



CLEAN FUELS NEWS FROM BRUSSELS

ENERGY & CLIMATE ARE HOT: NGVs ARE NOT...but they *could* be!

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Energy and environment legislative and regulatory initiatives are among the most important 'front page' issues being tabled in Brussels in the opening months of 2008. Some initiatives, like the 'Energy and Climate Package' launched on 23 January 2008 are newly emerging. But there are a host of other initiatives carried over from 2007 that will continue to be debated throughout the year and likely longer. While energy and climate are (in policy terms) 'hot', NGVs are not; but they might be if a credible campaign to get back on the political agenda becomes an industry priority. The strategy must include focusing not only on the European Commission and European Parliament, but also on specific environmental NGOs (non-governmental organisations) and, of course, the natural gas industry itself.

THE IMAGE CHALLENGES FOR METHANE: FOSSIL AND RENEWABLE

Fossil Natural Gas & Energy Security

Energy security has been one of the most important issues on the European energy agenda. At a recent meeting with a key policy driver at the Directorate-General for Transport and Energy (DG Tren) when NGVs were raised as one immediate possible solution to diversifying the transportation sector's nearly 100% reliance on petroleum the response was, "Natural gas for vehicles? You have a 'Russian problem'." He was, of course, alluding to Europe's 25% reliance on Russia for its natural gas supply. This policy maker also expressed concerns about natural gas being used as a political weapon and about the current entrepreneurial advances being made by the Russian gas industry to gain greater influence of the vertically integrated supply, transmission and natural gas distribution network between Russia and the rest of Europe. Fossil natural gas and its delivery network to Europe, at least from the Russian side, clearly have an 'image issue.'

Renewable Biogas

Judging from the sentiments from the energy, environmental and transportation policy makers NGVs has slipped off the legislative radar screen. The European

Commission's 2003 policy advocating replacing 10% of the transportation fuel by 2020 with natural gas has been diluted by the enthusiasm for liquid biofuels. On the other hand, the issue of biofuels sustainability – the origins of the feedstock and impacts on land use and food prices – is a high priority issue within the debate on biofuels that represents a major opportunity for NGVs.

The European Commission's Sustainable Energy Week in Brussels at the end of January included a series of policy sessions where a number of statements by senior policy makers and energy/environment stakeholders about future policies and decisions did not take into consideration an NGV option.

- Matthias Ruete, head of the Directorate-General for Energy and Transport said during the session on renewable energy, "Please tell me how to reduce greenhouse gas emissions in cars without using biofuels. It cannot be done. *We don't have any technology ready at the moment that allows us to have clean propulsion by 2020.*"
- The director of the European Renewable Energy Council (EREC) Arthouros Zervos, in this same session presented elements of their 'Renewable Energy Technology Roadmap Up to 2020.' The section of the roadmap on transportation called the *Biomass Technology Roadmap for 2020* focuses *strictly* on *liquid* biofuels. Biogas for vehicles **is not** on the roadmap. The EREC is comprised of eight non-profit associations and federations, including the European Biomass Association (AEBIOM), the European Biomass Industry Association (EUBIA), and the European Renewable Energy Research Centres Agency. Clearly the biogas-to-biomethane for vehicles message hasn't yet registered with these special interest, renewable energy organisations. Reaching these organisations and educating them about biogas is an essential part of an overall strategy to enhance the awareness and use of biomethane in vehicles.
- Following a presentation from an Italian gas industry executive during another session at Sustainable Energy Week the issue of biomethane for vehicles was raised in a private conversation, suggesting that it could be a great opportunity for incorporating renewable energy into the longer-term gas industry strategy. Biogas, in his view, was not interesting due to its decentralized supply and the relatively low potential to deliver quantities of gas comparable to the normal pipeline supplies. If this is a popular view within some of the largest gas companies in Europe, than part of a political strategy must be to convince the gas industry of the virtues of pursuing a 'climate friendly' business strategy that includes renewable biogas. It could provide the 'sex appeal' currently lacking to attract more support for NGVs and, broadly, natural gas.

