The City as a Resource

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Lower greenhouse gas emissions and a better urban environment

Thirteen towns in Norway have had a common climate goal since 2008: to create the cities of the future; cities that have lower greenhouse gas emissions, are adapted to climate change and have a better urban environment.

In 2008 and 2009, the cities of Oslo, Bærum, Drammen, Sarpsborg, Fredrikstad, Porsgrunn, Skien, Kristiansand, Sandnes, Stavanger, Bergen, Trondheim and Tromsø, the government, the business sector and the Norwegian Association of Local and Regional Authorities (KS) signed agreements to participate in the Cities of the Future programme. The practical basis for the cities of the future – cities with lower greenhouse gas emissions and better urban environments – was intended to be established between 2008 and 2014.

These 13 cities face considerable environmental challenges, as well as the strongest population growth in Norway. The Cities of the Future programme has demonstrated that the urban communities' diversity provides great opportunities for innovative enterprises and solution-oriented people. It has also shown that the climate-change and population-growth challenges create opportunities for new products, solutions and services.

This booklet is a brief summary of the work and results of the Cities of the Future programme. Hopefully it shows that the work done by the 13 cities, the government, the Norwegian Association of Local and Regional Authorities (KS) and the business community has made a difference.

THE AGREEMENT

The main goal of the Cities of the Future programme was to reduce the total greenhouse gas emissions from road transport, energy use in buildings and consumption and waste in urban areas and at the same time develop strategies for handling future climate changes. The programme's subgoal was to improve the physical urban environment as regards ecological cycles, safety, health, experiences and commercial development.

AREAS OF COLLABORATION

Cities of the Future proposed several specific measures addressing the climate and urban environment. The measures were originally based on the cities' action programmes and the state, cities and business community collaborated within the following prioritised areas from 2008–2014:

- Improving the urban environment
- Land use and transport
- Energy in buildings
- Consumption and waste
- Climate adaptation

A business opportunity

The Cities of the Future programme has demonstrated that assuming social responsibility is more than just an empty phrase. It is positive branding when the results have practical implications – it is good to know that what you are doing is also the right thing. That is why the business sector was an important participant during the programme period. Without companies, the cities cannot attain their ambitious goals.

The collaboration with business has promoted the introduction of climate-friendly solutions in the cities and created understanding of the different participants' roles. The participants proposed a number of innovative solutions and it was natural to try to find financial solutions where private capital can supplement public funding from central and local authorities.

Vital city centres

The Cities of the Future programme provided extra incentives for collaboration among the cities' businesses in an effort to preserve vital city centres. All 13 cities have had a strategy of focusing their developments around public transport hubs. Close collaboration has now been established between the authorities and business community and the city centres are starting to compete with car-based shopping centres located outside the downtown areas.

Higher market value

Through collaboration and a mutual understanding of each other's roles, the construction industry has changed from viewing environmental and climate requirements as just an additional expense to realising that complying with these requirements leads to a higher market value and is essential.

Teamwork

During the programme period, the Enterprise Federation of Norway (Virke), the Confederation of Norwegian Enterprise (NHO) and Finance Norway worked actively to make their members understand the necessity of eco- and climate-friendly solutions. Skilled managers were shown that it is expedient to collaborate with the authorities to determine how best to run their businesses under the framework conditions of a future low-carbon society.

CITIES AND THE BUSINESS COMMUNITY – CIVIC RESPONSIBILITY AND COMMERCIAL DEVELOPMENT

Finance Norway has collaborated with the Cities of the Future's Climate Adaptation Network on a pilot project to assess the utility value of the insurance companies' claims data for Norwegian municipalities. The project has evaluated whether the claims data may contribute to risk and vulnerability (RAV) analyses, or directly to improve planning work and prevent water damage in the municipalities in the short and long term.

Virke has supported Norsk Sentrumsutvikling (a Norwegian organisation for the development of urban centres) in its efforts to promote solutions in which all the players in a city centre are involved in developments to benefit the community. Funds have also been allocated to develop a sustainable parking policy for the cities.

At an early stage in the project period, **NHO**'s member organisation Abelia initiated a dialogue between the business community and authorities on how civic responsibility and smart, green growth could be combined. The answer was simple: a requirement of green public procurement solutions, collaboration between business competitors in order to develop prototypes and the use of public research funds to promote such innovations.

The Cities of the Future programme has contributed to progress in a number of networks that function as forums for the exchange of information and allow the business community and politicians to inspire each other. The largest of these networks is **Business for Climate (Næring for klima)** in Oslo, which has almost 50 member enterprises. Other important collaborative constellations are **Smart City Bærum, FutureBuilt** and the collaboration between politicians and the construction industry in connection with the **City District of the Future** in Kristiansand.

1

Better Urban Environment

A better urban environment was one of the Cities of the Future's objectives and involved all four focus areas and collaboration between the cities and business community.

A better urban environment involves social, economic and environmental aspects, which are all related to the city and sustainable development.

Cities of the Future decided to work on the following topics under the umbrella Better Urban Environment:

- A healthy city
- A vibrant city
- A city for pedestrians, bicycles and public transport
- A city with urban spaces and meeting places
- A blue-green city

Well-being in the city

The most climate-friendly thing you can do is to live in a city was a slogan used by Cities of the Future. Green and urban meeting places and attractive streets, roads and interconnections for pedestrians and cyclists allow people to leave their cars at home and make us willing to live closer to each other.

Through the work of the Cities of the Future programme, urban qualities and green urban development have attracted even greater attention in the cities, and the topic Better Urban Environment was established as a focus area in its own right in 2011. The goal of the various urban development projects in the cities has been to help improve the physical urban environment as regards ecological cycles, safety, health, experiences and commercial development.

Pilot projects

During the period, 25 pilot projects were initiated, along with revisions of city centre plans and other activities in the cities. The pilot projects explored the future practice relating to several different aspects of urban development. Various municipal agencies, volunteers, idealists, private individuals and the business community contributed to good unified solutions in several cities through new methods and arenas for collaboration.

Exchange of experience

The cities shared their ideas and projects with each other in various contexts and exchanged the lessons learned in connection with these processes. Working in networks contributed to a sharing of knowledge and experiences and the introduction of new methods and, not least, inspired the participants to go home and try out new measures. The meeting places established through the Better Urban Environment network in the 13 cities resulted in new knowledge and shared experiences and demonstrated how all the topics in the Cities of the Future programme are interrelated.

