



Legislative Assembly of Alberta

The 28th Legislature
First Session

Standing Committee
on
Resource Stewardship

Natural Gas Production
Stakeholder Presentation

Monday, December 2, 2013
6:17 p.m.

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First Session**

Standing Committee on Resource Stewardship

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Anglin, Joe, Rimbey-Rocky Mountain House-Sundre (W), Deputy Chair
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Barnes, Drew, Cypress-Medicine Hat (W)
Bikman, Gary, Cardston-Taber-Warner (W)
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Hale, Jason W., Strathmore-Brooks (W)
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Stier, Pat, Livingstone-Macleod (W)
Webber, Len, Calgary-Foothills (PC)

* substitution for Len Webber

Also in Attendance

Olesen, Cathy, Sherwood Park (PC)
Swann, Dr. David, Calgary-Mountain View (AL)
Woo-Paw, Hon. Teresa, Calgary-Northern Hills (PC)

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Standing Committee on Resource Stewardship

Participant

Liquiline North America.....RS-499
Calum McClure, President

6:17 p.m.

Monday, December 2, 2013

[Ms Kennedy-Glans in the chair]

The Chair: Good evening.

Mr. McClure, we are really delighted that you are able to join us through telecon tonight.

Mr. McClure: Oh, thanks very much.

The Chair: We debated inviting you here, but I think your being in some place other than Alberta is probably a wise move on your part. It's very difficult to travel right now in Alberta, so this is probably the most effective option.

My name is Donna Kennedy-Glans. I'm the chair of this committee and MLA for Calgary-Varsity. I'm going to go around the room, and it's probably a little hard for you to imagine us all, Mr. McClure, but I hope the assistant has provided you with photos so you can track us down.

I'll start with my vice-chair here.

Mr. Anglin: Joe Anglin, MLA, Rimbey-Rocky Mountain House-Sundre.

Mr. Lemke: Ken Lemke, Stony Plain.

Mr. Sandhu: Peter Sandhu, Edmonton-Manning.

Ms Woo-Paw: Good evening. Teresa Woo-Paw, Calgary-Northern Hills.

Ms Kubinec: Maureen Kubinec, MLA, Barrhead-Morinville-Westlock.

Ms L. Johnson: Linda Johnson, MLA, Calgary-Glenmore.

Ms Fenske: Jacquie Fenske, MLA, Fort Saskatchewan-Vegreville.

Mr. Bilous: Good evening. Deron Bilous, MLA, Edmonton-Beverly-Clareview.

Mr. Casey: Ron Casey, MLA, Banff-Cochrane.

Ms Olesen: Cathy Olesen, MLA, Sherwood Park, just sitting in.

Ms Calahasen: Pearl Calahasen, Lesser Slave Lake.

Mr. Hale: Jason Hale, Strathmore-Brooks.

Mr. Bikman: Gary Bikman, Cardston-Taber-Warner.

Mr. Barnes: Drew Barnes, Cypress-Medicine Hat.

Mr. Stier: Pat Stier, MLA, Livingstone-Macleod.

Dr. Swann: Good evening. David Swann, Calgary-Mountain View.

Ms Zhang: Nancy Zhang, legislative research officer.

Dr. Massolin: Good evening. Philip Massolin, manager of research services.

Mr. Tyrell: Chris Tyrell, committee clerk.

The Chair: All right. Well, thank you, and particular thanks to guests sitting in, MLAs sitting in tonight. It's wonderful that you're interested in what this committee is doing.

Just a normal drill here in terms of housekeeping. The microphone consoles are operated by *Hansard*. If you've got a

cellphone, if you could just pop it far away from the microphone, that will help. All of the committee proceedings are streamed live on the Internet and recorded by *Hansard*.

The first agenda item is to make sure that everybody is comfortable with the agenda. There was a revised agenda distributed to you this evening, and the change of the name of one of tonight's presenters is the only change on that agenda. If someone would move that the agenda for the December 2, 2013, meeting of the Standing Committee on Resource Stewardship be adopted as circulated. Mr. Sandhu. Thank you. All in favour? Any objections? Okay. The motion is carried.

Next, if you've had a chance to look over the minutes from the last meeting, would somebody move that the minutes of the November 18, 2013, meeting of the Standing Committee on Resource Stewardship be adopted as circulated?

Ms Calahasen: So moved.

The Chair: All in favour? Any objections? Carried.

