How to Play Cheap Natural Gas

By JIM LANE, Editor, Biofuels Digest

Godzilla could learn a thing or two from cheap natural gas in terms of frightening people.

All you have to say is “natural gas” and a lot of people in the biobased world turn pale, tremble, and scamper into corners.

The cause for anxiety? It seems to be a toxic combination from recognizing that interest in natural gas will take all the investors away — and make biofuels and biobased materials seem less urgent in terms of emissions, energy security and economic opportunity. The three E’s for which biofuels are known.

OK, relax. There’s still going to be lots and lots of room for biofuels and biobased companies. Cheap natural gas is a very good thing.

If you know how to play it.

So let’s look at that today. What do we know so far about how it will change the energy landscape?

1. Think regional.

Cheap natural gas via technologies like fracking, is a story so far limited primarily to the US and Canada. There are shale formations elsewhere — it is not entirely clear the scope of opportunity and the timing.

Further, it will be a while before it is entirely clear how much infrastructure is going to be available to move NG to markets. Right now, it is piling up at rail hubs and it is expensive to move.

2. Think applications.

Keep in mind, pilgrim, that NG has been selling at, oh, around $0.75 per million BTUs in Saudi Arabia. And for years, it was simply flared at the wellhead.

What does that mean? It means that it is not enough to have a transformation in supply – you have to transform demand through applications.

3. Think molecule platforms.

C2 – live in dread.

Genomatica CEO Christophe Schilling told the Digest, “If I had a process for producing ethylene I would be completely in dread of natural gas. But the benefits can be counter intuitive. Take for instance BDO, which is a C4 chemical. Cheap natural gas has a positive impact.”

“The larger impact is going to be on chemicals, rather than fuels,” Schilling said, but it will really have an impact on the big C2 chemicals. Especially for companies like Dow, Lyondell, ExxonMobil and Shell.”

So, how can cheap NG have a positive impact?

C4 – cheap gas is good news.

“If chemical companies are using natural gas instead of naphtha, and C4s are typically made from naphtha, well you are going to see the supply of naphtha tighten, and biobased alternatives are going to be more important.”

Was cheap North American gas a factor in Genomatica’s focus on C$s like butadiene and BDO?

“The reason we focused on C4s was not totally seredipituous. We had no idea about NG in the US, but five years ago the big fear was cheap natural gas from the Middle. East. NG is still priced in the Kingdom at $0.75 per million BTUs and there’s a lot of capacity.”

C6 and C12 – limited impact

Over in the C6 space — with chemicals like adipic acid — or in the C12 space with dodecanedioic acid (DDDA), Verdezyne CEO Bill Radany says that there is speculation on impact in both directions, but he sees the impact as limited.

“Cheap natural gas? It won’t directly help us,” he said, “other than we can maybe get cheaper energy. Cheap natural gas will change the production of other feedstock chemicals, and could create a shortage of butadiene and then affect the ability to produce DDDA by the petrochemical companies. And there’s no change for bioadipic expected.

“There’s speculation one way or the other, and I am not sure anybody knows how it is going to play. We plan to wait and see
— and hope it results in a reduction in energy costs to run a plant.

Longer chain molecules — C14 and up – impact positive, if any

Impact is limited – a lot of supply starts to come from the vegetable side — soybean oil, canola, and so on. If anything, cheap energy costs will reduce production costs for intermediates.

4. NG for transport fuels

For now, expect compressed natural gas to make impact with heavy-duty fleet vehicles — and some liquified natural gas, too. For the ordinary driver, it's not exactly a slam-dunk. As with all new fueling platforms — including plug-in electric and E85, refueling stations are scarce. There are around 450 CNG stations and 47 LNG stations, in the US — and only 12 LNG stations outside of California.

Model	MSRP	MPG	Range (mi.)	Fuel/gall	MSRP+Fuel/5yrs
Civic	$ 17,965	32	422	$ 3.54	$ 25,419
Civic Hybrid	$ 24,360	44	523	$ 3.54	$ 29,781
Civic CX (CNG)	$ 26,405	31	237	$ 2.12	$ 31,013
Jetta TDI	$ 22,775	34	493	$ 4.03	$ 30,762
Nissan Leaf	$ 36,050	85	85	$ 3.00	$ 38,428

Sources EIA, Alternative fuel price report (DOE), Plug in America

Like plug-in electrics, there is range anxiety, though less so. A Honda CX gets around 56% of the range that the Civic gets, and about 45% of the range of the Civic Hybrid.

But here's the thing about combining short range with few stations. With a Civic, you have confidence that after driving 350 miles or so, you're sure to find a gas station in a couple of miles. With CNG or all-electric, today, you can have a lot of "Last refuel for a zillion miles" situations, and the effective range is often halved, because you have to turn around and go home to get refueled or recharged. That may change.

Now, you'd think cost would be a no-brainer, especially over a couple of years of ownership.

But here's the tale of the tape — for the average driver over five years, the gasoline-powered Civic offers the best cost of ownership. The hybrid is in a distant second, followed by the B20 biodiesel powered Jetta TDI and the Civic CNG in 4th place. The poor leaf is a very distant fifth place. Overall, over 5 years the Civic CX will set you back 22% MORE than the Civic.

The bottom line

Gas is a big deal. As Genomatica Schilling warns, "the impact is already huge." But opportunity will accrue, as always, to the smart investor who sees NG in the context of a complex energy portfolio and energy infrastructure — and focuses on the best opportunities.

For biofuels and biobased materials and chemicals, opportunities will continue to abound.

What's your take? Please feel free to comment below!

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