Blue-green solutions

Cities must be attractive, and blue-green solutions contribute to a sense of well-being. We must solve the challenges associated with increased precipitation and flooding in the future. Using storm water as a resource in streets, squares and parks will also contribute

– The most climate-friendly thing you can do is to live in a city.

to a better urban environment that has a more diverse biology and makes people enjoy being there more. This requires collaboration across various professional disciplines and the Cities of the Future programme saw the value of cooperating on the topics of a better urban environment and climate adaptation.

Two professional environments have thus together focused on green roofs, developing the blue-green factor, storm water as a resource in urban spaces, designing parks and green open spaces as channels for storm water, and water retention using rain gardens.

Integrated solutions and compact cities

The work on a better urban environment was based on climate-friendly urban planning being about sustainable development centred on people. It is among other things about integrated solutions, a good mixture of elements, the quality of public spaces and, not least, public health. The Better Urban Environment network helped to put urban design, urban spaces, the interconnected city and the compact city on the agenda through the Cities of the Future programme.

Mosaic. Urban space in Skien.

With everyday destinations such as schools, day-care centres, shops, local services, meeting places with cafés, green open spaces and public transport stops within walking distance, we will achieve the five- to 10-minute city, which is also referred to as the compact city or city of short distances. The **Case Fredrikstad pilot project** is an urban laboratory for a compact city and has been transferred to the *Planning for Large Cities* programme. Tools and criteria are being developed as part of this project, which will be of value for other cities and locations.

Through the **Mosaikk (Mosaic)** project, Skien's old backyards have been transformed from tired old paved areas for the storage of waste and bicycles to beautiful urban spaces with art, gardens, squares, light installations, playgrounds and crop cultivation in roof-top gardens. The backyards have become a supplement to the other urban spaces and parks in the city.

In Fredrikstad, a ferry links the three parts of the city. When the ferry became free for the general public, the number of passengers rose from approx. 300,000 to almost 900,000 a year. Cities of the Future supported the development of a more eco-friendly ferry with room for a large number of cyclists. The river flowing through Fredrikstad has been transformed from a barrier into the city's most important urban space.

Temporary installations can breathe new life into dilapidated buildings and empty parking lots. The **Temporary Urban Spaces** project provides opportunities for trying out different ways of using temporary locations and for quickly assessing the reaction of the general public; Do they like it? Will they enjoy and use it? The Cities of the Future programme organised a course in temporary urban spaces in cooperation with the National Association of Norwegian Architects (NAL Academy) in 2013, which inspired the cities to initiate many new temporary projects.

The voluntary network organisation **Majobo** promotes local and urban organic food production. Majobo grows vegetables and other crops in public parks, in urban spaces and on the roof of a shopping centre in Oslo. Several beehives have been placed in the city's public spaces in cooperation with ByBi (City Bees). The gardens have become popular meeting places across generational and ethnic boundaries. Majobo has received some funding from the Cities of the Future programme.

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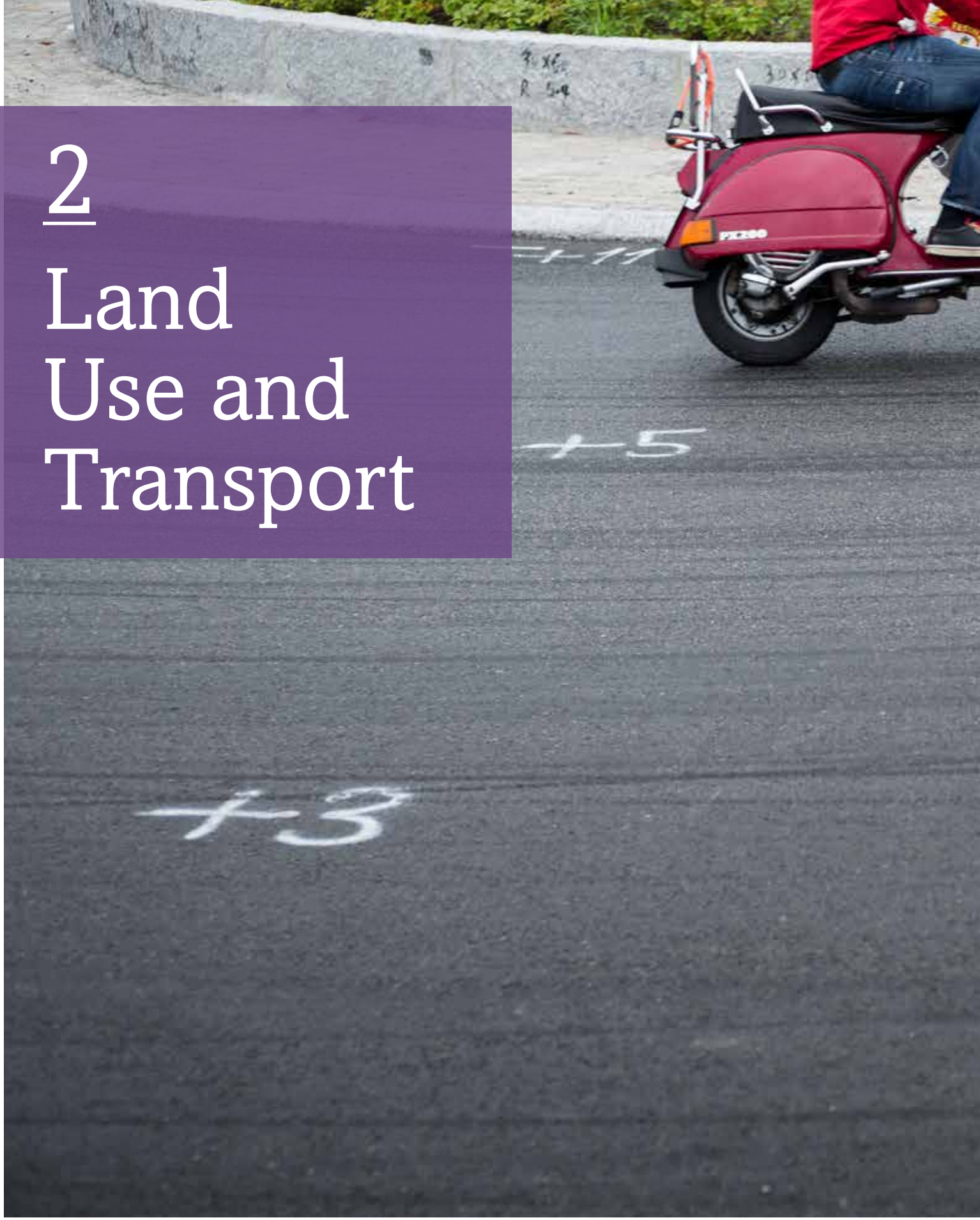
Land Use and Transport



We want less car traffic in the cities of the future. This means we must improve public transport and pedestrian and bicycle networks, implement constraints on the use of cars – and ensure city developments that reduce the need for transportation.

