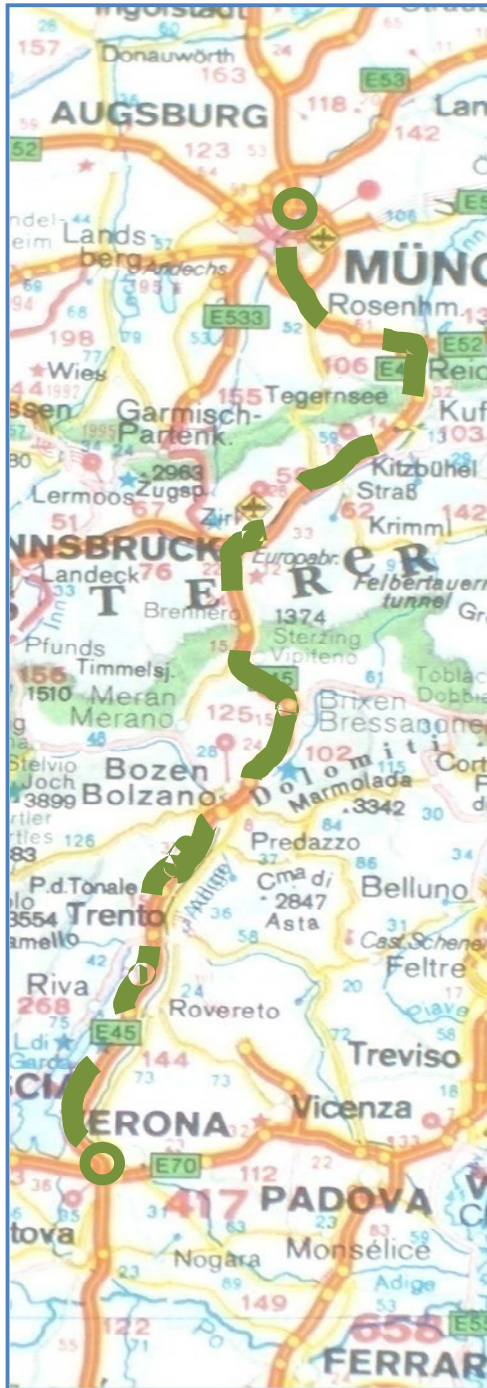


Green Corridor Brenner

Dr. Walter Huber

Bruxelles, 9th December 2009



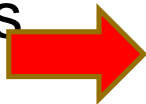
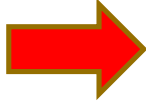
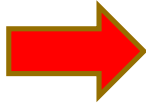
Green Corridor Brenner

3 states – 5 regions – 450 km

- Ø Initiative TEN 1: Munich – Verona (BBT)
- Ø BCP (Brenner Corridor Platform): Action Plan
- Ø Working group ‘Green Corridor’
- Ø Working group environmental monitoring
- Ø Co-operation contract R&D between Universities and BBT-SE signed
- Ø Governments of 3 regions (Tirol, Bozen/Bolzano, Trento): ‘Green Corridor’ integrated in their political programs

Stakeholders of the project GCB

Levels of competency

- n Traffic infrastructures: railways, highways (intermodality: seaways airways) seen as partners  International –national
- n Regions with the production sectors (produce freight, which needs transport)  Regional – provincial
- n Regions with the private sector (housing), special energy saving and renewable energy activation projects  Municipality – private

Interconnection between the different levels of competency

The different roles of institutions



Steps for real actions

- 1. Energy saving**, resp. reducing unnecessary losses. It requires analysis of the weak points on already existing structures and infrastructures.
- 2. Increasing the energy efficiency** of techniques, structures, plants, buildings. Needs continuous education, research and development.
- 3. Substitute the fossil energies with renewable** ones from regional origin. Local available sources have absolute priority.

Areas of activities in the Corridor

- 1. Railroad:** use of renewable energies, optimize old energy structures, use of energies produced from the new track
- 2. Highway** with renewable fuels (hydrogen), supply infrastructures with renewable energies
- 3. Initiatives** in energy saving, increase efficiency and use of renewables in cities and **municipalities** along the 'Green Corridor', ClimaHouse, CO₂-neutral cities
- 4. Energy networking** between regions and stakeholders in the Corridor

