

**Presentation of Richard Kolodziej to the
NGV Conference –Summit
October 15, 2007**

“Making Waves: Amplifying Our Message; Maximizing Our Potential”

Every year at this time, I get to present my views on the state of the NGV industry. The Good and the bad. The strengths and the weaknesses. The challenges and the opportunities. I’ve been doing that for the last 11 years. And to be honest, for a couple of those years, the bad, the weaknesses and the challenges seemed to form a bigger pile than the good, the strengths and the opportunities.

But not anymore. My message to you today is that we have all the tools we need for the U.S. NGV industry to break out from slow and steady growth and experience the spectacular growth NGVs are seeing in other parts of the world. We have the tools we need. But to realize that growth, we’re going to have to be a lot noisier. The theme of this year’s conference says it all. We’re going to have start really “making waves.” We’re going to have to “amplify our message.” We’re going to have to stop being bashful about telling the world that we’re the best. And by the world, I mean customers, policy makers and the public. And by “we”, I don’t necessarily mean just the people in this room. I mean everyone with stake in the NGV business and all our natural economic allies.

Advocates for other alternative fuels and technologies haven’t let the fact that their products are – how should I say this? -- inferior from making a public case that they are the silver bullet answer to America’s transportation and energy problems. When I’m speaking in public, I try my best (I really do) to take the high road with respect to the competition. I try to focus on the advantages of NGVs rather than the infirmities of other alt fuels. I try to keep in mind that the real competition is gasoline and diesel, and that it doesn’t make sense for alt fuels to fight among themselves for a small slice of the transportation pie.

We’re all family here. So let me cut through the hype and be totally candid and realistic about our alternative fuel competitors. When you do that, it shows how really great NGVs are. I think a lot of us believe that our barriers are bigger and more difficult than the barriers faced by the other alt fuels. In fact, the opposite is true.

Let me start with corn ethanol. From what you hear out of Washington and what you hear from farm fuel advocates, corn ethanol is almost the perfect fuel. It's renewable, so it displaces fossil fuels. It's cleaner, so it reduces urban pollution and greenhouse gases. And it's based on American crops, so it benefits America's farmers. This last point is critical because the farm lobby is very powerful in Washington, and they're very well organized in their support of corn ethanol. And it doesn't hurt that the Iowa caucuses can make or break a Presidential campaign. It would be political suicide for any Presidential candidate to NOT be in favor of massive loans, grants and tax credits for corn ethanol. That's why there is an 82-cents per gasoline-gallon-equivalent tax credit for ethanol blending, and why the President has proposed doubling the amount of corn ethanol produced by 2017. So corn ethanol should be sweeping the country, right? Wrong!! Why?

Well, I think that an article in the September 27th edition of the Economist magazine sums up pretty well the long-term prospects for corn ethanol. The title of the article? "Ethanol, Smethanol." The article's subtitle? "Everyone seems to think that ethanol is a good way to make cars greener. Everyone is wrong." It goes on to say that corn ethanol is a – quote – "lousy fuel." Irrational exuberance, to use Alan Greenspan's term, artificially forced the corn ethanol pendulum to swing all the way to one side. Now reality is bringing it back. Just about every day I see an article about the downside of over-dependence on corn ethanol. Among more the serious criticisms of corn ethanol are:

1. It might be renewable but a lot of energy is used in the growing, processing and distributing of corn and ethanol. Some analysts have shown that, when you take all the ground-to-wheels energy into account, more energy is required to make the ethanol than there is IN the ethanol.
2. Because of all the energy required for ethanol, the greenhouse benefits aren't that great. At most, somewhere in the 20 percent range – which is actually less than NGVs.
3. The urban pollution benefits are almost non-existent. As a matter of fact, the Argonne GREET model – which is the basis for most government emissions forecasts – shows that ethanol makes most pollution worse.
4. The production of ethanol has doubled the price of corn. Great for corn farmers. Terrible for everybody else. Almost all processed foods contain some corn products – like high fructose corn syrup. That means that the growing demand for corn ethanol is a hidden food tax on all Americans. The sharp jump in corn prices has caused riots in Mexico because of its impact on the price of

tortillas – a staple in the diet for poor Mexicans. And farmers are shifting away from other crops to plant more corn. So, the price of other food crops are increasing, too. Among the most cranky about this are the dairy, pork and chicken farmers, who have seen their feed costs jump and their profits shrink. They're starting to get real vocal in Washington.

