

EGCA 2018, Umeå, Sweden

10. Eco-innovation and sustainable employment

10A Present situation

Indicator		Unit	Year of data
Number of electric vehicles owned by the municipality	34*	number	2015
Number of electric vehicles owned by the municipality (in % of all cars owned by the municipality)	6*	%	2015
Number of charging outlets available for the cars owned privately.	13*	number	2015

*See also Table 10B1 and Section 10C2

A1. Innovations that address material / resource use, (substitution, minimisation of material use, closing loops, etc.) and reduce environmental impacts, i.e. measures to improve resource efficiency; new business models (sharing schemes), including actions inspired by circular economy thinking;



Figure 10A.1: Production of biogas from food waste.

On-going initiatives:

- Transport sector biogas production from food waste. In 2014, 3 156 tonnes collected food waste generated 352 000 Nm³ biogas.
- Waste incineration in state-of-the-art CHP plant Dåva. Total efficiency of Dåva1 (waste) and Dåva2 (biomass) are 94 % and 95 % and achieve R1 factor 1.2 (Annex II, Directive 2008/98/EC).
- Energy use in buildings owned by the municipality has been reduced from 206 kWh/m²/year in 2008 to 178 kWh/m²/year today through one of Sweden's largest EPC project. New energy objective for 2020 is 165 kWh/m²/year.
- Since 2015 public utilities company Umeå Energi offers key-ready package of photovoltaic cells to the public.
- Waste management is financed by fees, no taxes. Waste tariff includes; basic charge, vessel fee and a variable weight-based fee. This economic instrument encourage to reduce waste in three ways:
 - ✓ Sorting out food waste is cheaper than having a mixed waste bin.
 - ✓ Small bin cheaper than big bin.
 - ✓ Weight-based fee depends on waste amounts.

A2. Awareness raising and training to encourage the development and take-up of environmentally friendly technologies, particularly through training in industrial and business settings. Make reference to the authority launching the initiative as well as its target audience;

- SEE week (Social-Economic-Ecologic) - annual week-long September event since 2009, aiming to let everyone feel, talk, taste, challenge, develop and network around sustainability. SEE week has spread regionally across northern Sweden, gathering major stakeholders aiming to be role models organising sustainable events.
- Network for Sustainable construction and real estate management in cold climate has about 55 members from whole construction chain with vision to become world leader in the segment by 2020.



Figure 10A2: SEE Week and Construction of passive houses by Dragonskolan upper secondary school.

A3. Efforts to promote green skills, or green jobs

- *Dragonskolan upper secondary school* has Sweden's most modern building/construction program, where students participate/organize concrete building projects – in dialogue with citizens, municipality or private enterprises.
- The cleantech initiative, Cleantech Kvarken/Cleaner Growth, aims to promote the development of SMEs in the region. A city owned company, started in 2009 to enhance green jobs and export knowledge within the cleantech sector, runs the initiative.
- The city supports two initiatives, BIC Factory, supporting young entrepreneurs to start their own businesses and Uminova Innovation one of Sweden's best incubators challenging entrepreneurs and innovators to test and develop their business ideas.

A4. Efforts to promote Green Public Procurement

- The procurement policy includes sustainability, transports and food as important sectors. Starting close to zero 2009, a 30% *ecological food* target was set for 2015 which is now achieved, see Figure 10A4.
- Green parking payoff, public-private business model stimulating green mobility management investments, see Table 10B1.

