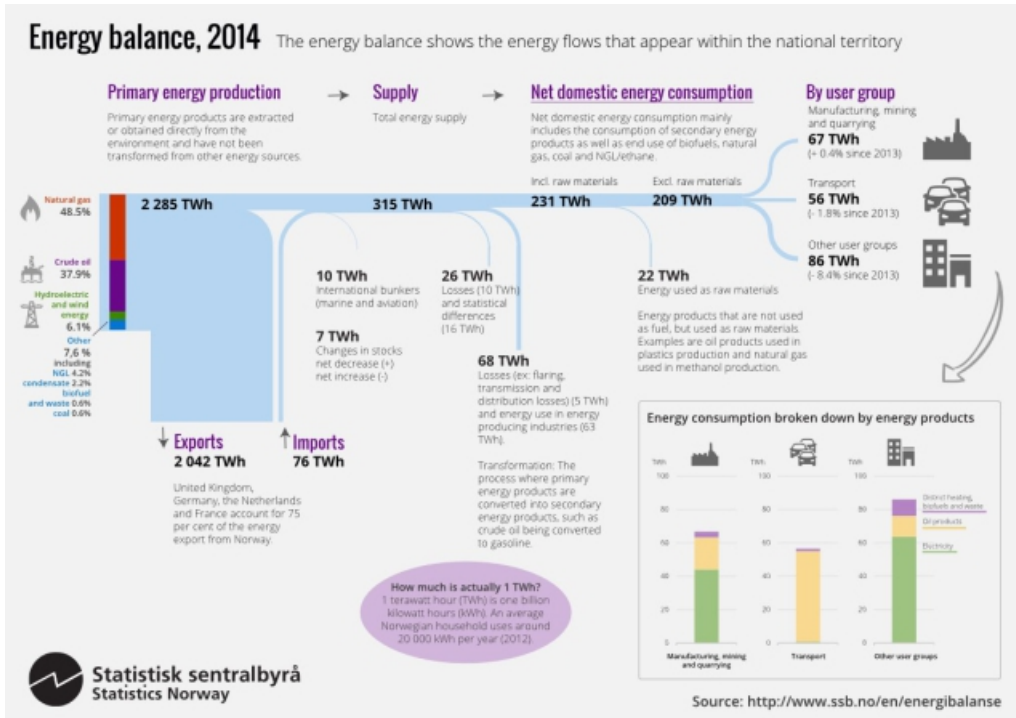


Figure 1: Energy balance in Norway 2014 (Statistics Norway).

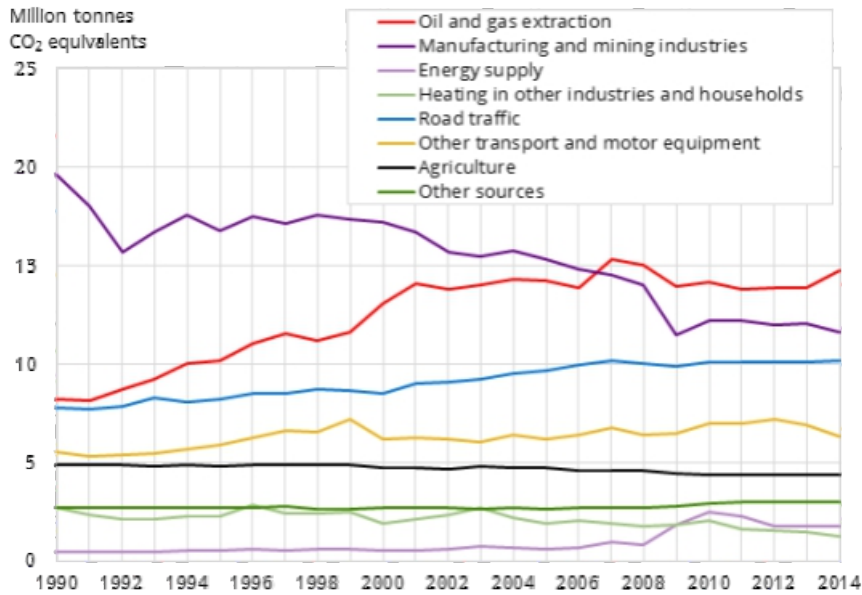


Figure 2: Domestic emissions of greenhouse gases, by source (Statistics Norway).

2.4 Legal framework

Regulations and standards regarding energy and electricity are of great importance for Norway, being part of the European internal energy market. The Norwegian Energy Act and underlying directives are based on EU's second electricity directive, and provide the legal framework for production, transmission, trading and use of energy.

The Norwegian [Water Resources and Energy Directorate](#) (NVE), under the Ministry of Petroleum and Energy, holds the managing responsibility according to the Energy Act and the Water Resources Act. Translations of regulations (not up to date) [are presented on the Ministry's web site](#).

The mainly state owned company Statnett is the only electricity Transmission System Operator (TSO), and is responsible for the transmission tariffs, see Figure 3. Regional and local distribution network is owned and operated by companies where counties and municipalities are among the most frequent owners. Many of the same companies own and operate power plants, heat centrals and systems for district heating.

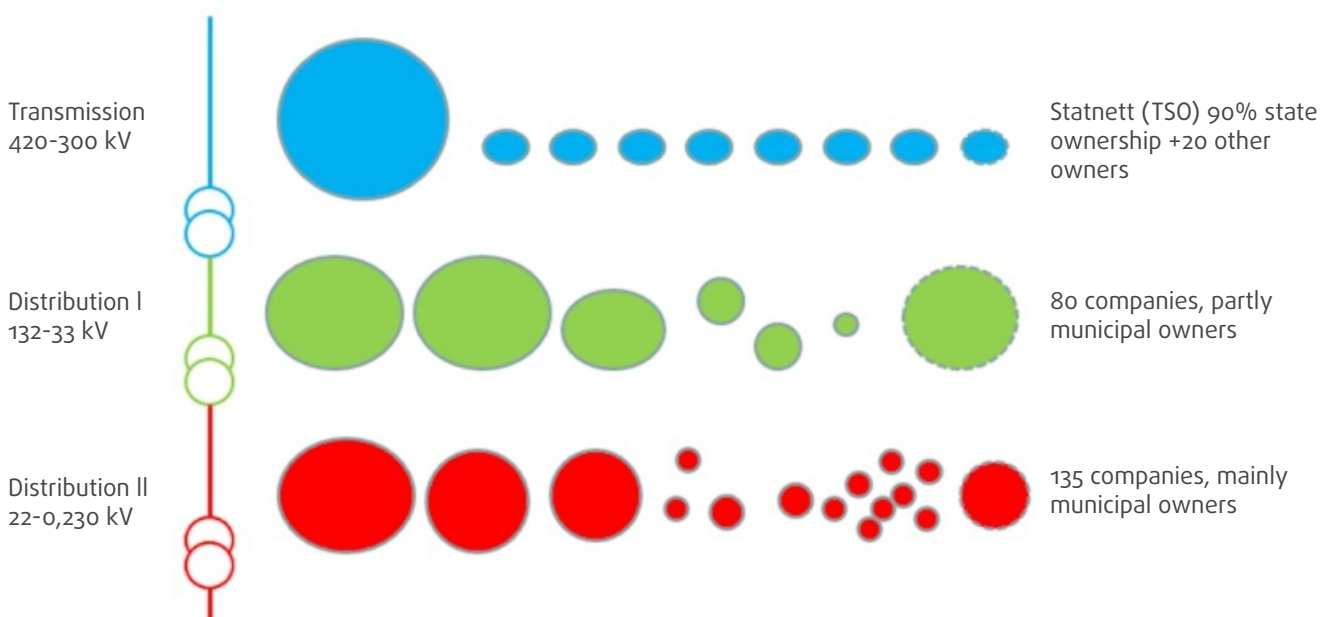


Figure 3: Electricity distribution in Norway (Source: NVE)

Through the wholesale market, power producers, suppliers, the industry and other participants can buy and sell power in competition with other market participants. The wholesale market facilitates export and import. In the retail market, private, public and commercial customers can choose vendor, though distribution costs are paid to the local network owner.

The [Pollution Control Act](#), administered by [the Norwegian Environment Agency](#), under the Ministry of Climate and Environment, is the authorities' main tool to regulate greenhouse gas emissions, other pollution and waste. In some areas, i.e. local air quality, Norwegian municipalities here have got limited authority, delegated from state level.

The [Planning and Building Act](#) (see section 3.2) is the Municipalities' most important tool for sustainable energy planning and management on local level. Technical regulations under this law include detailed and ambitious energy requirements for buildings.

2.5 Economic framework

Municipal energy use and related costs

Even with relatively low prices on energy for stationary use, related costs are a significant part of Norwegian

municipalities total running costs, approximately 1%. As indicates, energy costs are decreasing, partly due to lower energy prices. However, in the same period, the actual use of energy is also reduced. In 2012, the average energy use in municipal buildings was 181 kWh/m²; in 2015, it was 155 kWh/m².

