

VÄSTERNORRLAND COUNTY COUNCIL

Energy Factor 2



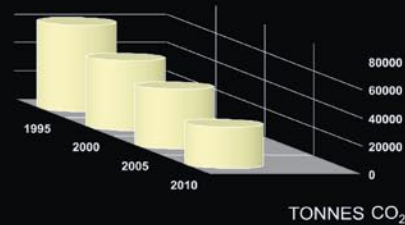
Landstinget
Västernorrland



Energy Factor 2



CO₂ emissions 1995-2010



Landstinget
Västernorrland



Project
**Sustainable
Transports**
Energy Agency Västernorrland

Västernorrland County Council has applied Demand-Side Management since 1995. The target is for each measure to yield an energy efficiency improvement of at least 50 %. Most of the measures taken to date have surpassed this target. A large step has been taken towards a sustainable county council.

- 10 years of practice
- 10 million euros invested
- 50 % reduction in CO₂ emissions*

* 2010 projection

It started with a willingness to change

In the early 1990s there was a rise in both energy use and costs for Västernorrland County Council. Carbon dioxide emissions consequently increased too. There was already an awareness at that time that energy prices would rise, as energy supplies are finite resources. Reducing the County Council's energy use would thus greatly benefit the environment and the economy.

The strategy was for all measures taken to be sustainable and cost-effective in the long term. Best Available Technology, BAT, was to be used, even it meant a major investment.

Each measure taken was to reduce energy consumption by 50 per cent (Factor 2). This

target was regarded as a vision to aim for, something that perhaps was not possible to achieve.

Now, a decade later, the target has not just been attained but surpassed.

Using snow to cool one of the hospitals reduced the need for electricity by as much as 90 per cent (Factor 10). When light fittings were replaced and lighting control was introduced, electricity consumption in the areas concerned fell by 70 per cent (Factor 3). Ventilation equipment and geothermal and river cooling have also been installed, with very good results. You can read about what we have done on the following pages.

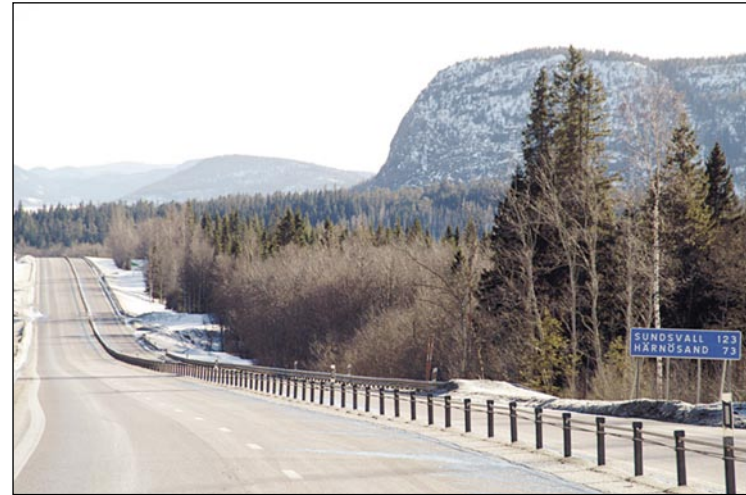
VÄSTERNORRLAND COUNTY COUNCIL

County Council operations:

- **Health care** 3 hospitals, 36 health clinics and 32 ambulance vehicles
- **Public dental care** 29 clinics, 8 clinics with specialised dental care and 5 technical laboratories
- **Regional development** with culture, education and R&D

With approximately 8,100 employees, the County Council is the largest employer in the county. Of the employees, 82 per cent work in healthcare and medical care. Over 80 per cent of the employees are women.





Cooling is needed in Scandinavia too

Västernorrland is in northern Sweden, a part of the world usually associated with snow and cold. But the summers are warm, and buildings and equipment need to be cooled. In the last ten years Västernorrland County Council has been steadily replacing cooling machinery with other solutions, resulting in a sharp reduction in the use of refrigerants with a greenhouse effect.

River cooling has been installed at Sollefteå Hospital, right next to the Ångermanälven river. The temperature of the river water in summer is no more than 14° Celsius. Even

better results are achieved with geothermal cooling in the office buildings in Härnösand. In summer 2007 seawater cooling, with a temperature of 6° C, will be installed at Örnsköldsvik Hospital.

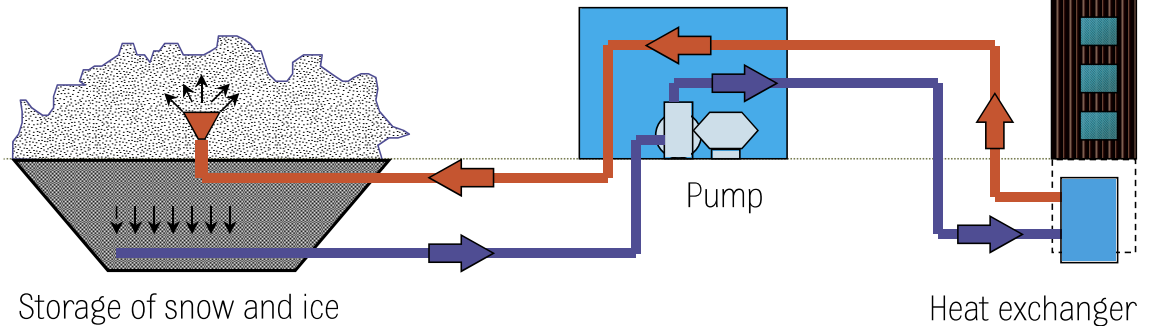
The most efficient cooling system is in Sundsvall, where winter snow is used for comfort cooling, the cooling of servers, chilling and freezing rooms and medical equipment.