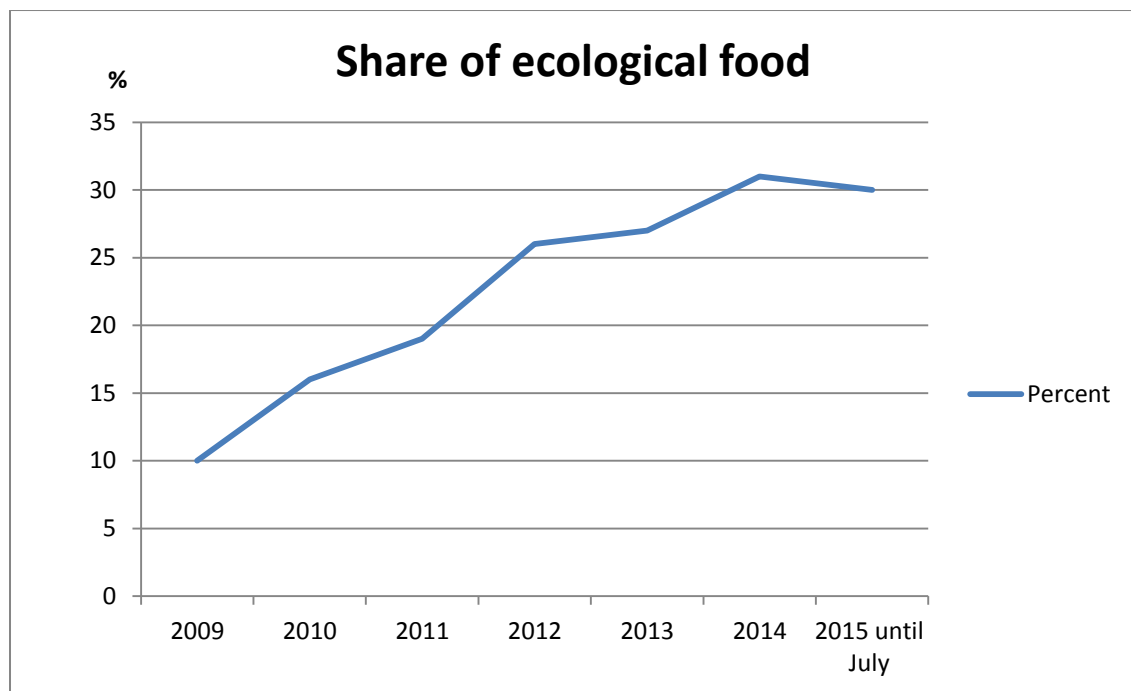


Figure 10A4: Share of ecological food, development since 2009.

A5. Social innovation/stakeholder participation, including for example community programmes, that show entrepreneurship and new ways of organisation that promote sustainable development and protect the environment locally and globally.



Figure 10A3: True recycling

- *Returbutiken (Recycling shop)* repairs and sells things from recycling centres. A labour market program strengthens individual's opportunities for meaningful employment and contributing to greener city through re-using/recycling.
- *Stadsodlarna (CityGrowers/Cultivators)* Since 2013 this citizens' group runs two growing areas in the city centre aiming to influence policy-makers and show importance of urban cultivation for city development.
- *Vi som älskar Umeälven (We who love the Umeå River)* is a digital phenomenon conducting advocacy. 3 000-5000 people are reached directly through Facebook, Instagram, Snapchat, Pinterest and Twitter. Through this platform for dialogue knowledge is spread and opinion can speak before decisions are made.

A6. Share of the city budget dedicated to support environmental R&D (with particular reference to eco-innovation) by public and private entities

Environmental R&D costs are usually not separated from other costs. A compilation shows that clearly dedicated environmental R&D support as part of total municipal budget 2014 was approximately 5.7% (municipal companies contributions included).

Environmental R&D and eco-innovation project 2014	SEK
Umeå Energi (Different projects)	3 774 629
Bostaden (Professor and PhD)	890 000
Bostaden - Cleaner Growth feasibility study	90 000
UMEVA (Agreement with Umeå University)	500 000
New Waste water treatment plant	140 000 000
Be Green Umeå – GreenCit	1 134 000
Electric buses and 2 charging stations	19 650 000
Sustainable Ålidhem (including reconstruction of the “Studentvägen”)	47 897 000
Green Parking Pay-off	100 000
Action plan for air quality	1 259 616
Aalborg	110 000
Bicycle lane Nygatan	5 835 000
The city between the bridges	50 141 000
Warm gritting (anti-slip winter cycling measure)	150 000
The Umeå Biker (Umecyklisten 2014)	150 000
STRADA 2014 (Accident Analysis System)	126 000
Bicycle activities 2014	100 000
Cycling traffic safety campaign “Kollisionen”	120 000
Travel survey	645 000
Virtualization Environment for reduced energy consumption	4 500 000
Passive house preschool	52 000 000
Prestudy Cleantech Kvarnen	85 000
Sun Map	100 000
Air - Technology Development	70 000
Biotech Umeå	500 000
CBRNE Center	200 000
Umeå Biotech Incubator 2014	1 000 000
Uminova Innovation	1 300 000
Biofuel Region 2014	309 500
Future Biorefineries Phase 2	225 000
TOTAL (SEK)	332 961 745
Municipal budget 2014 (SEK)	5 811 900 000
Share of the city budget dedicated to support environmental R&D	5,7%

Table 10A1: Environmental R&D and eco-innovation projects 2014, 1 SEK=€0.11

A7. Number of jobs created in green sectors in total, as a share of total jobs in the city and as total jobs created during a period of one year.