All right. That takes us to the meat of our presentation here. On that note I do have to note that Mr. Hale noted that we had beef tonight, and he was delighted by that. That's on the record. Yes, yes, yes.

Okay. More seriously, Mr. McClure, you're the president of Liquiline North America, and we, again, are delighted that you've been able to join us. Thank you for the presentation. It is now in front of everyone. We understand that you'll be walking us through that presentation. If you could present for about 15 minutes, in that range, then we will have questions for you. I'll try to moderate the questions appropriately, and I'll just make sure that you're aware of how many more questions we've got. We are in the Legislature tonight, so the meeting will have to end sharply at 7:15. I've got a few housekeeping things to finish up before that, so probably about 5 minutes after 7 I'll be looking at the clock.

I will happily announce that there are two other members who have joined us. If they could introduce themselves.

Mr. Khan: Stephen Khan, MLA, St. Albert.

Mrs. Leskiw: Genia Leskiw, MLA for Bonnyville-Cold Lake, sitting in for Len Webber.

The Chair: Thanks to both of you.

All right. Well, I will turn it over to you, Mr. McClure.

Liquiline North America

Mr. McClure: Okay. Well, thanks very much, first of all, for the invitation so that I could get the opportunity to at least outline a little bit about Liquiline and what we're trying to do and how that fits into, really, the value chain which is starting to emerge for liquefied natural gas in Canada. I've got a presentation that I'll use as a guide. If there are any questions, you can feel free to jump in. I'll just plan on being no more than 15 minutes, and then we could always take questions at the end.

The Chair: Mr. McClure, just to be clear, we will be asking for questions at the end. We will give you 15 minutes of uninterrupted time. Okay?

Mr. McClure: Okay. Yeah. That's fine. Thanks.

Just moving on to slide 2 and, really, a little bit about the background of Liquiline. The company was established in Norway in 2005. Basically, Norway and Scandinavia, I would say, have been

leaders in adopting LNG as an alternative fuel, and that's been driven by a political will and also the use of taxes and incentives to ensure that corporations and enterprises are incentivized to actually make the transition from regular liquid fuels like diesel towards natural gas.

The company was established with technology to develop into this midstream segment. Basically, that really encompasses all the equipment that you require to distribute LNG safely but also the equipment that is required at the end-user site to be able to use it and dispense it in the right way. Liquiline developed its technology. It had a lot of backing from the oil fund in Norway and was able to develop good technology, which is successfully in operation today. We provide both logistical and terminal solutions. We provide customers, which could be end users, with solutions which enable them to actually switch or displace diesel from their fuel mix.

One of the very important things in our company's motto is that we're independent of any specific LNG supply. In this space you start to see that there are companies that really want to start integrating vertically the supply chain, controlling the commodity and then also the distribution and end solutions. What happened in Norway was that that got controlled by a monopoly, and customers actually wanted to start looking for solutions that were independent of LNG supply, and that solution was then allowing us to be able to source LNG from different suppliers and also provide technology to customers independent of the field supply. The companies are certified by Det Norske Veritas.

6:25

Moving on to slide number 3, it just gives an outline of our geographical presence. We're headed out of Bergen in Norway but really seeing the growth opportunity in North America and also longer term in the Asia Pacific area. We established operations basically in these regions. The idea is, really, to take the experience and the technology that is already developed from Norway with the objective of successfully implementing those in these regions. That's really where we're set up.

The North American operation, which I head up, was established in 2012. We're based out of Vancouver in British Columbia. That's where I live, and basically we're starting to develop our operations from that location.

Our business focus, as I said, is not being in the LNG refining business but really sitting in between the suppliers of LNG on the market and end customers that want to make that transition and being able to provide sourcing, transportation, and also the receiving stations, allowing customers to actually make that transition.

When we talk about receiving stations, we're talking about: if you transport LNG to where you want to use it, then you need to be able to change LNG from liquefied form to whatever form you need. So for ships, for example, they would keep LNG as LNG on the ship and then regasify it when they need it. You do need storage and transfer solutions, and that's part of the terminals that we've developed in Norway there.

Filling stations in the transport industry. We're starting to see LNG filling stations but also LCNG filling stations. That is liquefied gas that's brought to a site but then vaporized and turned into compressed natural gas through a high-pressure pump and then using that for transportation. That's quite an interesting variant on LNG.