THE SNOW COOLING METHOD

The method is an old one and proven to work and can be used wherever snow falls or can be made.



The snow reservoir is the size of a football pitch. In the spring the snow is covered with 20 cm of wood chips.



Snow cooling

Snow cooling at Sundsvall Hospital is Västernorrland County Council's largest energy efficiency project to date. The plant, which has been in use since 2000, is the first of its kind in the world. The method is actually very simple. Snow is stored in the winter and melts in the summer. The meltwater is then used to cool the hospital during the summer months. The method is an old one and proven to work

and can be used wherever snow falls or can be made.

The actual plant consists of a reservoir the size of a football pitch. Snow that has been cleared from streets and car parks, a total of around 40,000 cubic metres a year, is tipped into it. In the spring the snow is covered with 20 cm of wood chips. Heat exchange takes place with the 2° C meltwater in the hospital's

cooling system. The heated water is returned to melt further snow.

In winters with little snow, snow-guns are used to make snow. Despite this, far less electricity is consumed than with a conventional cooling plant.

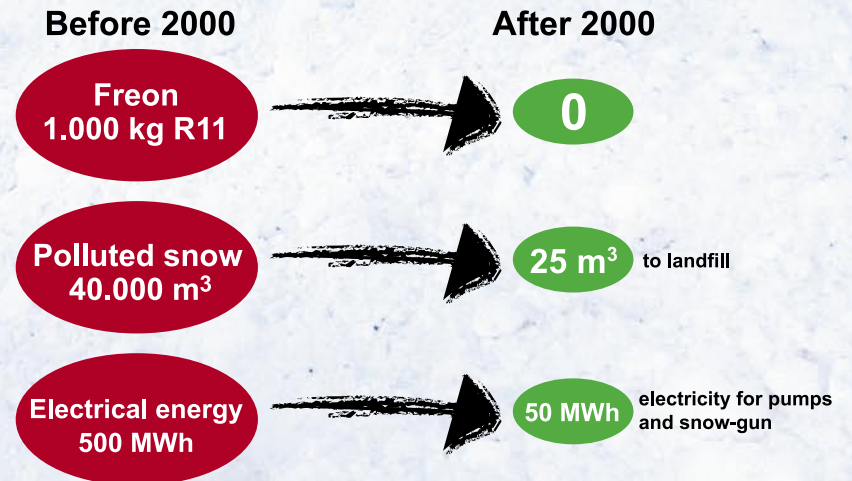
Snow cooling offers three benefits. No refrigerants are used, and electricity consump-

tion is greatly reduced. The requirement used to be 500 MWh per year. With snow cooling only 50 MWh is needed for pumps and snow-guns. Electricity use is reduced by 90 per cent (Factor 10).

The third benefit is that polluted snow is cleared away. There remains 25 cubic metres to be landfilled.



The snow store is around six metres high.





Lighting, heating and ventilation

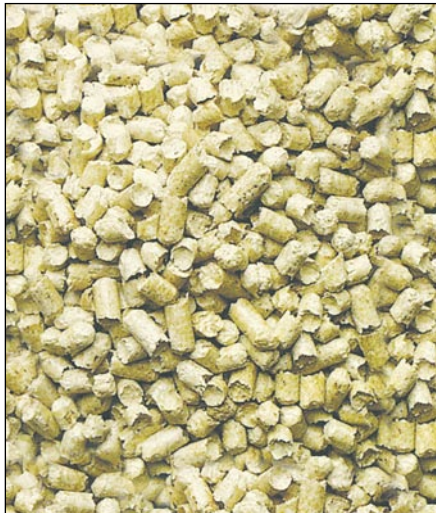
Replacing lighting is relatively simple yet highly effective. To date 12,000 of the County Council's 50,000 light fittings have been removed and replaced by just 8,000 new ones, as the new fittings have better reflectors and produce a far better light yield. All are fitted with T5 tubes and starters.

Occupancy and demand control are important. Only a proportion of the lights are on during the night. In some places, such as multi-storey car parks, the premises have been divided into sections with occupancy control.

A reduction in electricity consumption of 70 per cent has been achieved in areas where action has been taken, from 6 GWh to 1.8 (Factor 3). Costs have fallen by more than half, despite electricity prices having almost doubling.

Ventilation in hospitals and other buildings has been modernised. The new equipment is frequency-controlled and highly flexible. Air flow can be effectively regulated and adapted to activity during days, nights and weekends by computerised time control.

