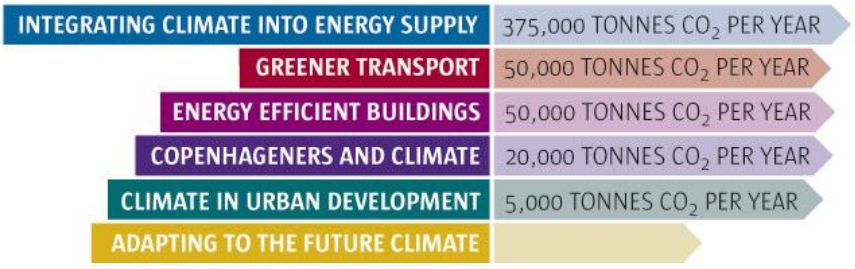
1. Local contribution to global climate change	Present details of the original and/or most recent Action Plan, including any relevant disadvantages or constraints resulting from historical and/or geographical factors which may have influenced this indicator area negatively. **Goals and objectives in the most recent action plan; The Copenhagen Climate Plan** In August 2009, a unanimous city council passed an ambitious climate action plan, the Copenhagen Climate Plan. Though the City of Copenhagen had been working on reducing green house gas emissions for many years, the new plan raised the level of ambition significantly. The objective of the plan is to reduce greenhouse gas emissions from Copenhagen by 20 percent (in relation 2005) by 2015. The plan specifies 50 initiatives to achieve this objective. The plan also sets the goal that Copenhagen is to be a carbon-neutral city by 2025. **Disadvantages or constraints resulting from historical and/or geographical factors** Copenhagen has an advantageous starting point in relation to pursuing ambitious goals regarding the city's contribution to global climate change. Since 1990, the City of Copenhagen has reduced its CO_2 emissions from electricity, district heating and transport by more than 20 percent. The main driver of this achievement is continual expansion of the city's district heating system, to which 98 percent of all homes in Copenhagen are now connected. Besides this, the city has been successful in keeping growth in road traffic very low. This is also a result of high Danish taxes on cars as well as Copenhagen's widespread system of biking lanes. Besides district heating and bike lanes, Copenhagen's pedestrian streets, wind turbines and visionary town planning have made the Danish capital a well known paragon in relation to climate policy. Thus, Copenhagen has an advantageous starting point in relation to the goal of achieving CO_2-neutrality by 2025. **The Copenhagen Climate Plan** The Copenhagen Climate Plan will lead the City of Copenhagen towards a 20 percent reduction in carbon emissions by 2015, reducing a 2005 level of 2,500,000 tonnes CO_2 to a level in 2015 of 2,000,000 tonnes per year. The Climate Plan encompasses 50 specific initiatives. The initiatives are inter-related, and have been grouped into six themes. The six themes are:  **Changes in the energy supply** are the source of 75 percent of the CO_2 reductions**.** In 2010 the first major step towards substantial carbon reductions was taken at the

Amager power station, where renewable energy replaced coal at one production unit. This has reduced the CO_2 emissions by approximately 130,000 tonnes per year. The remaining reductions will be accomplished through putting up wind turbines and switching fuel from coal to biomass in the city's other major combined heat and power plants (a few small plants running on fossil fuel will still be used in peak demand situations).

Making the transport greener is the source of 10 percent of the CO_2 reductions. Today more than one-third of everyone working or studying in Copenhagen commutes by bike. The ambition in the Copenhagen Climate Plan is to further increase the percentage of people commuting by bike or public transport. This will be achieved through still better biking infrastructure and better public transport as well as through implementing a congestion charge for road transport in the city. Also, the municipality's vehicle fleet will be replaced with hydrogen cars and electric cars. More information on this can be found in indicator 2 on local transport.

Improved energy efficiency in new and existing buildings is the source of 10 percent of the CO_2 reductions. The City of Copenhagen has a strong focus on climate in the management of its own real estate portfolio, both in relation to new construction projects and renovation projects. In relation to urban development areas, it is a requirement that new buildings comply with very strict energy standards. Thus, on an annual basis the energy consumption related to heating, ventilation, air-conditioning, and hot water consumption are not allowed to exceed 30 kWh/m^2 plus 1000 kWh divided by the floor area in square meters. The standard requirement in the Danish building code is 52.5 kWh/m^2 plus 1650 kWh divided by the floor area.

Mobilizing citizens to reduce their CO_2 emissions are the source of 5 % of the CO_2 reductions. The average Copenhagener emits much less CO_2 than the average Dane. Nonetheless, there is still much more to be done. One important focus area is reaching children and youth, educating them, and changing their habits.

A strong focus on climate in urban development will generate 1 % of the reductions. Among other things, availability of public transport or easy access by bicycle and by foot is prioritized in the city planning.

Climate adaptation is an important part of the Copenhagen Climate plan. One of the initiatives is the preparation of a detailed climate adaptation plan for the city; the Copenhagen Climate Adaptation Plan. More information on this can be found in indicator 3 and 8 of this application (on green areas and on waste water treatment).