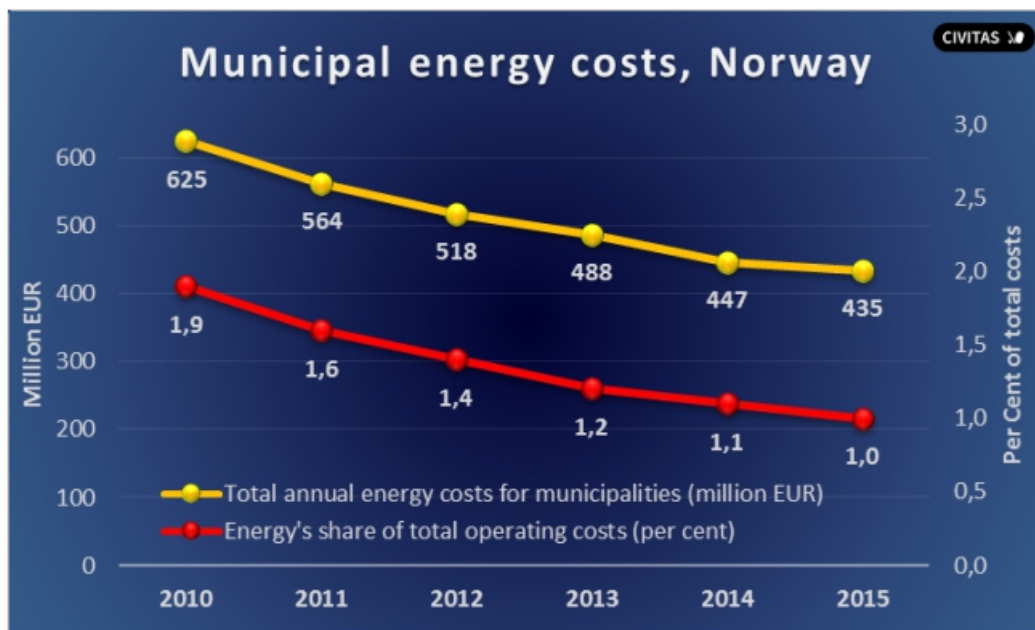


Figure 4: Norwegian municipalities; total energy costs, and energy's share of total costs 2010-15. Data from Statistics Norway.

Figure 5 shows energy costs per inhabitant and per square meter:

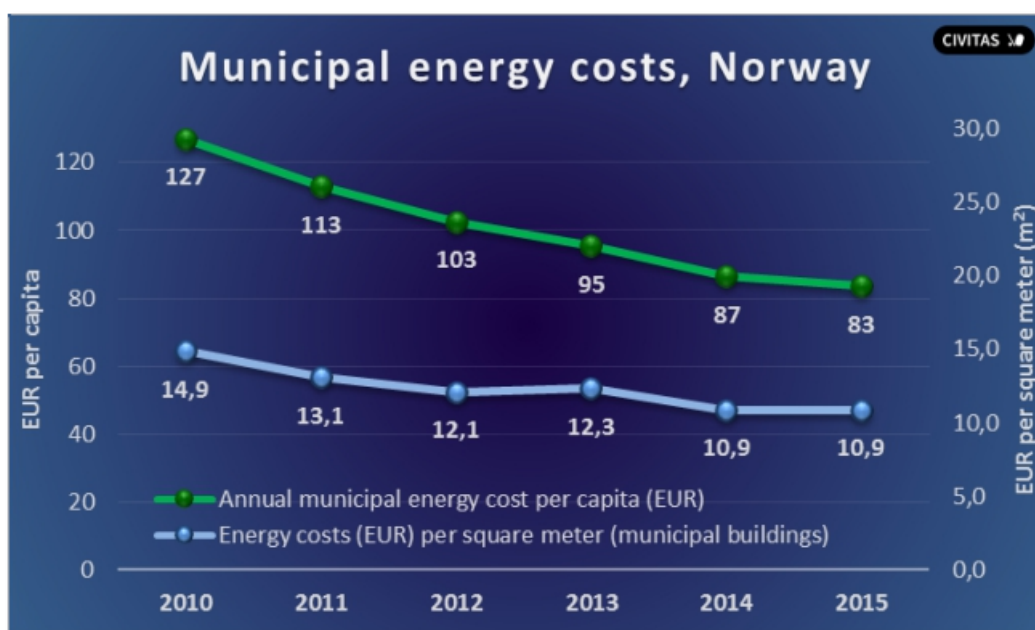


Figure 5: Norwegian municipalities' energy costs per capita, and per square meter 2010-15. Data from Statistics Norway.

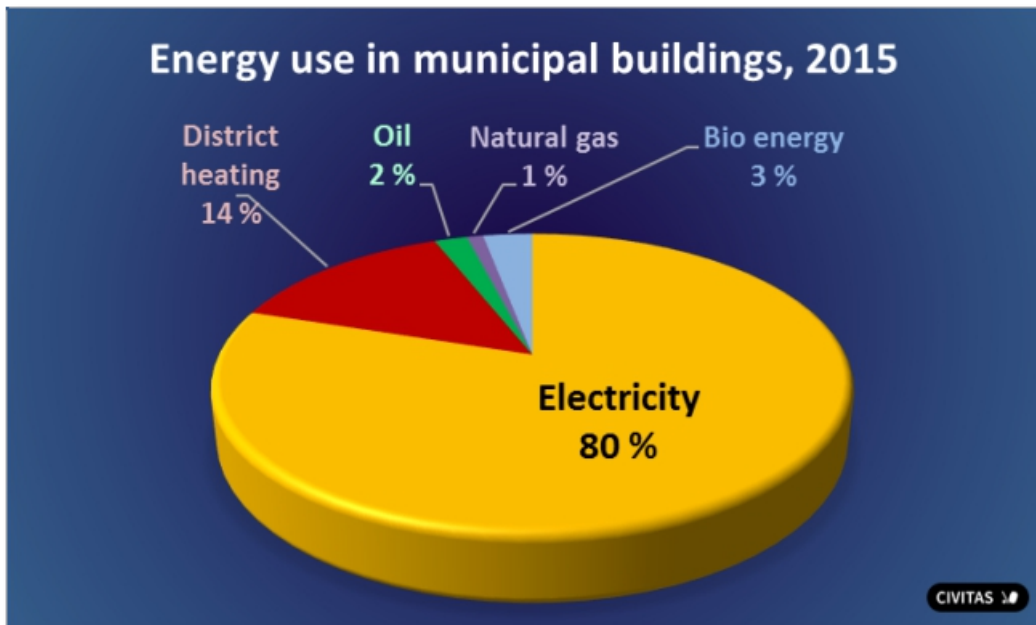


Figure 6: Energy use in Norwegian municipal buildings, type of energy. Data from Statistics Norway

Electricity is the dominating energy carrier - see Figure 6. Practically all electricity and district heating comes from renewable sources. However, with reduced electricity use, this energy could have been exported and replaced use of non-renewable energy in other countries. This is of special interest in countries where coal is used for heating and electricity production. In addition to high carbon emission, coal causes problems with local pollution in many European cities.

Figure 7 shows difference in energy use per square meter in different types of Norwegian municipal buildings. Energy use in schools and kindergartens is significantly lower than in other types of buildings.

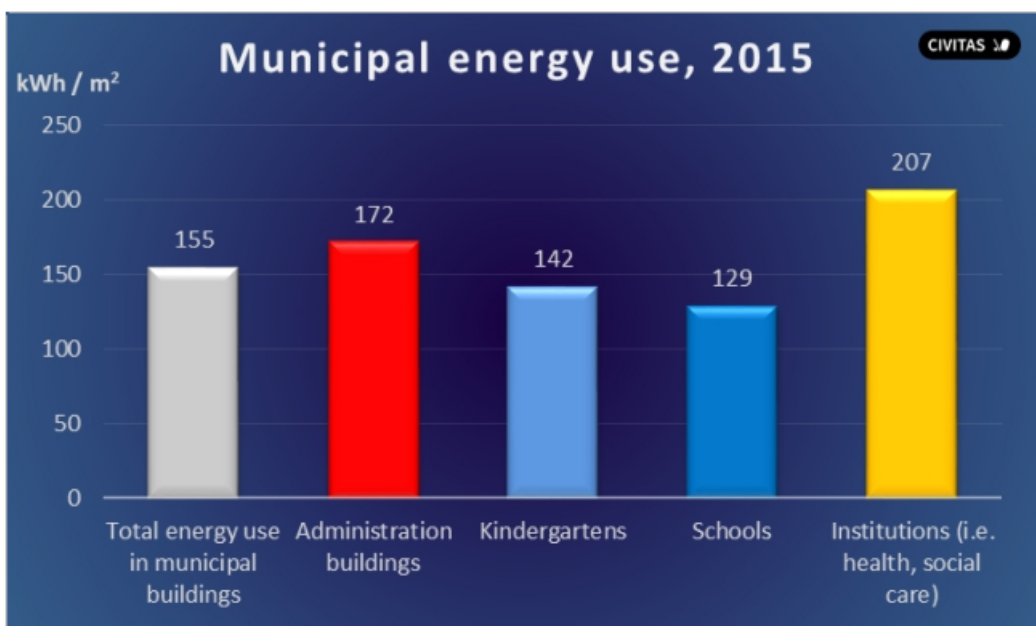


Figure 7: Energy use in Norwegian municipal buildings, type of buildings. Data from Statistics Norway.

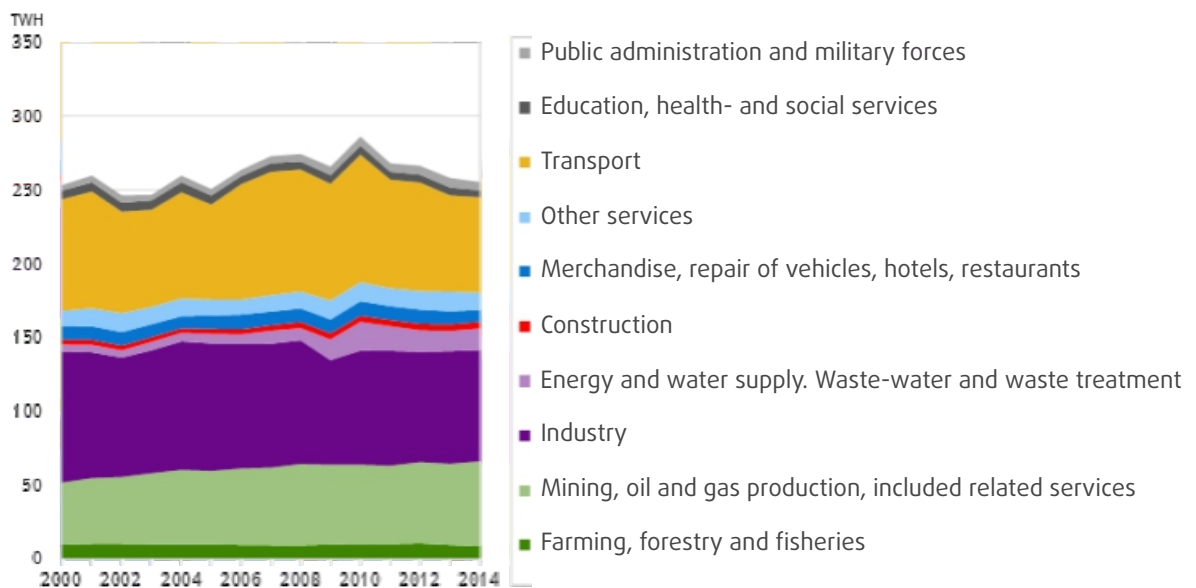


Figure 8: Total energy use (TWh) in Norway 2000-14 split into different sectors. Source: Statistics Norway.