Cities of the Future decided to work on the following topics under the umbrella Land Use and Transport:

- Incentive schemes to increase the use of public transport and reduce vehicle traffic
- Development of the ATP Model – a method and planning tool
- More charging stations for electric cars
- Urban packages for coordinated urban and transport development
- A regional planning strategy for Oslo and Akershus county
- Commercial transport analyses
- City centre development
- Regulations to limit parking
- Eco-friendly commercial transport
- The effects of the action programmes
- Better adaptations for cyclists

Room for everyone

Land-use and transport planning is a complex discipline which entails long-term planning and cooperation among numerous players. This is primarily a public-sector responsibility, but good societal development also requires collaboration with private players. Cities of the Future therefore considered it important to ensure that the work on land-use and transport planning was an arena for the exchange of experiences and knowledge.

The work of Cities of the Future focused on policy instruments and measures where the cities, counties, transport agencies and ministries had a common arena for discussing technical issues. The Land Use and Transport network served as an important meeting place for the cities to discuss common challenges and learn from each other.

Awareness and prioritisation

Land-use and transport planning was an important issue for a number of years in the cities - long before this programme started. With the Cities of the Future programme, however, the focus on the coordinated planning of land use and transport has become even stronger. Several of the urban areas experience that the project has resulted in a greater focus on coordinating land-use and transport planning in municipal plans and across municipalities, sectors and administrative levels.

Through Cities of the Future, this professional area has been given more attention in the cities, and this has led to greater competence and the use of resources. This has been particularly important to small municipalities, where land-use and transport planning has not previously been given the same priority. In some municipalities, land-use and transport planning has not been a separate professional area.

Network building and increased knowledge

An important result of the focus on the work on land use and transport through the Cities of the Future has been a strengthening of the network which serves as a basis for a further exchange of knowledge and experiences. The network has also played a key role in ensuring cooperation with other players within the public sector and state.

There is no doubt that the knowledge about land use and transport in urban areas has improved in recent years, including regarding which policy instruments the municipalities have at their disposal for promoting good transport solutions. Even though this is not only thanks to the Cities of the Future, the

network has served as an important arena for raising the awareness of the cities' opportunities to reduce transport needs. Increased awareness in the cities has also contributed to a stronger focus on the agreements established by the cities with the state, including agreements related to the incentive scheme.

Coordinated land use and transport planning

Important planning work involving the creation of common land-use and transport plans has been initiated in all urban areas. These plans will be used as the basis for the municipalities' land-use plans, the county councils' prioritisations and the state's sector planning, and will provide a basis for a common strategy for land use and infrastructure investments. An example of such a plan is the Regional Plan for Coordinated Land-use and Transport in Grenland 2014-2025 which was agreed to in June 2014.

Improved public transport

All the cities are working to improve their public transport systems. Much of this work involves improving the accessibility of the public transport system. Trondheim, for example, has established a continuous bus/taxi lane throughout the entire downtown area by removing one of the existing vehicle lanes. The project has improved accessibility for buses and resulted in more people using the public transport system. Such accessibility projects have also been implemented in a few locations in Oslo, where parking spaces have been removed to improve accessibility for trams.

Another example of a proactive measure is the establishment of Bergen Light Rail. This has not only resulted in a better public transport solution for many people in Bergen, but has also served as an important driver for urban development. For example, the construction of the rail section between the park in the city centre (Byparken) and Lagunen Shopping Centre in Bergen has resulted in the improvement and vitalisation of the areas along this route.

Adaptations for cyclists

Many of the Cities of the Future have worked very hard and for a long time to improve conditions for cyclists. Different types of cyclists may be targeted in such efforts. Kristiansand has established express routes for cyclists, "Sykkelekspressen", which are aimed specifically at commuters who cycle to work. Similar work on bicycle express lanes is going on in Stavanger, Sandnes and Trondheim. Trondheim has also ensured good accessibility for cyclists by using elements such as red bicycle lanes, important interconnections and separate pedestrian and bicycle bridges. The district of

– The attention and awareness resulting from the Cities of the Future programme have accelerated projects and given the cities the courage to implement new solutions.

Grenland has been very successful in its effort to encourage children to cycle more through the project called “On the road to school”.

Measures to promote walking
Several cities are in the process of establishing walking strategies. These strategies are often viewed within the context of the cities’ work to improve the urban environment by making downtown areas more attractive, with good urban spaces, market squares and meeting places. The city of Tromsø is trying to make it easier for pedestrians, cyclists and skiers to pass through Tromsømarka, on the outskirts of the city, which is an important access route to the downtown area. Another example is the work on the 10-minute city in Stavanger and the compact city in Fredrikstad. These projects emphasise creating attractive downtown areas with good qualities which also accommodate pedestrians/cyclists.

Unified use of policy instruments in cities
All the city areas are currently introducing unified policy instruments to achieve climate-friendly transport. Such policy instruments include restrictive measures for cars, such as parking fees, higher or time-differentiated toll road rates, congestion charges or other measures to reduce the use of vehicles. Most cities are now revising their parking regulations to ensure future development projects lead to less parking and the use of cars in general.

Kristiansand and Trondheim have introduced rush-hour fees (time-differentiated toll road rates). When this was introduced in Kristiansand, it had an immediate effect on the use of private cars and public transport, and the measure has been an important step in daring to implement unpopular political decisions.

