

Future road transport and associated fuels

Will conventional fuels remain the dominant component of road fuels supply over the next two decades?

Over the past year, many new initiatives have been launched in the area of sustainable transport. The EU Commission's 'White Paper' on European Transport Policy was issued in 2001, followed by initiatives on biofuels, other 'renewable' fuels and diversification of energy supply. Both DG TREN and DG Environment currently have work programmes under way aimed at new policy development, with specific emphasis on compressed natural gas (CNG) and hydrogen, while DG Research's proposed 6th Research Framework Programme aims to develop longer-term knowledge on sustainable transport, including alternative and renewable energy supplies. There are also a number of individual Member State initiatives in this area.

The collaborative 'well-to-wheels' study between the Commission's Joint Research Centre (ISPRA), EUCAR (the European Council for Automotive Research and Development) and CONCAWE (see the 'Activity update' section of this *Review*) will provide valuable information for this debate.

Road Transport Research Advisory Council (RTRAC)

Looking to the longer term, there is a need for more efficient coordination of European research on road transport and to this end, EUCAR recently launched the Road Transport Research Advisory Council (RTRAC). This follows similar initiatives in the rail, aviation and shipping sectors and responds to the EU Commission's wishes to establish a similar body for road transport. RTRAC has been set up as an industry committee with high-level representatives from the automotive sector, energy and component suppliers, independent research organizations and road infrastructure builders. Its objectives are to:

- develop a vision of the year 2020 road transport system;
- identify the research agenda required to realize the vision;

- advise industry, the EU Commission and Member States on the required research and priorities; and
- identify and promote areas of collaboration between the European and National Research Programmes.

The oil industry has two seats on RTRAC and in order to coordinate input, CONCAWE has set up its own RTRAC shadow group.

Oil industry view of road transport in 2020

As a first input into the RTRAC process, CONCAWE's shadow group has developed its own view of the evolution of road transport, and particularly of transport fuels, over the next two decades. This view (see box) represents what the industry sees as the most likely scenario, where conventional fuels remain the dominant component of the road fuels supply while alternative fuels and powertrains assume a significant but still relatively minor role. It is also consistent with the car industry's forecast for vehicle sales.

At this point in time the major breakthroughs in key technologies, such as harnessing of renewable energy or

Road transport as we know it has a bright future



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improved fuel cells, which would be required for a step change in penetration, are not expected to occur early enough to materially affect the 2020 scenario. A large-scale shift away from crude oil-based fuels is more likely to occur later in the century. The future is of course uncertain and unexpected technology developments or extreme regulatory initiatives cannot be ruled out.

Avoid 'picking winners' too early

RTRAC offers an opportunity for improving coordination of European research on road transport and for debating the key research needs with the EU Commission and Member States. The oil industry view will be taken forward into the development of the formal RTRAC vision and a high-level research plan should then be developed.

From a CONCAWE perspective, it is important that potential future fuel/powertrain options are assessed against advances in conventional systems on an integrated 'well-to-wheels' basis, taking account also of practicality and cost-effectiveness. Understanding the fuel requirements of future internal combustion engines continues to be important, as these systems will still form the bulk of the vehicle population in 2020. It is even more important that attempts should not be made to 'pick winners' too early. Potential future technology options are at an early stage and further research is needed prior to legislative action. Time is available for the necessary research.

CONCAWE's view of European road transport in 2020

1. Road transport remains the main means of goods transportation and personal mobility

- Demand for road transport and mobility has increased over the past 20 years
- Personal vehicles are still the major means for personal mobility
- Road remains the primary instrument of goods transportation, despite contributions from rail and water
- The impact of road transport on air quality is minimal
- Progress has been made on greenhouse gases, but a technology breakthrough is still sought

2. Oil and gas remain major sources of energy for Europe for the foreseeable future

- Oil and gas are in sufficient supply
- Diversification of energy sources is taking place where economically viable

3. Internal combustion engines, including hybrid concepts, powered by conventional fuels provide the major part of road transport demand

- Internal combustion systems supported by low sulphur fuels have continued to improve
- The shift from gasoline to diesel has continued, driven by pressure on CO₂ reduction together with road haulage growth
- Hybrid concepts have shown their potential to deliver GHG savings and see increasing market penetration as technology improves and costs are reduced

4. Fuel cell vehicles are achieving a small market share, but no route to large-scale sustainable hydrogen production yet exists

- Fuel cell vehicle options are still actively researched in terms of performance, reliability, durability and cost because of their inherent energy efficiency and perceived environmental benefits
- Emissions benefits are very small compared to the new generation internal combustion engines
- Development of stationary applications and auxiliary power units have facilitated progress in automotive fuel cell technologies
- Reforming of hydrocarbon fuels is providing the hydrogen for the first generation of fuel cell vehicles
- Non-fossil electricity is still limited and is not available for large-scale hydrogen production as it contributes more to CO₂ savings via other routes
- Hydrogen use in internal combustion engines remains marginal

5. Other alternative fuels and vehicle systems that have proven benefits are penetrating the market

- Local priorities drive limited markets for alternative systems
- Environmental benefits are insufficient to justify large investments in production, transport and distribution infrastructure for compressed natural gas
- The objective to diversify energy supply sources drives a steady growth of other natural gas based fuels such as GTL ('gas to liquids')
- LPG has a limited role
- Fuels from biomass are available in limited quantities and are mainly used as blending components
- Alternative uses of land have been found more beneficial than production of ethanol and FAME (biodiesel)