Concrete actions,
already realized or
in realization process or
planning

New Rail Munich-Verona

TEN Nr.1: New Brenner-Line

- ∅ The 5 regions along the axis are producing enough renewable hydropower energy, to satisfy the most energy need of the railroad, but from local production.
- ∅ The equipment and the running facilities along the axis can be done with renewable energies. Terminals, stations,
- ∅ Standardization of different existing electrical power types (I: 3 kV =; A+D: 15 kV~, 16²/3 Hz; new: 25 kV~, 50Hz)
- ∅ Increase efficiency of old electricity lines and transformers
- ∅ Logistics, terminals and capacity: action plan of BCP
- ∅ Noise reduction on old railroad track
- ∅ Life cycle of new structures, wagons and containers

Energy saving in flat track

- ∅ **Actual situation:** Innsbruck-Brixen, 75 km: 26 ‰ max. slope , 450 m = max.length of train, 3 locomotives needed
 - ∅ **New flat track.** Innsbruck-Brixen, 60 km: 6,7 ‰ max. slope, 750 m = max length of train, 1 locomotive needed.
 - ∅ This means **60% energy-saving** per t of freight.
 - ∅ Most energy saving on the steepest part of the track means running the 750 m train the whole distance
 - ∅ This means increasing competitiveness of the rail, transfer transport from road to rail.
 - ∅ Road – rail as partners: terminals: structures and logistics:
Road → < 250 km distances > • rail
-

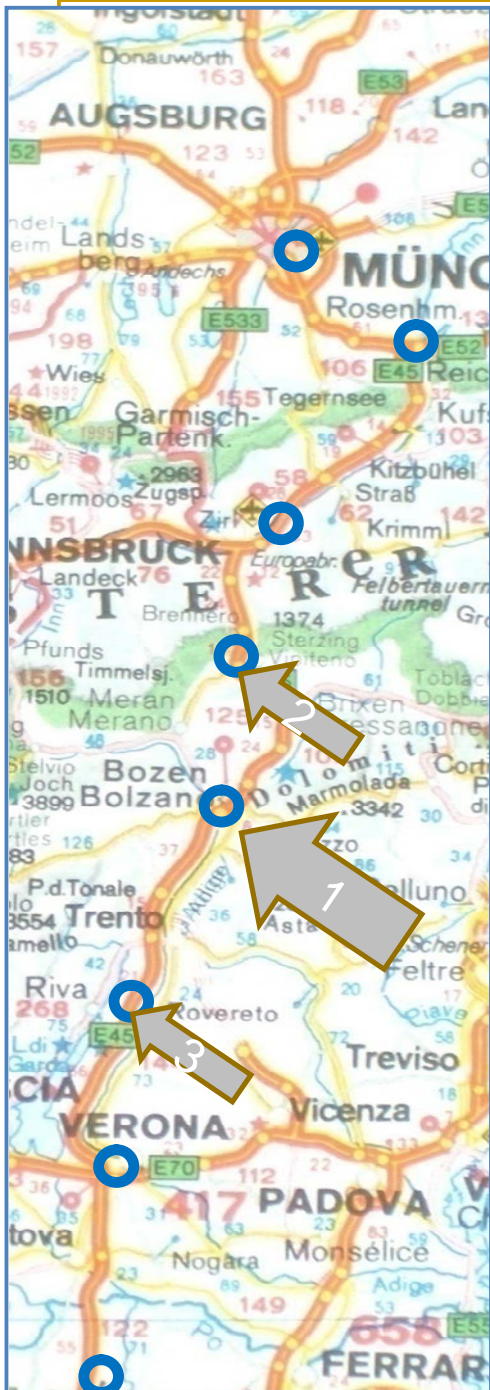
Energy from tunnels

- ∅ Recovered heat from tunnels will be utilized from the villages, cities: green energy
- ∅ Inn-valley (Innsbruck – Kufstein): inner walls of tunnels: installing elements with thermal exchanging capacities: no additional cost
- ∅ Periadriatic tectonic line from east - west: temperature gradient $> 3,5^{\circ}\text{C}/100\text{m} \Rightarrow$ deep geothermic
- ∅ Pilot tunnel can be used afterwards for energy transport: 5 GW electrical line in gas-cooled 50 cm tube (research financed by DG TREN): low maintenance, no landscape disturbance)



Concrete actions,
already realized or
in process of realization or
planning

Highway Munich-Verona



Hydrogen highway

- ∅ Production of hydrogen only from local available renewable energies: 'green H₂'
- ∅ H₂-highway (Munich –) Brenner – Modena: every 100 km a H₂ refill station
- ∅ Bolzano: first production and distribution for hydrogen. Energy: hydropower. Activation 2011.
- ∅ 2nd distribution Brennerpass, production: electrolysis from wind. Activation end 2012.
- ∅ 3rd distribution Rovereto (TN), production: Photovoltaic. Activation end 2012.
- ∅ Extension from Brenner to Munch (250 km): Tirol and Bayern. H₂-Highway ready 2015.
- ∅ The refill stations will be accessible from the highway but also from outside.