THE GOALS OF THE WORK ON LAND USE AND TRANSPORT IN THE CITIES OF THE FUTURE PROGRAMME HAVE BEEN TO:

Ensure land use and a localisation pattern which minimise land interventions and transport needs and facilitate environmentally sound transport

- Strengthen public transport, the use of bicycles, walking and accessibility and stimulate more efficient goods transport and good common solutions
- Implement policy instruments which limit the use of vehicles
- Strengthen the coordination of and collaboration on land use and transport measures for the entire functional, regional urban area or establish such collaboration if this is lacking
- Integrate the work on land use and transport measures within the Cities of the Future with ongoing or future urban packages addressing transport, the environment and urban development

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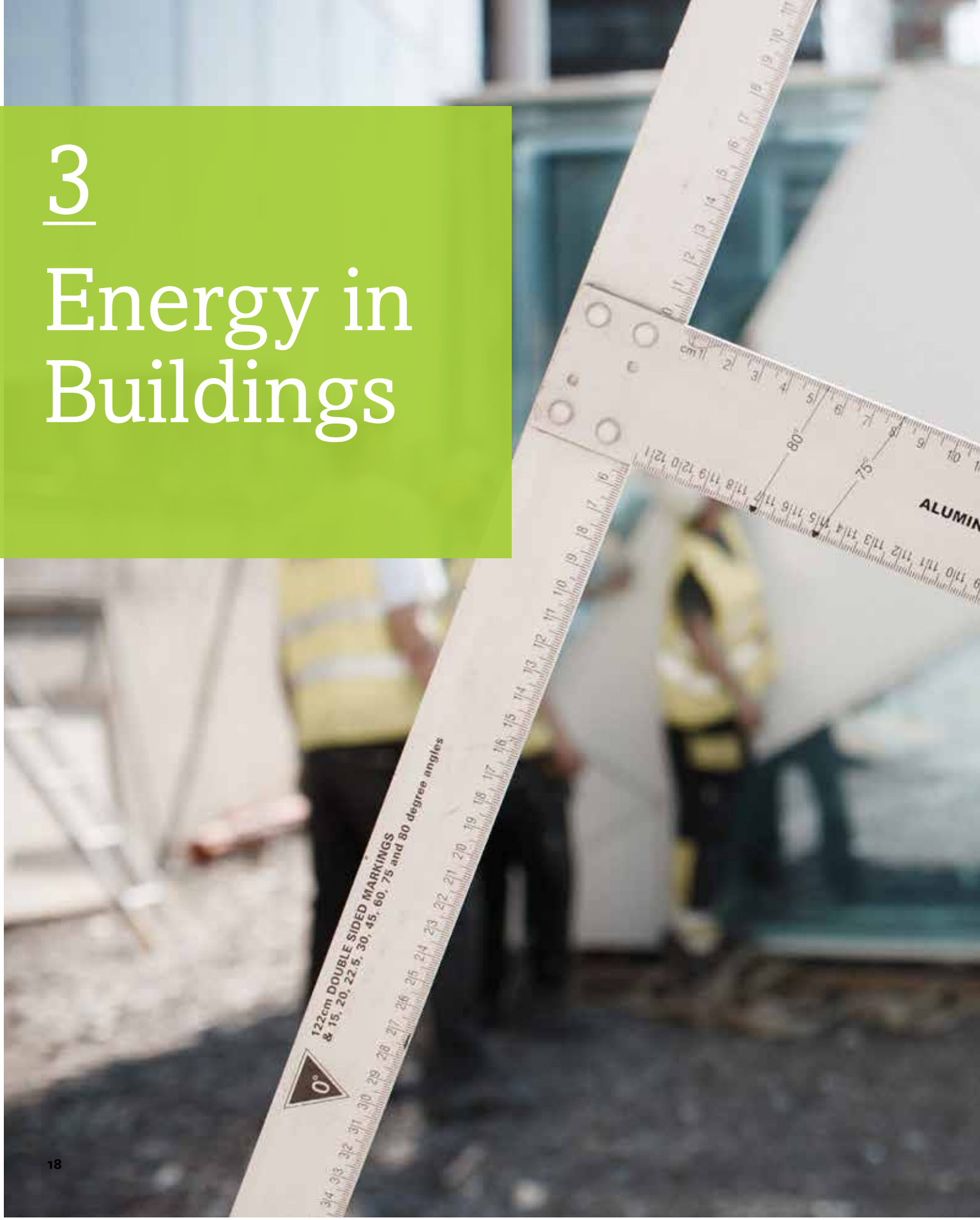
Energy in Buildings



In the cities of the future, we will have more low-emission and zero-emission buildings and use more renewable energy sources.

Cities of the Future decided to work on the following topics under the umbrella Energy in Buildings:

- Increased support to large cities
- Pilot projects
- Energy management and energy efficiency
- Renewable energy supply

Sufficient energy in the city

The buildings owned and managed by the 13 Cities of the Future represent a significant share of the total number of buildings in Norway. The more efficient use of energy and increased use of renewable energy sources are therefore important climate measures. The Energy in Buildings network has over six years increased the skills of the participating cities through a joint project to reduce greenhouse gas emissions from energy use in buildings. The participants have exchanged knowledge and lessons learned, which has been inspiring and resulted in action. The project's main focus has been on reducing energy usage, growing the share of renewable energy and increasing people's knowledge of energy and the climate.

Highly ambitious new buildings, improving the energy efficiency of existing buildings, switching to renewable energy sources and knowledge as an agent for action have been the main focus areas for the network.

Role models

It has been emphasised as part of the work of the Cities of the Future that the participants must act as good role models and walk the talk. The network has coordinated the development of pilot projects in the cities, including the construction of new buildings and rehabilitation of old buildings, private and municipal construction clients, areas and individual buildings.

The energy and climate challenges of the future must be solved now, and the pilot projects have helped develop methods to deal with these challenges and inspired others to build for the future. The sub-programme Buildings of the Future was initiated early on and has, together with FutureBuilt, constituted the pilot programme for the 13 cities. All the cities have now built or are in the process of building prototype buildings or developing model areas which will halve the current greenhouse gas emissions.

Through their focus on pilot projects, the cities have served as drivers for the development of climate-friendly urban areas and architecture. The projects have been high quality, adapted to the current and future climate and contributed to good urban development. The pilot projects have been ambitious and forward-looking and several steps ahead of the current practice, and they have functioned as an arena for testing future solutions.

New knowledge

The projects have raised awareness of climate-friendly construction practice and competence and the level of ambition in the cities and construction industry has increased. The projects have generated new knowledge, new technology and new design and calculation tools. An example of this is klimagassregnskap.no, which has been used on a large scale

during the Cities of the Future programme. This accounting tool for greenhouse gases is used to measure attainment of the targets established for the pilot projects.

Common criteria
Dynamic quality criteria with guidelines were prepared and rolled out during the project period. These criteria were the same for individual buildings and area development projects.

By the end of the programme period, more than 30 projects had been assigned the status of a Building or Area of the Future. In addition to these, there were all the model projects and area projects in Oslo, Bærum and Drammen that were part of the FutureBuilt project.

It is particularly gratifying to see that several cities are interested in area projects which include all the elements addressed by the Cities of the Future project. Several cities developed area projects during the last part of the programme period.