Then on industry we see that we need to regasify the liquefied natural gas that's extremely cold and, basically, be able to turn it back into a usable gas, and we do that through vaporization and regasification solutions. We've seen an interest from industry

moving towards that, particularly in Canada. We've got one project up in the north of Canada, in Yukon, with ATCO Gas, where a community that's off grid in Watson Lake is seeking to actually displace diesel from their fuel mix, displace that with natural gas in a blended fuel solution. That application is the first of its type with a bifuel power generation plant, and that's got application, really, right across the north of Canada and in through remote settings where the only fuel of choice today is actually diesel, and it provides a new fuel option.

Slide number 5 is really talking about some of the technologies that were developed for transportation. We use what we call LiquiTainers, which are special tanks designed to carry LNG, and they can be used for both transportation and also storage. It's a very flexible solution that allows people to develop infrastructure in a straightforward way. In this industry nothing is ever simple, so with the various rules and requirements, et cetera, it's still quite complicated to set up a project, but this type of technology is intended to be able to take equipment that's standardized and then use it in different applications.

We also have a system which is called LiquiSys, which is a logistics and terminal system. One of the things about Norway is that it's very similar in some regard to Canada, where you've got very remote communities maybe not having the full depth of competence to run all these types of facilities in their communities, but what this allows is for a remote monitoring system so that you can have support provided remotely. You can confirm if there are any alarms or any challenges with the terminal that's actually been established.

Also, from a security perspective, for example, if you look at, say, vessel refuelling networks or even truck refuellings in very remote places, typically today these aren't manned, and you have things like card-lock systems. Well, this type of monitoring system allows the same thing for LNG where if there were any issues with the plant, that could be remotely monitored. Really, that's an important thing.

I mean, one of the things that LNG does is that it competes against a very established fuel source and infrastructure in place of diesel. For example, if you look at the Watson Lake project that we're working on, you have a diesel infrastructure where you have diesel being shipped in bulk by rail to Fort Nelson into depot storage tanks, and then the final distance is only about a hundred miles to the actual end site, but you get the benefits of all that bulk distribution system.

For LNG we haven't got any of that. We have an ISO tank that's being fuelled in Vancouver and having to travel, basically, over 2,000 kilometres by truck to achieve the same outcome as the diesel. Even with that really inefficient emerging supply chain, you can make it work where the end customer sees a benefit, but it's still quite challenging to get some of these pilot projects moved forward.

The LiquiStation is also at some of our terminals that we've put in. You can see here that the grey things on the left of that little picture are actually the vaporizers, and then they're integrated into a storage tank, which is one of our tanks being used in a storage mode. Again, that can all be monitored and supported remotely.

For our logistics projects we use the LiquiTainers. Moving on to slide 6, on the top left you can see moving LNG by road, in the middle moving LNG by rail. Canada hasn't ever moved LNG by rail. We're hopefully going to be establishing a project with one of the larger LNG refiners to actually start piloting rail distribution using containers just to start understanding the logistical challenges around that. Then on the top right you can see LNG being moved by one of these ISO tanks by vessel. Where that has real application, certainly, is on the west coast where we have

stranded communities, where the only access is through barge or by water access.

Interestingly, we're also starting to see an interest from communities, for example, in Hawaii, that are interested to move LNG on a pilot basis from, potentially, Canada to Hawaii just to start seeing whether LNG is going to be a fuel that works on those islands.

Moving on to the next slide, again, this is just a bit more of some of the screenshots of our monitoring system, LiquiSys. It shows basically the ability to be able to go on and check the status of a station and also check the status of the tanks that are in circulation.

Moving on to slide 8, we also have track and trace. One of the things that's very important with LNG is, obviously, the safety of moving LNG by transportation, whether that be road, rail, or ship, and we have various technologies to really support the integrity of that operation. For example, if you were going to move LNG by rail and you had a problem with one of your tanks, then how would you know that you actually had a problem? If it was just a complete mechanical system, which it was in the early days, then basically you'd put your tank on the rail network, and it was then just assumed that everything would be okay.

Well, as of today we actually have quite sophisticated monitoring systems that monitor both the location of the tanks and also the pressure, temperature level. Most importantly, if there are any abnormalities, it's not just sitting there not informing anyone, but there is a forced alarm system that actually then goes back to the central control station, that then can alert the necessary people that there's actually a problem with one of the tanks in our logistics system. That's an important safety feature that we provide on our tanks.

6:35

Moving on to slide 9, we can see where the opportunities exist and where we've had experience. We've developed LNG bunkering solutions for ships. This is to offshore supply vessels, which were fuelled by an LNG terminal, and that's been successfully put in place. We're seeing more in Canada. We're certainly seeing more interest on the shipping side with both B.C. Ferries and also STQ ferries starting to have an interest in actually moving forward with LNG projects.