At a recent gas industry dinner/discussion event in Parliament sponsored by Eurogas (27th March), the leading natural gas industry lobbying organisation in Brussels, Claude Turmes, a Member of the European Parliament (MEP) from Luxembourg discussed the virtues of pursuing a biogas-to-biomethane strategy for vehicles. Mr. Turmes is the designated Rapporteur who is organising the Parliament's response and amendments to the European Commission's proposed Renewable Energy Directive. He is the Vice Chairman of the Group of Greens/European Free Alliance and a strong supporter of renewable fuels. His view to using biomethane in vehicles was that the CO₂ savings from using biogas in the electricity sector was three-to-five times greater than when

biogas is upgraded and used as a transportation fuel. This same argument also is frequently heard from the European Commission, especially DG Environment. Mr. Turmes, listened carefully to the facts about the opportunities to link waste management, clean water and clean air strategies to renewable biogas, also as an energy strategy element for the transportation sector. Mr. Turmes asked for documentation to support the statements about biomethane, which was a refreshing response from a well-respected MEP. Mr. Turmes, along with several MEPs from other parties will play a pivotal role in the upcoming debates about the EU's renewable energy policy.

THE EUROPEAN POLITICAL AGENDA: CHALLENGES & OPPORTUNITIES FOR NGVS

There are no less than six different legislative initiatives currently in debate in Brussels that have an impact on natural gas and biomethane as a vehicle fuel. Debate on each of these initiatives has been lively, and decisions being made in the upcoming months could have a wide-ranging impact on the European perception about and markets for natural gas and renewable biomethane.

The BIG ONE: European Energy & Climate Package

On Wednesday 23 January 2008 the European Commission President José Manuel Barroso presented the energy and climate package to a specially convened plenary session of the European Parliament. The comprehensive and ambitious package was based on an agreement among heads of European governments who called on the European Commission to develop policy proposals to achieve:

- Reduction of carbon emissions by at least 20% (or 30% if a global agreement on emissions is reached);
- Increase of 20% in energy efficiency ;
- 20% share of renewables in overall energy consumption; and
- 10% biofuel component in vehicle fuel.

President Barroso told Parliament that the energy and climate proposal was “the most complete package of measures in the world”. Mr. Barroso had two political messages. The package would allow the EU to “lead the way” on climate change issues while continuing to compete effectively in the world economy. At the same time, the package would demonstrate to EU citizens that Europe was able to tackle the large issues and shape global policy in an area that affects daily life.

The package presented proposals for:

- An expanded emissions trading system (ETS) covering more emissions and allowing firms in one EU country to buy allowances in any other Member State. The transportation sector is not included in the ETS but member states will be requested to adopt policies and measures to lower emissions such as traffic management, shifts away from carbon-based transport, taxation regimes, the promotion of public transport, biofuels, as well as urban and transport planning.
- An emission reduction target for industries not covered by the ETS (e.g. buildings, transport, waste) so that everyone is contributing;
- Legally enforceable targets for increasing the share of renewables in the energy mix – the targets will reflect each country's individual needs and its potential;
- New rules on carbon capture and storage and on environmental subsidies; and

- New guidelines on state aid for environmental protection.

For the transport sector, each member state will be assigned a minimum, binding objective of 10% of the overall consumption of petrol and diesel to come from biofuels by 2020. Addressing concerns over the sustainability of biofuels, Mr.Barroso said that the proposal set up a comprehensive and sustainable certification procedure for biofuels to ensure the sustainability of the production. In fact, a definition of 'sustainable' is yet-to-be established and it remains to be seen if such a methodology can be: 1) developed; 2) implemented; and 3) enforced.

The European Commission is hoping that in March 2008 EU leaders will endorse the plan and make financial commitments as well. This includes support for a Strategic Energy Technology Plan (SET Plan) that includes a Joint Technology Initiative for fuel cells and hydrogen, valued at about €450 million through 2013 as well as a plan for CO2 capture, transport and storage. By Spring 2008 a second strategic energy review is anticipated.

There will be a variety of places within this large plan for NGVs, but at the moment there is little specific mention of the NGV option. Thus, the legislative playing field is wide open and it is a matter of targeting specific elements in the plan – such as the promotion of low-carbon transportation technologies – in order for NGVs to be firmly included within the large energy and climate package.