5. Environmentally, corn is not so earth-friendly.
 - Corn is a water hog. In fact, it needs more water than almost any other crop. The aquifers all over the U.S. are already being depleted. More corn production will make the situation worse.
 - Corn growing also is fertilizer intensive. And all that extra fertilizer ends up polluting in the groundwater.
 - And, corn growing and harvesting is highly erosive. Every year, destructive harvesting techniques deplete large amounts of the vital top soil – again, requiring more fertilizer. EPA and the environmental community are very worried about all these problems.
6. Ethanol BTUs are more expensive than gasoline BTUs. Drivers don't have a choice about using ethanol when a 10 percent blend is mandatory. But drivers of flex-fuel vehicles do have a choice as to whether or not to fuel up with E85. Some drivers will buy E85 because they believe it's the right thing to do. But once most drivers figure out that it's costing them more to drive on E85, they'll stop buying it. Right now, supply is much greater than demand. Two Sundays ago, the New York Times had a front page story titled "Ethanol Boom Stalling as Glut Depresses Prices." Unless the government steps in with some type of bailout, many of these ethanol plants will go out of business. The inter-play between supply, demand and price is finally laying bare the reality of corn ethanol. Corn ethanol will never make economic sense without major government subsidies. It's not economically sustainable. And, even with government subsidies, it's not environmentally sustainable.

And the list goes on. My point here is that the use of corn ethanol has grown tremendously. But it's achieved its prominent place among the gasoline alternatives NOT because it's a superior fuel. It's gotten there because its advocates have been vocal and effective in "making waves" -- primarily in Washington. But with the media and the public, too.

How about the other major farm fuel – biodiesel – primarily made from soy beans. Biodiesel use continues to grow, in part, because advocates have successfully been making many of the same benefit claims for biodiesel as are made for ethanol – it’s renewable, it reduces urban air pollution and greenhouse gases, it’s economical and it can make a big impact on our use of imported oil. Again, reality is at odds with these claims:

- As to air pollution, biodiesel blends actually increase Nox, and, in new diesel vehicles, have no PM benefits.
- Biodiesel DOES have fossil fuel displacement and greenhouse gas advantages, but, as with ethanol, when you do a comprehensive ground-to-wheels analysis, many – if not most – of those benefits disappear.
- The potential for biodiesel to have a big impact on America’s use of petroleum is limited. The U.S. will be using about 50 billion gallons of diesel by 2017. At most, soy biodiesel can represent 3 billion of that. And even that is unrealistic - - because one of the crops that’s being displaced by corn is soy beans.
- As to cost, biodiesel has been competitively priced compared to petroleum diesel because of the federal tax credit of one dollar per gallon. But soy beans prices are climbing. Biodiesel has the advantage of not requiring any engine changes for blends below 20 percent. But, as biodiesel prices rise, this advantage turns into a disadvantage because businesses can stop using as fast as they started.

But biodiesel’s biggest challenge may come from “renewable diesel.” Petroleum refiners can modify their processes to take vegetable oils and animal fats directly into the refinery process. What comes out looks and acts just like petroleum diesel. Two plants have already been announced – one by ConocoPhillips and one by Syntroleum. Both will be taking waste animal fats from Tysons Foods. In almost every way, renewable diesel is a superior fuel to biodiesel. It also can be transported in existing oil pipelines. The refiners are not interested in selling renewable diesel as a separate alt fuel. Their primary interest is just meeting the federal renewable fuel requirements. The biodiesel industry is petrified of this development since, if successful, refineries will begin to outbid the biodiesel industry for soy oil.

How about cellulosic biofuels? That’s the latest “next great thing.” Taking cellulosic waste (like corn stalk waste) or cellulosic crops (like switchgrass) PROMISES to be a big improvement over corn ethanol. It PROMISES to require much less water and

fertilizer. And it PROMISES to have a much better energy balance – so more energy comes out than goes in. The federal government can't put enough money behind cellulosic biofuels R&D and projects. There currently are huge grant and loan programs in place, and there are more in the House and Senate versions of the energy bill. And the Senate Democrats just unveiled the biofuels provisions for their upcoming Farm Bill. This is 130-pages of grants and loans – mostly for cellulosic biofuels. Originally, all these farm bill provisions said “cellulosic ethanol.” NGV America successfully made the case that ALL cellulosic biofuels should be encouraged – including cellulosic biogas – and the phrasing was changed. But even though it now says cellulosic biofuels, the focus of policymakers still is on cellulosic ethanol.

