

**“NGVs Now: The Clean Drive. The Secure Energy. The Proven Solution.”**

**Presentation by Richard R. Kolodziej  
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Those of you that know me, know that I'm an optimist. Every year at this meeting, I get up here and focus on the good things that are going on in the NGV industry, and the bright future that I see for NGVs – both in the North America and the world. And I don't plan to back away from being optimistic again this year.

But I have to admit that, even for an optimist, 2004 has been a disappointing year for America's NGV industry. Neither NGV sales nor government policy decisions have been what we wanted, expected or worked hard for. Why has that happened?

Well, as for the slowdown in our business, I know it won't make it any less disappointing to you, but, to be fair, much of what's happened has been beyond our control. We can start with the national economic recession that, despite rumors to the contrary, is still with us. The economy continues to suffer from the lingering effects of 9/11 and the collapse of the dot-com bubble. And, while the rapid rise of oil prices makes NGVs more competitive, high oil prices really have been a drag on the economy, too. All this has meant less tax money – and that has led to a huge federal government budget deficit. Since the federal government has to borrow more to keep the country solvent, this has meant that there is less money available for private sector investment. The government, in effect, is competing with the private sector for investment funds. The net effect of all this is that the private sector has cut back drastically on capital investment – including purchases of NGVs.

And to make matters worse, our important state and local government customers have gotten a double whammy. They're collecting less tax dollars *and* they're getting less money from Washington. This has meant less incentive dollars for alt fuel vehicle programs. It's also meant that governments at all levels have cut back their NGV purchases, too.

A second factor that has worked against us this year is that hybrids and hydrogen vehicles have become the darlings of the media and policy-makers. Don't get me wrong. We love hybrids and hydrogen vehicles. But the hype has really been over-the-top, and the facts are often wrong. For instance, gasoline-hybrids are frequently portrayed as alternative fuel vehicles. Never mind that gasoline-hybrids are 100 percent dependent on gasoline, and that the majority of cars, trucks and buses will be non-hybrids for as far in the future as you want to look. And, never mind that hydrogen fuel cells vehicles are decades away from commercialization. Americans want silver-bullet solutions to complex problems. They want home runs that promise to make the

problems magically go away. And that's how the media is portraying – and less-informed policy-makers are viewing -- hybrids and hydrogen. They are the easy answer to our transportation dilemma. More importantly, with the OEMs under pressure regarding fuel economy, they *have to* emphasize their plans for hybrids. Unfortunately, sometimes hype becomes reality. And, as we're seeing, most OEMs now appear to be putting all of their near-term eggs in the hybrid basket. None of this has been good for NGVs. With hybrids and hydrogen being advertised as the panacea, NGVs – and the other alternative fuels – are being wrongly painted as passé. The result has been that gasoline-hybrids have been given many of the incentives that should be limited to alternative fuel vehicles. And many fleet managers are using this confusion as an excuse to either do nothing now or to simply stay with petroleum vehicles.

A third factor is that the federal NGV incentive legislation - which this industry has worked for so hard the past several years – continues to be stalled in Congress. This legislation – the CLEAR ACT – would provide financial incentives for the purchase of NGVs, for each gasoline-gallon-equivalent of natural gas used as a vehicle fuel and for installing NGV fueling infrastructure. The delay in getting this legislation passed has hurt us in two ways. The first is obvious. If the incentives were in place, NGVs would be even more economic to buy and operate. But just as importantly, the anticipation of the legislation passing has cost us sales this year. Many fleet managers and other potential NGV buyers have opted to delay buying NGVs because they wanted to wait until the purchase incentives were in place. And they've waited and they've waited.

The Supreme Court case on California's South Coast Air Quality Management District's vehicle rules also hurt sales this year. California – especially Southern California – is America's strongest NGV market. And the AQMD's rules have played a key role in strengthening that market by restricting or prohibiting the purchase of gasoline and diesel vehicles in a whole series of government fleets and fleets that support government facilities. These include transit buses, school buses, trash trucks, airport vehicles, and more. In 2003, the Supreme Court agreed to hear a case questioning the validity of those rules. This immediately paralyzed the decision-making process of many affected California fleet managers. And in April, when the Supreme Court ruled against the AQMD on several aspects of their rules, it further added to the confusion. The net result? The robust growth of NGV sales in Southern California that had been expected slowed considerably.