(Reference: Decision on the effort of Member states to reduce their green house gas emissions to meet the Communities reduction commitments up to 2020; COM 20082008/19 final, 23/1/2008)

Community Strategy to Reduce CO2 Emissions in Passenger Cars and Light Commercial Vehicles (COM 2007/856 final, 19/12/2007)

One of the most contentious elements in the general energy initiatives is the mandate for automobile industry to reduce CO2 emissions levels in its entire range of light duty passenger and commercial vehicles to 130 grams per kilometer. Initially set at 120 g/km to be achieved by 2012, intensive lobbying by the car industry resulted in the Commission stepping back the requirement to 2015 and moving to 130 g/km, presuming that the additional 10 g/km can be made up through 'complementary methods' such as improved driving habits, better tires, and other related non-technical measures.

A proposal to charge auto manufacturers penalties for non-compliance within the specified time-frame has, not surprisingly, met with fierce resistance by the car industry. But a system of providing redeemable credits for vehicles achieving low CO2 levels also has been discussed. Such a 'carrot' to accompany the financial penalty 'stick' would apply to low CO2 vehicles such as those using hydrogen, fuel cells or plug-in systems. NGVs were not specifically mentioned, however, if a credit system were introduced they likely would apply.

The NGV industry previously has advocated CO2 credits for an NGV of zero grams per kilometer to apply toward the CO2 reduction requirements. So far, General Motors is the only car company publicly advocating such credits. In a private

conversation with a representative of the European Automobile Manufacturer's Association (ACEA) Clean Fuels Consulting was told that the idea of credits has not yet been widely considered by the industry but that, perhaps, leadership from automakers such as GM might open them to advocating such a position. Clean Fuels Consulting raised this same issue to Commissioner of the Environment Stavros Dimas at a meeting of the Automobile and Society in Brussels. Unfortunately for clean fuel vehicles, the approach advocated by the Commissioner was oriented more toward raising the tax on fuel as well as other price mechanisms designed to encourage consumers to purchase smaller, more efficient cars.

There will be a huge amount of discussion and debate about how to structure and implement the CO2 reduction requirements over the next seven or more years. Since NGVs are low CO2 emitters -- 20-25% less than the comparable petrol vehicle -- there is a lot of room to work with both the vehicle manufacturers and government, particularly at the European level.

Directive on the Promotion of the Use of Renewable Energy Sources

The European Council in March 2007 agreed to a 10% binding minimum target for the share of biofuels in transport by 2020. The Council, concerned about impacts on food prices, land use, and the destruction of forests (including rain forests) attached strict conditions to this target, notably, "*subject to production being sustainable, and that 'second-generation biofuels' becoming commercially available and the Fuel Quality Directive being amended accordingly to allow for adequate levels of blending.*"

Currently the share of renewable energy in the EU's final energy consumption is 8.5% meaning that an average increase of 11.5% is needed to meet the target of 20% in 2020. The options for developing renewable energy vary from Member State to Member State. Three sectors are envisaged: electricity, heating/refrigeration and transport.

The draft directive sets a series of gradual overall objectives for 2012, 2014, 2016 and 2018. Member states will decide how to spread their national efforts across the three sectors in order to achieve its own national objectives. Each will, therefore, be able to choose the methods that are best adapted to the national situation and potential. (The current jargon for Member State's rights is called *subsidiarity*.) Member States also will have the possibility to achieve their objectives by supporting the development of renewable energy in other member states and third countries through the creation of a transferable guarantee of origin scheme: instead of developing domestic renewable energy sources, member states could buy guarantees of origin (certificates proving the renewable source of energy) from other Member States where the production of renewable energy is "less problematic"

The good news for NGVs is that biogas upgraded to bio-methane for vehicles is 100% sustainable and 100% of European origin, since the feedstock normally is comprised of agricultural or urban waste products or sewage from water treatment facilities. Additionally, biomethane production already exceeds conversion efficiency levels that liquid biofuels producers are hoping to achieve with 'second generation' processes: 50-70% depending upon the conversion process and the feedstock. NGVs and biomethane for vehicles should be positioned very strongly but it will take a focused and consistent educational effort with Parliament, in particular, which will be providing its

recommendations back to the European Commission. There are NGV-friendly forces at work within the ranks of those in Parliament leading the amendment process, nevertheless, more MEPs need to be better 'educated' about the biogas-to-biomethane potential for vehicle applications, and that the effectiveness of biogas to reduce CO₂ emissions is not just limited to the electricity generating supply.