1.7% of all jobs are green. Of 62,306 employed people in Umeå, 1035 had clean-tech jobs 2013, a 44% increase from 2003.

A8. Share of hybrid or fully electric cars in total stock of vehicles owned by the city. Number of charging outlets available for the cars owned privately.

- 6% of all cars owned by the municipality are electric cars. The municipal car-pool open for citizens have a target of 60% electric cars in March 2016 (table 10B1 and 10C2)
- Electric buses are running in the public transport system, with plan of 33 buses (70%) by 2020 (see table 10B1).
- 13 (fast- and normal-) charging stations publically available; another 30 are planned in near future.

10B Past performance

B1. Initiatives aimed at increasing eco-innovation and sustainable employment

There are several triple- or quadruple-helix platform initiatives currently implemented to stimulate eco-innovation and sustainable employment in the Umeå region. Each platform has a different focus to stimulate innovative and sustainable approaches.



Figure 10B1: Eco-innovation and sustainable employment initiatives – Sustainable Ålidhem

Technical visits Umeå (Kompetensspridning i Umeå)

Because of great interest in sustainable solutions in Umeå from partners around the world a city owned company (Kompetensspridning i Umeå AB) was started 2009 and together with regional business and universities *Technical visits Sustainable Umeå* was set up to enhance green job development and export sustainable city knowledge.

Umeå has a history as one of the most frequented Swedish destinations for sustainable solutions – in 2012 it hosted the second most sustainable technical visits in Sweden after Stockholm (IVL report, 2013). A number of different study visits and training programs are offered. Technical visits was also part of the Swedish *Environment-driven markets* programs funded by the Swedish Agency for regional and economic growth and supporting SMEs to take part in EU clean-tech sector programs. Kompetensspridning represents Umeå in several national and international networks, including Swedish clean-tech network ASSET and Global sustainable cities network (GSCN). The Technical Visits project has been further developed in the ongoing cleantech initiative (Cleantech Kvarken/Cleaner Growth).

Be Green Umeå/Sustainable Ålidhem

Be Green Umeå – an award-winning innovative co-operation platform for communicating and demonstrating the benefits (easy, cost-efficient and fun!) of green mobility and living choices for citizens in the urban area. *Be Green Umeå* is designed to contain different kinds of project and is based on several national and European initiatives, one of them, the *Green citizens of Europe* project co-financed by Life+, aiming to support the inhabitants to be more sustainable, changing the way they travel and use energy¹.

Sustainable Ålidhem – a unique pilot project for sustainable urban development which included social, technical, environmental and economic changes. The overall objective of the project, which runs 2010–2016, is to reduce energy use in the area, create a more comfortable and safe environment and transform Ålidhem to a sustainable neighbourhood. The initiative was awarded the *European sustainable energy award – Living category* in 2013.

BioFuelRegion

Since 2003 Umeå are co-financing Biofuel Region, which supports the transfer to renewable energy within the transportation sector and is financed by Västernorrland's and Västerbotten's Counties, municipalities in the two counties, and about 15 companies. Efforts includes; collaborations with schools and awareness-raising activities to citizens, officials and politicians, and also coordination of EU projects, notably BEST (Bio-Ethanol for Sustainable Transport) nominated for Sustainable Energy awards 2009, and currently BioGaC (TEN-T) on development of biogas filling stations in northern Sweden.

¹ <http://www.greencit.se/>

Other initiatives include:

Miljötekniskt Center, MTC (Environmental Technology Centre), an open platform for industry, academia and the surrounding community working for green solutions. MTC initiate and conduct research and development within environmental technology. MTC develops new technologies within waste management, contaminated land and water.

The **Green North** project, aiming to strengthen competitiveness of regional SMEs and to increase export.