Figure 8 gives a wider picture of Norwegian energy use, including historical data back to year 2000. The statistics clearly indicate that focus on buildings is not sufficient. Other types of use, also within municipalities, need attention i.e. water supply and wastewater treatment.

Funding opportunities

Ordinary municipal budgets are the main and dominating financing source, also for projects to promote energy efficiency and RES use. Even within ambitious projects, external financing will normally pose far less than 10% of the total project costs. Anyhow, such contributions will often trigger higher environmental ambitions.

The main national instrument to promote environmentally friendly consumption and generation of energy is Enova SF, established in 2001. Private individuals, enterprises and public entities including municipalities are supported. This is done via targeted programmes and support schemes in the areas in which the greatest effect in the form of saved, converted, or generated clean energy can be documented.

[Enova](#) is a public enterprise, owned by the Ministry of Petroleum and Energy. Most of its funding comes from a small additional charge to electricity bills, and is spent financing concrete energy measures and offering active advice.

Enova supports innovation, testing of new methods, collecting experience and spreading knowledge. This includes wind power, district heating, geothermal energy, heat pumps, and energy efficiency in industry and in buildings. In order to motivate, Enova emphasises spreading knowledge of potentials to adopt efficient, environmentally friendly energy solutions, and the positive results that can be achieved. In addition, [the Norwegian State Housing Bank](#) (Husbanken) provides subsidised loans for low-energy homes.

Enova considers a well-functioning market as a key to obtain change. By stimulating demand, they will force the supplier chain into development, innovation, competence increase, and better quality. This will increase the provision of better solutions and simultaneously reduce process costs. This method enables multiple solutions to be implemented in more areas and at a lower price. In addition, both volume and experience will increase in proportion with innovation, conversion, and energy savings.

Enova also offers financing of transport related measures, primary technology based solutions. Several ministries also offer limited funding to reduce road traffic, i.e. supporting zero increase in private car use in the major cities – a national goal adopted by the Parliament.

For other environmental measures, sparse external funding is available for Norwegian municipalities. KS has especially pinpointed the need for more targeted instruments to reduce greenhouse gas emissions within the range of municipal activity (see Section 3). This does not only include municipalities' internal activities as energy user and/or polluter. A potentially more important, and less observed area is municipalities' role as authority, especially within integrated transport and land use planning and as building authority.

[Innovation Norway](#) and [The Research Council](#) also promote development of new environmental friendly solutions, and many municipalities take part in related projects. Development and testing of new environmental technologies on the national market has paved the way for innovative Norwegian products and services entering the World market. In this testing phase, municipalities play an important role.

Economic requirements

State funding of Norwegian municipalities is mainly based on block grants, and it is the local authorities' own responsibility to balance their budgets, including eventual necessary costs reductions. If additional earmarked funding is received, documentation of its use will be required.

2.6 Social framework

Energy and environmental issues have been high on the Norwegian agenda for more than thirty years, including public debate. During this period, the level of energy awareness of citizens is significantly increased. On all levels of education, this is subject to extensive focus. Non-governmental organisations (NGOs), the national broadcaster (NRK) and other media are among the important contributors.

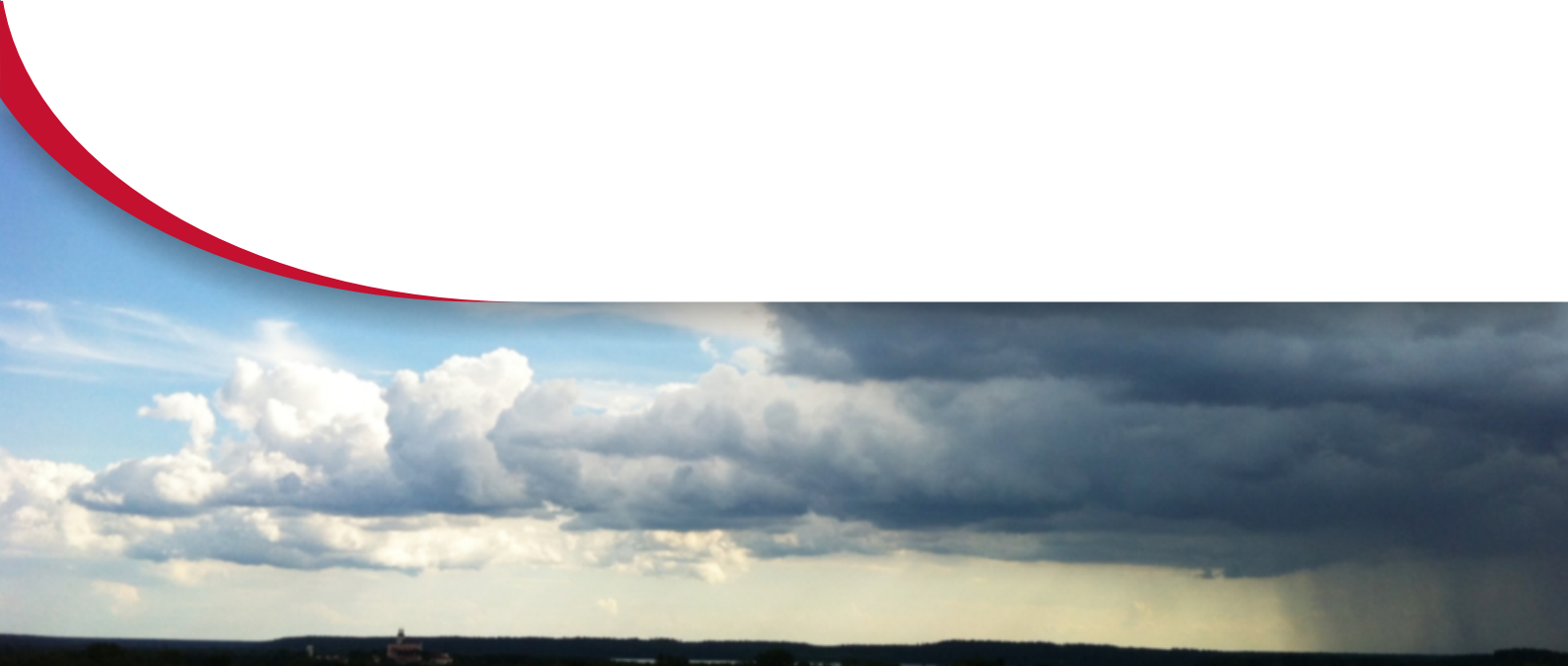
However, many practical issues have to be resolved, and the everlasting lack of funding for all good purposes characterize the daily municipal agenda. Especially in smaller municipalities, the engagement is dependent of idealistic and committed individuals, able to create interest, see Section 4.2.

In earlier days, energy related and environmental projects were seen as a good arena to engage unemployed people, or for other social projects. Today, related work normally is more complicated, and requires a high level of professionalism. The combination of social and environmental purposes is therefore not always conspicuous. In addition, the general quality of housing is so high that there is no obvious link between poverty fighting and energy efficiency in buildings.

2.7 Municipalities taking part in international cooperation

Norway participates in European research and development programmes, and municipalities can apply for related EU funding, see Section 2.1. Municipalities also take part in projects related to the [EEA-grants](#).

Both individual municipalities/counties and the KS are widely engaged in international cooperation between local governments, i.e. in [ICLEI](#) (Local Governments for Sustainability) and the [Covenant of Mayors](#) for Climate & Energy. Especially the City of Oslo takes part in many international activities and has numerous relations. Environment and energy is often high on the agenda in relations between friendship cities.



3. Climate & Energy Planning

Climate and energy plans are documentation of a publicly initiated process where relevant sectors in the municipal administration and their stakeholders have been involved. An agreed distribution of roles, responsibilities, priorities and tasks is the most important outcome of the process. The very fact that people work on the plan contributes positively to increasing knowledge at the local level. Plans are adopted politically and shall become an integral part of the municipal planning hierarchy.

In an early phase, climate and energy efforts were concentrated on the municipalities' own buildings. Here, municipalities are like any other owner of buildings, i.e. state institutions or private enterprises. The planning needed was more or less an internal matter, and could be seen as some kind of "Corporate Social Responsibility" (CSR) exercised by the local authorities.

Municipal buildings are still important, but today Norwegian local and regional (county) authorities pay more attention to their unique role – areas where climate and energy results cannot be achieved without municipal action. Figure 9 illustrates the difference between the municipalities unique role and the "CSR-like" part of municipal activity. Examples are given in Figure 10.

