Press Release for Future Energy Summits

Clean Transportation and Sustainable Mobility for Development

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Transport and mobility are now high on many agendas as countries and regions across the world seek to increase mobility and to lessen transport's impact on the environment and the climate.

Sustainable mobility and clean transportation comprise various factors:

Societal Factors: Safety, affordability, accessibility, consumer acceptance, perceived investment required in infrastructure.
Economic sustainability: Fuel cost impact on public expenditure, impact on private companies.
Environmental Sustainability: Improved fuel standards and vehicle technology to reduce emissions of GHG and mileage fuel consumption, recycling options.

Other key elements for developing mobility options for people and freight are power train technologies, mobility demand trends, public policy, etc.

The goals of clean transportation and sustainable mobility are attainable and we should work together to achieve better understanding of the challenges and options. It is clear that if we are to achieve sustainable mobility it will require contributions from every part of society throughout the world.

Intelligent polices, innovative vehicle technologies and the generation of alternative fuels will be the main 3 drivers. The policy, the companies and individuals are committed to making their contributions. The progress in all these issues in the last years is considerable.

The future strategies of clean transportation depend of the availability of fuels, appropriate engine technologies and their impact on climate and environment. The transition from fossil fuels into alternative and renewable fuels is already taking place along with new engines and will continue to grow. Leading car and vehicle manufactures have contributed and are contributing in creating the adequate technologies.

Progress has been achieved in implementation of legislative structures, directories, improving of engine efficiencies, fuel generation and marketing strategies in the USA, EU and other parts of the world.

Present and future Transportation Fuels
Commercially available
• Gasoline, diesel, CNG & LPG, CTL, bio ethanol, bio diesel, batteries (electric)
Not commercially available:
• Biogas, methanol, butane, GTL, BTL, DME, hydrogen

Worldwide present and projected biofuels contribution in the transportation sector

It is worthwhile to mention that 80% of the newly released cars (2007) in Brazil are flex-fuel vehicles, running with pure ethanol or with gasoline and ethanol.

Biofuels

Fuel supply from biofuels implies a complex analysis of the local natural and environmental conditions. Perspectives of increasing and improving of biomass productivity, via plant breeding, gene- and biotechnologies and optimising management practices of conventional and new crops as well as new species including algae and micro organisms, improving of conversion technologies and engine efficiencies are considerable. The potential of biofuels share in total fuel consumption and could amount up to 20% in long-term time scales. This would have positive effects on income of the farmers, poverty alleviation, the mitigation of GHG and the environment as well as food security. This would also have positive effects in Developing Countries. The companies BASF (Germany) and Monsanto (USA)has reached an agreement in March 2007on collaboration aimed at developing higher-yielding crops that are more tolerant to adverse environmental conditions such as drought. As first stage, $1.5 billion has been devoted to the joint pipeline collaboration.

Around 35% of the world-wide existing areas of arable land are not under cultivation, currently 4 Mio ha in the EU cannot be used for food production due to the "Overproduction Set Aside Policy". Food production corresponds to 140% of the needs of world population. The OECD member states are spending $1 billion every day for supporting their farmers, resulting in exporting of cheap food commodities into Developing Countries which inhibits the development of their agriculture, decreasing the income of poor farmers and accelerating depopulation of rural areas.

Tall grasses, i.e, Miscantus, Arundo donax, Bamboo, Eucalyptus, Acacia, Salicornia, Sweet and Fibre Sorghum are some of most promising energy crop candidates in the future. They are naturally high productive, the majority are perennial and need less chemicals and water. They can be converted to a wide variety of biofuels.

Integrated food and energy crops farm, Braunschweig, Germany

Algae grow rapidly, are rich in vegetable oil and can be cultivated in ponds of seawater, minimising the use of fertile land and fresh water. Algae can double its mass several times a day and produce at least 15 times more oil per hectare than alternatives such as rape, oil palm, Soya or Jatropha. Facilities can be built on coastal land unsuitable for conventional agriculture. In the long term, algae cultivation facilities also have the potential to absorb waste carbon dioxide directly from industrial facilities such as power plants. Oil companies, DOE (USA) and other institutions are intensifying research activities in this field. Shell and Hawaii-based algal biofuel company HR Biopetroleum have formed a joint venture to grow marine algae for conversion into biodiesel.

Some companies have far surpassed the 15,000 gallon per acre accepted benchmark.
In fact, one company can produce 180,000 gallons of biodiesel every year from just one acre of algae. That comes to about 4,000 barrels, at a cost of $25 per barrel or $.59 per gallon

A farm in Southern Japan grows chlorella in circular pond and New Ambadi farm in India grows spirulina in raceway style ponds.