Now, note that I said that cellulosic biofuels “promise” improvements. If you read the media coverage or listened to the advocates (including many Congressmen and Senators), you'd think that these biofuels will be commercially available any day now. You'd be very wrong. There are no commercial cellulosic plants operating today. The reason -- cost. Despite all the federal incentives, cellulosic biofuels aren't even close to being economic. Major technical breakthroughs are required – especially in the development of enzymes capable of breaking down cellulose in the plants. Could all these breakthroughs happen tomorrow? Possibly. Might they never happen? Possibly. One analyst is quoted as saying that it is technologically on a par with bringing commercial hydrogen fuel cells to market. But again, you wouldn't know it from listening to the cellulosic biofuels advocates. They're out there selling the promise – and they have been very successful at it.

Another silver bullet solution we're hearing a lot about is coal-to-liquids. The coal industry is fond of saying that the United States is the Saudi Arabia of coal. They say we could make all the synthetic gasoline and diesel we need from coal, and solve our oil dependence problems. Not surprisingly, the coal industry is lobbying hard to include a smorgasbord of tax credits, grants and loans for coal-to-liquids in the energy bill. And they have quite a bit of support. Unfortunately, none of that support comes from anyone concerned about global warming. Coal-to-liquid produces twice the amount of greenhouse gases as burning gasoline or diesel. No problem say the coal advocates. We'll just sequester all that CO₂. In other words, the coal-to-liquid plants will capture the CO₂ and inject it into old gas wells and other underground reservoirs, where it will surely stay safe for hundreds or thousands of years. The big problem is that the technical and cost barriers for this sequestering are daunting -- and maybe not even doable. But the coal advocates continue to be successful in keeping the idea on the agenda.

Electric vehicles get a lot of positive attention. As you know, there are three flavors here –electric-only vehicles, hybrid electrics and plug-hybrids. Electric-only vehicles don't have any tailpipe emissions, and, depending on the fuel used to make the electricity, offer lower greenhouse gas emissions. And, since very little powerplant electricity is made from oil anymore, they help reduce our dependence on foreign oil. What could be better? The U.S. should be the EV capital of the world. But it's not. There is still not a single EV available that can approach the driving range, interior room and performance of a typical gasoline-powered family sedan, at anywhere near the price that an average consumer would pay. The culprit has always been – and continues to be -- the batteries. For electric vehicles to be a major player, you need light, safe and cheap batteries that can be charged quickly (like in five minutes). Decades of effort and billions of dollars have been invested in solving this problem, and a lot of progress has been made. But not nearly enough. As a result, not a single pure electric vehicle with four seats and the ability to reach highway speeds is being mass-produced anywhere in the world. Until they come up with the magic battery, electric-only vehicles will remain a very niche market.

Hybrid electric vehicles have much more promise – but, unfortunately, much less benefit. EVs don't use any petroleum. Gasoline and diesel hybrids are just more efficient gasoline and diesel vehicles. More efficiency is good, but America is not going to solve its petroleum dependency problem by using just a little less petroleum per vehicle. If every vehicle on the road were a hybrid, the overall fuel savings would be significant. But that's not going to happen. After 10 years of sales and heavy publicity, hybrids have grabbed less than two percent of the market. Cost is a big factor. The average driver is just not willing to spend more money for a little more fuel economy. Don't get me wrong. Hybrids are an important technological advance. But I believe the hype of the advocates has outrun the actual public policy benefits. By the way, one of the energy saving features on hybrid vehicles has nothing to do with hybridization, and could be built into every vehicle. When a hybrid stops -- at a light say, the engine shuts off. When the driver steps on the accelerator, the engine immediately starts, thereby not wasting fuel idling. I keep hearing hybrid advocates talking about the fuel efficiency advantages of hybrid transit buses and trash trucks over natural gas models. Because of their driving cycle, these vehicles get a large part of their efficiency gains from the stop/start feature. If the manufacturers wanted, natural gas trucks and buses could have this feature, too. They say they don't because of cost. But that cost is dwarfed by the incremental cost of hybrid buses and trucks over natural gas buses and trucks. So I don't know why start/stop isn't offered.