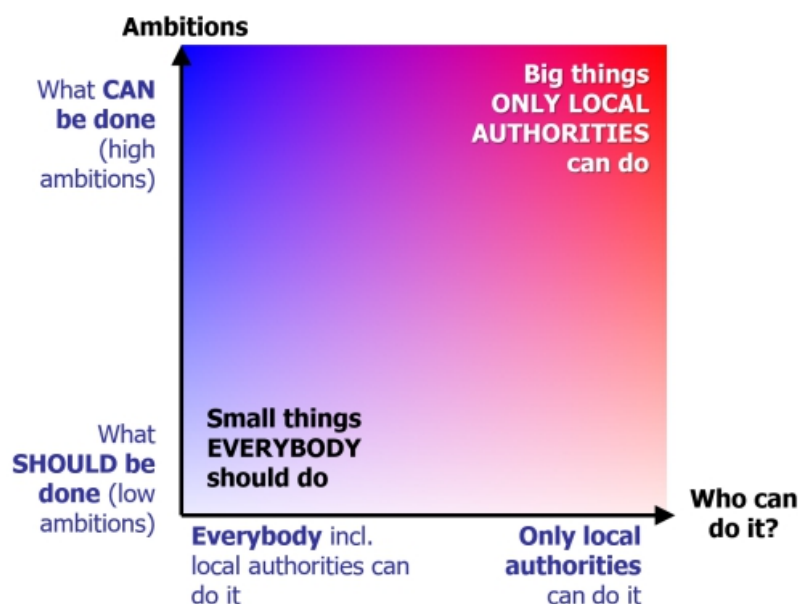


Figure 9: Aspects of climate and energy planning – municipalities' role.

- Corporate social responsibility (CSR) like any other public or private enterprise
- Good example for others

- Any action is entirely dependent on municipalities
- Reaching national goals relies on the municipalities

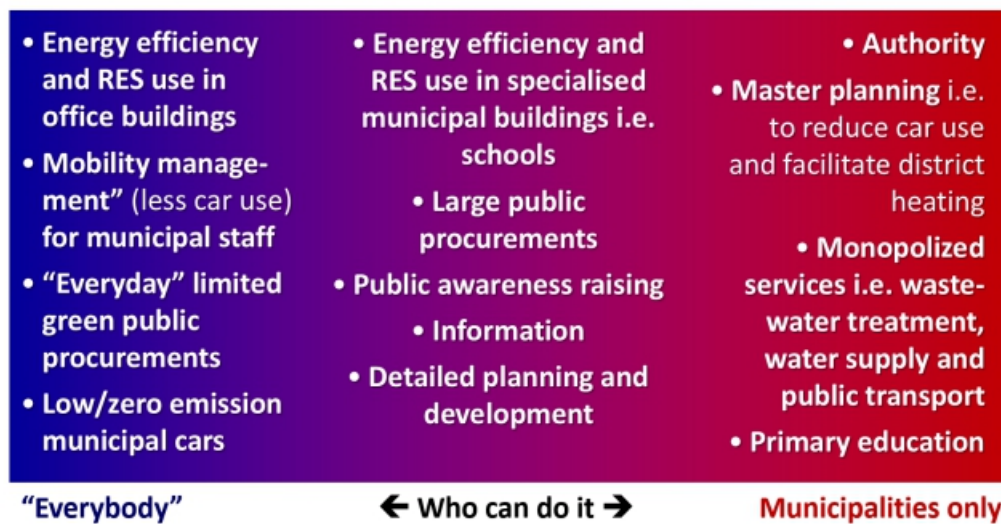


Figure 10: Examples of areas where municipalities have the same social responsibility as other public or private entities (left), and where municipalities have a unique role (right).

Figure 11 displays important focus areas in newer climate and energy plans in Norwegian municipalities. In addition, improved energy efficiency is still high on the agenda, both for municipalities' own buildings and supporting other building owners. See Figure 23, page 26 for the actual content of municipal plans in Norway.

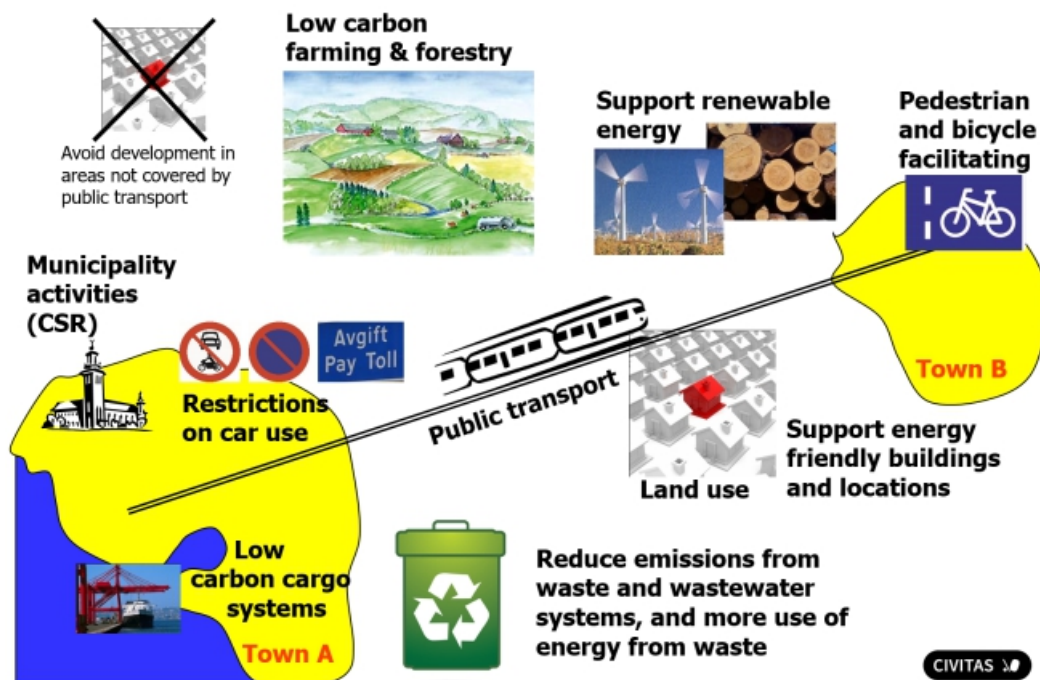


Figure 11: Focus areas for climate and energy planning in Norwegian municipalities (examples).

3.1 Main principle of climate and energy planning

The reason for climate and energy planning is to make change. In everyday life, it is easy to focus too much on producing documents, fulfilling national requirements, or bringing together people. All this is only necessary tools in order to get what we want – lower carbon emission, less use of limited energy and more renewables.

WHY CLIMATE AND ENERGY PLANS?



Figure 12: Why make climate and energy plans?

Planned change is a result of action. If nothing is done, a baseline shows the expected development in future energy use and greenhouse gas (carbon) emissions. Baselines are created by projecting historical data and analysing trends and changes outside the municipalities' span of control.

Targets for reduced carbon emissions, reduced energy use, and/or more RES use are set politically, and include ambitions to make change. To obtain this, municipalities need to initialize and/or conduct action.

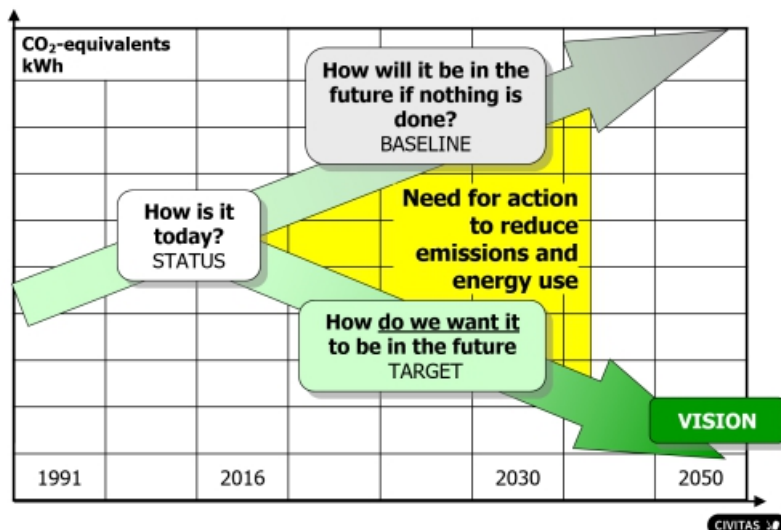


Figure 13: Connection between status, baselines, targets and need for action in climate and energy planning.

In order to know how much action is needed to reach the targets, local authorities will have to quantify (estimate) the effect of their action. They should also make sure that the planned action is realistic, and include needed funding in their budgets. For long-term “visions”, the relation to needed action is less emphasised.

Figure 13 illustrates the “ideal” principles of climate and energy planning, which also are in line with climate schemes on national and international level. Though, practically speaking available historical data and methods to quantify effect from action are not sufficient to develop plans that fully are according to these principles.

Within the municipalities' span of control, they will normally prefer the most cost effective measures. Here cost effectiveness is not limited to municipal budgets, but applies for the whole community. Figure 14 shows how cost effectiveness for different carbon reduction measures can be systemised. However, regardless cost efficiency, local politicians may not want to realise all types of action, i.e. heavy restrictions on car use. These kind of choices are an important part of the planning process.