With sales slowed, we were concerned about the impact on the OEMs. And rightly so. Earlier this year, after first announcing that they would be discontinuing the Crown Victoria, Ford announced they were canceling its entire line of natural gas and propane models for 2005. Many of you – and many Ford customers -- wrote to Ford urging them to reconsider their decision. They were presented with a long list of good reasons why they should do so. But they were committed. They said that NGV sales were too low, and, anyway, they never had been able to figure out how to sell NGVs. They said that their "alternative fuel" strategy was hybrids and hydrogen. We pointed out that they'll be investing much more in hydrogen vehicles than they ever spent on NGVs, and that they

would be selling more NGVs in 2005 than they will hydrogen vehicles for 20 years. Clearly, none of that was convincing.

A second shoe dropped shortly thereafter when General Motors announced it would not be producing NGV vans in 2005. Again, many of you – and many GM customers – wrote to GM urging them to reconsider. We pointed out that 2005 would be the first year Ford would not be making their natural gas van, and that sales of GM vans would clearly go up. Again, none of this was convincing.

So, as I said, so far, 2004 has been a disappointing year for NGVs ... and it would be easy to get discouraged. But I'm not discouraged. I'm disappointed ... but I'm not discouraged.

I'm not discouraged because, as I look forward, there are too many events and trends that all point to a much more positive environment for growth in NGV sales. Let me tell you just ten of those – starting with something we have been predicting for years.

\$2 a gallon for gasoline. Do I hear \$2.50? \$2.75? \$3.00? That's not a sweet sound for the American economy. But, like it or not, it means opportunity for us. Economists are now predicting that increasing oil prices will knock economic growth back 1 to 2 percentage points. That's real money with real consequences. Airlines in bankruptcy. The trucking business scrambling. Inflation higher than projected – high enough that the Fed has decided to up interest rates—dampening growth further.

The current record (or near-record) price for oil is not an aberration. It is *not* just a short-term spike. To quote Boone Pickens, "Say goodbye to \$30 oil." And while you're at it, you might want to say goodbye to \$40 oil. The culprit is market economics. After decades of OPEC setting the price for oil, worldwide demand is now outstripping worldwide supply. OPEC can't increase capacity enough to bring the price down much. And it will only get worse as world economies come out of recession. To underscore this point, just look at China. Most every news report on rising oil prices points to growing demand for oil by China as one of the culprits. And that's true. But the real story is that China hasn't really even started to use oil. China's economy is among the fastest growing in the world, and experts expect that to continue. And as the Chinese people become more affluent, one of the first things on their wish list is a car. China's population is huge, but its vehicle population is relatively quite small. In fact, on a vehicles-per-thousand population basis, China has the same vehicle market penetration as the U.S. had in 1913. Yes, 1913! And then there's India. It's projected that, within 50 years, India will have a larger population than China. All those jobs we're outsourcing to India will be paying for new cars, which also will help steadily drive up the price of oil all over the world. Natural gas prices too will continue to rise, but the gap between natural gas and oil will widen. The New York think-tank, INFORM, has just released (or is about to release) a report titled "The Transportation Boom In Asia: Fueling A Crisis For The United States." I commend that report to your reading. It's scary.

A second positive factor for us is vehicle availability. In the light-duty area, despite the recent Ford and GM announcements, we still have a strong vehicle line-up. Honda will continue aggressive marketing of its dedicated Civic GX, which, by the way, was named "America's Greenest Car" by the American Council for an Energy-Efficient Economy. (Yes, even greener than its sister hybrid Civic.) In fact, Honda will be stepping up that marketing effort. Two weeks ago, Honda and Fuelmaker announced that beginning next spring, the Phill home refueling appliance would begin to be introduced in California, and that Honda, which had focused its GX marketing on fleets, would now expand that focus to individual customers.

And while GM won't be producing OEM built NGV vans, they still will be offering their natural gas Silverado and Sierra pick-ups and chassis cabs. They also will offer a natural gas-fuel-ready 6 liter Vortec engine in the Express and Savana vans for aftermarket up-fits.

And, speaking of up-fits, if you haven't looked into aftermarket up-fits recently, you should. The technology is light-years ahead of where it was only five or six years ago, and now performs as well as OEM products. In fact, in many instances, it's the same technology. Companies like Baytech, BAF and DRV stand ready to make a wide range of Ford, GM and other gasoline vehicles that operate cleanly and flawlessly on natural gas for you and your customers.

There's also good news in the heavy-duty area. Our engines continue to get cleaner and perform better. Companies such as Cummins-Westport, Deere and others are making engines that outperform their diesel counterparts in urban emissions, greenhouse gases and more. And you'll be seeing even more improvements in the near future.