In the centre we have LNG stations and LCNG gas filling stations, and Liquiline has been successful in delivering four of these solutions now in Scandinavia. With the LNG filling stations there's a bit of a question, really, about what's going to be the preferred mode of fuelling heavy-duty trucks in the future. The challenge with LNG is that you need a big throughput of LNG. You need to keep it cold. If the temperature increases and the density drops off, then trucking companies start finding their ranges reducing. There are challenges associated with handling the LNG as a fuel, and we're also seeing that there are a lot of LCNG trucks actually coming out. I believe there's a bigger split now for CNG over LNG. I think it's an easier medium to handle. It's much more predictable than LNG.

The way we work, LCNG is actually the energy. You still take advantage of the distribution of LNG by truck and the efficiencies of that. Then you actually store it on-site as LNG. When you need to dispense it as CNG, then you actually vaporize it at a very high pressure, and then you have the dispensing. We're able to fuel CNG trucks within five minutes going from LNG as the fuel stock. The interesting thing there is that it's really good for off-grid locations that don't have a pipeline network. The other thing that's very good is that the power required to regasify the LNG is far, far less than using a compressor to actually compress natural

gas in the first place. The only energy is what's gone into making the LNG cold, and the power that's required on the local system is very small. You can also combine both, so you can have an LNG and LCNG combination, which I think will be also applicable for certain locations.

Then on the right we have LNG satellite terminal solutions, and the top picture I think is one of my favourite applications. This is a small community in Norway where they're off the grid, but they have an LNG terminal which allows them to put in LNG and regasify it and then have it as a gas distribution system for cooking and heating. Actually, the tank that you can see, the larger of the two tanks in that picture, is actually used as the transportation vessel. It goes away and fills up with LNG when it's required. Meanwhile the little community is running off the buffer tank in the middle. Again, it's a really innovative way in terms of how you introduce storage and transportation in a really sort of flexible way. Certainly, there's a lot of application for that.

Below that picture there's a larger satellite station. What we see, certainly, in Canada is that there's a very big application for off-grid applications; for example, in heavy industry like mining anything that's off the grid is using diesel currently. Really, when you look at these companies, it's a real challenge to make that transition toward a new fuel source. Typically fuel is always the lifeline of any company in these areas. The risk of a new fuel not working or being suboptimal is a massive risk for any operation. So to actually move toward a new solution or a new fuel requires a lot of support for that decision, and there's a lot of support needed in terms of training, operational preparedness, evaluation of whether it's even right for the company, and also an established distribution and logistics system that's actually going to get them the fuel reliably.

What we see at the moment is that there's a lot more interest in terms of derisking that through a dual-fuel application, where typically some of these power generation facilities can actually operate off a blend, where you can use LNG to displace essentially the diesel. We're seeing a lot of interest in that because it just derisks the whole immaturity of the LNG supply chain. And if fuel is not available, then you still have your backup of diesel whereas if you go to gas only and change everything out, then, really, you're looking at making sure that you've got enough storage, that you never have supply outages, and that your training in the operation is always extremely robust to make sure it can accommodate an early supply chain.

Certainly, in the early stages it's very challenging for companies to move towards a new fuel source. There's a lot of support that's needed for any organization or operation to actually do that. Basically, part of our motto is really to be there to help support companies when they make that transition.

That's essentially my presentation. The last slide gives you my contacts. If anyone has any questions that don't get answered or has any further follow-up, please feel free to contact me.

The Chair: Thank you, Mr. McClure. That was very well done.

I'm going to open up the floor to questions. I will take a speakers list, and I will start with Mr. Hale. If you can just give me a flag that you want to ask a question.

Mr. Hale: Yes. Thank you, Madam Chair. Thanks for your presentation. I was wondering if you could explain a little bit more. You mentioned in the Yukon using the bifuel application, diesel and natural gas. Can you give us some sort of a comparison, I guess, on the cost? You know, a litre of diesel compared to a litre of LNG: how much power can it provide? Just so we can get

a sense, I guess, of whether diesel is better than LNG or why they're switching to LNG from diesel.