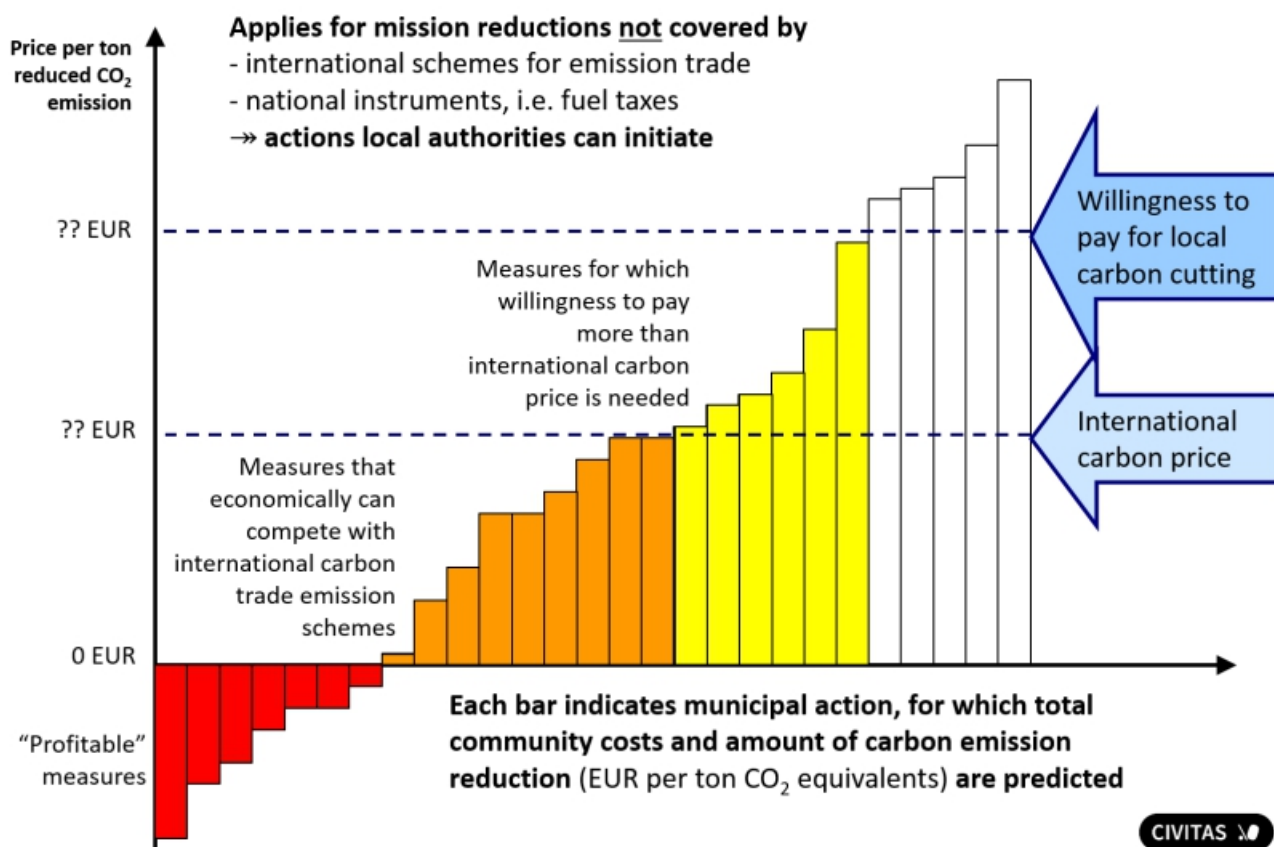


Figure 14: Systemising cost effectiveness for measures to reduce greenhouse gas (carbon) emissions.

Planning is meant to result in action that creates deliberate change. Daily work should focus on action. The “flowchart” in Figure 15 illustrates how ideas can be concretized using standardized data sheets representing each potential measure. Such measures include things the municipality can do alone, and/or utilising its role as authority, coordinator, “catalyst”, etc.

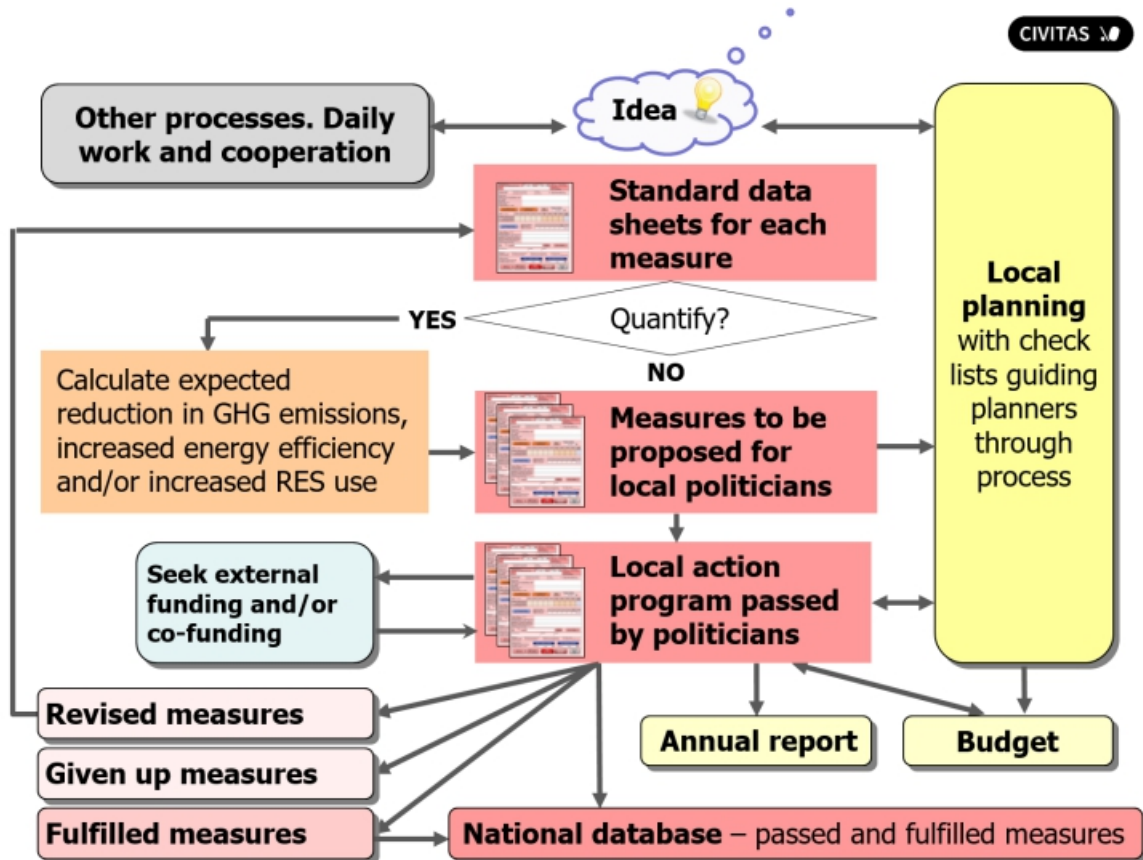


Figure 15: "Flowchart" showing how ideas can be turned into action, including the role of climate and energy planning.

In Figure 15 measures, represented by data sheets, can be followed through a municipal planning and budget process, until they are fulfilled, given up or revised.

A web based checklist guiding planners through an open planning process, including stakeholder consultations is already developed by KS an in use, see section 3.5. However, such ambitious planning processes are only run maximum every 4th year, according to the Norwegian planning system. The mean time is the time for action, including possibility to develop and pass new measures, only revising the action program.

Measures passed by local politicians can be put into a local action program, where they may be arranged in order of priority. Here it will also be possible to summarize the effect of all measures and compare with local targets. If there are not sufficient measures to reach the targets, more action, or reduced targets will be necessary. Completion of measures is also linked to local planning and budget processes, annual reports, etc.

Though not yet realized in Norway, it is possible to establish a national database containing all data sheets included in municipal action programmes and data sheets for fulfilled measures. This makes it possible to exchange ideas for new measures between municipalities, counties and national authorities. Calculated (expected) carbon/energy effect from one or more municipalities can be summarized and compared. Thus, it will be possible to calculate the total contribution from local authorities and include this in national action plans and analysis. The same database may also be used by national funding schemes.

Today, Norway has only a database where complete climate and energy plans are electronically available, see Section 3.5.

3.2 Basis in the Planning and Building Act

The Norwegian Planning and Building Act (PBL) is the municipalities' most important tool in their extrovert energy and climate work.

PBL assigns responsibility for land use planning and facilitating transport systems to the counties and primary municipalities. This is important for energy and climate planning, because location of households, schools, day care centres, working places and services is seen in connection with the possibility of transport between these places, such as bicycling, walking and public transportation. Improvements and concentration within the building zone, locating businesses and activities in close proximity to public transportation and restricting parking options are important tools utilised by the municipalities. In addition, initiatives such as city bicycles, ride-share schemes and promoting low- or zero emission vehicles are included in many climate and energy plans.

Norwegian land use plans also play an important role facilitating energy efficiency and RES use. For instance, effective district heating is dependent of how land use is organised. Detailed plans under the PBL Law are also used to ensure favourable climate orientation and mutual localisation of the buildings. Several surveys show that variations between alternatives for Norwegian land use plans can entail a difference of 15-25% in future energy consumption.

The law also defines municipalities as the local building authority, monitoring new and renovated buildings' compliance with the detailed and ambitious energy requirements in regulations under PBL. The building regulations also include a separate provision requiring the use of renewable energy where this is profitable in a life-cycle perspective.

Obligatory climate and energy planning

Pursuant to the Planning and Building Act (PBL) the national government has decided that climate and energy planning shall be obligatory for all municipalities. National guidelines require that plans are developed and revised in accordance with the planning system defined in the PBL. The guidelines also describe recommended content for the plans.

3.3 State of sustainable energy planning

Figure 16 shows the status for climate and energy planning in Norway. The first generation of plans are now passed in most municipalities. In addition, the county municipalities (regional authorities) have passed plans covering these topics. According to the planning and building act (PBL), regional plans shall be followed up in the primary municipalities' planning.

Both in municipalities and counties, the Climate and energy planning processes have resulted in political and administrative awareness locally and more cooperation with citizens & stakeholders.

Dedicated officers for climate and energy planning, or municipal energy managers/energy experts are only common in large municipalities. In smaller local authorities, the ordinary planning and environmental staff handle related tasks. Cooperation between communities, using common experts frequently takes place. Use of consultants assisting in planning process is common.

Most county authorities play an important role, especially in supervising the smallest municipalities. They also organise network meetings for local authorities. Web-based fora for planners have been initiated. In addition, there have been a couple of coordination and information meetings between the 19 counties, KS and state authorities.