Another event that will be helping our industry is EPA's new, more restrictive standards for ozone and particulates. Under the old rules, 221 counties were not in attainment. Under the new standard, part or all of 474 counties in 31 states will be in non-attainment. This is only 15 percent of America's counties, but over half the population. Now, that rule just went into effect in April and it'll be phased in over a number of years. But as officials in all these new non-attainment areas start wrestling with policies to come into attainment, they're going to quickly find that the only way they can do that without driving businesses and industry away is to focus some of their policies on reducing emission from vehicles. And you can't do it with hybrids alone. You can't do that by substituting a Prius for a Chevy Cavalier. Switching more vehicles to non-petroleum fuels -- especially NGVs -- will have to be part of many of these areas' compliance programs.

My number four positive trend is the rising cost of using medium and heavy-duty diesel vehicles. Diesel fuel is going to cost more -- partially because oil itself will cost more. But also because of EPA's sulfur rule, which goes into effect in just two years. How much will ultra-low sulfur diesel fuel cost? No one really knows. EPA continues to

forecast 5 cents a gallon more. But that's obviously wrong. The low sulfur diesel that is already available in scattered areas around the country is more expensive than that. And the refineries that make this fuel *today* were cherry-picked because they were the cheapest to retrofit. Upgrading the older refineries will be much more costly. That's why the petroleum refiners, in testimony before EPA, said that, removing sulfur from gasoline and diesel at the same time – which they now are required to do -- could result in diesel prices increasing by as much as 50 cents a gallon. In addition, they testified that the rule could lead to regional and seasonal shortages of ultra-low sulfur diesel, which could cause significant price spikes. So diesel fuel will cost more.

Then there are the diesel engines themselves. Under EPA's rules, beginning in 2007, engine manufacturers will need to cut particulate emissions by 90 percent from the 2004 standard. At the same time, they'll need to cut NOx emissions in half. The engine manufacturers say they'll all comply – but at a price. According to presentations made at a truck meeting earlier this year, the new engines, the exhaust after-treatment and changes to the chassis to handle the greater engine cooling load are expected to add between \$15,000 and \$20,000 to the price of a new Class 8 truck.

And the fuel economy of those trucks will be worse. The engine manufacturers are saying that there *should* be no further fuel efficiency penalty. But keep in mind that this is what they said when the 2002 engines were rolled out. Truck fleets, however, have consistently reported 3 to 7 percent lost mileage. It shouldn't be surprising if mileage deteriorates further with these new engines. And maintenance costs should go up too since these diesel engines are going to be much more sophisticated and more fragile. Truck fleets have reported a long list of failures with the 2002 engines – including sensors, EGR valves, EGR coolers and injectors. As one fleet manager put it “No huge horror stories, but lots of pain and extraordinary costs.” Greater fuel cost, greater vehicle cost, greater maintenance cost and reduced mileage. There definitely is an opportunity for us there because heavy-duty natural gas engines already are close to meeting the 2007 standard. And they'll meet it at only a fraction of the incremental cost of diesel.

Now, that's 2007. Keep in mind that heavy-duty engine NOx standards will be reduced by another 80 percent in 2010. That certainly will be a challenge for our engine manufacturers, but no diesel engine manufacturer knows the details on how they're going to be able to do that.

The number five reason I'm confident about the future concerns the fine, forward-looking people at the South Coast Air Quality Management District. The Supreme Court may have knocked them down a little, but they jumped back up, and are charging ahead. First, as soon as the Supreme Court decision was announced, they made it clear to those fleets that were not affected by the ruling that nothing had changed. Second, the AQMD has requested that the California Air Resources Board apply to EPA for a waiver of Clean Air Act requirements. California is the only state allowed to set its own vehicle emission standards. All of the other states have the option to either follow EPA's rules or CARB's. If CARB agrees to make the request and EPA approves it, the

AQMD would have the authority it needs to implement all their rules as originally promulgated. CARB's decision on whether to make the request to EPA has been kicked upstairs to the Governor, and we hope that he'll move quickly to approve it. Finally, the AQMD is now discussing expanding its rules to cover additional facilities such as ports. All this means that Southern California is back on track to continue to lead NGV growth in America.

Number six. There still is a chance that the NGV incentives included in the CLEAR ACT might pass this year. The CLEAR ACT has been included in the Senate's version of a trade bill that is considered "must pass" legislation. Congress is now in session, but will adjourn soon for electioneering. It's expected that, after the election, depending on who wins and who loses, they'll return for a lame-duck session, and we hope that the trade bill will be taken up and passed then (if not before) – with the NGV incentives included. If not, we'll start the legislative process all over again in January, and we'll work that issue until we're successful because it's not just good for the NGV industry – it's good for the country.