The renewable directive proposal is now forwarded to the EU Council and Parliament for approval, with the target date for the final adoption of the legislation in March 2009. The tentative deadline for EU states to present National Action Plans (NAPs) on renewables is 31 March 2010.

(Reference: Proposed Directive on the promotion of the use of energy from renewable sources; COM 2008/19 final, 23/1/2008)

Fuel Quality Directive (COM 2007/18 Final 31/1/2007)

The fuel quality directive amends Directive 98/70/EC relates to the specification of petrol, diesel and gas-oil with the objective of developing a monitoring mechanism whereby greenhouse gas emitted from road transport of fuels can be reduced.

The Commission's proposal suggests a maximum limit of 10mg/kg of sulphur in all diesel fuels, from 2009 for road transport and from 2011 for non-road vehicles and inland waterway vessels, and proposes cutting the permitted content of polyaromatic hydrocarbons (PAHs) in diesel from 11% to 8%.

The Commission also is proposing mandatory monitoring and reporting of "lifecycle greenhouse emissions" from fuels as of 2009, and an obligation for fuel suppliers to ensure that greenhouse gases produced by their fuels throughout their life-cycle (i.e. production, transport and use) are cut by 1% per year between 2011 and 2020 (Article 7a). Furthermore, there is a debate about changing fuel standards to accommodate ethanol, which has higher evaporative emissions than gasoline.

Natural gas as a vehicle fuel is not specifically included except to the extent that it is a renewable biofuel in the form of biomethane. The key issue, as in the renewable energy legislation, is the degree to which biofuels can be sustainable and produced in such a way whereby low food prices are not sacrificed and land use that is favorable toward CO₂ reduction is not destroyed. Criteria to determine a fuel's 'sustainability' is one of the key aspects of the bill, which also will be shared within the proposed renewable energy directive. Since biomethane could easily meet whatever sustainability criteria for fuels that is created, the Fuel Quality Directive is important to the NGV sector. Additionally, blends of natural gas and hydrogen also could be specified within this directive.

The Dutch Socialist MEP Dorette Corbey is the Parliament rapporteur in charge of steering the proposal through Parliament. She was approached by the NGV industry in 2006 to support amendments then proposed in the Sustainable Energy bill working its way through the Commission and Parliament and she is broadly knowledgeable about NGV issues.

Mrs. Corbey held a heavily-attended Parliamentary workshop on 4 March 2008 called "Sustainability Criteria for Biofuels." A panel of experts discussed technical aspects, CO2 efficiency, land use, biodiversity, water and social issues associated with the production of liquid biofuels. A natural gas specialist from the Royal Society (UK) raised specific and challenging questions about how best to create a methodology to identify direct causal relationships between biofuels production and negative impacts on such things as land use and food prices. While the empirical evidence seems to point to direct impacts of biofuels production on things such as food prices, he said that the effects are difficult to prove and, thus, are difficult to put into legislative language, which will be an advantage for the liquid biofuels industries.

Euro VI Heavy Duty Emissions Regulations: Positive Changes for NGVs (COM 2007/851 final, 21/12/2007)

The NGV industry scored an important victory when a non-methane hydrocarbon (NMHC) standard was included by the European Commission in the latest proposed Euro VI heavy-duty vehicle emissions regulations (Meeting of the Motor Vehicles Emissions Group -- MVEG -- 6 November 2007). Previous versions of Euro VI proposals omitted the NMHC, which was vigorously advocated at meetings of MVEG, in private conversations with Commission principals, and in the NGV industry response to Euro VI public consultation in September 2007. The earlier lobbying efforts, at that time undertaken by ENGVA, and continued by Clean Fuels Consulting from October 2007 on behalf of the International Association for NGVs (IANGV) have proven, to this point, successful regarding hopes for the inclusion of an NMHC standard.