An innovative **torrefaction technology**, for production of black pellets developed by Umeå Energi/BioEndev. Investments are now made in a pilot plant and an Industrial Demonstration Unit.

B2. How European and national policies have been transferred into policy action at the city level

To complement descriptions on how European and national innovation and sustainable employment policy are implemented in the city (see Section B1 above), European and national environmental policy are also implemented in Umeå.

The *Swedish national environmental objectives* are specified in 16 areas and these are broken down also at a regional level. In 2006 Umeå worked with all these objectives together with NGOs, private, academic and public sector to distinguish priorities for Umeå. City council subsequently agreed on three profile areas:

- An attractive living environment
- An energy efficient society with renewable energy sources
- Umeå's good drinking water

In 2007 the City of Umeå signed the *Aalborg Commitments*, now incorporated in city steering documents such as our Comprehensive plan. The city of Umeå is also a signatory of the *Covenant of Mayors*, and as such Umeå has adopted an "Action plan to decrease the emissions of greenhouse gases" to reach the EU 2020 targets in the energy sector. As a matter of fact, Umeå has already reached this target, as all houses built since 2010 by the city were "nearly zero energy houses" according to a policy adopted by the municipality that all new buildings constructed by the municipality shall not use more energy than 65kWh/m²/year.

One concrete measure is the setup of one of the largest Energy Performance Projects (EPC) in Sweden. The project, led by the municipality's Property department includes 130 properties and 425,000 m² floor area, more than 50% of the total area of the municipality

owned buildings. Between 2010 and 2014, the overall use of energy decreased with 20% within the project. The Property Department is also certified in quality, environment and energy.

B3. The publication of reports, such as green accounts, revealing the timely implementation of planned initiatives

Umeå has a long experience of publishing green reports. The latest report, *Livsmiljöbokslutet (Living environment report)*, was adopted by the City Council in August 2014. The digital data base on which the report is based is continuously updated².

In order to monitor the implementation of its comprehensive plan strategies, Umeå has also been involved in the development of the EU Reference framework for sustainable cities (RFSC), and is today using the RFSC developed indicators as one inspirational tool in its local monitoring system.

B4. Any action which the city is taking in order to develop the urban tissue/ infrastructures in an innovative/sustainable way

One fundamental measure for the city's sustainable development is the comprehensive plan. In 2011, Umeå adopted a new comprehensive plan, including infrastructure, outlining the vision for the future with continued sustainable growth of the city to 200,000 inhabitants in 2050. The plan was awarded Swedish Plan award for 2012 for its inclusion of sustainability in six development strategies, and focus on monitoring of progress. The six strategies are:

- Five kilometer city
- More city! Complementing existing city districts as a vitalizing force
- High density in new city districts
- Growth in public transport corridors and conversion of transport through-ways
- Investments in public spaces and parks
- Everybody shall take part (Co-creation of the city)

² <http://livsmiljo.umea.se/>

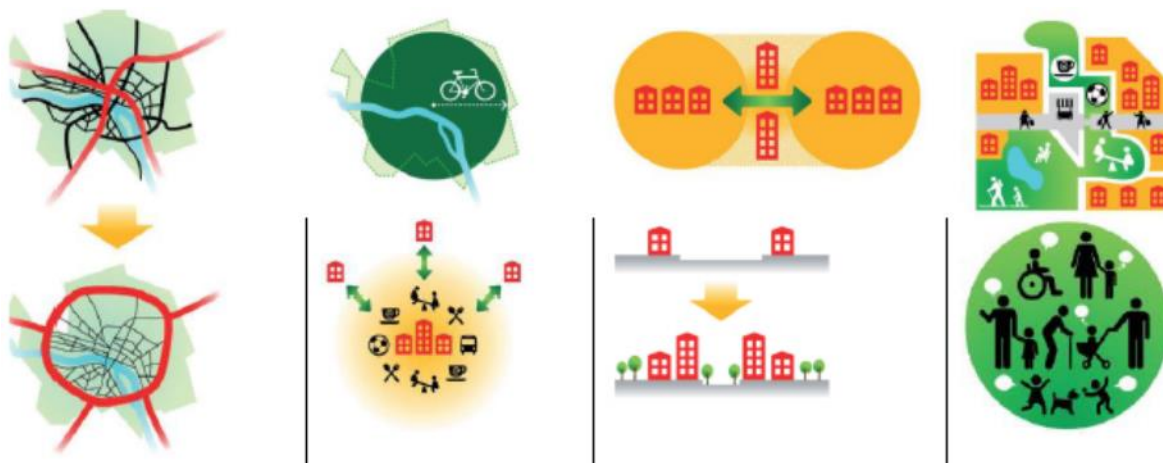


Figure 10B2: Pictograms of the six sustainable development strategies and new ring road in the comprehensive plan

