

EGCA 2018, Umeå, Sweden

Good practices

Good practice 1: Ultra-fast chargeable electric buses

Indicators: Climate change mitigation and adaptation, Local transport, Ambient air quality, Quality of the acoustic environment, Eco-innovation and sustainable employment, Energy performance

Umeå municipality's investments in electric buses are done to fulfill the intentions of the comprehensive plan. When densifying a city more people get exposed to noise and emissions. The electric buses reduce noise levels up to 10 dBA and also have a big positive impact on the climate and air quality. With Umeå's well-developed renewable electricity network based on wind and hydro-electric power, the new buses will result in close to zero GHG emissions.

Umeå has been a partner developing the world's first ultra-fast charged electric buses adopted to cold climate with hybrid backup, in cooperation with European stakeholders from e-Traction, Opbrid to name a few, and local company Hybricon Bus systems.



Figure 1.1: Ultra-fast charged electric bus.

There are already two buses in traffic and by 2016, there will be nine buses in traffic which will have replaced 600 000 kilometres of diesel-powered traffic with electric power. The vision is to add another 24 buses by 2020. Umeå is thereby facing up to the climate challenge by committing to investments in green innovation that will increase the share of electric buses in the city transport system from 0% in 2010 to 70% in 2020.

In October 2015, Umeå received the CIVITAS Award of Technical innovation for the work with implementing fully-electric buses and ultra-fast chargers.

Good practice: Sustainable Ålidhem

Indicators: Green urban areas incorporating sustainable land use, Water management, Eco-innovation and sustainable employment, Energy performance

Sustainable Ålidhem is a unique national pilot project for sustainable urban development which includes social, technical, environmental and economic changes. The project is focusing on large-scale sustainable renovation of 1960s and 1970s buildings, side-by-side with new low-energy building. The overall objective is to reduce energy use in the area, create a more comfortable and safe environment and to transform Ålidhem into a more sustainable neighbourhood. The energy use in the area should be halved, with sustained rent levels. About 400 kW of photo-voltaic cells have been installed, which will supply the area with a third of the building electricity.



Figure 2.1: Image of the newly built Sustainable Ålidhem with the winter garden in the centre.

The project is a co-operation between Bostaden¹, Umeå Energi² and the municipality. Umeå University coordinates an integrated research and monitoring project using open data from the project partners. The project won the *Sustainable Energy Europe award* in 2013.

This has been done within the project:

- Renovation of 405 apartments with a decreased energy consumption of 40–50%.
- New construction of 137 apartments with an energy consumption of 65 kWh/sqm per year, 50% less than the specified building standards require.
- Photo-voltaic cells which, when fully developed, will be over 2,650 sqm, one of Sweden's largest, producing around 350,000 kWh per year.
- Winter garden that gets all the power supply via solar cells during the light period of the year.
- New washing machines that are connected to the district heating system which reduces electricity consumption.
- Echolog, an apartment display, is installed in the apartments. It shows the consumption of electricity as well as hot and cold water.

