

# NSBs energy project reducing train energy consumption

NSB started working on improving their energy efficiency in 2005. Together with Jernbanelverket (the infrastructure provider) meters were installed onboard the trains, and an energy project was started to achieve both focus and commitment from the management and for establishing facts.

## Stabled trains

Earlier stabled passenger trains were often heated all night, and other unnecessary equipment was never turned off. Solutions for reducing energy consumption were the development and implementation of intelligent control tools for stabled trains or better routines for manual control by personnel.

## Energy efficient driving

Various driving strategies exist that can save considerable amounts of energy at the cost of slightly increased running time by using some of the slack in the timetable. NSB uses a train simulator to show the effect of different driving techniques and important topics is:

- Coasting
- energy efficient driving style (improve driver's skills)
- time-efficient boarding at stations to gain buffer time

## HVAC

Improved climate control was implemented to reduce the energy consumption related to ventilation and heating/cooling of carriages. There were also implemented several measures to reduce the energy consumption such as:

- Labelling switches and temperature controllers
- Standardisation and lowering of the temperature inside carriages
- Improved automatic control of doors
- Predefined stabling modes which automatically reduce heating, ventilation, light etc. (through refurbishment)

## Training

In 2007 NSB started an energy-efficient driving training course for all drivers which included use of a simulator. The main objective with training programmes is to motivate personnel by showing that their driving style and behaviour matters and that they play a major role in successfully achieving NSB's energy saving goals.

On-board personnel also have a large influence on the energy consumption. In 2010 a training course for these personnel was started to increase awareness and motivation for energy saving.

## Measurement devices

In 2007 measurement devices were installed in all of NSB's trains. A measurement device installed gives better control over the energy consumption and the energy bill. The measurement device has also provided NSB with energy data for other systems, see Reporting and monitoring.

## Reporting and monitoring

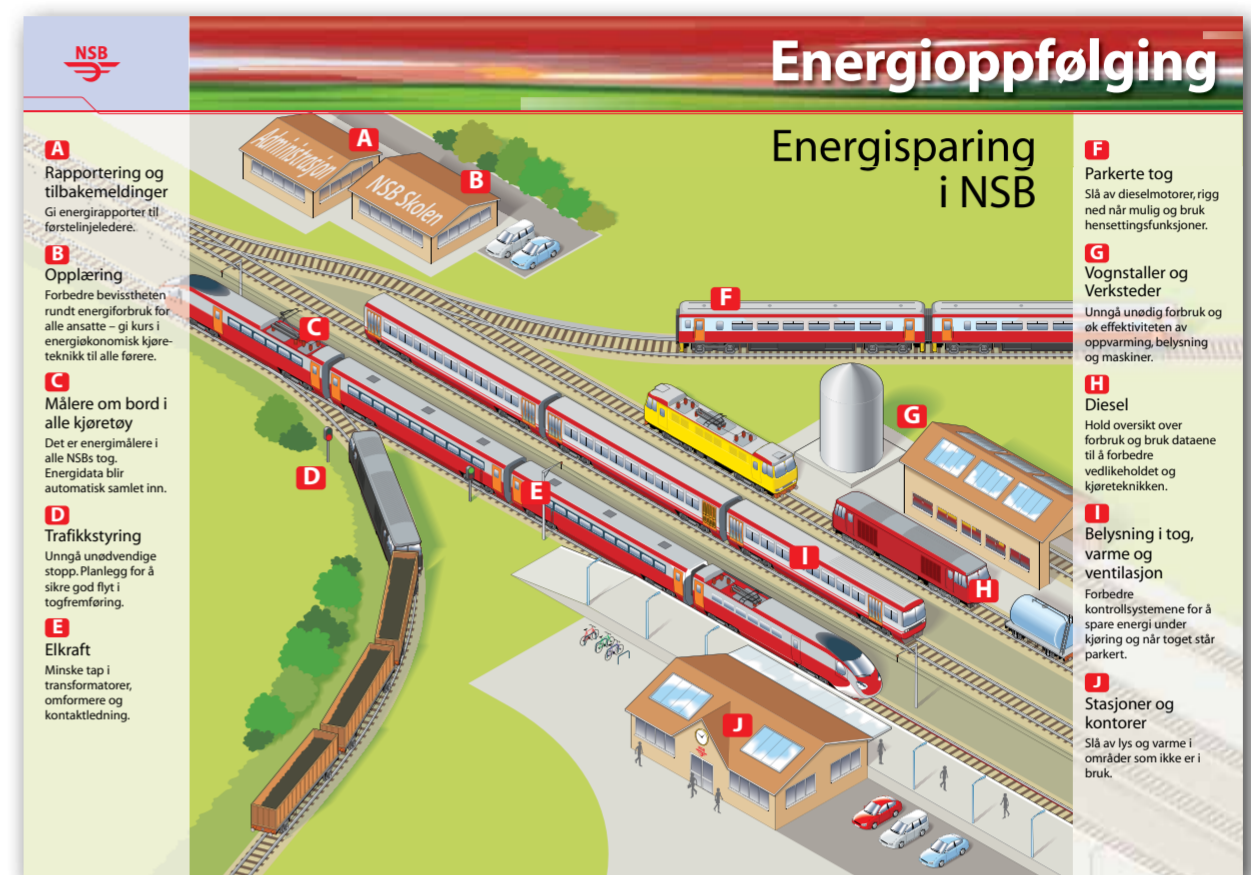
"Enka - Energy, Control and analysis" is a web based energy management tool developed for drivers and their management.

