

Title: **No time to lose in saving energy.**
Subtitle: **NS reduces energy reduction by refurbishment of rolling stock**

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Sustainable business of NS

The core business for NS, providing transport services by rail, is as such a very sustainable activity compared to our competitors car and plane. Therefore, expanding and improving the core business of NS is the first priority in our sustainability strategy.

NS is already active for years to reduce the use of energy in running our trains. Since 1997 NS achieved an improvement in energy efficiency of more than 20%. For 2020 the objective is reduce the CO2 emissions by 20% compared to 2008, mainly by reducing the energy use.



Sustainability includes obviously many more issues. For NS the sustainability strategy is focusing on energy, waste and noise. The most important social aspect of our strategy may be the employability of our staff. Long term profitability is a strict target that applies also for investments in environmental and social business improvements. This focus implies that NS will put less or no efforts in buying green energy.

The NS annual report 2009 is created conform the GRI-rules for sustainable reporting. NS will stick to integrated reporting of financial issues and sustainability. The annual report of 2010 will include more sustainability issues that are assured externally.

The normal quarterly business reporting to the executive board and non-executive board is recently extended with a sustainability chapter. In addition the regular investment sheets used to decide on all investments for NS will be extended with a strict sustainability paragraph. These are for NS the most important ways to include sustainability into the regular governance.

A good example of a project fitting in this strategy is the investment decision for the refurbishment of the short-distance double deck rolling stock.

Energy Efficiency in refurbished double deck fleet of NS

NS is continuously improving their fleet. Refurbishment of the DDAR fleet is one of the main actions of this moment. The operator NSR has ordered refurbished rolling stock at the NedTrain Haarlem. The



first refurbished train will operate late 2011. The design-phase of the project will be finalized mid 2010.

One of the requirements is related to energy efficiency. By improvement of the coaches a reduction of minimum of 5% was required.

Double deck train before refurbishment

Together with their technical partner, Lloyd's Register Rail, NedTrain and NSR have been able to realize a design with 15% reduction on energy consumption. From a list of 30 investigated measures, the measures have been selected based on: feasibility and potential energy reduction volume (between the brackets the individual reduction in intercity operation):

- Heat pump (6%);
- CO₂-controlled HVAC(3,5%);
- Isolation of coach (0,6%);
- Automated Parking-mode (1,3%);
- Flush-windows (in combination with air conditioning) (0,2%);
- Reduction of air-resistance in roof-area (2%);
- Improved regeneration (1%, depends on implementation of energy efficient driving).

The investment decision has been made based on life-cycle analysis. Decisions taken in the first phase of this project will influence most of the cost during the life cycle.

Several years of testing with non-proven technologies separate from refurbishment projects, such as heat-pump, brake-blending and CO₂-control have a positive effect on the decision making process within NS.

Besides energy reduction measures, this train will be prepared for IC-operation and the entire interior will be modernized according to the new NS-philosophy. This will contribute to a positive and customer-oriented image of NS and her trains.

NS is working hard to reduce their energy consumption and to operate in a sustainable way their business. The refurbishment of the old-fashioned, short-distance train DDAR to an energy efficient attractive double deck train for long distance is a major step in their contribution to more sustainable transport in the Netherlands.