As it currently stands, positive ignition engines (i.e. heavy-duty, spark ignited engines running on natural gas -- or LPG) must meet an NMHC of 160 mg/kWh. For compression ignition engines (i.e. diesel cycle engines) the Total Hydrocarbon (THC) limit value is 160 mg/kWh (using the European Test Cycle -- ETC). There is no THC limit value included for positive ignition engines; just the NMHC. (There also is a limit value for methane at 500 mg/kWh.) This differs significantly from the light duty vehicle Euro 5/6, which includes *both* an NMHC and THC, which has not been the preference of the NGV industry. (The document can be downloaded from http://ec.europa.eu/enterprise/automotive/mveg_meetings/meeting98/euro_vi_proposal.pdf; and see Annex I, Table 1)

The other position advocated by the NGV industry was the inclusion of an Environmentally Enhanced Vehicle standard for Euro VI, as has existed in heavy duty regulations as a target standard since 1999, as advocated successfully by ENGVA. An EEV has not been included in the current version of Euro VI and it is not likely to move further in the Directive. There is support outside of the EURO VI, however, to create a 'clean fuel vehicle' label, something that Malcolm Harbour, MEP UK has been advocating. Mr. Harbour was a principal in the Cars 21 Group, which organised auto industry and related stakeholders to create favorable legislation and regulations that are environmentally friendly but also achievable by the European vehicle manufacturers.

Also being advocated in the Euro VI regulations has been a definition of 'dual fuel' natural gas/diesel engines. Although a specific 'dual fuel' definition was not included, despite the industry efforts, the latest definition of *alternative fuels* in the regulations seems to be flexible enough to support further efforts by dual fuel advocates to bring their products to individual European country markets, although not adequate to

achieve European-wide type approval. The new Euro VI definition says: 'Alternative fuel vehicle' means a vehicle designed to be capable of running on *at least* (emphasis added) one type of fuel that is either gaseous at atmospheric temperature and pressure, or substantially non-mineral oil derived.

At this time the exact schedule of the final disposition of the Euro VI regulations remains 'under consideration.'

Promotion of Clean & Efficient Road Transport Vehicles Directive (COMMUNICATION (2007) 817 final 19.12.2007)

The European Commission issued a directive in December 2007 that will require public authorities, or their agents, to purchase vehicles that include in the purchasing criteria consideration the *lifetime* costs of energy consumption, CO₂ emissions and other emissions. The concept is to advocate a specific methodology that is deemed to be fuel neutral for all road vehicles – light, medium and heavy duty vehicles – in order to promote clean and energy efficient vehicles. The Directive also includes public transport vehicles either purchased directly by public entities or provided by lease. The Directive mandates member states to implement the methodology (or modified methods with the same intention and characteristics) by 1 January 2012.

According to the Commission, this Directive:

- Is technology neutral;
- Monetizes the actual pollutant emission without requiring additional standard setting (i.e. such as an environmentally enhanced vehicle standard);
- May help overcome the lack of knowledge as a barrier and increase the public purchasing of clean vehicles;
- Provides additional incentives for alternative fuels and biofuels to existing measures on CO₂ reduction;
- Provides an incentive for private fleet and vehicle operators by setting a 'clean fuel' example by governments;
- Does not prohibit the choice of retrofitted vehicles upgraded for higher environmental performance.

There are a number of challenges that must be considered within the new Directive.

- Value of energy included must be untaxed. It is not specified if the energy cost would be over the lifetime of the vehicle or based upon one moment in time.
- It will be very difficult to calculate vehicles that run on 'flexible' quantities of fuel blends, such as ethanol in gasoline, which may be from zero to 85% ethanol. The same would apply for dual-fuel natural gas/diesel vehicles. For bi-fuel NGVs some assumptions have to be made as to what proportion of time the vehicle will run on natural gas or its primary fuel source.
- The cost of CO₂ is included but not for other global warming gases, including NO_x and methane.

Within the European Union total procurement accounts for 16% of the gross domestic product. Total annual vehicle purchases that could be affected by this Directive would include: 110,000 passenger cars; 110,000 light commercial vehicles; 35,000 trucks/lories; and 17,000 buses. This accounts for about 1% of car purchases, 6% for vans and lorries/trucks, about one third of the buses.

Summary

There are substantial opportunities for NGVs within the large body of legislative and regulatory initiatives now being undertaken by the European Union policy makers. Continued vigilance and active participation in the policy making process in Brussels will be required to ensure that NGVs are well-represented, and that a fair and balanced legislative and regulatory environment can be created and maintained in order to enhance the European market opportunities for natural gas vehicles.

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