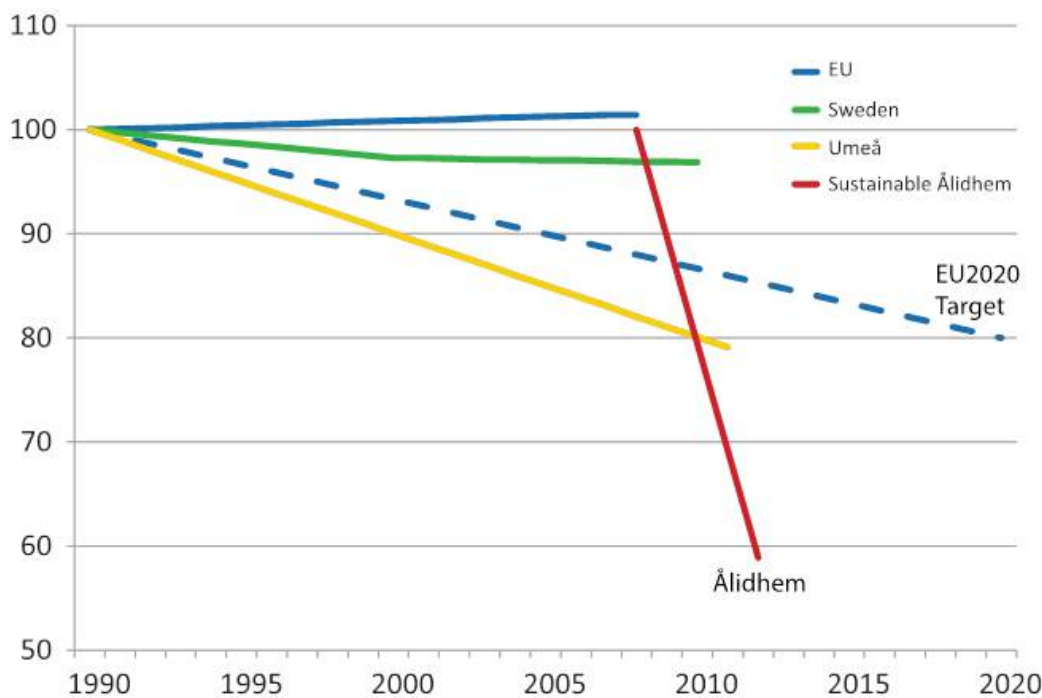


Figure 2.2: Energy use per capita. Comparison between index trends for EU, Sweden, Umeå and the Sustainable Ålidhem project that accomplishes a more than 40% reduction in energy use in just five years.

¹ AB Bostaden, municipal housing company.

² Umeå Energi AB, municipal electricity company, owns the city electricity system.

Good practice 3: School for sustainable development

Indicators: School for sustainable development is relevant for all indicators.

For a long time there's been a systematic approach on how to integrate sustainability into the education in Umeå's schools. This gives the young citizens an invaluable knowledge that they'll be able to use both in their personal and professional life in years to come.

The pre- and primary school assignment plan states e.g. that "Education for sustainable development shall permeate the entire sector" and that "All units shall apply for and work on the bases of the criteria *School for sustainable development*".



Figure 3.1: Exhibition at the Counsel for sustainable development in 2014.

In 2015 all preschools and schools have applied for or obtained the Swedish National Agency for Education's distinction *School for sustainable development*.

The systematic approach of the work is shown in figure 1. The model includes, among other things:

- Skills development for teachers and tutorial in the work of education for sustainable development. Outdoor education is carried out in about 50 classes/preschool groups each school year, five days each.
- Teacher network with representation from each unit, approximately 160 preschools and schools, meet four times each school year.
- Seminars are arranged every other week during the entire school year.

- Every year there's a large conference with lectures and workshops focusing on global sustainable development. The conference gathers 300 teachers and principals.
- Once a year there's a Counsel for sustainable development, collaboration between students, teachers, politicians, officials and experts on sustainability issues. The officials and experts present the background and some current issues that need to be solved or discussed. Students then work with the different cases and present their result and solution in the shape of their choice; a presentation, a movie, an information folder etcetera. During the presentation the students get to ask questions and present their ideas to the politicians and officials.