Mr. McClure: Yes. Okay. That's a great question. It gets right to the fundamentals of why anyone would want to probably change in the first place. Obviously, there's a great spread between LNG and diesel. If you take it on an energy equivalent basis, then currently, today, out of FortisBC we can buy LNG at the gate at around \$8 to \$9 per what we would call gigajoule, which is a unit of energy. Today that same unit of energy in diesel costs anywhere in the order of \$20 to \$24 an MMBTU. Basically, you're looking at anywhere up to three times more expensive. That's at the gate of the liquefaction plant.

The next question is that you have to then factor in: what's my cost of energy at my facility? Off grid generally means very remote, and it means that you've got to go a long way for it. So when you look at the Yukon, it's off grid. It's about two days' drive from Vancouver. Basically, the distribution cost still has to be within the \$20 to \$24 a gigajoule to make it worth while.

What we see is that this is this whole idea that the distribution infrastructure is so immature and that, also, the supply options for LNG are so sparse at the moment. You have FortisBC in Vancouver with limited volumes. You have EnCana with a very small plant in Calgary and also plans in Grande Prairie. But, really, when you look at these evaluations, the whole thing hinges on: what is the cost of fuel at my facility versus diesel? If it can arrive there with a large enough spread to cover the capital costs and return, then generally companies are interested. If it can't do that, then they're not.

The other thing is that even if there's a really good return, it's very challenging for companies to even get their heads around how they'll make a transition to it. It's very much, "I don't want to be first," or "I just want to sit back and watch other people go and try and learn from that experience."

6:45

Mr. Hale: Yes. Thanks. Just one more little short one. A tank of diesel fuel compared to a tank of LNG: will the LNG last all that long? Is it more efficient to burn?

Mr. McClure: No, it won't last any longer. To get the same amount of power, you have to consume a certain amount of energy. On a volumetric basis LNG actually is not as energy dense as diesel. On a weight basis it is, but it requires a much larger volume, so you would have to probably transport more LNG to a site than diesel.

The Chair: Mr. Barnes, you had some questions.

Mr. Barnes: Thank you, Madam Chair. Thank you very, very much, Calum, for an excellent presentation so far.

Just a couple of questions. Did I hear you say early on that the government of Norway was the owner of the company and expressed lots of support? I'm wondering how many similar companies there are to yours that are competitors or adding capacity.

Then, if you could, after you answer that one, if you could head towards this. We've talked to some bigger fleet operators, whether it's buses or taxis or that kind of thing. Do you see a possibility of your company helping in that industry development and if there's some involvement there for you?

Thank you.

Mr. McClure: Yeah. Thanks very much for your question. First of all, the government isn't an owner of Liquiline, just to be clear,

but in the earlier days they did provide some funding to help support the development of technology that Liquiline currently uses. That was more of an arm's-length grant type of approach. There's no actual participation from the government in Liquiline.

When you look at the competitive landscape, in terms of operators of LNG equipment, really, there aren't that many in Canada today. You have companies like Shell, like EnCana that are really looking to develop the markets, but our model is different in terms of that we're independent from the LNG commodity. Typically EnCana will be developing similar technologies and solutions where they can but basically still with an aim of making their supply base be the preferred point of supply for a project.

We actually work very closely with the large refiners because they're very interested in developing technologies and helping getting the market moving as well. I mean, for Shell, for example, having a larger volume of LNG being used helps with the development of LNG liquefaction facilities, so we're very complementary in the market at the moment. I would say, really, that the market is so small and immature, it's a collaborative approach to try and get the market to move forward as opposed to being a real head-to-head on a competitive basis. Really, that's what we see today.

The Chair: Thank you.

Mr. Casey, you are the only one left on my list, so if anybody has got a question, you can just put your hand up.

Mr. Casey: Thank you. Maybe you could just expand a little bit on the operating temperature situation. That's sort of, I think, the first time we've heard of that. We've had some presenters in that were using some LNG in their trucking lines and so on, so I'd like to understand a little more what the issue is around operating temperature and maybe, just from your perspective: why LNG over compressed natural gas? What's the benefit of going down the road of LNG?

Mr. McClure: Yeah. Thanks very much for that question. I actually realize I missed the last part of the previous question, that was: can we provide LNG solutions, fuelling solutions for trucks? Absolutely, that's where we can work with end customers. If there are companies that are looking to transition away from diesel and have an aspiration to do that, then what we're able to do is quite accurately project where the sourcing opportunities would be, what the cost to distribute LNG would be, so we can come quite quickly to a figure, a distributed cost of LNG, actually, at the facility that's being assessed.