A systemic thinking is present through the whole of the city planning. The comprehensive plan is the foundation, in which different strategies are integrated. For example, Umeå has problems with inversion in winters, with bad air quality as a result. Because of that we have a traffic strategy to reduce emissions of NO_x gases and particles. Based on the traffic strategy an action plan has been developed with more specific actions to solve the problem.

Examples of actions taken to develop the infrastructure in a sustainable way are seen below.

<p>Gender planning</p>	<p>Several initiatives to strengthen the gender perspective on urban development – summarised in “Gendered landscape report” with overview of all initiatives by different stakeholders in the city. It also involves an organised bus tour, which highlights the urban development in the city from a gender equality perspective.</p>
<p>Prohibition of heavy trucks in the city centre</p>	<p>Umeå has problems with air quality, due to winter-time inversion 50% of the time. A lot of effort is put into decreasing levels of NO_x and particles. In October 2013 the city of Umeå prohibited heavy trucks to pass the city centre.</p>
<p>Change from heavy trucks to railway</p>	<p>Umeå owns a company in the infrastructure segment, INAB, working to change the goods transportation sector from heavy trucks to railway transportation.</p>
<p>Ultra-fast charged electric buses with hybrid back-up</p>	<p>Ultra-fast charged electric buses with hybrid back-up are running in the public transport system today. By January 2016 there will be 9 buses in traffic and the vision is to add another 24 buses by 2020. Umeå will thereby increase the share of electric buses in the city transport system from 0% to 70% from 2010 to 2020.</p>

Change of car stock	Umeå municipality is continuously changing its car stock to more sustainable vehicles. Cars that are driven less than 1000 km/year shall be replaced by public transportations, electric- or hybrid cars, biogas cars or electric bikes before 2015.
Algae conversion project	Triple-helix demonstration project at to grow and convert algae into bio-fuels based on waste-water nutrition, Sweden's largest of its kind.
Car-sharing system	A car-sharing system has been established. Employees are obliged to use vehicles from the car pool at work, but citizens are also allowed to use the car pool, thereby contributing to the decrease of cars owned by citizens. The municipality has set the target of 60% electric cars in the car pool in March 2016.
Green parking pay-off	Voluntary agreement for reduced parking standards for employee parking. In exchange, the real estate owner makes a commitment in effecting a change in travel behaviour in his/her property with less car use and increased number of pedestrians, cyclists and users of public transport. It gives the real estate owner the possibility to provide properties with an environmental focus while making savings with fewer parking purchases.
Hedlunda Passive house preschool	A new preschool with six departments in central Umeå is recently completed. This is a modern preschool, inspired by the Reggio Emilia philosophy and with a gender perspective. It is also Northern Sweden's first public Passive pre-school.
Certified schools	All schools in Umeå are certified with "School for Sustainable Development". This is very positive since sustainable development is an essential part in the new governing documents for schools and preschools.
Umeå Urban Forum	A local network coordinated by the municipality with the objective to develop ideas and methods for sustainable urban development. Public spaces are in focus and social, technical and cultural activities will be implemented the coming years.

Table 10B1: Additional actions taken to develop the infrastructure in a sustainable way

B5. Name/describe what you consider the flagship of eco-innovation in your city.



Figure 10B3: Ultra-fast charge all-electric articulated bus, 4 wheel-drive and 18 meters long

Hybricon Bus Systems makes the world's most energy efficient, clean and silent bus system. The European, national and regional goals for 2020 concerning energy efficiency, air and noise pollution and fossil fuel reduction will not be met with traditional internal combustion (diesel, alcohol or biogas) engines. Umeå municipality has largely contributed to the positive development, and are now using electric buses in the public transport system. A large-scale deployment, replacing 70% of the city buses by 2020, is now underway. In October 2015, Hybricon were honoured with the prestigious Civitas Award for Technical Innovation, Europe's premier award for sustainable urban transport.