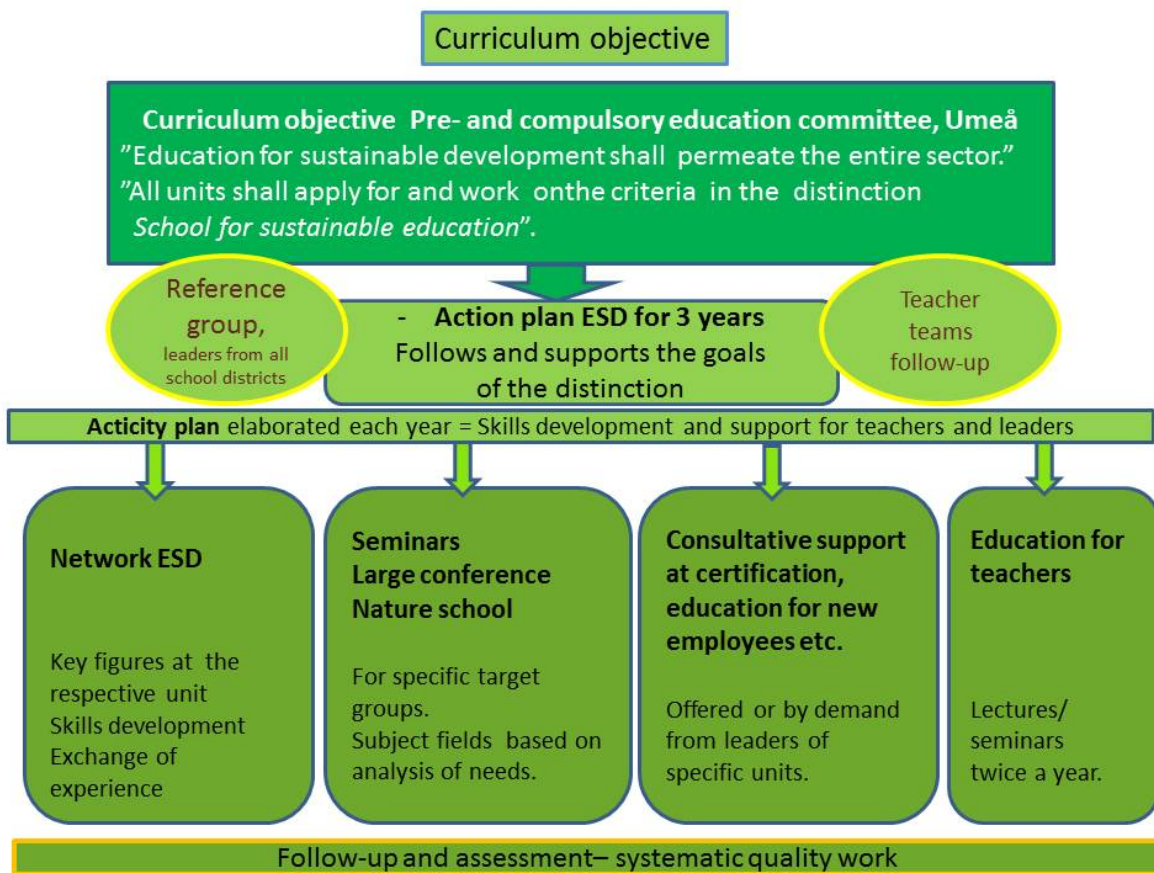


Figure 3.2: The working model for school for sustainable development.

Good practice 4: Green parking payoff

Indicators: Climate change mitigation and adaptation, Local transport, Green urban areas incorporating sustainable land use, Nature and biodiversity, Ambient air quality, Quality of the acoustic environment, Eco-innovation and sustainable employment, Energy performance, Integrated environmental management

Umeå is one of Sweden's fastest growing cities. This creates several challenges linked to urban development e.g. a deteriorated air quality and risk for urban sprawl. To address these challenges, a voluntary pilot called green parking payoff is currently active, which can reduce traffic and enable a more efficient land-use.

Based on an agreement between the city, the city parking company and property developers, the number of employee parking places on commercial properties can be reduced. Forecasts show that the full potential of the project is a 41% shift from car to more sustainable transport modes at real estate level. The project aims to create a clear win-win situation for Umeå, the real estate owner and the environment. So far the project has been a success and has been extended to incorporate more property developers including Umeå municipality.



Figure 4.1: The newly developed city block Forsete is part of the pilot project Green parking payoff.

In the green parking payoff project, property developers provide sustainable mobility services, in exchange for lower parking requirements. Examples of services are to provide bicycle facilities such as service stations and dressing rooms, connect the property to a carpool and allocate resources to a mobility management fund.



Figure 4.2: At Umeå City Hall, bicycle parking is located closer to entrances than car parking, and with Green parking pay off, 40% less car parking places will be built.

Umeå municipality wants to set a good example by carrying out the green parking payoff ourselves. A rebuilding of City Hall will result in 40% fewer parking places than would otherwise have been requested. A new bicycle parking establishment with a service station will be built and employees are encouraged to walk, use bicycle, public transport or carpool instead of their own cars.

As a further development of the Green parking payoff, Umeå is examining the possibilities to extend the project to include residential parking as well. This poses a greater challenge than work place parking, but at the same time offers a greater impact on traffic and land-use in the city.

Good practice 5: Lowering water consumption – a research and demonstration cooperation

Indicators: Water management, Energy performance, Eco-innovation and sustainable employment

In a two-year (2012–2014) pilot project of 134 apartments the municipal housing company Bostaden in cooperation with Umeå University conducted the installation of energy-saving, “intelligent”, low water-consuming equipment. The pilot resulted in a 30% decrease of hot water consumption (15% for cold water) compared with reference apartments. Based on

these results, Bostaden plans to successively substitute the equipment in all its apartments (15 400 apartments in total, corresponding to 27% of the total housing market in Umeå, and 57% of all rented apartments).