Existing buildings
The cities made headway in the work on energy-efficient operations in existing buildings over the programme period. This was achieved partly through systematic work on energy management, energy monitoring and energy conservation measures.

Network seminars focused on topics relating to new buildings, existing buildings and operational energy consumption. In connection with the establishment of a new energy management standard, this topic was discussed in detail, with examples from public and private enterprises. Energy performance contracts are another area where the Cities of the Future played a key role in putting the topic on the agenda and initiating projects in several of the member cities. Energy-efficient street lighting was also a topic that was discussed.

Renewable energy
The cities have implemented measures to reduce the use of fossil fuels for heating purposes and increase the share of renewable energy. All the cities have district heating facilities with plans for further development. Changes in energy requirements in the building regulations have served as a driver for the increased use of renewable energy solutions in buildings along with a tightening of the energy consumption requirements. These changes are considerable in a historical perspective. Today's buildings need less energy than before and can to a greater extent use energy sources other than electricity, such as heat pumps and district heating. Heat pumps, bioenergy, biogas, waste incineration and

– Over six years, the Energy in Buildings network helped its members to become skilled players in a joint project to reduce greenhouse gas emissions from energy used in buildings.

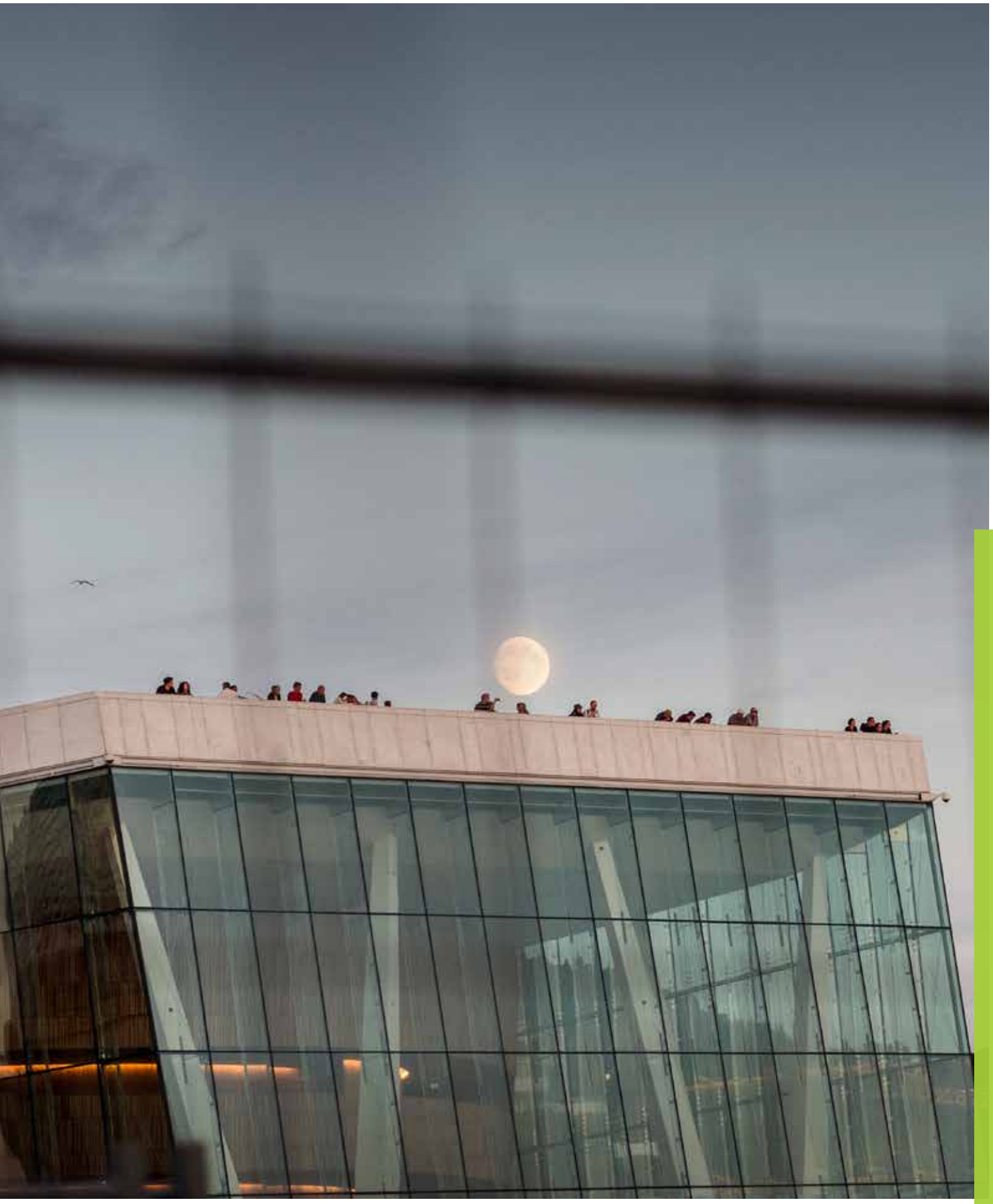
solar energy are among the technologies addressed at network gatherings. New concepts such as zero-energy buildings and positive-energy buildings have put the focus on local energy production in buildings.

Competence

Network seminars build competence in the municipalities and make them better equipped to walk the talk. The seminars were organised in close collaboration not only with the cities, but also with others such as Enova, the Norwegian State Housing Bank and the Norwegian Lighting Institute, Lyskultur. In 2012, Enova presented the results of large studies of potentials and barriers to the cities. Strengthening local knowledge through role models and cooperation has been an important driving force in the network.

Tools

Greenhouse gas budgeting for new buildings and greenhouse gas operations accounting are very important tools for measuring the effectiveness of implemented measures. These tools therefore received a lot of attention in the Cities of the Future programme. New versions of the greenhouse gas accounting tools used by Buildings of the Future were issued during the programme. The programme cooperated with other players to harmonise the emission factors used in greenhouse gas accounting. Through an assignment for Vestregionen (the regional organisation for the 16 municipalities to the west of Oslo), the Cities of the Future supported the development of greenhouse gas accounting templates for municipal enterprises. Energy was also addressed as an important element in the Cities of the Future's Smart City initiative.