Most effective measures:

- The comprehensive plan from 2011 with six sustainable development strategies
- Hybricon Bus System's electric buses
- The Be Green Umeå platform

10C Future plans

C1. Plans to establish eco-innovation clusters, strategies and initiatives to attract public-private partnerships for further developing eco-innovation and sustainable employment

Several existing eco-innovation clusters (see B1) are currently evaluated for further development. Complementing initiatives currently planned for are:

Cleaner Growth

Umeå is involved in *Cleaner Growth* – a new regional long-term initiative with neighbouring municipalities, companies, universities, focusing on innovation, commercialization and export. It will enhance the competitiveness of the region, companies and universities while mitigating climate change. The initiative includes two sub projects: International markets and Commercialization.

In addition to creating conditions for better, more environmentally friendly work with increased efficiency, an investment in the development of innovations contributes to sustainable growth, commercialization of new products and services, new and growing businesses, increasing employment and increasing tax revenues.

Cleaner Growth Commercialization, as a light version, started 2014–2015, with the extended plans due to start in 2016.

Smart University City – Umeå

A public-private partner initiative to develop the university campus area (3 700 inhabitants) focusing on sustainable mobility, integrated infrastructures and low-energy built environment is scheduled for implementation 2016–2020.

The initiative builds on previously agreed political objectives – to establish Umeå as a Northern hub for cleantech and sustainable city solutions. To this end an agreement of collaboration on sustainable urban development and cleantech has been signed with Umeå University, and is now further developed, along with other interested stakeholders.



Figure 10C1: Smart University City – an overview of the Umeå University campus today

+Project

+Project is an innovation initiative centred on inter alia 3D-printed sustainable housing, new methods of design and production in architecture and housing and circular sustainable business models. In collaboration with Umeå University, innovation consultants and the “Network for Sustainable Construction”, research and academic infrastructure is made available to entrepreneurs and SMEs interested in developing innovative solutions.

Open North/Open testbed

Open North, a collaboration between Luleå University of Technology, Skellefteå and Umeå municipalities and Umeå University. The partnership revolves around Open data aiming to increase supply and reuse of data. Open data is a strong positive force for innovation and transparency/citizen participation that our region is particularly well placed to provide. From a public involvement perspective it’s an interesting tool for sustainable urban development and with its strong public sector Umeå has unique access to public information. Examples include heating, electricity, transport, wastewater, sewage etcetera.

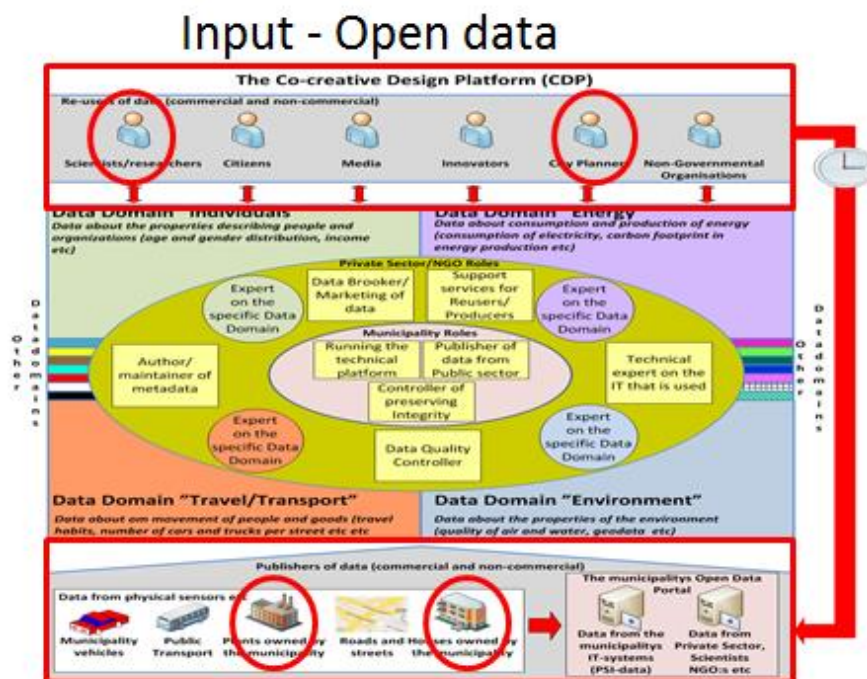


Figure 10C1b: Open test-bed for environment and energy technology - Co-creative design platform model, outlining “data publishers”, “data re-users”, and “data domain hub, based on experience from Sustainable Ålidhem initiative et al.