Figure 5.1.: (A) The terminal “Echolog” in all Bostaden’s new apartments shows the consumption of electricity and hot and cold water in real time. The purpose is to help reduce consumption through increased awareness. (B) “Intelligent” equipment as used in the Bostaden pilot study.

The study looked at the reduction of hot and cold water usage with the installation of energy efficient armatures. It was based on 23 months measurements of individual water usage in 77 apartments (test and reference). The test apartments were first equipped with earlier generation water armatures, to later be replaced with the latest generation energy-efficient armatures. The cold and hot water usage was then logged with 10 minute resolution, and the monitoring was based on average daily water usage for the times when tenants have used the apartment. Apartments with change of tenants in the test period and other sources of error were omitted from the study, to reduce uncertainties.

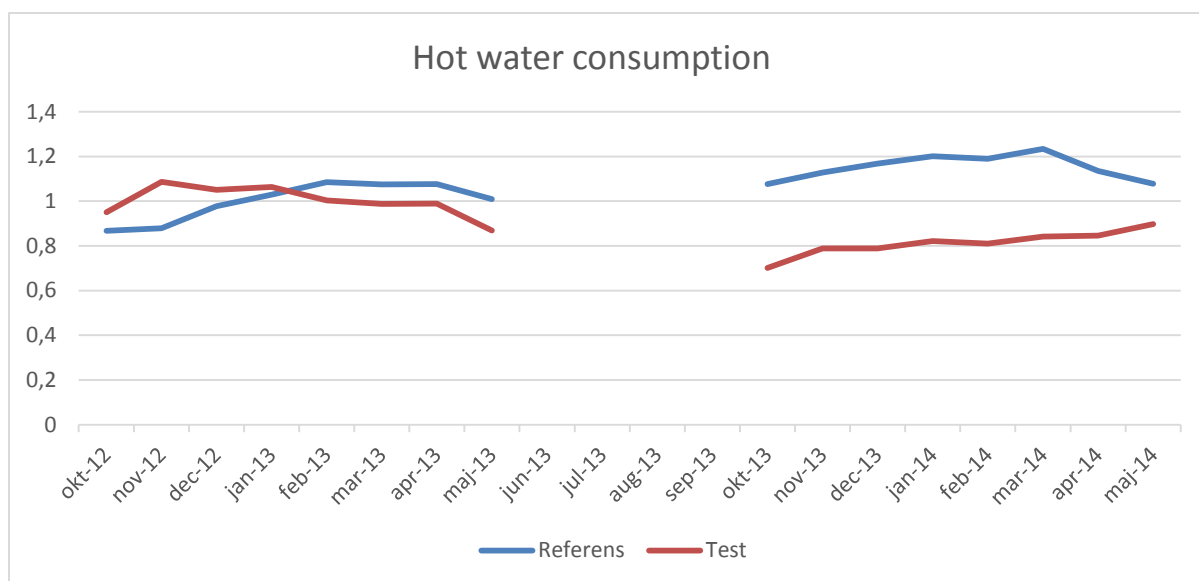


Figure 5.2: Normative hot water usage with earlier generation water armatures and latest generation energy-efficient armatures in Reference and Test apartments

Good practice 6: Straight-trough railway improved Nature 2000 area

Indicator: Nature and biodiversity

When the Bothnia railway was planned, the stretch suggested went straight through the Umedelta, a 30 km² large Natura 2000 area close to Umeå city. Planning and implementing the offsetting scheme, the largest in northern Europe so far, has involved many stakeholders with different interests, including the City of Umeå, and the result is extraordinary.

The Umedelta area extends from the Umeå city boundary in the north to the estuary of Umeälven in the Gulf of Bothnia. There are plenty of public accessible entrances located within a few km from the city. The Bothnia railway, constructed 1999–2010, runs through the area on its way towards Umeå.

The biodiversity offsetting scheme, funded by the Swedish Transport Administration, was implemented to ensure that the bird fauna of the delta stayed intact even with the new railway. Almost 500 acres have been put in order for wetland birds and another 750 acres are protected and restored for forest conservation values. Wetland birds reacted quickly and started to use the new grounds almost immediately. After five years of scientific monitoring, result shows that the area is better for the birds today, with the new Bothnia railway and the compensation measures, than it was before. Another lesson learnt is that wetlands also are very attractive sites for the Umeå citizens.

