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Lauterbrunnen/ Grindelwald, 4 June 2009

Jungfrau Climate Charter / CO₂ Reduction Paper by Peter Balmer, CEO Autoverkehr Grindelwald AG

Grindelwald, a mountain village with barely 4,000 inhabitants, or a small town with a traffic volume comparable to a medium-sized town in the canton of Bern?

Both statements are correct, depending on what time of the year we are talking about.

In every visitor survey in the past 30 years, traffic was named as problem number 1 in our town.

Since we are both a mountain village and a small town, it is very difficult to implement measures with regard to traffic in a way that our municipality can finance. Of course, strategies have been planned, concepts worked out, measures tested and even partially implemented.

Unfortunately, the measures taken have been cancelled out again by the rapidly increasing traffic volume during the past few years.

A masterstroke, the decisive step has, however, never been implemented, since it is virtually impossible for 4,000 inhabitants to support the investments and operating costs for concepts that have been designed for a small town.

In the area of traffic alone, a considerable reduction of CO₂ can be achieved with a public transport service adapted to the village's seasonable requirements.

For the journey from the church to the Männlichenbahn valley station, a distance of 3,102 metres, comparable emissions are

for a standard service bus	3,000g CO ₂
for an environmentally-friendly car	490g CO ₂

In order to transport the same number of passengers as carried on average by a bus along the stretch mentioned, 18 cars would be required. Thus, using cars, approximately 8.8 kg CO₂ would be produced. These figures show that the CO₂ emission would be less by roughly 5.8 kg, or two thirds, if a bus were to be used on this route.

This comparison shows that an investment in Grindelwald's public transport service would result in a considerable amount of CO₂ being saved.

We are pleased that the canton of Bern has recognized the urgency of expanding the public transport service in Grindelwald and are grateful that Grindelwald may count on the continuing financial support of the canton.

Alternative drive concepts will enable the CO₂ emissions of buses to be further reduced, thus making public transport services even more environmentally friendly.

At the present time, various drive concepts are being developed by vehicle manufacturers. Research into natural-gas engines, hybrid technology and hydrogen propulsion is being actively pursued.

Hybrid engines on the road will become a reality in a few years time.

Engineers have been preoccupied with energy wasting stop/go driving in town and local traffic ever since one can remember. Braking is regarded a waste of energy. When decelerating, the considerable energy



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of an 18-ton bus is converted into heat which is, for the most part, released into the environment. Town driving, in particular, offers the ideal conditions for making use of braking energy.

The focus of hybrid engines is on fuel saving and the related reduction of CO₂ emissions, without relinquishing good vehicle performance.

In a hybrid motor, an environmentally-friendly diesel engine drives a high-performance generator, which in turn provides energy for the vehicle's electric motor. Furthermore, the vehicle engines are connected to the electric storage systems in which the braking energy can be accumulated. This energy is sufficient to accelerate the vehicle away from the bus stop using pure electricity, hence emission-free. Thereafter, if the driver requires more power, the diesel engine once again cuts in.

The fuel savings achieved with mass-produced hybrid-drive systems are dependent on the vehicle's usage profile. The biggest savings, around 30%, are achieved in town centres. The smaller the stop/go part of a route is, the lower will be the savings potential of a vehicle with hybrid drive.

Expanding public transport will help reduce CO₂ pollution in our valley. In addition, further reductions can be achieved by using new drive concepts. Unfortunately, the discrimination against mountain and outlying districts will also become a reality in this area. It will still be some time before vehicle suppliers are able to deliver vehicles with alternative drive concepts that are suitable for use in our topographical conditions.

It now gives me pleasure to invite you to take a short ride in a hybrid bus manufactured by MAN.