The third electric vehicle option has been getting an awful lot of press lately. Plug-in hybrids are a combination of EVs and hybrids. The concept is a great one. You build a hybrid vehicle with the ability to operate on electricity alone and with a lot

more battery capacity (let's say 40 miles range). Most trips by most American's are far shorter than that. You always charge up the battery at home, and do most of your driving in electric-only mode. If you do drive farther than the battery range, the gasoline engine kicks in and (directly or indirectly) powers the vehicle. I personally believe that among all the options I've just covered, plug-in hybrids have the most promise. But even here, many cost and technological barriers must be overcome. Plus, most of Plug-hybrid benefits are limited to commuter-like driving patterns where you drive somewhere and park for most of the day. For vehicles that are driven most of the day, the "plug-in" part of plug-in hybrids has very limited benefit. And, if there's a lot of highway driving involved, they may even be less efficient than a straight gasoline vehicle. In addition, if they do become popular, there is the minor issue of where all the electric generation capacity will come from.

Finally, there's hydrogen. Let me just say this about the hydrogen options. HCNG vehicles – where you blend some hydrogen with natural gas – are a great way to help transition to hydrogen as a transportation fuel. But, in my opinion hydrogen-only internal combustion engine vehicles make no economic sense, and I can't believe they ever will be commercially available. Hydrogen fuel cells may at some time be a commercial option. In a study completed two years ago, the National Academy of Sciences (a big supporter of fuel cell technology), forecast that it will be 2050 – that's 2-0-5-0 -- before fuel cell vehicles make a significant impact on America's petroleum use. And I think those boys are optimistic. Suffice it to say that it would be prudent to put the fuel cell option in the "long-term" category. But you wouldn't know it listening to the fuel cell advocates. In fact, the just-released California State Alternative Fuels Plan has one scenario where fuel cell vehicles begin becoming commercial in about 12 years. The fuel cell advocates have really been making waves.

So that's our non-petroleum competition. Again, this was not meant to be negative. It was meant to point out that these fuels and technologies have gotten as far as they have despite these disadvantages. None of them are perfect and none of them are the silver bullet answer to America's transportation and energy challenges. Despite that, their advocates have been able to put the spotlight on their advantages and play down the disadvantages. How? In every case, their advocates and their allies have been out there telling the positive parts of their story over and over. For plug-in hybrids, cellulosic biofuels and hydrogen, it's been easier. Their technologies aren't commercial yet, so there's no reality to compare them to. It's all hypothetical. They're emphasizing the benefits and at key technology breakthrough.

It's been harder for ethanol, biodiesel and hybrids. Like NGVs, they are here and now. The warts are more obvious. Having said that, their advocates really have done a great job in playing up their successes, and a credible job in repositioning their warts

as beauty marks – especially with Congress and other federal, state and local policymakers.

We have to do the same. While some NGV companies have done a great job, as an industry, I think we've been "out waded" and "out amplified". And that's really unfortunate because we are the superior option. Making the case for NGVs is a lot easier because we have the best story to tell.

What is that story? What are OUR talking points? Here's just a small bunch of them:

1. NGVs are a technology that is commercially available -- right now. We've having an impact -- right now. No technological breakthroughs are needed.
2. Last year, NGVs displaced over 200 million gallons of petroleum in the U.S., and, with the right policy support, by 2017 we can grow to 3, 5, 7 or even 10 billion gallons. I think this is our number one, best-kept secret.
3. Natural gas supply is not a problem. America has a huge natural gas resource base, with more being found every year. Last year, we saw the largest volumetric and percentage increase in the estimate of the U.S. natural gas resource base since records started being kept. Even if the NGV market should grow to 10 billion gallons equivalent, that would represent only six percent of our annual natural gas consumption.
4. We're a domestic fuel. About 97 percent of the natural gas used in the U.S. is produced in North America – 85 percent in the U.S. and 12 percent in Canada. And that won't change a whole lot in the next 20 years or more.
5. What WILL change is the amount of renewable natural gas produced from landfills, animal waste, crop waste and sewage. A DOE analysis concluded that, from these sources, America could reasonably produce one and a quarter quadrillion BTUs of renewable natural gas. That's the equivalent of 10 billion gallons of gasoline or 20 percent of all the diesel fuel used in America.
6. As I mentioned before, everyone is focused on cellulosic ethanol as a silver bullet answer. But cellulosic biomethane makes more sense. The fact is that, making renewable natural gas from cellulosic material is more energy efficient and less costly than making cellulosic ethanol.
7. According to a study done for the California Energy Commission, on a well-to-wheels basis, NGVs produce 23 percent fewer greenhouse gases than

comparable diesel vehicles and 29 percent less than gasoline vehicles. This is as good as or better than most of the fuels and technologies getting a lot more greenhouse credit.

