Via Azul Europe 10 (VA) Executive Summary

Today's high carbon footprint mobility is not sustainable and needs a quantum leap!
The carbon footprint contributes inevitably to Global Warming and doesn't prevent economies from consequences arising from Peak-Oil. EU 20-20-20 goals will hardly be reached.

Nevertheless primary energy providers seem to be more focused on sustaining current revenue streams of conventional energy provisioning. Correspondingly inconsequent improvement on the required energy supply infrastructure prolongs continuously the 'chicken and egg challenge' for the automotive industry, in addressing new electric vehicle generations to the market.

Nearly market-ready Plug-in Hybrid Electric Vehicles (PHEV), Battery-Powered Electric Vehicles (BEV), Hydrogen-Powered Fuel Cell Electric Vehicles (FCEV) require an amplified or new charging and fueling infrastructure, based on a dynamically growing amount of sustainably produced primary energy. Currently renewable energies, like wind and solar power, with their fluctuating surplus power generation, would have to be fed into the classical grid. Without the required application of new Smart Grid technology along with new grid layouts, the feed-in of renewable energy will be limited technically and economically by several disadvantages, like: Lowered overall efficiency and losses, due to missing supply/demand balancing capabilities, dangerous instability in the AC net etc. Utilities delay their required significant expansion of transmission infrastructure, incl. energy storage, due to the fault of an encouraging European strategy for the capitalization of renewable energy transmission and plants.

Nevertheless the Utilities industry is pushing the market introduction of battery-powered-electric vehicles, to profitably extend the supply of unsustainably produced electricity, also to be used for the electrolysis of water for hydrogen production. The Oil&Gas industry seeks to benefit as well from pushing on fuel cell vehicles, powered by hydrogen reformed from natural gas.

Those early competing, divergent strategies impede harmonized infrastructures for the mobile energy carriers Electricity and Hydrogen, dissipate crucial infrastructure development resources and withhold significantly Europe's low-carbon footprint mobility!

Via Azul Europe 10 is a crosscutting, comprehensive synergy initiative
to enable the time critical establishment of a European Mobility
based on the energy carriers from renewable sources: Electricity & Hydrogen.

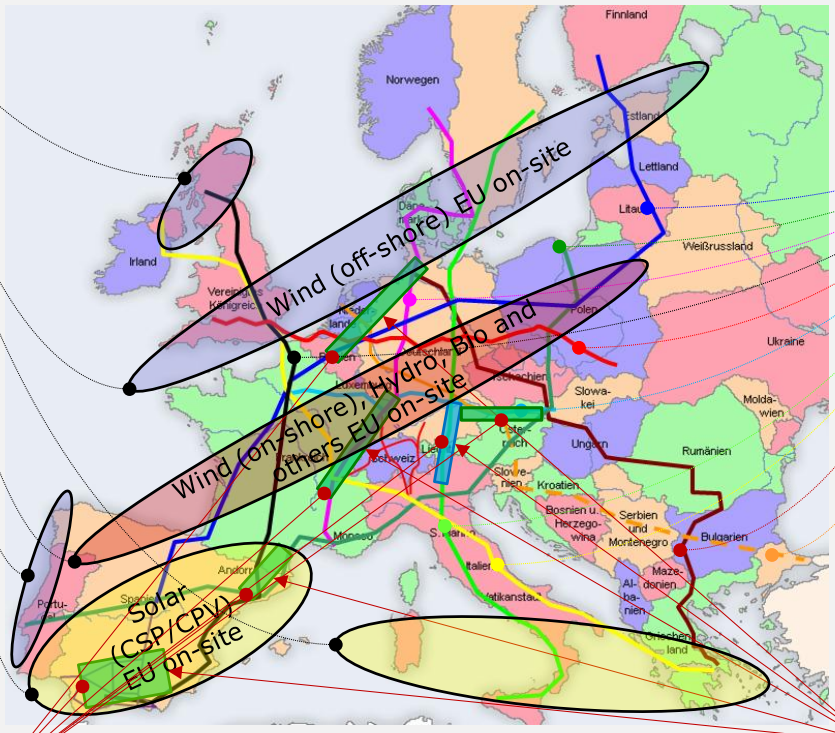
The invention is: **Move electrical energy to the Point-of-Sale - NOT fuels!** The concept comprises simultaneous setups of renewable energy supply, energy storage, charging/fuelling infrastructures, and substantial electric vehicle fleets, on an initial European highway network. This cross-cutting initiative between Energy and Transportation will be based on a smart fusion of the VA Quadrants: Energy Resources, Energy Transmission, Energy Storage and Energy Application.

The aim is to be the umbrella European mobility project framework for a common approach, focused on Renewable Energies, but open to integrate with existing projects and solutions. This includes development support, coordination and application of required newest technologies.

The roadmap towards the challenging realization goal of setting-up electric propulsion vehicle fleets on 10 initial European VA Highways until 2025 is elaborated. It will be refined during the VA Feasibility Study (2012-01 till 2013-06) in the context of the ERA-NET Electromobility+ Call. Benefiting from the experiences of the Green Corridor Brenner, Blueprints for the implementations in 5 further VA Pilot Regions and the 10 initial European VA Highways will be developed during the VA Feasibility Study to be presented to the European Commission (2013).

1. Renewable **Energy Resources (RES)** like :
- EU-North Wind-Off-Shore farms
- EU-South Solar Power plants
- Wind-On-Shore, Water, Biomass etc.

2. The Electrical **Energy Transmission** to the Point-of-Sale (PoS), realized through the **VA Energy Supply Grid** and applying the HVDC/AC buried cable technology for its **W**ide **A**rea **N**etwork, can substantially shorten line approval cycles, if this **WAN** will be implemented along 10 VA Highways. Complementary DC/AC **L**ocal **A**rea **N**etworks**,** amplified by local RES and H_2 supply, enable charging/fuelling every 50 km.



Via Azul Energy Supply Grid

4. Mobile energy carrier (Electricity and Hydrogen) supply **for Electro Mobility applications** BEV, PHEV and FCEV, starting in VA Pilot Regions + incl. cities.

3. Required infrastructure at PoS fuelling station, providing **Energy Storage** via: - Direct grid connected vehicle batteries
- Local facilities for **hydrogen** generation, storage and flexible disposal

These enable, together with the supporting Smart Grid technology, accurate net stability and supply/demand balance (Demand Side Management) for renewable energy sources.

Smart fusion of the Via Azul Energy Quadrants
driven by a European VA Feasibility Study Consortium (www.via-azul.eu/feasibility_study)