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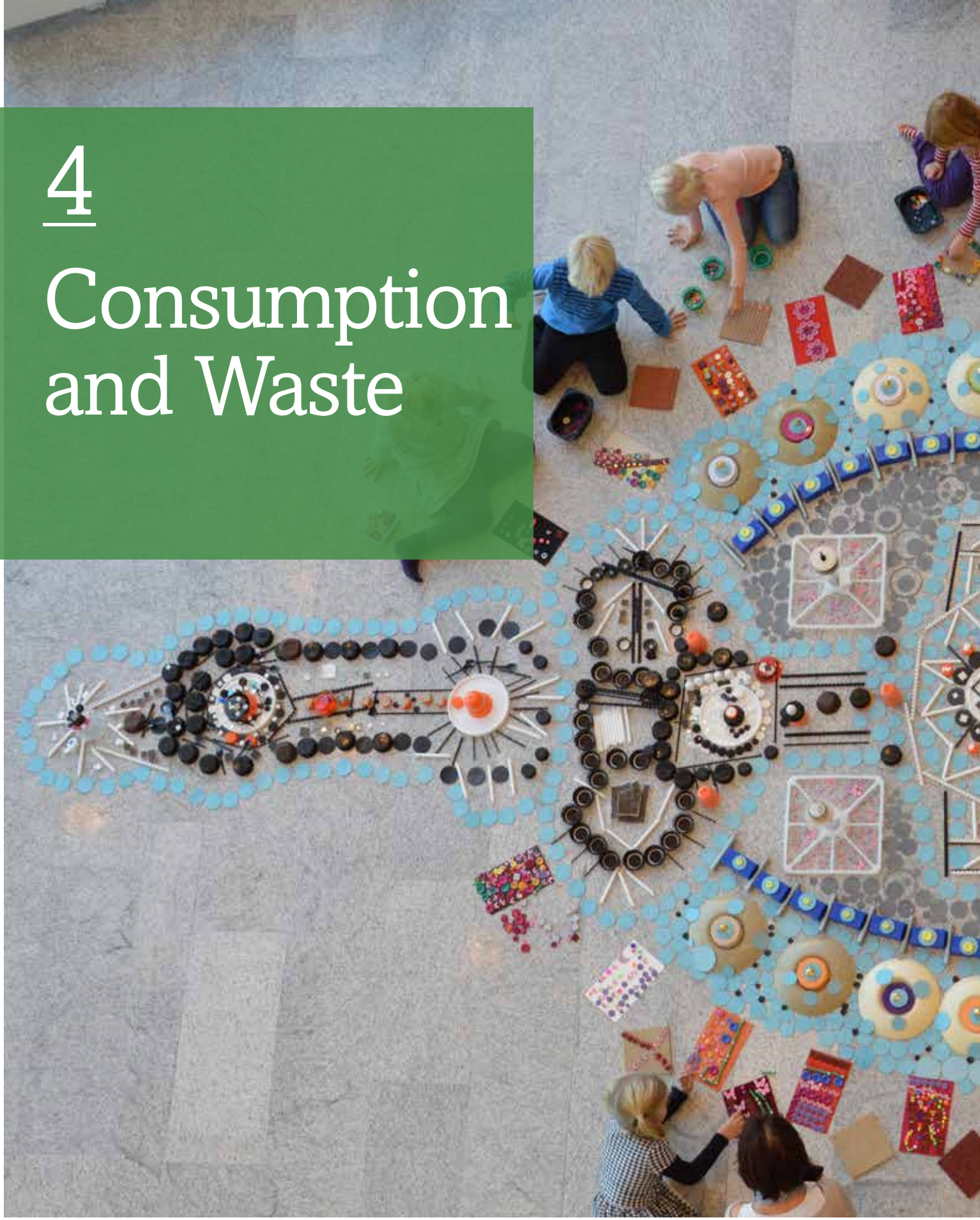
Consumption and Waste



The growth in consumption is contributing to large greenhouse gas emissions because goods must be manufactured as well as transported – before being turned into waste after their use. Cities of the Future will buy goods and services which result in low greenhouse gas emissions.

Cities of the Future decided to work on the following topics under the umbrella Consumption and Waste:

- Environmental management and environmental certification of public and private enterprises
- Climate-friendly public procurements
- Facilitation of a more eco-friendly way of life
- Waste reduction, reuse and the environmental effects of waste
- Teaching schemes for consumption-related topics

Everything can be bought and thrown away – and recycled

Everything that is used affects the environment when it is manufactured, transported and thrown away. In order to reduce the volume of waste, the cities and business community worked together in a network with the aim of ensuring that everyone buys fewer things, and that the things we use have a longer lifetime and are recycled to make other products.

The public and business sectors purchase goods and services for large amounts every year. By stipulating requirements for these products and services, the state, cities and business community have influenced the suppliers' environmental profile.

Through awareness work and the creation of meeting places, the state, cities and business community have collaborated and put consumption on the agenda, and encouraged citizens and their own employees to make environmentally sound choices.

Another of the Cities of the Future objectives was to increase the cities' competence concerning environmentally sound procurements. The Consumption and Waste Network learned that, by stipulating strict environmental requirements during the procurement processes, the public sector can both influence individual procurements and send signals to the market which may help ensure more long-term changes. The cities worked to provide buyers with better tools, and linked buyers and industry together in innovation projects which resulted in the development of new environmentally friendly products, solutions and services.

Environmental management and control

The cities purposely worked to ensure the environmental certification of as many public and private enterprises as possible. The introduction of environmental management systems was a general measure to ensure the most environmentally sound operations possible. Through environmental management, the enterprises have improved their own operations and ensured an emphasis on the environment at all levels – from procurement, via energy usage and transportation to the generation of waste, including waste handling. Thus, the enterprises have also complied with increasingly strict requirements in the marketplace regarding various environmental criteria.

CLIMATE STATISTICS AND CLIMATE-EFFICIENT PROCUREMENTS
A project related to greenhouse gas accounting and climate-efficient procurements in Trondheim showed that approximately 80 per cent of the municipality's emissions come from the procurement of goods and services linked to large construction and urban development projects. The municipality not only calculated its climate footprint, but also considered how the results could be used to stipulate more effective environmental requirements. This tool may also be used by other municipalities, and highlights the importance of the state, municipalities and business community stipulating environmental requirements in their tender documents.

ONE MAN'S TRASH IS ANOTHER MAN'S TREASURE
The cities of Skien and Porsgrunn have joined forces to establish a Creative Recycling Centre for their region. The centre receives surplus materials from businesses and private households and recycles the materials in creative new products. The centre has generated positive ripple effects, among other things by putting environmental issues on the agenda and promoting recycling and waste reduction through its focus on the fact that most things are of value, and by strengthening the collaboration with the business community.