8. The natural gas Honda Civic GX is the cleanest internal combustion vehicle ever commercially available. That includes all the gasoline-hybrid vehicles.
9. Virtually every major auto and truck manufacturer in the world is now making and selling NGVs -- somewhere. That includes: Fiat, Renault, Peugeot, Volkswagen, Citroen, Honda, Toyota, Nissan, Isuzu and, yes ...GM, Ford and Daimler.
10. We've got small volume manufacturers that produce equipment for GM and Ford conversions that are better than when GM and Ford produced OEM NGVs.
11. Trucks and buses are the backbone of America's commercial transportation system and the lifeblood of the nation's economic health. Yet most of the alternative fuels and technologies are directed at the gasoline market. Natural gas can make a big impact in displacing diesel fuel.
12. Over 125 transit agencies are now using NGVs, and one-in-five buses on-order are NGVs.
13. In the trash truck market, four of the five largest chassis suppliers are offering factory-built CNG or LNG units.
14. Right now, the only engine on the market that already meets the EPA's 2010 heavy-duty engine standard is the Cummins-Westport natural gas engine. And, the heavy-duty Emissions Solutions engine, which currently is one-third cleaner than new diesel engines, plans to have a 2010-compliant natural gas engine by the end of the year.
15. There's nothing magic about petroleum being the fuel to power hybrid-electric vehicles. Hybridization doesn't care. Natural gas hybrids would offer the benefit of both fuel and technology.
16. There are over 6 million NGVs around the world -- making NGVs one of the most rapidly growing transportation fuels. Over 20 percent of all vehicles in Argentina are NGVs. Brazil, the sugar cane-to-ethanol capital, has 1.4 million NGVs. Pakistan has over 1.4 million. Germany, Italy, China, India, Thailand,

and many more countries all have rapidly expanding NGV markets.

17. NGVs are the best pathway – and maybe the only pathway -- to a hydrogen transportation system. Every natural gas fueling station is a potential hydrogen fueling station. Every NGV mechanic and inspector is a potential hydrogen vehicle mechanic and inspector. With only minor modifications, every building built to safely handle NGVs is ready for hydrogen vehicles. And, as I mentioned before, using Hythane will get us using hydrogen in vehicles much earlier than waiting for fuel cell vehicles.

These are just a handful of powerful NGV talking points. There are a lot more. Sure we have our challenges. We need more vehicle offerings, for example. More engines options. More platforms for more applications. But even with our challenges, we have one hell of a story to tell. When you stack the facts – without the hype -- against the other alternative fuel contenders, it's no contest. We have a wave machine that'll make huge waves. And we have huge amplifiers that will really amplify our message. But, as an industry, we just haven't turned on the equipment.

That's got to change. We've got to make more waves and we've got to amplify our message. And one way to do that is to get more feet-on-the-street selling NGVs – or at least selling the BENEFITS of NGVs. For example, we need to re-engage all the gas utilities that don't have an NGV marketing program (or, worse, aren't using NGVs in their own fleet). We need to get truck, bus and car dealers – as well as leasing companies -- to be talking up NGVs. I truly love Honda, but I want them to have OEM competition. We need to convince other OEMs to get back to making NGVs, too. The environmental groups are our natural allies, but we need them to be more excited about the role that NGVs could play and more active in their support of NGV policies.

You get the idea. At the national, state and local level, we need to reach out to these and other allies and make them strong NGV advocates. We need louder voices and more feet-on-the-street. That's one of NGVAmerica's objectives to 2008. And we stand ready to support you to help make 2008 the best NGV year yet.

We've got a great story, and the more people that hear it, the faster our message will spread. If the industry and its allies all work together, that wave we help build will become a NGV tidal wave.

Thank you.