Ventilation measures have reduced energy



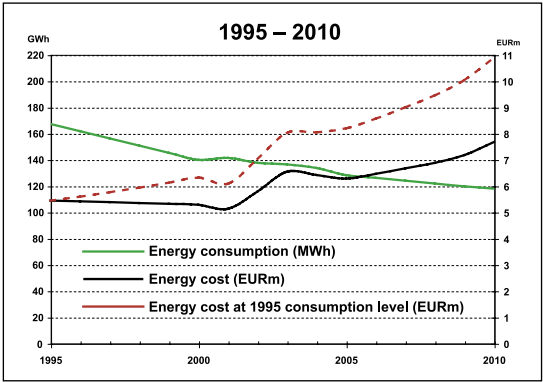
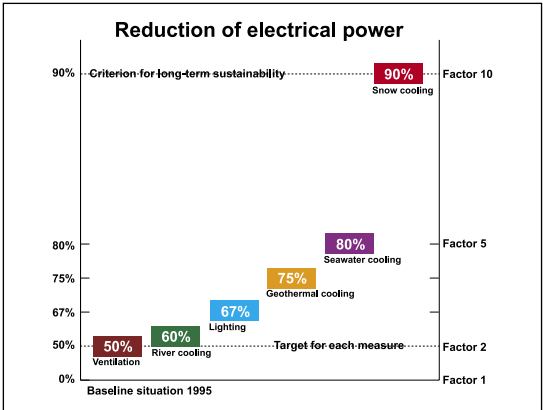
consumption by half, from 5 GWh to 2.6 (Factor 2).

In the area of heating, oil-fired and electric boilers are being steadily replaced, mainly by district heating. Outside the district-heating networks pellet-fired boilers are being installed, sometimes in combination with solar panels. The result has been not just reduced heating costs but major environmental benefits too.



A willingness to change is more important than ever

Västernorrland County Council began applying Demand-Side Management in 1995. The Factor 2 concept, which at that time was a vision, has proved to be a sustainable strategy. EUR 10m was invested in energy-efficiency measures in 1995-2005. Another EUR 5m will be invested between now and 2010.



Results 1995-2010

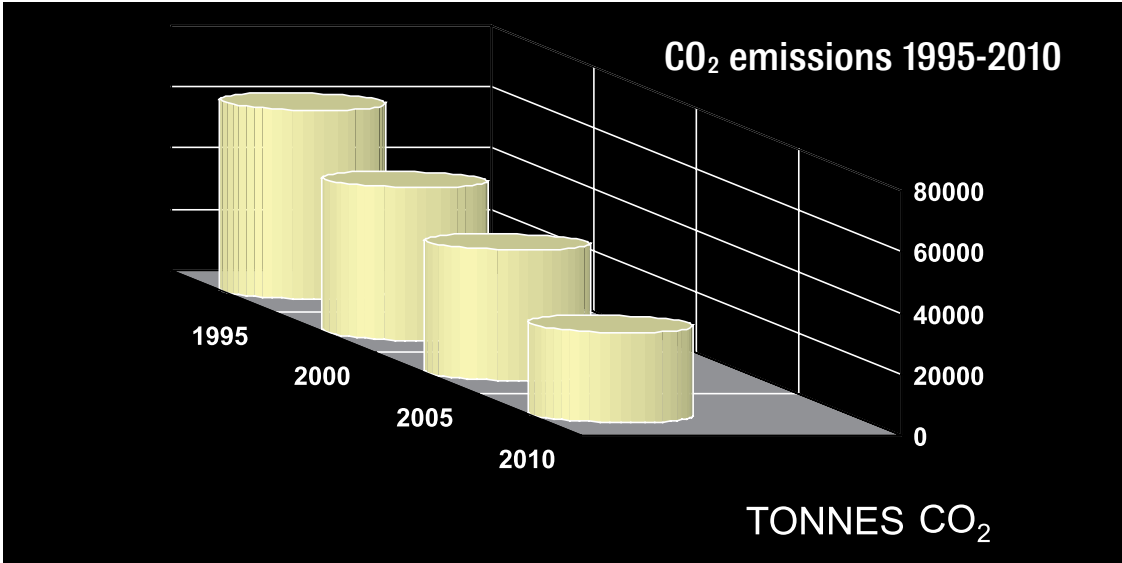
- 80% of compressor cooling has been replaced by free cooling from snow, rivers etc.
- 30% less electricity needed for lighting and ventilation
- 30% less energy needed for heating
- 50% lower CO₂ emissions
- 4 million euros reduction in annual energy costs

The results are obviously very positive for Västernorrland County Council. It is hoped that

others can draw inspiration and benefit from the experience. This is needed if the climate threat the world faces is to be met. The only way to counter this threat is to reduce emissions of CO₂ and other greenhouse gases.

Reducing the need for electricity has the greatest energy and environmental effect. For every kWh of electricity saved, three fewer kWh of fossil fuels are consumed.

The examples from Västernorrland County Council show that Factor 2 is not a vision but perfectly possible to attain and surpass.







Landstinget
Västernorrland

More information www.lvn.se/energyfactor2