Then what we can do is also provide the terminal. If it's an LNG station, for example, we can provide that on a turnkey type of basis. Certainly, we're really interested where there are communities, maybe if it's buses and fleets that are interested in making that transition. There's certainly a connection that could be made there, for sure.

Moving to the next question, I think the first point was, really, operating temperature. One of the problems with LNG is basically its stability as a fuel. As you load LNG, say, for example, from the liquefaction plant, it will get loaded into a tank, and it will be at a very low pressure but extremely cold. Obviously, the LNG wants to actually start turning back into a gas again, so what happens is that the pressure starts to build up in the tank. As the pressure builds in the tank, the temperature starts to rise. Where that's really important for fleets is that when that LNG gets dispensed from the filling station to their truck, what's really important to the truck is what the density of the LNG actually was going into

its fuel tank. As the density becomes less and the temperature increases, then basically the amount of energy on your truck reduces. Where the truck may on its nameplate have a range of 500 miles, for example, it may be that if the density has increased too much, that could have dropped off by anywhere up to 15 per cent or so. That's where, I think, some fleets have found some challenges with managing LNG. It works very well for some fleets, and for others it's maybe not been as successful.

In terms of CNG the advantage of CNG is that although it's less energy dense than LNG, you can still dispense it very quickly. It still can have a reasonable range, and it's still a very predictable fuel source. Once you've filled your tank – it's a bit like a car – you know how much is in the tank. Once it gets to empty, then you've got to refuel it again. That's really the difference between the two fuels.

The one challenge is that there's certainly more fuelling that's required on an LCNG truck because you carry less energy in the fuel tank. But I do believe, looking at the current trend, that the jury is out on LNG and LCNG, and I'm certainly interested to see how that progresses. Certainly, in Norway, in Scandinavia the trend is towards LCNG rather than actually straight LNG. But it may be different, certainly, in Canada, where you've got much longer ranges and distances that are required. Then you need a different fuelling infrastructure, depending on the range.

The Chair: Does that answer your question, Mr. Casey?

Mr. Casey: Yes. Thank you.

The Chair: Ms Johnson.

Ms L. Johnson: Thank you, Madam Chair. I have two questions, the first being on slide 2, the truck that's moving the equipment. What fuel source does that truck actually use? The other question is about standards for building LNG facilities.

Mr. McClure: Okay. Yeah. The first one. The truck: there's no interaction between the tank and the trunk, so they're totally independent systems. I believe that in this one the truck will actually have been diesel. I mean, it would make sense to have LNG trucks pulling LNG tanks. Particularly, for example, when we look at northern projects, the infrastructure isn't there at all yet, so initially it will be done with diesel trucks. Obviously, where possible, it should be done with LNG, but you still need to then have the infrastructure, like the filling stations in the right locations, to be able to support that.

Ms L. Johnson: Thank you.

Picking up on the infrastructure, we've heard from other presenters the concern about standards when building LNG fuelling stations. You know, you're in three different countries now. Are there any comments you'd like to share with us on what standards should be adopted, recommended? Is there a European standard for that?

6:55

Mr. McClure: It's another great question, and I could talk about it for a long time. In Norway and Scandinavia they've really gotten to a point where LNG is now becoming like a new diesel, like a new gasoline, like a new propane, for example, where they're comfortable with its safety performance. There have not been any catastrophic spills, any really significant issues. They've gotten to a level of safety that's certainly very robust, and the rules are now a quite well-established basis on that.

One of the challenges that we've got in Canada is that the standards that were in place and that we're working from have been for LNG production facilities, which also include LNG terminals like Canaport, for example, on the east coast. Well, that type of project related to a small vaporization terminal in the Yukon is like night and day. It's really, really different. If we start regulating these facilities based on export facilities, it just creates a real challenge to actually create solutions that can meet all of these requirements in a way which doesn't add excessive cost into the system and is questionable about how much additional safety it really adds into a system.

Where we are, I would say, is that we're developing new standards, but we don't have a lot of experience to base those new standards on. I'd be wary about overregulating in Canada. I mean, obviously, safety is absolutely paramount, and the worst thing that can happen to the industry is that you have a substandard safety performance. That would be devastating to the industry. We're all behind robust standards and quality requirements and design standards, but at the same time we have to be careful that we look at things like the propane industry or the diesel industry: are we managing the risk in an equivalent type of way? Is the equivalency between fuels – obviously, they're different, but are they really on the way to where we're going to support a transition towards a cleaner, more efficient fuel source? Because these early projects are so challenging in terms of meeting these new standards which we don't have experience in yet, then that will be a challenge for the industry to get over. That will inevitably take more time and cost to be able to get to the end solution.