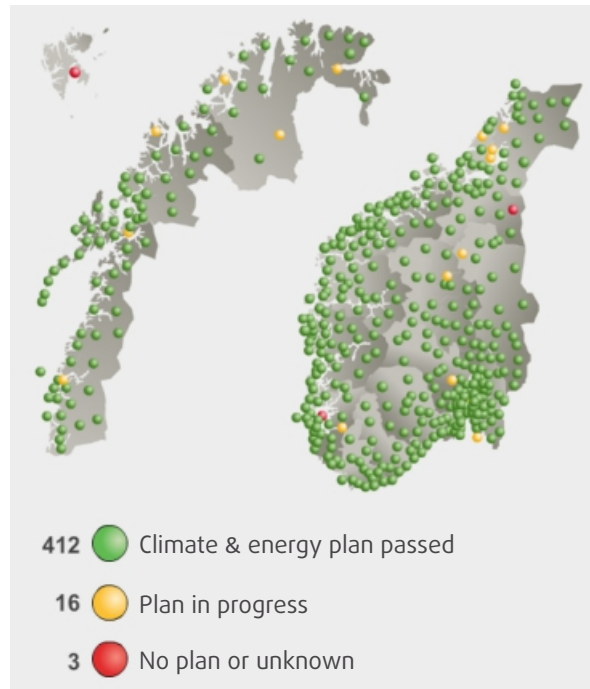


Figure 16: State of municipal climate and energy plans in Norway (Source: Enova).



Figure 17: Norwegian climate and energy plan documents.

NGO's often take part in climate and energy planning, especially in the obligatory stakeholder consultation prior to political adoption of the plans. NGO's are also active on national level, i.e. information campaigns or "lobbying" towards local and regional authorities, and the KS.

3.4 Statistical and factual base

[Statistics Norway](#) has provided climate and energy data including historical data on municipal level. Statistics can easily be accessed online, including user-friendly tools to combine and present statistical data. Due to low background data quality and lack of resources within Statistics Norway, climate and energy data on municipal level were not presented for a period after 2009. New funding and statistical methods have made it possible to re-establish some of the statistics, starting 2015-16.

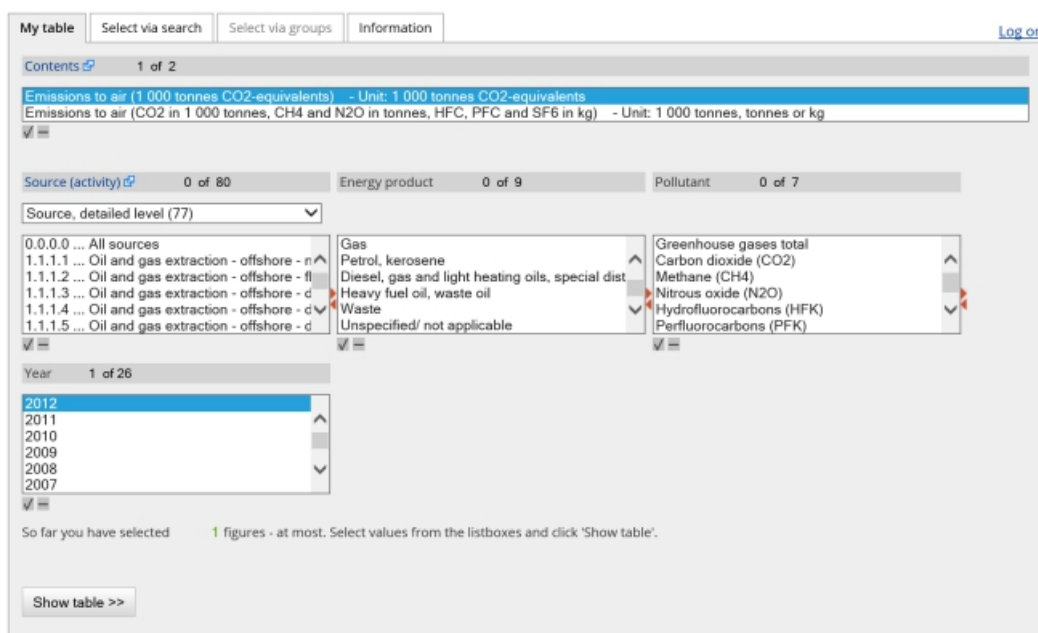


Figure 18: Statistics Norway' free tool lets you create your own tables (i.e. Excel) and graphics based on national statistics. Many data are on municipal level.

A regulation under the Energy act has made the local network providers (see Section 2.4) responsible for local “energy analyses” including the existing use of energy and potential for increased energy efficiency and use of energy from renewable sources. These analyses have been of great importance for the climate and energy planning in most municipalities.

Regarding greenhouse gas emissions and other environmental aspects, the web site www.environment.no presents State of the Environment (SOE) Norway. The service presents environmental topics in a simple and easy-to-follow way and provides access to more detailed scientific presentations, data sets, graphical illustrations, maps, and web links. Users will also find information on legislation and international agreements and environmental targets.

The [Norwegian Environment Agency](#) has the overall responsibility for SOE Norway. Content is also produced by the other environmental agencies, including the [Directorate for Cultural Heritage](#), the [Norwegian Polar Institute](#) and [The Norwegian Radiation Protection Authority](#). [Statistics Norway](#), the [Norwegian Institute for Water Research](#), the [Norwegian Institute for Air Research](#), the [Norwegian Institute for Nature Research](#) and the [Norwegian Institute for Cultural Heritage Research](#) supply the website with data.

In addition, the environmental agencies run the web site www.miljokommune.no (Norwegian text only). This web site contains environmental information and tools designed for municipalities, including some guidance for climate

and energy planning. Links to existing plans, examples of related projects and some further background information is presented on a [web site](#) developed by KS and Enova. Adaption to climate change is covered by parallel guidelines.

The [Cities of the Future programme](#) (2008-14) helped city municipalities to share their climate friendly city development ideas with each other and with the business sector, the regions and the Government. Numerous projects got funding and free cooperation arenas from several ministries. Participating cities were Oslo, Bærum, Drammen, Sarpsborg, Fredrikstad, Porsgrunn, Skien, Kristiansand, Sandnes, Stavanger, Bergen, Trondheim and Tromsø.

[FutureBuilt](#) programme (2010-20) in the Oslo area has a vision of developing carbon neutral urban areas and high-quality architecture. Numerous projects are already finished, and the aim is to complete 50 pilot projects. Projects include urban areas as well as individual buildings – with the lowest possible greenhouse gas emissions. These prototypes will also contribute to a good city environment with regard to ecological cycles, health and the general impression of the city.

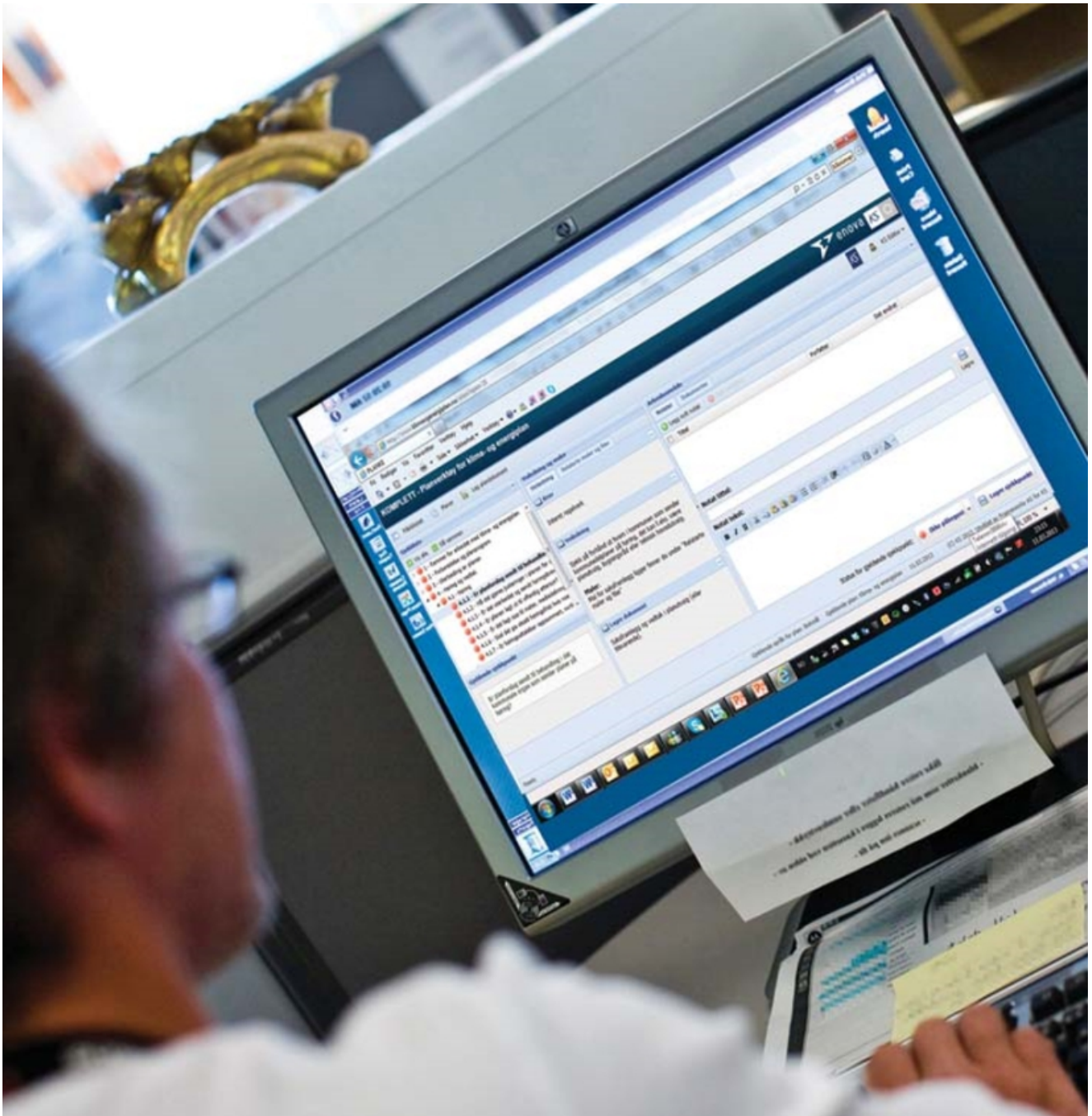
3.5 The KOMPLETT planning tool, developed by KS

The most complete guidance for municipal climate and energy planners “[Komplett](#)” is developed by KS with co-financing from Enova. This online checklist driven planning tool ensures and documents that plans are developed according to national requirements, see section 3.2. At the same time, Komplett facilitates and simplifies the process of making and maintaining climate and energy plans.