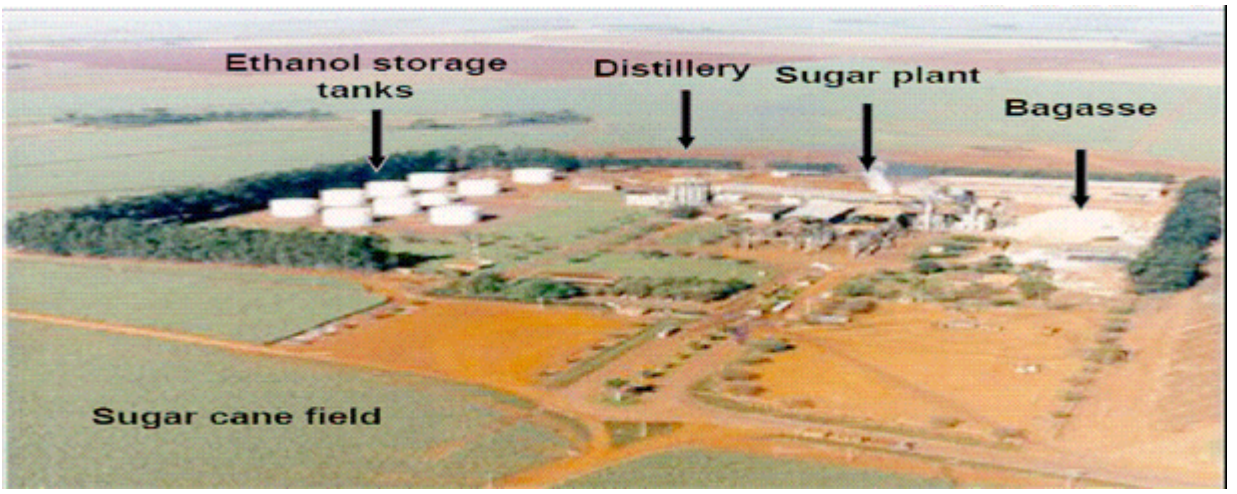
It should be clearly stated that deforestation or shifting large areas for growing of energy crops is not only unnecessary but also cannot be tolerated. Up to 10 % of the arable land, (in Brazil the current land under sugar cane cultivation for sugar and ethanol production amounts to less than 4%), could meet the requirement of biofuel production without influencing the worldwide food security. This will boot the food production capacities especially in Developing Countries and contribute to poverty alleviation.

Conversion Efficiencies of Biofuels:

Field to processing plants: Very positive

Field to wheel: Almost positive

The improvement of these efficiencies is underlying continued efforts and will achieve great successes in the future. The integration of renewable energy sources in the conversion processes will accelerate this improvement. The whole plant use in the ethanol production in Brazil is a success story in this context.



Typical Sugar & Ethanol Plant in Brazil

Power Generation 5 million kWh from Biogas in Jühnde which could also fuel electric cars

Vehicle and Engine Types:

Combustion and Combined Combustion Systems:

Types of engines are: Hybrid, flex-fuel for gasoline, diesel, ethanol, and bio-diesel as well as well as 100% electric power trains.

Total Flex Technology (alkohol or gasoline), Brazil

Major car companies i.e. GM, Volkswagen, and Toyota are intensifying their efforts to improve all-round efficiencies and to develop alternative engines for various fuels and purposes. General Motors Corp. will introduce 14 new or significantly revised power trains in the 2008 model year - including five 1.0L to 2.0L small-displacement engine variants - with a focus on saving fuel and improving performance in GM's cars and trucks. For 2008, GM's power train lineup includes hybrids, clean diesels and fuel-saving technologies such as Active Fuel Management, direct injection, variable valve timing, six-speed transmissions and flexfuel options for consumers.

German industries are joining their forces to develop high-performance batteries for stationary and mobile operation. Volkswagen is one of the initiators of this alliance with a two-door city vehicle which offers more space and a four-door microvan with maximum variability and zero emissions thanks to an electric engine and fuel cells.

VW zero emission vehicles
Toyota is very successful with Lexus and Prius hybrid cars.

Air New Zealand announced plans to mount the first test flight of a commercial airliner partially powered by biofuel in 2008.