The biodiversity offsetting schemes at the Umedelta are managed by a foundation with funds allocated by the Swedish Transport Administration. The conflicts that preceded the construction of the railway have now subsided and the earlier counterparts now cooperate in this multi-stakeholder foundation. Since most of the compensation measures require annual maintenance of pasture, grain cultivation and regulation by pumps, job opportunities have arisen, primarily at local farms. Furthermore, farmers from the area supply local free range beef to the local grocery stores.

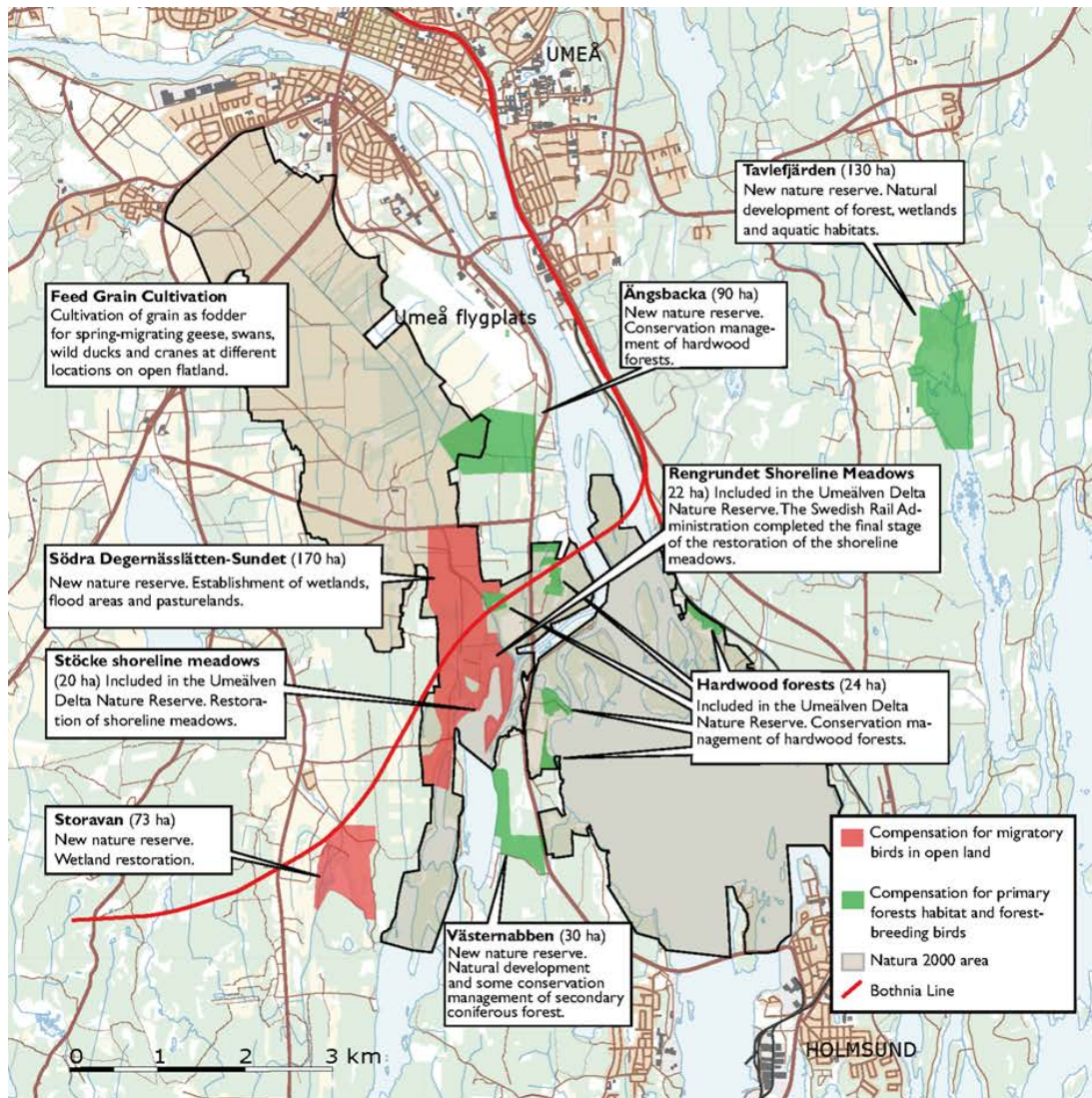


Figure 6.1: Map of compensation measures for the Umedelta and plains Natura 2000 site with a view on the new established wetlands Södra Degernässlätten-Sundet.