The Copenhagen Climate Plan can be found here:
http://www.kk.dk/sitecore/content/Subsites/CityOfCopenhagen/SubsiteFrontpage/LivingInCopenhagen/~/media/558FF07CE6404 1AE85437BB71D9EDF49.ashx

Current greenhouse gas emission

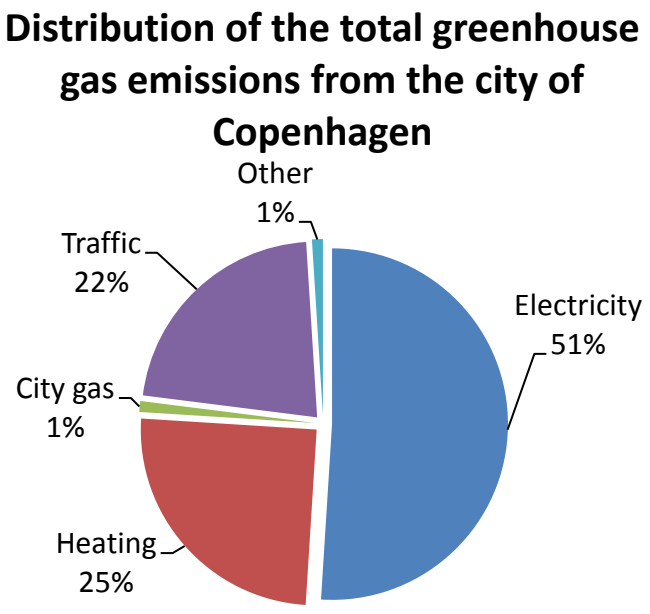
Include details of:

1. Total CO_2 equivalent per capita, including emissions resulting from use of electricity;
2. CO_2 per capita resulting from use of natural gas;
3. CO_2 per capita resulting from transport;
4. Grams of CO_2 per kWh used.

In 2010, emissions of CO_2 equivalents from Copenhagen were 2,515,250 tonnes, corresponding to a per-capita emission of 4.7 tonnes.

Emission source	Per capita emission (Tonnes CO2-equivalent)	Percentage of total emissions
Electricity consumption	2.4	51 %
Heating consumption	1.2	25 %
Natural gas consumption	0.03	1 %
Traffic*	1,0	22 %
Other	0.05	1 %

* Traffic includes road traffic, non-road traffic and the city's share of domestic air traffic and domestic ship traffic. Per capita emissions from road transport were approximately 0.7 tonnes CO_2 per capita.



Grams of CO2 per kWh used/year	2005	2010
Electricity	541	511
District heating	146	122

More information can be found on: www.kk.dk/climate

Details of those targets achieved or not, to date (within the last 5 – 10 years). Provide a review of how both situations occurred and lessons learned.

Targets achieved

As mentioned earlier the objective of the Copenhagen Climate Plan is to reduce greenhouse gas emissions from Copenhagen by 20 percent (in relation 2005) by 2015. The plan specifies 50 initiatives to achieve this objective. The plan also sets the goal that Copenhagen is to be a carbon-neutral city by 2025.

The overall 2025 goal has not been reached yet and neither has the 2015 target. Thus, the 2010 CO2-emissions were only slightly lower than the 2005 emissions. However, important milestones and intermediate results has been reached that will help to kink the curve, including:

The emissions from one kWh of electricity and from one kWh of district heating, has been reduced significantly since 2005. Thus, the emissions from one kWh of electricity were 5 % lower in 2010 than in 2005, and the emissions from kWh of district heating were 16 % lower in 2010 than in 2005.

T**he city has build an organisation for implementation the Copenhagen Climate Plan** and assigned the required funds to it. Thus, the City of Copenhagen has set up a Climate Secretariat, which is to support the initiatives in the Climate Plan, and to follow the implementation of the 50 initiatives in the Climate Plan closely.

The city council has assigned the necessary funding. Thus, in 2010 an amount of DKK 28 million was assigned for implementation of the plan, as well as DKK 62.5 million during 2011-13, making a total of DKK 90.5 million. This is approximately equal to EUR 12 million. Also, the City Council has also issued a loan guarantee of DKK 5.5 billion (EUR 738 million) to the city's utility company in relation to investments in offshore wind turbines.

44 of the 50 initiatives in the Copenhagen Climate Plan have been launched (but not yet completed). These include energy refurbishment of municipal buildings (schools, kindergartens etc.), putting up wind turbines, improving conditions for electric vehicles and establishing small parks for recreation purposes and rain water drainage. The list of the 44 launched initiatives can be found here:

http://www.kk.dk/sitecore/content/Subsites/CityOfCopenhagen/SubsiteFrontpage/LivingInCopenhagen/~/media/19BD236CB76B4AB8B7D0D59CEAB9E5F1.ashx

Coal has been replaced with biomass at unit 1 at *Amagerværket* (Amager Power Plant). The unit is owned by Vattenfall and was put into operation as old, less efficient CHP units in the city were shut down. *Amagerværket* was the first plant in Denmark subject to a requirement for a minimum percentage of biomass-based CHP production. *Amagerværket* is mainly biomass-fired, with coal as a backup fuel. This initiative has been the main cause of a 20 percent reduction in CO_2 emissions per MWh heat from the district heating system realized from 2009 to 2010.