## Results

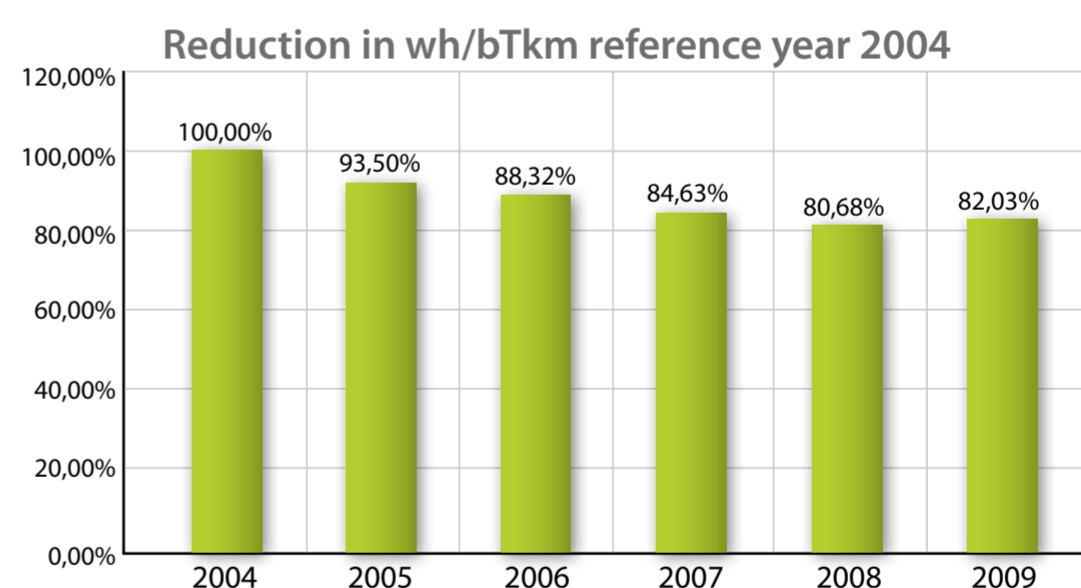
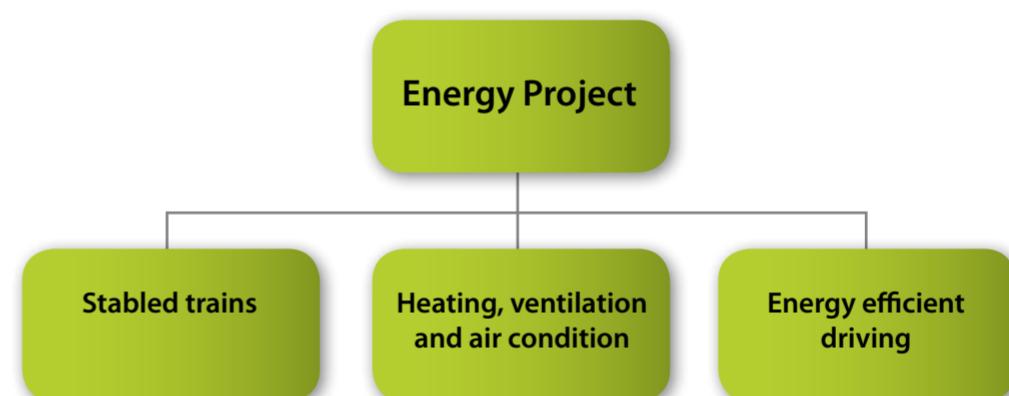
By the end of 2007 NSB reached their goal of saving 15 % of the total energy consumption. NSB started a new energy efficiency project in 2008 that is planned to run until 2012. The new objective is to reduce the energy consumption with an additional 12 %.

To achieve the new goal NSB is now focusing on:

- energy efficient refurbishment of their trains
- energy management
- system for monitoring and reporting



In 2009 NSB conducted a publicity campaign regarding environmental issues. The campaign was aimed both externally and internally and created many local and regional headlines in newspapers and on TV. Internally, NSB produced a version of the UIC brochure "Process, Power, People" called "Energy saving within NSB"



## NSB facts:

Rolling stock: 210  
Employees: 2800  
Passengers: 52 000 000  
Total energy consumption: 345 GWh  
Diesel consumption: 8,2 mill. liter

### Energy project facts:

#### Phase 1

Duration: 2005 – 2007  
Goal: 15 % (normalized 60 GWh)  
Focus areas: Stabled trains, energy efficient driving, and HVAC

#### Phase 2

Duration: 2008 – 2012  
Goal: further 12 % (normalized 40 GWh)  
Focus areas: Energy management, retrofitting, and refurbishment