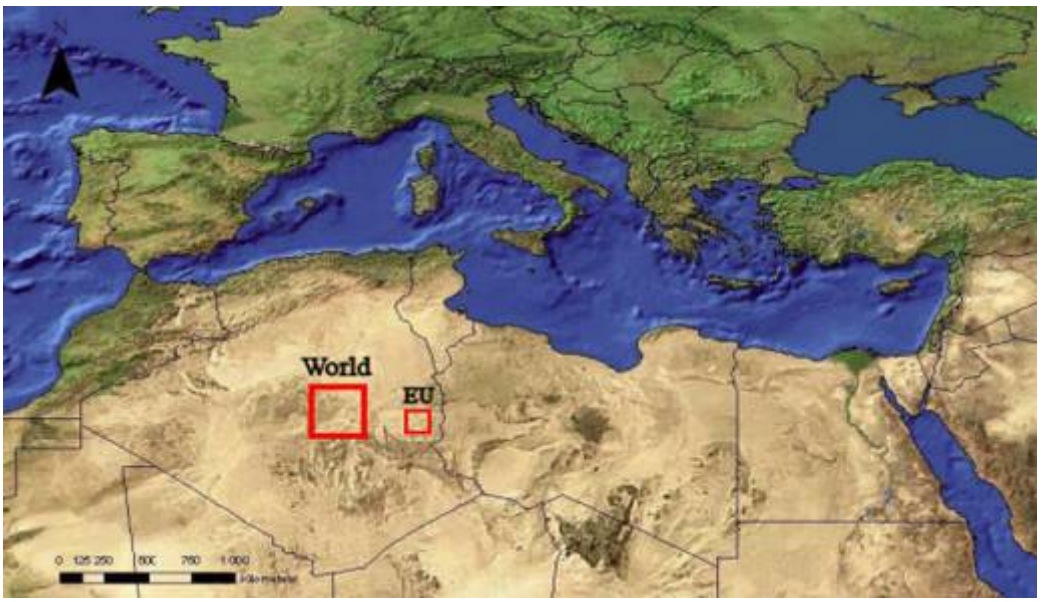
Boeing 747 of Air New Zealand will be powered by ethanol in 2008

Electric vehicles along with hybrid and flex-fuel power trains represent the best option for the future because they are more efficient even than hydrogen-powered vehicles. Along with a high degree of efficiency, electricity can be generated from renewable energy resources such as solar, wind and hydro power.

Electricity generation

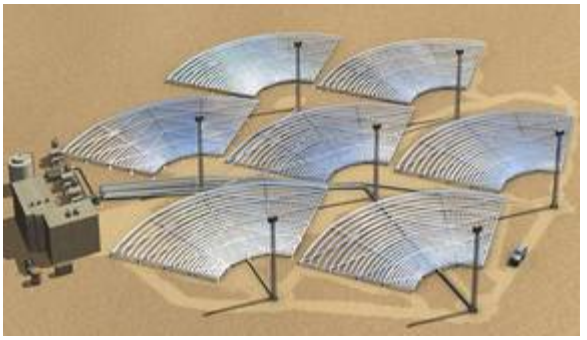
Electricity could be produced in deserts or in dry and hot regions by means of Concentrated Solar Power (CSP), Photovoltaic (PV), and Wind-power worldwide.

Global power requirements could be generated from 1% of the desert areas by using CSP technologies.



Proportion of desert area required to produce global electricity demand

The following images demonstrate some existing, under construction and projected CSP and PV power plants worldwide.

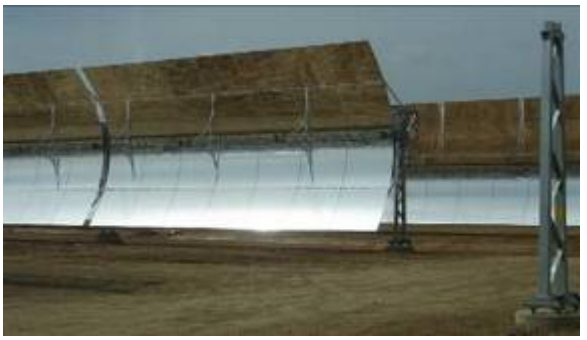


Projection of CSP power plant

SEGS 350 MW, California

Nevada Solar I, 64 MW

Planta Solar 10 MW, Sevilla



Andasol 2 x 50 MW, Guadix

Dish/engine systems, Umuwa

PV-power generation plant

Conclusion

The future strategies of clean transportation and sustainable mobility depend on the availability of fuels, appropriate engine technologies and their impact on climate and environment. The process of transition from fossil fuels into alternative and renewable fuels is already taking place along with the development of new engines and power train technologies and will continue to grow. Leading car and vehicle manufactures and alternative fuel producers have contributed and are contributing in creating the necessary mainstreams.

The goals of clean transportation and sustainable mobility are attainable and we should work together to achieve better understanding of the challenges and options. It is clear that if we are to achieve sustainable mobility it will require contributions from every part of society throughout the world.

Transportation fuels will never run out. The targets of clean transportation and sustainable mobility will be achieved with intelligent policies, along with the innovation capability of our scientists, engineers and technicians.

Let us act while we still have the choices.

El Bassam
19 December 2007

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