Challenges

The main challenge in relation to implementation of the Copenhagen Climate Plan is that a number of the initiatives in the plan require changes in the current national regulation. Three changes in the regulations are particularly important in relation to the possibility of the achieving the objectives of the Copenhagen Climate Plan:

1. A change in the incentives for converting coal-based combined heat and power plants to biomass
2. Implementation of a congestion charge on road traffic in Copenhagen
3. A change in the incentives for putting up wind turbines in coastal areas

A change in the incentives for converting coal-based combined heat and power plants (CHPs) to biomass is the official policy of the new Danish government, and is expected to be enacted in relation to an upcoming new energy policy agreement. Substantial delays in the process of reaching a new energy policy agreement could, however, impair the possibilities of reaching the goal of a 20 percent reduction in greenhouse gas emissions by 2015.

Until recently it was unclear whether it would be possible to introduce congestion charges on road traffic in Copenhagen. However, after the recent general election in Denmark, a majority in the national Parliament backs the implementation of a congestion charge in Copenhagen.

Whether the incentives for putting up wind turbines in coastal areas will be changed in a way that is favourable for the implementation of the Copenhagen Climate Plan remains unclear at the moment. Politically, the idea of putting up wind turbines in coastal areas, which originated in a group of large cities in Denmark (including Copenhagen), has been well received and new regulations in relation to this are on the way.

Lessons learned

In The City of Copenhagen, the combination of an ambitious long-term climate target, a tough short-term goal, and a detailed and wide-ranging action plan has proved to be very powerful in terms of generating enthusiasm among, and securing support from, a wide range of stakeholders, including citizens, utilities, business people, NGO's and legislators. Therefore, the City of Copenhagen has been able to create a number of successful public-private partnerships with utilities and other companies, which are all contributing to making the Copenhagen Climate Plan a reality, as well as forging a durable political consensus around the City's climate policy.
What the City has done seems to suggest that an ambitious long-term target does inspire; but only if it is rendered credible by immediate action. The results seem to suggest that an initiative can only win general support if a broad range of stakeholders are able to see themselves having a role in relation to it. Only if local firms can see business opportunities in the climate policy, and only if local politicians can see how the climate policy can be used to promote growth or better quality of life for the citizens, will such a policy be viable. That it is possible to forge political consensus around ambitious climate goals, and win support for these from the local business sector, is perhaps the most important lesson we have learned in Copenhagen.

The City has also learned that it is possible to reduce dramatically energy consumption and CO_2 emissions in cities through the implementation and continual expansion of a district heating system. The City has shown that, through changes in the energy production, it is possible to reduce significantly emissions per kWh electricity and heating without affecting people's lives in any noticeable way.

Finally the City has learned that it is possible to have 35 % of those commuting into the city and 50 % of the Copenhageners themselves going to their workplace or educational institution by bike.

	Plans to meet or revise key targets for the reduction of GHG emissions for the future and proposed approach to achieve these. **The 2025 Copenhagen Climate Action Plan** In addition to the Copenhagen Climate Plan, which will make Copenhagen reach a 20 percent carbon reduction by 2015, the city is currently developing a wide-ranging action plan, the 2025 Copenhagen Climate Action Plan, which will lead the City toward carbon neutrality by 2025. By our definition the city will be carbon-neutral when heat and power production is carbon neutral, and the city's renewable energy production is large enough to displace so much fossil-based energy production elsewhere, that it can compensate for emissions from traffic, waste water management, and industrial processes, etc. Thus, the city plans to establish production of renewable energy that is larger than annual energy consumption. A first draft of the plan is currently being qualified through a stakeholder process and is expected to be enacted in 2012. The 2025 Copenhagen Climate Action Plan, which is still at a preliminary stage, is centred on the following themes: Green Energy, Green Transport, Green Energy Consumption, and Climate Adaptation. **Green energy** A new, integrated energy system is needed to fulfil the vision of a carbon-neutral Copenhagen. Among other things this will be based on more than 100 wind turbines, both within the city and outside. In the combined heat and power production, coal will be 100 percent replaced with biomass. Photovoltaic's, geothermal energy and solar panels (heat) will also play a role. **Green transport** Developing a transport system which contributes to a carbon-neutral capital requires goal-oriented urban planning, based on reduced transport needs, improved access to public transportation and improved bicycle and pedestrian flows. An infrastructure to support electrical and hydrogen-powered cars will be created. **Green energy consumption** By 2015, a number of the City's buildings will have become significantly better places to live, work and be in. New building construction initiated after adoption of the Climate Plan, will make up 15 percent of the municipality's total real estate holdings. Energy savings among Copenhageners, businesses and the Municipality are also a central part of the plan for how Copenhagen can achieve carbon neutrality by 2025.