Production site Bozen/Bolzano

transformer



refill
Bus



SASA Remise Bozen



Produktion

Multienergy



0 0.5km

Production Bozen/Bolzano - South



- ∅ All permits ready
 - ∅ Start construction: January 2010
 - ∅ Capacity: 240 Nm³/h H₂
 - ∅ Energy from hydropower
 - ∅ Working: mid 2011
-

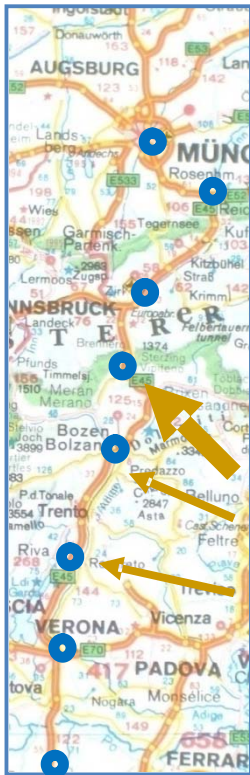
Brenner H₂-plant

∅ H₂-electrolysis with wind-energy

∅ Co-operation with Innsbruck

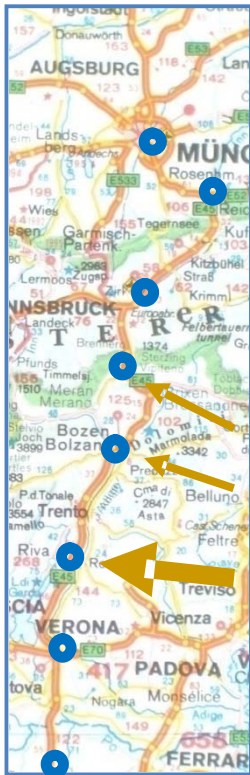
∅ Start construction wind park: summer 2010
working autumn 2011

∅ Electrolysis and H₂-equipment installation: 2012



Trento H₂-plant with photovoltaic

∅ Noise protection walls with photovoltaic panels on the highway A22, Rovereto



Data sheet:

1069 m long

5,60 m high;