Komplett is built like a hierarchical guide where planners execute the planning process from a- to z in the form of a template based checklist. Information is stored in order to make revision of plans easier. The interface is illustrated in Figure 19.

Checkpoints – things to do	Help and tools related to current checkpoint	Writing zone for information and plan text related to this checkpoint
<input checked="" type="checkbox"/> 3-3-2 Pre-previous checkpoint	<p>Guidance text:</p> <ul style="list-style-type: none"> - What to do in order to “check our” this point - Relevant regulations and requirements - Information on available data and other useful information, tools etc. <p>Data files for download,</p> <ul style="list-style-type: none"> - Document templates, i.e. information letter for stakeholder consultation - Illustrations: maps, photo, graphics etc. <p>Examples from other municipalities</p> <ul style="list-style-type: none"> - Plan text, illustrations, spreadsheets etc. - Related documents, i.e. info sheets - Activities i.e. public meetings <p>Links to other web sites</p> <ul style="list-style-type: none"> - More information and inspirations - Other web based tools - Useful addresses, networks etc. 	<p>Plan text:</p> <ul style="list-style-type: none"> - Text is automatically transferred to a “stitched” plan document (MS Word), based on a recommended template - The check list will guide the user to the Word document when needed <p>Data files saved for future use</p> <ul style="list-style-type: none"> - Letters, information brochures, presentations, spreadsheets, - Illustrations: maps, photo, graphics etc. <p>Internal memos for the planner's own use</p> <ul style="list-style-type: none"> - Experience (useful for plan revision) - Addresses, contact persons etc. - Reminders
<input checked="" type="checkbox"/> 3-3-3 Previous checkpoint		
<input type="checkbox"/> 3-3-4 Current checkpoint		
<input type="checkbox"/> 3-3-5 Next checkpoint		
<input type="checkbox"/> 3-3-6 Second next checkpoint		

Figure 19: Komplett planning tool by KS, with use of checklists.



How the climate- and energy-planning tool “Komplett” appears for the user.
Web interface by [Framewoks](#), content by Civitas. Photo: KS.

Former information and guidance documents include an [information folder](#) from, KS describing how municipalities can contribute reducing greenhouse gas emissions. Enova has developed a guide for Municipal energy and climate planning (2008), including an [English translation](#).

For construction projects the web based tool www.klimagassregnskap.no, helps municipalities and others conducting life cycle analysis of carbon footprint. This widely used tool is financed by the state owned Administration Company [Statsbygg](#) (content by Civitas).



4. Experience

The first climate and energy plans were made by Norwegian municipalities in the late 1990's. Most of the existing plans are from 2008-10.

Many plans are characterized by a relatively comprehensive analysis of existing greenhouse gas emissions, energy consumption and use of renewable energy. This is described in different ways and numbers from different plans are not always comparable. Relatively few municipalities have created "baselines" showing expected future development in emissions and energy use if nothing is done.

Most municipalities have set targets for reducing energy consumption and / or greenhouse gas emissions. Many municipalities have also set targets for RES use. Targets are normally set in terms of a percentage of today's (or 1991) emissions and energy use, but without quantifying how many CO₂-equivalents or kWh this will include. Municipalities will therefore not know how much action (measures) is needed in order to achieve their goals, see Section 3.1.

With some positive exceptions, municipality's main challenge is transferring all their knowledge and ambitious goals in their plans into action. In addition to not knowing how much must be done to reach their goals, there is lack of effective strategies to obtain change. Measures are often described in a vague manner, with no description of how much GHG emission and/or energy use will be improved. Realistic approaches to how measures practically can be implemented and necessary funding raised is often missing. Many plans have **not** pointed out what measures will cost, who will be responsible and when the work will be done.

4.1 Barriers and challenges

Norwegian municipalities' own assessment of major challenges within their climate and energy planning was mapped in a comprehensive survey carried out by Vista Analysis in 2014. Results are presented in Figure 21.

Municipal economy, lack of support from national authorities, limited possibility to act and lack of professional expertise are summed up to be the most important barriers and challenges.

After municipalities finished their first generation of plans in 2008-10 revisions of plans are overdue. However, until now not many municipalities have revised their plans. One reason for this may be that state funding of planning work (approx. 10.000 EUR from Enova) is no longer available. However, if the municipalities were really "keen on"

revising and vitalising their plans, this limited support, or funding of limited projects may not be the main hinder. In order to engage municipal politicians and leaders, effective economic drivers may have greater importance.

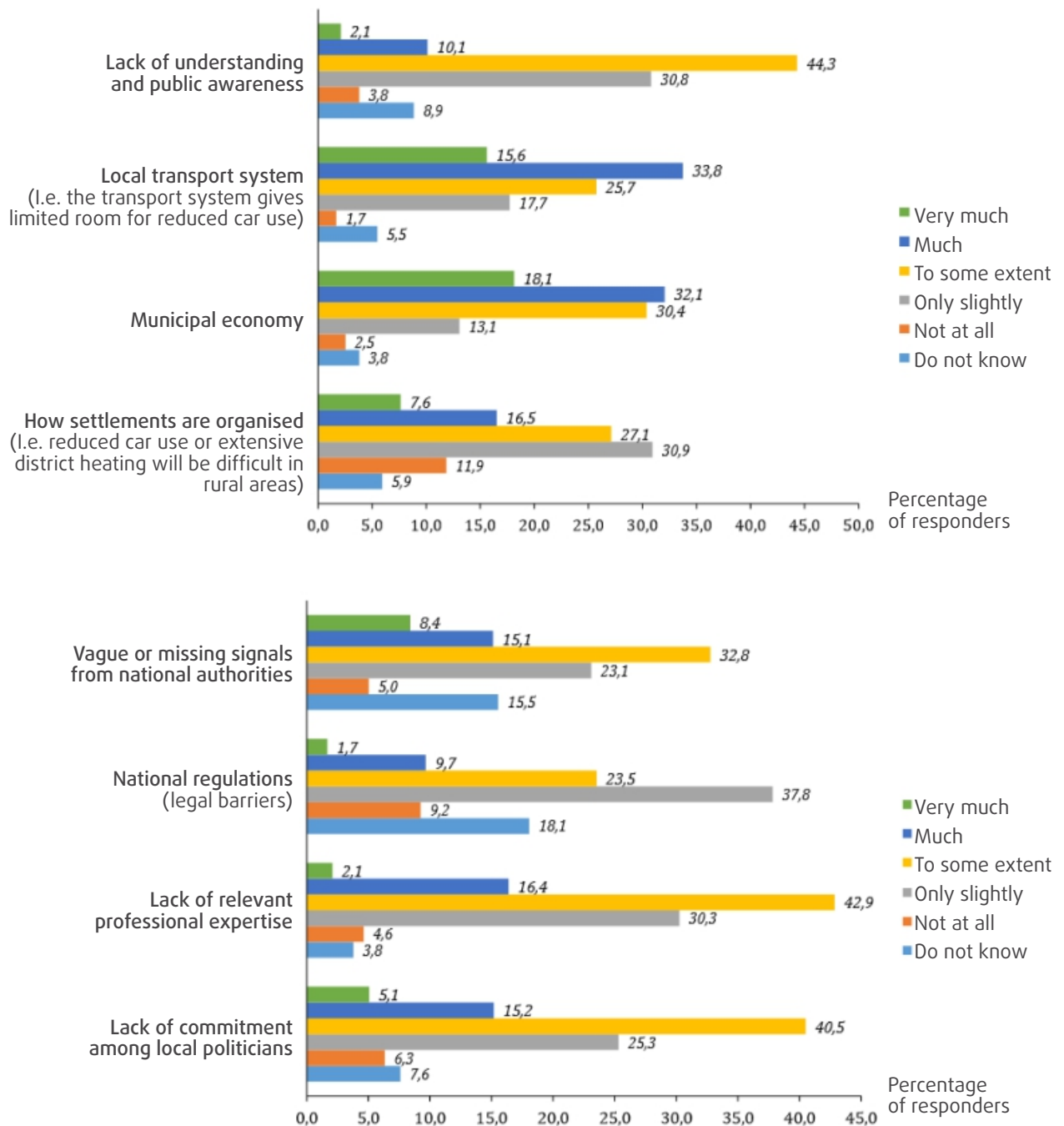


Figure 20: "To which extent have the following aspects hampered your work with climate and energy planning?"
Survey performed by Vista Analyse, 2014.

Lack of organisation and cooperation is regarded a challenge, i.e. within use of biofuels and district heating, where many players with different interests will need to cooperate. In Norway, low energy prices, especially on electricity, sometimes reduces the interest for saving energy, and makes it more challenging to find economically profitable measures.

4.2 Drivers & Needs

Figure 22 shows some “helpers” Norwegian climate and energy planners are encouraged to seek.

The most “low hanging fruits” are of course types of action that anyhow will be popular among municipal leaders and politicians. The same applies for those measures where the municipality, politically or economically experience that action is needed, i.e. the legal consequences of **not** doing anything are considered unacceptable. Secondly, measures giving a wide range of health- and environmental benefits may be easier to put through, i.e. measures reducing local air pollution.