Ms L. Johnson: Okay. I appreciate that.

One more quick question. You also use the phrase: we've gotten comfortable with that. Was that a five-year process for the public and producers to get comfortable, or was it a shorter time period? What was the buy-in?

Mr. McClure: We've always been running, really, since the 2000s. They implemented a taxation regime called the NO_x tax. It taxed NO_x, and it really forced LNG into the fuel mix. Basically, in Norway it's become the same way as propane is in the north of Canada. It's like how everyone lives with propane in northern Canada. Propane, you could argue, is even more dangerous than LNG, yet when you look at the requirements, they're very different between the two fuels whereas, I would say, when you look at Norway, obviously, there have been a lot of standards and code around it, but they haven't taken it to a level in which it's adding so much additional cost into it that it's really causing a challenge for people to make that transition.

It's a very important point. Certainly, it's an area where we really need to have good rules that are very robust, but they have the objective of creating an equivalent level of safety that's acceptable without over-engineering all of these systems and designs and creating something that's over-engineered to a point where it's really not adding the intended safety benefits. Really, a lot of that comes from experience, and also it comes from looking at the way other countries do it.

I think Canada needs to also be somewhat outwardly focused in terms of looking at how other markets have developed before regulating an industry that hasn't started yet in Canada, really, and saying, "These are the standards we need," when you could actually do quite a good job of looking at other equivalencies across the world where we've got a good safety performance in the industry. There are some good standards that can be taken from different parts of the world.

The Chair: Thank you, Mr. McClure.

We have time, I think, for one more question from Dr. Swann.

Dr. Swann: Thanks very much. I appreciated your presentation very much. You mentioned the need for support for this emerging industry, and I'm wondering what would be kind of the most basic level of public support you would like to see to enhance the various stages of this development.

Mr. McClure: Are you talking about support in terms of, say, customers wanting to make the transition?

Dr. Swann: I thought you were discussing what government or public support would assist the industry.

Mr. McClure: Yeah. I think that from government support the key elements are, certainly, to feed the market, to support companies that want to make that transition and are going to face a really challenging situation in terms of making that transition – I think that's very important from government – also the education of companies that really have got no idea around this fuel source. In a lot of cases it's so unique in terms of its temperature, in terms of its cryogenic properties that companies are really challenged to even get their heads around how it could even work. There's not really a big awareness about it, with the public as well.

The public doesn't really understand what LNG is about. We're certainly seeing it here on the west coast, where we're starting to have a number of these export facilities coming into development, and really the initial polling, I believe, of the public has been that there's very little awareness, actually, about what LNG is and how it performs. Then having the sort of basic understanding about what it is, what are its challenges, where it's beneficial, and where there's risk is not available today.

I really think that from a government perspective, the best is a supporting environment for it and to make sure that where companies want to engage and move forward on these projects – and a lot of the time pilot projects are needed, so help for those projects is very beneficial.

Then for the end customer the support that's needed is really a whole thing around, like, new operating procedures. It would be new training and competency requirements in the workplace. Going to things like insurance, we find that as soon as a company starts wanting to make a transition, the insurance starts saying: well, it's going to blow up; you've got increased risk in your whole operation. Then that's causing problems. Companies have to uncover all of these different challenges to start changing to a new fuel source. Really, whatever government can do in that whole process is very beneficial.

Dr. Swann: Just a quick follow-up. Is anybody doing it well? Is anybody doing it well in Canada in terms of government support?

Mr. McClure: I think the program in B.C., where there was – I'm not familiar with many other parts, but I know that the support that was given to Fortis through the utilities to allow fleets to start changing is a good incentive. Initially, a lot talked about was actually the value that comes back from LNG, but a lot of the time we certainly see that the first projects are very much demanding. Obviously, for anyone needing to make a transition, all the things like training are often things that aren't really thought about in the economic transitional costs. So I do believe that the government in B.C. has done a pretty good job. It's part of their sort of stated strategy of trying to encourage industry to start transitioning towards LNG. But then that also needs to be extended not only to transportation uses but, I think, also to things like industrial uses

that are off grid, and support for the projects that allow bigger users also to go towards LNG is an important thing.