LOCAL CAMPAIGNS
Trondheim was the first city in Norway to organise events linked to environmental highlights and environmental activities such as the worldwide celebration of Earth Hour. Since 2009, several other members of Cities of the Future have joined in celebrating this event.

World Environment Day, Reuse Day, Redesign, Mobility Week and Aktiv skoleveg (Be Active on Your Way to School campaign) are examples of events and campaigns organised in cooperation with the state and business community.

LEARNING FROM EACH OTHER
Drammen Municipality achieved its objective of having all municipal enterprises certified under the Eco-Lighthouse certification scheme in 2011. The Eco-Lighthouse scheme has been used as an environmental management system for three and a half years. In 2012, Drammen adopted the main office model for municipalities as a pilot municipality in order to use this as a recertification model. The introduction of environmental management in Drammen has resulted in better overview and control for the central administration, and reduced the energy, procurement and waste handling expenses. Other municipalities can learn a lot from this work.

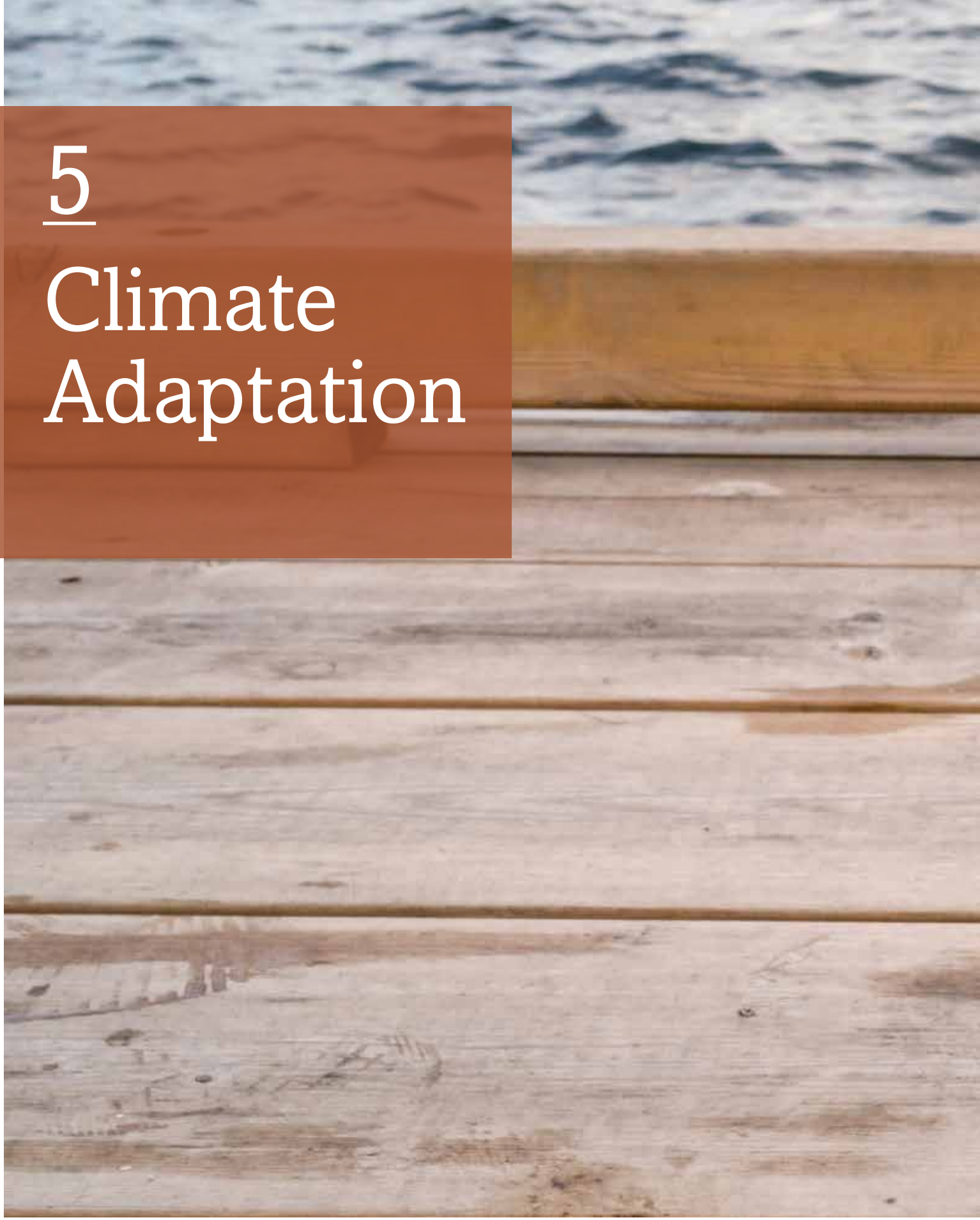
SUPPLIER DEVELOPMENT
In 2009, the Confederation of Norwegian Enterprise (NHO) and Norwegian Association of Local and Regional Authorities (KS) started collaborating on supplier development. NHO organises extensive training in all 13 cities and is involved in pilot projects in seven of them. The pilot projects include the development of alternative energy sources to replace oil-fired heating plants, biogas buses and systems for the coordinated distribution of goods. The supplier development programme is extended to 2019. Oslo's new procurement strategy, which emphasises innovation and dialogue with suppliers, underlines the significance of this work. Several other cities are now starting similar processes.

The cities learned that there is a need for a network for municipalities and counties that focuses on environmental management and certification and have worked to establish an environmental management network. The objective is for this network to function as a permanent environmental management competence body, primarily vis-à-vis public agencies, after the Cities of the Future programme.

Facilitating environmentally sound choices

The cities want to make conditions suitable for their inhabitants to have more environmentally sound lives. The efforts to achieve this have ranged from campaigns and actions via information measures and guidelines on factors such as energy saving, to large transport infrastructure measures. Another key element has been activities in schools and day-care centres related to topics such as saving electricity and sorting waste.

An essential and very important lesson learned by the cities for future awareness work is that generally increasing knowledge influences the choices made by the inhabitants. The inhabitants make environmentally sound choices when barriers are removed. In other words, facilitation and information are essential in order for everyone to be able to make environmentally sound everyday decisions.



5 Climate Adaptation

Climate changes will result in higher sea levels, more precipitation, stronger winds and a greater risk of flooding and landslides/ avalanches.