Number seven is about hybrids. As I mentioned before, hybrids are a great technology. A gasoline hybrid is significantly more efficient than a comparable non-hybrid vehicle, and that helps reduce emissions and reduces petroleum use. But hybridization alone cannot solve our urban pollution problem or our greenhouse gas problem or our oil dependence problem. Gasoline and diesel hybrids still get 100 percent of their power from petroleum. DOE has concluded that, even if we hybridize all cars, by 2025 we'd still be using the same amount of oil we're using today. Another problem is that the tests that EPA uses to determine a car's mileage isn't accurate for the way American's drive. Yes, hybrids do get better mileage, but a lot less than EPA would have you think, and customer complaints are now rolling in. In addition, hybrids aren't appropriate for many applications – like over-the-road trucks, and it'll be a long time – if ever – that hybrid technology will penetrate those markets.

What all this means is that, at some point, the media and policy-makers will begin to understand that you can't rely on petroleum-based hybrid-electric technology to be the transportation panacea from now until that magical time when hydrogen transportation becomes commercial, cost-competitive and widely available. We have to switch a significant percentage of our vehicles to non-petroleum fuels quickly – either in internal combustion-only vehicles or in non-petroleum hybrids.

Now I mentioned hydrogen. The NGV industry is very supportive of hydrogen vehicles. We're supportive because a hydrogen transportation future would be good for the country. We're also supportive because – and I know many of you have heard me say this over and over – we're supportive because NGVs are *the* pathway to hydrogen vehicles. There are many barriers that have to be overcome before hydrogen vehicles can become a commercial reality. There's the need for continual technological advances in on-board compressed hydrogen storage to reduce cost and weight and increase capacity ... and do it safely. There's been lots of hype about low-pressure hydrogen storage using technologies like metal hydrides, carbon nanotubes and even

borax. And some day, these technologies might work – maybe. Right now, though -- and for the foreseeable future -- it's compressed gas tanks. And who refined and continues to refine compressed gas storage technology? The NGV industry. It's not surprising that virtually all compressed hydrogen tank manufacturers were compressed natural gas tank manufacturers first.

Hydrogen vehicles also will need some place to fill up. To do that, they'll need hydrogen compressors ...and meters ... and dispensers. Guess whose technology their building on? Ours. It's our station equipment manufacturers who the hydrogen vehicle industry is turning to for product.

A growing hydrogen transportation system will also need a significant human resource support structure. This includes specialists such as mechanics, inspectors, and fire marshals who are familiar with gaseous fuel vehicles and fueling stations. The NGV industry is already helping to create that support structure. The more NGVs on the road and NGV fueling stations that are put in place, the more of this support structure will be created, and the easier the transition to hydrogen vehicles will be.

Then there are facilities. Hydrogen vehicles will need maintenance garages, enclosed fueling structures for buses and similar buildings in which they can be serviced. Unfortunately, if these structures were built for petroleum vehicles, they'll need to undergo extensive modifications to house hydrogen vehicles safely. This'll be costly and will represent a significant barrier to the adoption of hydrogen vehicles. Except for hydrogen detectors, every building built or retrofitted to safely handle NGVs already has made these changes. A growing NGV market today will make it cheaper and faster to make these buildings hydrogen safe tomorrow.

How about siting new hydrogen stations? That'll be a real challenge for a number of space, safety and financial reasons. Fortunately, each new natural gas station is a site that has already overcome many of these problems. Every natural gas station is a potential hydrogen-fueling site. The more natural gas stations, the faster the hydrogen system can grow.

Then there's the issue of public acceptance. Before hydrogen vehicles are generally accepted, there needs to be a major behavioral change in our society. The public is very familiar and comfortable with *liquid* transportation fuels, but generally unfamiliar with *gaseous* transportation fuels. No one is more aware of this barrier than the NGV industry. But we've done an exceptional job in overcoming this perception – especially for fleets. As NGV use continues to grow, the public is becoming more familiar with and accepting of gaseous-fueled vehicles.

Then there's H-CNG. I believe that blends of hydrogen and natural gas are the best way to start getting hydrogen used in on-road vehicles. Using HCNG is technically much, much easier than using 100 percent hydrogen – either in an internal combustion engine or in a fuel cell. And the environmental benefits are impressive. For example, Collier Technologies of Reno is in the process of introducing an 11-liter heavy-duty

HCNG engine (based on a Daewoo block) that produces only 0.08 grams of NOx per brake horse-power hour. That's less than half the NOx standard that EPA will require beginning in 2010. You're going to be hearing a lot more about HCNG in the near future.

For all these reasons, the NGV industry is setting the stage for the more rapid acceptance of hydrogen. *We are* the pathway to hydrogen vehicles.

