Interview Carl Mesters - GTL

Earth and sky.

Mesters: These GTL fluids, transportation fluids, and have different, better burning properties in car engines. And that is why they make a difference. And we can measure that in scientific terms.

Intro speaker: You are listening to internationally recognized chemist Carl Mesters and this is EarthSky's Clear Voices for Science.
Dr Mesters is chief scientist for chemistry and catalysis for Shell. Speaking with us from this office in the Netherlands, he explained to EarthSky's Jorge Salazar about creating synthetic fuels from natural gas, known as Gas to Liquid Technology.

Interviewer: Dr Mesters, welcome to EarthSky's Clear Voices for Science.

Mesters: Thank you.

Interviewer: So we are here to talk about Gas to Liquid Technology or GTL. What is that?

Mesters: Gas to Liquid, what GTL stands for, is a process where we take natural gas and convert that into liquids and those liquids are transportation fuels, basically. Shell started in around 1973 -as others did- with trying to convert coal into transportation liquids. We thought that the coal to liquids process -as we were investigating it let us say in the late 70s- typically produced a fuel, a transportation fuel, that looked like gasoline. We first saw in the early 80s that there would be a growing market for diesel fuelled cars, compared to gasoline fuelled cars. We changed not from coal as a supply but natural gas as a supply. It was considered also to be somewhat easier to do. Now what is different is that because you have a completely different chemistry, you make something, molecules that might fit say in the GTL process the existing diesel engines but since the molecules are -I would say- completely different, the way they behaved in a diesel engine are also completely different. I mean, some people call GTL liquid for a diesel car simply a kind of diesel, but I call it a completely

different kind of liquid, that is also suitable and has very neat advantages in a diesel engine. And a few of them are related to specific technicalities for a diesel engine; we have a -inaudible- number, a boiling point and so forth. But another important thing is the sulphur content, yeah? Sulphur content in this gas to liquid product is virtually zero. So if there is no sulphur or almost virtually zero sulphur in your liquid, there can't be any sulphur emissions from that liquid, yeah? Also the polyaromatic level in the fuel is virtually zero -I should say extremely low- compared to the diesel that you produce from a crude oil. And that gives the fuel a much leaner burning, less particulate matter; so you can imagine that in areas where the cleanliness of the fuel, the environmental issues are a concern, that this product has indeed -because of these properties- has more value. And that is what we are currently… Have been testing for a long time and still continue to test in several kinds of -inaudible- tests.

Interviewer: We understand that there are some pilot projects of gas to liquid fuels in city cabs and trucks. Yeah, tell us more about that.

Mesters: Yeah, there is a couple of very interesting trials going on. One of the nicest, I thought, because it is very close to my home town in the Netherlands; it is a ferry between the Dutch mainland -although that is not that big- and one of its islands. And there is a ferry going back and forth on this fuel, simply to reduce emissions. That is a local thing in the Netherlands. But there is also a big bus trial going on in China. We have had some fleet tests with Volkswagen in Germany, -inaudible-. And apparently the Department of Transport in the US has used the fuel, tested the Shell GTL fuel, in transport of Yosemite water. I thought that was a very appropriate trial to see what emissions reduction can be achieved.

Interviewer: Tell us a little bit about what Shell is doing to develop GTL. We understand that Shell is building a Gas to Liquids plant in Qatar, which has been in development for more than 30 years. There us more about that.

Mesters: We are indeed building a plant in Qatar at this moment, but we have already a plant in operation; smaller sized, but in operation since 1993 in Malaysia. And that has been in operation for about 15 years, and basically that has developed our knowledge about how to first of all run the process, and produce the product -that is

the second part- and get the product properties and get them into the market. To get an interest of the market into these properties, the properties of the fuel. To say simply allow for a bigger plant to be built. It doesn't make sense to build a big plant if you don't have an outlet for it, yeah? And it certainly doesn't make sense to build big plants if you don't know how to operate it. So we have 15 years operations experience in a relatively smaller plant and we have the product. We know indeed after all this time what it does and what it does not. And what -inaudible- and what the advantages are.

Interviewer: I would like to follow up on the output of these two plants, the one in Malaysia and that you described as being in operation for 15 years now, and the one that is planned in Qatar that is going to be 10 times that size. What sort of outputs are we talking about here?

Mesters: From the top of my head the plant in Malaysia has an output to delay of about 14.000 barrels per day. And the plant under construction in Qatar will be 140.000 barrels. So that is about the factor of ten that you mentioned, indeed. And that is in part by… What we do is… It is not simply building everything ten times as big; there is process intensification going on. But indeed there is also an area of multiplication involved in that. So some parts can be done bigger, more intense, more of it in the same type of apparatus. And some of it is simply multiplying. You can do 10 times as much by having 10 times as much things to do it with. So it is a combination of the both. And the combination gives us the confidence that we are not trying something utterly new. Because you can imagine if you have a small car and you have to build a car 10 times as big; there is a lot of risk with that involved. We have a lot of this process -I think- de-risked by multiplication.

Interviewer: Well, Dr Mesters, thank you very much for taking this time; I really appreciate it. What is the most important thing that you would like the public to know about Gas to Liquid technologies?

Mesters: What I would like public to know about Gas to Liquid technology is that it produces a superior liquid with respect to the properties in transportation -cars so to say- with respect to the environment. That it is a technological challenge to improve

that process. That it is a very well rewarding job to be in that environment within Shell, of helping to bring this technology further. That is a very challenging, but also rewarding job.

Extro speaker: That was Carl Mesters, the Shell Group's chief scientist for chemistry and catalysis, on fuels made using Gas to Liquids technology.
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