CO2NeuTrAlp

CO_2-Neutral Transport for the Alpine Space

Sustainability Guidelines

for Renewable Energies in Alpine Mobility

25 March 2009

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Introduction

The following criteria shall serve as orientation for local decision making with regard to the use of renewable energy sources in the transport sector. It is impossible to establish fixed rules on the basis of objective and clearly quantifiable criteria that apply to all regions with their specific conditions. These guidelines shall be seen as working hypothesis for the CO2NeuTrAlp project. Therefore the document shall be subject to revision at a later stage of project implementation according to the experiences made in the different pilot regions.

1. Environmental Criteria

1.1 The shift to cleaner energies and propulsion technologies shall not replace the basic objective of first of all **avoiding unnecessary trips** through user awareness raising, promotion of a modal shift towards less energy consuming modes of transportation, mobility management measures as well as the general promotion of economic and settlement structures characterised by short distances that generate less traffic.

1.2 In the **selection of renewable energy sources**, as far as regionally available and technologically appropriate, the use of waste material (biofuel production) and of surfaces already covered by buildings (solar power) or agricultural lands shall have preference over the use of fresh resources and new surfaces with other important ecological functions of the landscape.

1.3 If a **cultivation of energy crops** is necessary it shall follow the principle of a minimum application of artificial fertilizers and pesticides with negative consequences for the environment. The cultivation of energy crops on land with great biological diversity and the drainage of wetland must be avoided. The cultivation of energy crops shall not serve as a door opener for genetically modified plants that in future will also deteriorate food crop species by pollen loading. The production and use of biofuels shall follow the biofuels sustainability criteria of the European Commission to ensure that biofuels do not have a negative environmental impact.

1.4 If suitable with the general local conditions regarding availability of appropriate resources and technologies, preference shall be given to **renewable energy sources with the lowest overall CO_2 output** (from well to wheel balance taking into consideration the positive effects of by-products as e.g. the use of heat in CHP plants), the highest efficiency in land use and the smallest input of non-renewable raw materials needed for energy production and the use of the transportation technology.

1.5 The selection of transport and propulsion technologies shall be guided by the objective of achieving the **greatest possible net reduction of toxic emissions** compared to the existing solutions to be replaced.

2. Technical Criteria

2.1 If suitable with the general local conditions regarding availability of appropriate resources and technologies, preference shall be given to the propulsion technologies with the **highest overall energy efficiency** (energy input from well to wheel versus mobility output plus the use of collateral energy output as e.g. heat in CHP plants).

2.2 Where short daily usage time on relatively flat terrain prevails or quick recharging is possible, preference shall be given to **electric mobility** with energy efficient engines. On board power generators that shall serve as range extenders may use easily storable biofuels in energy-efficient combustion engines.

2.3 When promoting the use of electric mobility, measures shall be sought to **integrate e-mobility in the net management of electric grids** (grid to vehicle, vehicle to grid) by using batteries to store power from renewable energy supply and releasing it to the grid in case of high power demand. In the benefit analysis of electric mobility concepts a realistic life span of the batteries and the needed raw materials shall be taken into consideration.

2.4 In the transport sector **biofuels** shall have preference in specific applications where electric propulsion is up to now not a technically viable option (e.g. long distances, heavy loads or air transport) or where trips cannot be avoided by measures of mobility management or modal shift. Renewable energies from biomass, as an easily storable source of power, have great importance for levelling out electric energy supply in a future fully renewable energy based system, solving the problem of supply fluctuations. Therefore, the needed capacities shall be reserved for this important purpose.

2.5 Since **vehicle weight** influences the energy demand significantly, preference shall be given to lighter, however secure, vehicles with less energy-consuming engines.

2.6 The selection and implementation of new transport technologies and infrastructure shall always take into consideration the need for **internationally standardised or compatible solutions** instead of isolated local or national approaches which will hinder transnational mobility and systemic integration in the future.

3. Economic Criteria

3.1 The cost-benefit calculation on which the decision for a new transport technology will be based shall **take into consideration hidden social and environmental costs**. This way negative consequences provoked by the failure of the “free” market and thus misguided long-term decisions on the basis of short-term profit calculations shall be avoided.

3.2 The provision of renewable energy sources for transport and of the technologies (vehicles and infrastructure) needed for implementing new transport technologies shall give preference to solutions where a **decentralised regional structure of supplying SMEs** is given instead of highly centralised and sometimes even global supply chains. This shall help local and regional economies to benefit from new mobility scenarios and the respective communities to control possible negative effects of renewable energy production.

4. Social Criteria

4.1 If there is a harmful **competition between the cultivation of energy crops and food production**, food crops shall have preference. Biofuels from energy crops shall only be used if the producer can prove with transparency and credibility the respect of international social and environmental standards (as the biofuels sustainability criteria of the European Commission) within the overall production process.

4.2 Technologies and infrastructure shall be compatible with the needs and expectations of all users, also the disadvantaged ones. They shall help to **maintain flexibility and quality of live** while preserving the natural landscape and environment for locals and guests of the Alpine Space.

4.2 Tariffs for new mobility offerings shall **take into account the limited financial resources** of certain user groups like elderly people or pupils and students. New offerings shall make environmentally friendly (public) transport systems economically accessible.

5. Spatial Development Criteria

5.1 The **use of endogenous renewable energy sources** in the respective regions shall have preference over the use of resources imported from remote regions or even continents. This way, renewable energies shall serve as an instrument to promote integrated regional development processes that also benefit disadvantaged rural areas without jeopardising the preservation of the respective natural landscape heritage and important ecological functions.

5.2 Infrastructure for alternative transport technologies, as e.g. public plugs for e-vehicles, plug roaming systems, access control systems, or filling stations for biogeneous fuels shall be designed in a technically standardised and harmonised way in order to **facilitate transnational mobility and spatial integration**. Small municipalities in remote areas shall not be excluded in order to avoid negative tendencies of spatial segregation against the objective of balanced spatial development.