C2. Future targets of how eco-innovations can be applied by the city, e.g. make reference to share of hybrid or fully electric cars in total stock of the public fleet, or plans to support the infrastructure development for electric cars in public areas (i.e. increase the number of charging points for electric cars in public car parks)

Umeå municipality has a policy that cars driven less than 1000 km/year shall be replaced by electric bikes/cars, and is also coordinating a public car-sharing system with city-owned cars made available to Umeå citizens.

Umeå already has a city-wide low-speed charging network with standard electric sockets installed at practically all public and private parking spaces in the city, for engine heating purposes. Designated semi-quick charging places are scattered in carparks and other strategic places, a dozen more will be operating in the coming year. In 2014, Umeå Energi in corporation with fuel company OKQ8, installed a quick-charging station with two more to come 2015-2016. The number of chargers will be expanded gradually with growing demand. Umeå Energi is in the process of launching a product for its customers (supermarkets, hotels, etcetera) wanting to provide the opportunity for their customers to recharge vehicles.

The city has also decided on an investment program to replace 70% of public transport buses with ultra-fast charge all-electric buses, by 2020.

C3. Participation at green business networks or partnerships and covenants and cooperation with knowledge institutions, such as universities;

Umeå is very active in national/international sustainability networks/projects, see examples in Table 10C1. The participation is continuously evaluated to optimize added value for the region and national/international contributions.

Covenant of Mayors	The Covenant of Mayors is the mainstream European movement involving local and regional authorities, voluntarily committing to increasing energy efficiency and use of renewable energy sources on their territories. By their commitment, Covenant signatories aim to meet and exceed the European Union 20% CO2 reduction objective by 2020.
ICLEI	Umeå is one of over 1,000 city members globally in ICLEI-Local Governments for Sustainability impacting 20 % of the world's population. The network of towns and metropolises is committed to build a sustainable future, including low-carbon, resilient, eco-mobile, biodiverse, resource-efficient and productive, healthy and happy cities, with a green economy and smart infrastructure.
EU CIVITAS Network	Connecting around 200 cities across Europe for “cleaner and better urban transports”, Umeå is currently represented in the Political advisory committee through Mayor Mrs. Margareta Rönngren.
Union of Baltic cities	Umeå is currently vice-President (Mayor Mrs. Marie-Louise Rönmark) in the 100+ city network on sustainable development around the Baltic Sea. Umeå is also coordinating the UBC work on Gender equality.
Global Sustainable Cities Network (GSCN)	Umeå is part of Global Sustainable City Network (GSCN) as one of five selected progressive Swedish cities, coordinated by the Swedish Energy Agency. GSCN is a part of Clean Energy Ministerial (CEM), and includes Sweden, Denmark, Finland, China, France and United Arab Emirates, and focus is on transfer of knowledge.
Nordic city network	Knowledge cities in the Nordic countries focusing on development of attractive and sustainable medium-sized knowledge cities.
UN 10YFP – Swedish national reference group	The city of Umeå is part of the national reference group working on Sweden's contribution to the UN 10-year framework on Sustainable construction and production. The work is coordinated by the Swedish Ministry of the Environment and the Swedish Environmental Protection Agency.
RCE North Sweden	United Nations Regional centre for expertise on education for sustainable development.
The northern hub for sustainable urban development	The city of Umeå and Umeå university has an agreement to collaborate on sustainable city development and clean-tech aiming to make Umeå a “Northern force for sustainable urban development”. In 2015 a similar agreement was signed with SLU, the Swedish University of Agricultural Sciences, also based in Umeå.
ASSET	Umeå is part of the Association of Swedish Environmental Technology Industries (ASSET) a co-operation with front-runner cities and regions supporting clean-tech in Sweden.