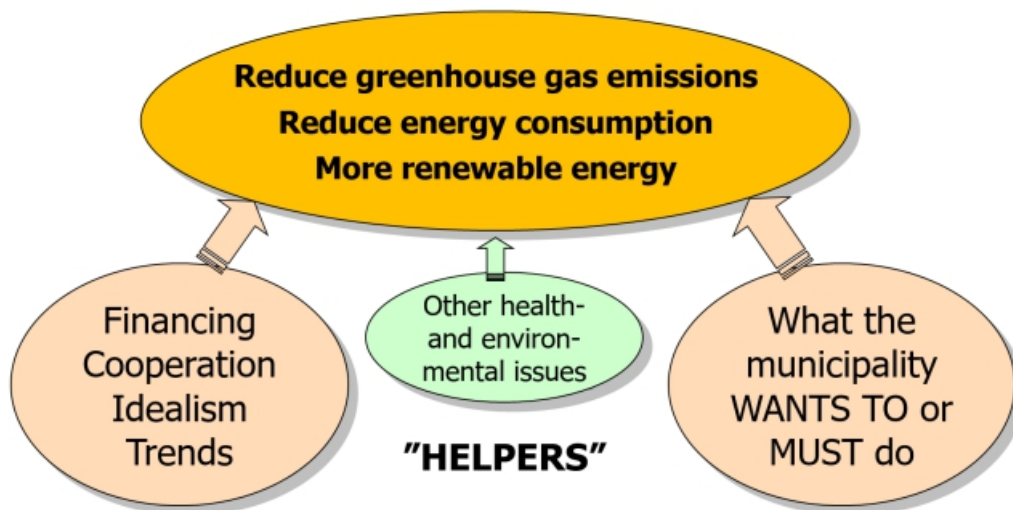


Figure 21: Drivers related to local climate and energy planning.

Even with dedicated idealists and available funding it may be hard to pass plans and action programmes containing measures for which municipal leaders and politicians have limited enthusiasm. Other examples of weaker drivers may be possibility for cooperation with interesting partners or trends, i.e. city bikes. A way forward may here be to convince decision makers that measures are profitable, necessary etc. Increasing environmental awareness among young people may contribute here.

National authorities are likely to create some of the strongest drivers. For example prohibiting use of oil for heating has resulted in a boost for renewable energy within Norwegian municipalities.

Another strong driver is commercial interests. For example, use of biofuels and wood based building materials both are supported by strong Norwegian forestry interests and give significant environmental gains. The same applies for recycling and other measures that reduce waste treatment costs.

The single most important need for Norwegian municipalities is strong national drivers to realise the many cost effective carbon reduction measures that municipalities can conduct, especially to reduce car use in cities. These are not necessarily cost effective and/or politically feasible for the municipality alone, but may be extremely cost effective compared with alternative measures on national and international level. Thus, KS has worked to make more types of municipal action part of carbon trade.

4.3 Trends & Perspectives

Norwegian climate and energy planning now stands at a crucial crossroads. If overdue revision of municipal plans is not done, much professional knowledge built during the first round of planning will be lost, and it will be harder to start from "scratch" again.

At the same time, the 2015 elections put a record number of environmentalists into Norwegian municipal councils. Although they also have focus on more traditional measures, i.e. energy effective buildings, strong focus now seems to be directed on city environment in a broader perspective.

Also on national level, activity is increasingly focused on city environment. KS has initiated close R&D cooperation with the ministry responsible for planning and the national road administration (Civitas is secretariat). The common project (KIT) develops methods to calculate how improved land use, and municipal measures to promote walking, use of bicycle and high standard public transport can reduce carbon emissions.

With such calculation methods in place, it will be possible for municipalities to enter international carbon trade with extremely cost effective measures. Less car use gives less need for expensive road building. Municipalities only need something in return for the political costs related to reductions of their citizens' car use. The idea was presented at the COP 15 in Paris, and the development work is in full progress.



5. Useful experience

5.1 Typical municipal measures in Norway

In the survey carried out by Vista Analysis in 2014 (see Section 4.1), municipalities also reported within which sectors their climate and energy plans contained measures. Results are referred in Figure 23.

Some of the early Norwegian climate and energy plans only contained measures related to stationary energy use in the municipality's own buildings, see Section 3. This is still the most common type of action. Transportation and land use count for the highest share of “extrovert” measures – those outside the municipal organisation itself.

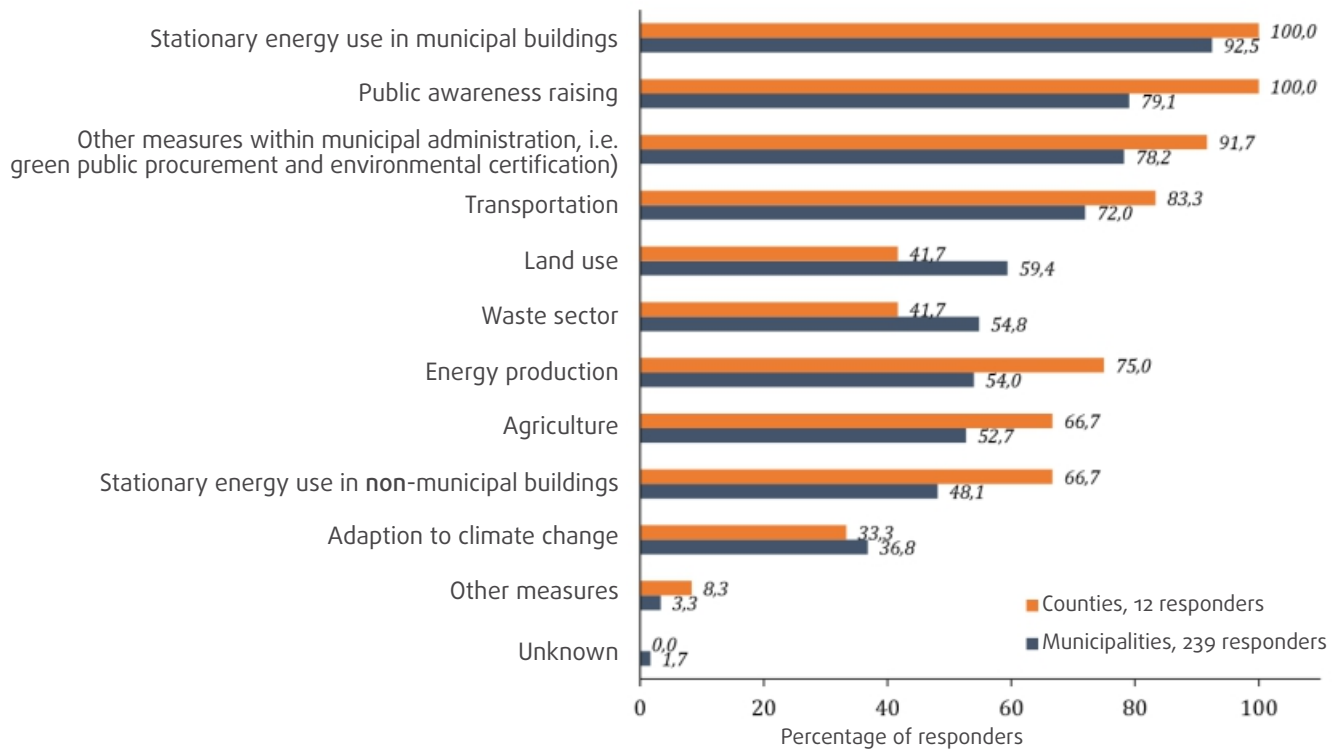


Figure 22: Sectors in which municipal plans contain measures. Source: Vista analyse.

5.2 Sources for inspiration



Planned new National Museum in Oslo with minimised energy use, extensive RES use and low carbon footprint. Low emission ferry (Norled for Ruter#) in the foreground. Illustration: Kleihues + Schuwerk Gesellschaft von Architekten mbH, MIR kommunikasjon as, Statsbygg.

Along with this short report, 20 fact sheets have been made, presenting Norwegian projects that may inspire Polish municipalities. Not all of these are included in climate and energy plans, some projects are not even carried out by municipalities.

Nevertheless, in most cases, municipalities are partners in the projects, or they have helped facilitating them. The main purpose has been to find well-documented projects that may inspire Polish municipalities. In addition, tools and information sources described in Section 3.4 and 3.5 may be of interest.

Below, key words for five innovative Norwegian projects are given. For further details on these projects, please refer to the corresponding fact sheets.

Åsveien School, including local sports and community centre, Trondheim

- GHG emissions 50% down
- Energy use minimised
- Wooden constructions that bind CO₂
- Optimised light and ventilation
- Waste recycling
- Planned for minimised car use



School project, Trondheim, photo: Trondheim municipality.

Oseana Arts & Cultural Centre, Os municipality

- Covered with solar panels
- Water source heat pumps
- Minimised energy use and environmental friendly materials
- Pattern for cultural buildings



Cultural centre, Os municipality, photo: Tove Heggø.

«Power House» Kjørbo, Baerum

- The worlds first rehabilitated office building that produces more energy than it uses
- Esolar energy and water source heat pumps



Renovated office building, Bærum municipality, photo: FutureBuilt.

«The Three», Bergen

- The worlds tallest wooden building
- 62 flats, 14 stories, 51 metres tall
- Wood in the whole constructions binds CO₂ through the building's life time
- "Passive house" with minimised energy use



Residential building, Bergen, photo: BOB.

All public transport in the Oslo area fossil-free by 2020

- Trams and metro already there, networks are now expanded
- Introduction of electric busses
- Biofuel busses incl. household waste as source
- Low emission boat technology



Public transport project, Oslo, photo: Ruter#.



Renewable energy sources Energy saving Solar energy Low-carbon economy Climate protection
Bilateral cooperation Energy conservation Exchange of experience Knowledge transfer Energy
saving Partnership for climate Good practice innovative projects Solar energy Wind energy Water
energy Clean air Joint initiatives Cooperation platform Energy efficient Energy saving Wind energy
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