3944 panels
installed

monocrystallin,

690.000 kWh/a

Will be used for H₂-
production end 2012

Concrete actions
already realized or
in process of realization or
planning

Regional activities

Some examples

Brenner: electricity, district heating, hydrogen, all from wind-energy

Sterzing: District heating biomass

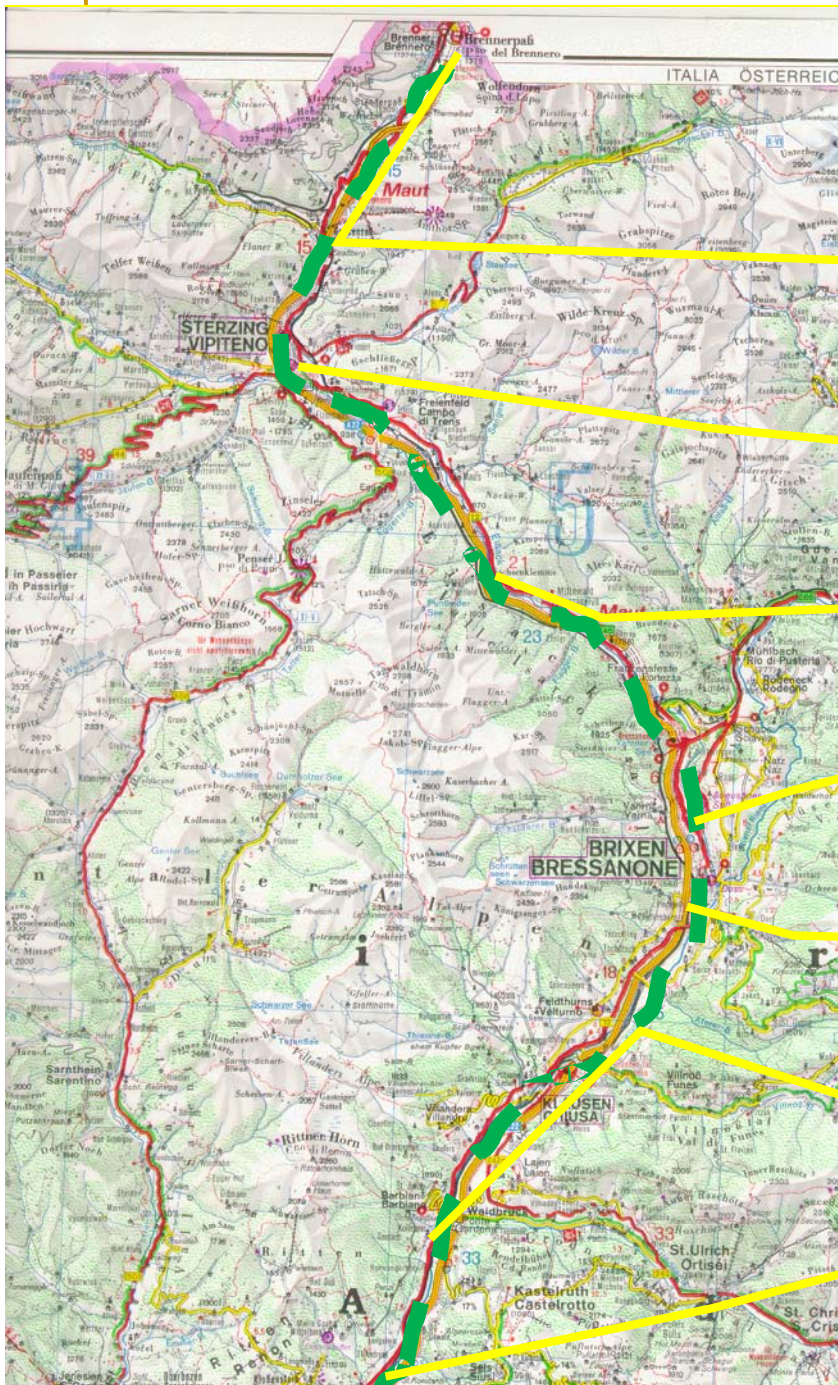
Freienfeld: District heating from BBT

Brixen: Solar city, district heating

Brixen industrial zone:
Energy autarky

Klausen-Barbian: many district heating's with biomass

Bozen: CO₂-neutral area



Concrete actions
already realized or
in process of realization or
planning

Housing activities

Buildings

- Ø Energy saving in domestic sector, offices and industry: applying ClimaHouse criteria, other initiatives
 - Ø Energy saving and CO₂-reduction up to 90%
 - Ø 3.500 buildings in Bolzano province restructured following the new criteria
 - Ø Clear rules and regional legislation and certification
 - Ø Financial and non financial incentives (bonus on room)
 - Ø Education of all categories: architects, engineers, craftsmen, certifiers, assistants
-

Necessity of criteria: proposals

- Ø Initiatives since 1990 (district heating's on biomass ...)
- Ø Renovation: Reduction of CO₂: min. 50% (buildings, illumination)
- Ø New initiatives: min. 75% CO₂-reduction in comparison with traditional solutions: new plants, new techniques, new buildings
- Ø Substitute fossil energies with renewable energies: CO₂-neutrality (only with biomass), resp. zero-CO₂-emissions.
- Ø Long-term concepts, realization stepwise. Intermediate steps (milestones) and timetable.
- Ø Label "Green Corridor Brenner" for initiatives, reaching a CO₂-reduction of minimum 1.000.000 kg CO₂/a.
- Ø Annual reports keep track of the initiative and the efficiency, stimulates competitiveness.
- Ø Reduction of CO₂: 50% • 2030? Has to be defined !

Make vision to reality

- ∅ The citizen must participate actively!
 - ∅ Sensitization – make clear, it's a win-win-situation!
 - ∅ Financial and non financial support
 - ∅ BBT: Infopoint, open days, visit the site of engineering, exhibitions, fairs and conferences – prepare the territory
 - ∅ Events H₂:
 - ∅ September 2009: H₂-car driving by everybody
 - ∅ H₂-Platform: Information and discussion platform
 - ∅ August 2010: rally only with electro-cars Munich - Verona
 - ∅ Be present in the mind of the citizen, keep the citizens informed, but be serious !!
-

Actions limited to the energy?

Speaking about energies means speaking about a basic resource and basic key for humans, nature, environment

- ∅ Energy = fundamental for human life
- ∅ Energy = life and lifestyle
- ∅ Energy = well being
- ∅ Energy = mobility
- ∅ Energy = working places
- ∅ Energy = competitiveness
- ∅ Energy = industry, manufacturing...
- ∅ Energy = basic for the environment
- ∅ Energy = local independency
- ∅ Energy = global growth
- ∅ Energy = global effects





**Thank you for
your attention**

Dr. Walter Huber