Cities of the Future decided to work on the following topics under the umbrella Climate Adaptation:

- Visualisation of climate changes
- Mapping of climate change vulnerabilities
- Regional networks
- Climate projections
- Rising sea levels
- Handling of storm water
- Integration of adaptation work

More water in the city

The objective of the work of the Cities of the Future's Climate Adaptation Network was to establish safe and robust cities and towns. This entails focusing on the current and future climate and implementing solutions which make the municipalities able to cope with the climate.

Can the city handle rising sea levels?
This is one of the questions asked by cities when new urban areas are to be designed. Most of the cities are located by the sea and have large areas exposed to storm surges, and many of the largest urban development projects take place in former industrial and port areas located along the ocean front.

In the years leading up to 2100, there will be more days with a lot of precipitation and the average amount of precipitation on these days will also increase. Many of the cities have already experienced urban flooding. Norwegian cities must to an even greater extent plan for the future climate and implement solutions that make municipalities able to cope with the climate. Climate adaptation has been a focus area for the cities for the very reason that they wish to establish safe and robust cities and towns.

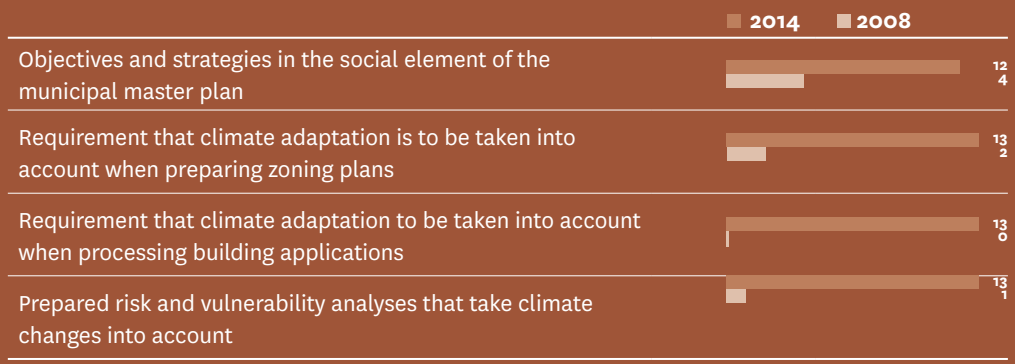
Networks
In the Cities of the Future programme, experience and knowledge played a key role in the efforts to put climate adaptation on the agenda both locally and nationally. The experiences and lessons learned have contributed to a valuable exchange of knowledge between the cities, general competence enhancement and increased involvement by both experts and inhabitants. Over the years, the cities have identified new opportunities when planning cities and towns that can cope with the climate.

The networks have been one of the biggest gains for the cities. This meeting place served as a dialogue forum where the state and cities could meet informally. The cities were the link between different players responsible for climate adaptation efforts locally, regionally, nationally and internationally. The networks also contributed to collaboration between the cities themselves and between the cities, research community and industry.

A climate adaptation knowledge database was established and the network functioned as a driver for the municipal climate adaptation work.

CLIMATE ADAPTATION IN PLANS AND ROUTINES

From the start in 2008 till 2014, the cities moved from blank sheets to assigning climate adaptation measures a natural place in their plans and procedures. The key issues in the early phase were what the climate changes would entail in one's own city and how this should be handled. Climate adaptation is now incorporated into the cities' governing documents and procedures:



All the cities have climate adaptation on their checklist for dealing with land-use plans and zoning plans and have prepared documents and plans that contribute to the climate adaptation work.

– The network has played an important role in the work of preparing a national climate adaptation policy. Further developing the fruitful cooperation which has been initiated has therefore considerable potential.

Storm water strategies
Future climate changes will require both emergency preparedness and adaptive measures. The Centre for Interdisciplinary Environmental and Social Research (CIENS) has carried out a preliminary study of climate change and adaptation strategies in the Oslo Fjord region.

Oslo and Bærum have taken the initiative to organise an R&D project to gather information on how to handle surface rainwater at Fornebu. Knowledge regarding this topic will help to soften the effect of a warmer, wetter and wilder future.

Bærum requires plans for the retention and/or infiltration of storm water in connection with planning and building applications. Open solutions are preferred and new roads must be designed to withstand the effects of anticipated climate changes, such as increased storm water and road maintenance.

The blue-green factor – a tool to ensure high-quality outdoor spaces
Oslo and Bærum have collaborated on the preparation of a report that will help other cities and municipalities find good solutions with a stronger focus on blue-green qualities in new construction projects. The report contains simple tools for calculating the blue-green factor, and includes examples which show how the blue-green factor has been used in specific areas in addition to a separate report on legal considerations.

Visualisation through mapping and decisions incorporated into municipal master plans
Through the Planning and Building Act, the municipalities may ensure that new buildings and infrastructure are built in areas that are less affected by rising sea levels, storm surges and waves. A general risk and vulnerability analysis in accordance with the Civil Protection Act may help municipalities to determine whether existing buildings are at risk. Trondheim municipality has prepared a map showing the expected ocean and storm surge levels for the years 2050 and 2100. These maps have been integrated into the municipality's management database which is used for processing building applications. The effects of rising ocean levels on the sewage system in parts of Trondheim have also been analysed.

The project's results have been incorporated into the new revised land-use part of Trondheim's municipal master plan, with separate regulations regarding rising ocean levels.

Cities of the Future are at the forefront

The Norwegian Association of Local and Regional Authorities (KS) played an active role in the establishment of Cities of the Future. It has been important for the municipal sector to be involved in influencing the programme's structure and management.

Reducing greenhouse gases and adapting to a changed climate have been new fields for the municipalities. The Cities of the Future programme has therefore led to greater knowledge about both climate challenges and how the municipal sector can help to reduce greenhouse gas emissions. Through specific measures and evaluations, the municipal sector has gained experience of and become better at climate work. The interaction between the political leadership, administration and experts has led to a change in the attitude to climate work.

KS has helped facilitate the documentation of the effects of various measures and among other things served as a driver for energy performance contracts (EPC).

The Cities of the Future programme has demonstrated that the municipalities can identify challenges and find solutions that are adapted to local conditions.

In January 2014, NHO, Finance Norway and KS organised their first joint event at which they and national and local politicians discussed the topic of private funding of infrastructure; roads, railways, water and sewage, purpose-built buildings and energy supply. This meeting took place after Finance Norway contacted the Ministry of Finance regarding this issue.

KS is establishing a municipal climate adaptation network. KS believes it is essential to spread the knowledge and lessons learned from the Cities of the Future work and invite other cities to participate in a pilot climate adaptation network. Participants will have access to the lessons learned and knowledge generated by the Cities of the Future programme.

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