Table 10C1: Examples of national and international sustainability networks

Umeå has signed and supports several important European commitments and has also coordinated European-wide projects, examples below:

European commitments signed by Umeå	Signed
Covenant of Mayors	2011
CEMR declaration on gender equality between women and men	2008
RFSC, Reference framework for sustainable cities	2012
Aalborg commitments	2008
European project coordinated by Umeå	Project period
Green citizens of Europe (Life+)	2010-2015
Be Green Umeå platform	Launched 2011
Sustainable Ålidhem	2010-(2016)
M-SPICE Monitoring for participatory sustainable cities in Europe, URBACT	2012
Peer city network project on Open data and the RFSC (cooperation with ICLEI, CEMR and Platform 31).	2013-2014
CleanTech Kvarken (part of the Cleaner Growth initiative) (Botnia-Atlantica programme)	2015-2018

Table 10C2: Examples of European sustainability commitments and initiatives signed and supported by Umeå and examples of some European projects coordinated by Umeå

C4. Programmes to reach the population and industries promoting green economy thinking



Figure 10C2: Examples of green creativity

- Several programmes and initiatives are in place where business and society cooperates jointly to promote green economy thinking, including the *Network for sustainable construction and real estate management in cold climate* (see 10A2), *SEE week* (10A2) and *Returbutiken* (“Recycling shop”) (10A5). A work in progress is also to further develop the *Be Green Umeå*-platform (10B1).

- Umeå's ambition as European Green Capital is to build on the experience from Umeå as European Capital of Culture 2014 – to change consumption and behaviour patterns through citizen participation and involvement, and generate new sustainable investments and innovations. Our aim is to open the minds of all citizens to change their preferences and live more sustainably.

C5. Key future plan considered as flagship of eco-innovation in your city.

Through *Cleaner Growth* – a regional long-term initiative focusing on innovation, commercialization and export, Umeå works with neighbouring municipalities, companies and universities to strengthen the region within the clean-tech sector.

Interaction between the private, public and academia will create new cooperation opportunities, and development of Technical Visits to the region creates business opportunities for companies in the region.

By attracting venture capitalists exciting business models can be created and new sustainability solutions can come about.

The investment in innovation development contributes to sustainable growth, commercialization of new products and services, new and growing businesses, increasing employment and thus new and increasing tax revenues.

10D References

Umeå Energi, CHP <http://www.umeaenergi.se/om-oss/produktion/dava-1-och-2>

Technical Visits in Sustainable Umeå

<http://www.umea.se/mer/tema/miljo/technicalvisitsstart/inenglish.4.53d5e3e9132250fdb618000581.html>

Network for Sustainable construction and real estate management www.hallbarahus.se

Green Citizens of Europe www.greencit.se

Biofuel Region www.biofuelregion.se

Umeå Energi <http://www.umeaenergi.se/el/egen-produktion/solceller/vart-solcellserbudande>

Sustainable Ålidhem project (<http://www.bostaden.umea.se/sustainable-alidhem>)

Environmental objectives for Umeå

<http://umea.se/download/18.2aeb902411d30c9e460800015040/1225973075800/Milj%C3%B6m%C3%A5l.pdf>

Returbutiken <http://returbutiken.com/>

European Capital of Culture 2014 and Umeå Urban Forum www.umea2014.se

Aalborg commitments

http://umea.se/download/18.2aeb902411d30c9e460800015062/1225973601941/Aalborg_committments_english.pdf

Local action plan for the reduction of greenhouse gas emissions in Umeå

<http://umea.se/download/18.3343915a13c39d421191d98/1358756341037/%C3%85tg%C3%A4rdsplan+f%C3%B6r+minskade+utsl%C3%A4pp.pdf>

Green accounts report for Umeå – published 2014 <http://livsmiljo.umea.se/>

Local action plan for improving the air quality in Umeå

http://umea.se/download/18.2aeb902411d30c9e460800015082/1225975387829/%C3%85tg%C3%A4rdsprogram_milj%C3%B6kvalitet.pdf.pdf

Ultra-fast charging hybrid buses - Hybricon <http://www.hybricon.se>

+Project <http://sliperiet.umu.se/en/making-and-thinking-start/plusproject/>