But the length of that pathway – that's the real unknown. And this brings me to my ninth point. Except for some support for farm fuels like ethanol and biodiesel (primarily to help get votes in farm states), the Bush Administration's transportation policy boils down to petroleum hybrids now transitioning to hydrogen fuel cell vehicles soon after. I would argue that this could be a disastrous policy for the United States and the world. It's not that hydrogen fuel cell vehicles are a bad idea. There not. They will be wonderful -- someday. They will be wonderful when and if commercial, cost-competitive hydrogen fuel cell vehicles become widely available. But that's the problem – when and if.

It seems to me that there are at least three major flaws in putting all our future transportation eggs into the fuel cell basket. First, it is now generally conceded that it will be at least 11 to 15 years before affordable fuel cell vehicles will be commercially available. DOE Secretary Spencer Abraham stated that a go/no-go decision on commercialization is not expected to be made until 2015. Today, there are over 220 million vehicles on America's roads, and virtually all of them will be replaced between now and 2015. From a public policy perspective, it makes no sense that all these vehicles should be replaced with others that run on gasoline or diesel – even if they are more efficient hybrids.

Second, let's assume that all the technical, logistical and economic barriers to fuel cell vehicle commercialization are achieved on schedule, and, further, that market penetration exceeds expectations. Let's assume that there are 20 million fuel cell vehicles on the road by 2020. This is far more than even the optimists are predicting. By 2020, they'll probably be over 240 million cars, trucks and buses on America's roads. 20 million fuel cell vehicles on the road at that time means 220 million *non*-fuel cell vehicles on the road at that time. From a public policy perspective, it makes no sense that virtually all these non-fuel cell vehicles should be powered by petroleum.

Third, what if, when we get to 2015, the technical, logistical and economic barriers to fuel cell commercialization have *not* been overcome. What if the situation with fuel cell vehicles *then* is the same as the situation with battery electric vehicles today – namely, not enough range and much too expensive. From a public policy perspective, it makes no sense to run such a risk. It's like planning your retirement around the assumption that you're going to win the lottery.

Instead, smart public policy would invest – and invest heavily -- in hydrogen fuel cell R&D. But ... it would make a hydrogen fuel cell transportation future "Plan B" -- a fantastic option if it comes to pass, but not one that we should absolutely count on to

come to pass -- because it may not. "Plan A" would assume the worst case, namely, no fuel cell vehicles at all. If you make that assumption, it quickly becomes clear that NGVs must play a bigger role in America's transportation future -- especially for the next 50 years.

Fortunately, for all of us, the public luster on the hydrogen fuel cell future is beginning to tarnish ... just a little. It's not that most people still aren't intrigued with the concept. They are. Everyone wants them to succeed. It's just that reality is starting to set in. We're all seeing more articles in magazines and newspapers taking a more sober look at hydrogen transportation. While acknowledging that manufacturers increasingly will have small fleets of demonstration hydrogen fuel cell vehicles on the road, analysts and commentators are looking more warily at all the significant technical, economic and other barriers that must be overcome before commercial, cost-competitive hydrogen fuel cell vehicles become widely available. For instance, the National Academy of Sciences -- a strong supporter -- recently issued a very comprehensive report that concludes that it will be 2050 before hydrogen fuel cell vehicles displace a substantial percentage of the oil we use. Others say that's optimistic. Still others say that a hydrogen transportation system will *never* make sense. I certainly don't know the answer, but I believe all this debate is very healthy -- especially if it leads to more grounded, less risky transportation planning today and for the immediate future. Because I'm confident that that will inevitably lead to a greater role for NGVs.

Finally, let me just point out that outside North America, the NGV market is expanding like it *should be* growing here in the United States. I won't go into details here because Jeff Seisler will talk about the world NGV picture tomorrow. But suffice it to say, that policy-makers in many other countries understand and appreciate the urban pollution, greenhouse gas and oil displacement benefits of NGVs, and are working aggressively to make NGVs a key part of their transportation future. I hope -- and expect -- that our elected leaders will soon begin to look around and realize that policy wisdom doesn't only reside *here*. That other countries may be ahead of us on some things, and that we may want to look at them as a model for some of our policies -- like NGVs.

As I said when I started, I'm disappointed in 2004 thus far. But I'm not discouraged. And neither should you be. Because, for the ten reasons I've just discussed -- and the many other reasons I don't have time here to discuss -- I'm excited about the prospects for our industry around the world and here at home. NGVs now! Because, we are the clean drive. Because we are the secure energy. And because we are the proven solution.

Thank you very much.