7:05

One thing I should note very much is that if you seek the market, it will be the early adopters that have got the hardest point, but as you get more momentum behind it, then it will become easier and easier. Then as that becomes easier, the infrastructure only gets better. So it's a self-fulfilling benefit. Certainly, all of these early phases need a tremendous amount of support and nurturing just to make sure the market moves forward effectively.

The Chair: Thank you, Mr. McClure. I think we're in quest of the tipping point here in how to create the conditions for that. If you have other thoughts around these questions that we've posed or if you happen to have a chance to take a look at our website or what we're looking at, we invite those comments because we will be making recommendations as all parties to our Legislature.

I again thank you on behalf of 19 MLAs. I think this is the most we've ever had in one room, so this is quite powerful. Again, we're very grateful that you missed our winter storm. We're going to carry on our meeting here, and we'll totally understand if you hang up on your end.

Mr. McClure: Yeah. Okay. I'll plan to hang up. Thanks again for the opportunity to at least give an introduction to our business and how we really want to support the building of a new industry in Canada with LNG.

The Chair: Thank you.

Mr. McClure: Okay. Have a good evening. Bye.

The Chair: I'm now going to turn the meeting over to Dr. Massolin just to give us an update on the research that we had from the previous meetings. We had a couple of outstanding pieces.

Dr. Massolin: Yes, and I'll pass it in turn to Ms Zhang.

Ms Zhang: Thank you. The committee inquired about pipeline capacity and accessibility between Alberta and B.C. EnCana had said in their presentation that there were existing pipelines between Alberta and B.C. that could easily be reversed. But CERI in their presentation had said that those were not readily available, so we contacted them in an attempt to clarify those comments. We didn't receive a response from EnCana, but CERI did tell us that there are pipelines that exist between Alberta and B.C. such as the Alliance or the Gordondale pipeline. They currently flow from B.C. to Alberta. But they did not believe that they could be readily reversed particularly due to the increased production at the Montney formation. The Groundbirch pipeline, which is a bi-directional pipeline, had potential, but it currently only transports gas from B.C. to Alberta.

Furthermore, CERI stated that they believe that long-term drilling in the Montney will continue flowing more gas from B.C. to Alberta until LNG facilities are built, at which time CERI believes that B.C. gas will be able to supply that demand until 2022. In particular, they noted that the TransCanada Coastal Link pipeline appears to have the same capacity as the proposed LNG Canada export terminal in Kitimat, B.C., which Shell is a part of. So they concluded that Shell will likely fully contract to this pipeline, so Alberta gas will not be able to access that.

In the document that we provided to the committee, we also included a map of the current pipeline system in Alberta and B.C. If you would like more detail on that, you can take a look.

The Chair: Thank you. Was there any other outstanding research piece?

Ms Zhang: There was that request for that study on groundwater from ESRD, and we did inquire of them about that, and I believe, last I heard, that they had gathered the information and sent it up the chain for approval. We haven't heard back about that yet.

The Chair: Mr. Tyrell.

Mr. Tyrell: Yes. I inquired about that today and a few days ago as well, and it still needs to go through the approval process. It's somewhere between the deputy minister and the minister at this point. I'll continue to inquire, and hopefully we'll get that soon. That's where it is as of right now.

The Chair: Thank you.

Is everyone okay, then, with the status of the research? You've been seeing it on the website and shared. Thank you very much. It's a lot. These are some very technical questions.

I just want to do a reminder. We've got the Williams Energy trip this Friday, the field trip. That's at the end of this week, the finale to our legislative experience for 2013. I think that for hard hats and boots that drill has been dealt with. Mr. Tyrell was going to e-mail the itinerary again to people who are coming.

Ms Fenske and Mr. Khan, you're maybe going to meet us there. Is that correct? Yeah. Okay.

The pickup point is the driveway just east of the main Leg. Building and just south of the Legislature Annex, so I'm sure we'll be gathering around, and that will be interesting.

We also got an invitation to MEG Energy's facilities near Christina Lake. They came back to us with some dates in January. I promised you we would not have a meeting in January, so this is technically not a meeting. It's by invitation. You're all invited if you wish. They gave us some dates: the 13th, the 17th, and Monday the 20th. My sense was: the farther out, the better. So if I can put that out to folks, the 20th of January, and I'll let Mr. Tyrell contact you individually to see who's interested. It'll be something that's not mandatory, but if you're interested, you're welcome.

Is there any other business? Any other questions? Okay.

The date of the next meeting is Thursday, December 12, after the Williams field trip, from 12:30 to 1:30. The purpose of that meeting will be to not hear from anybody but you. We're going to talk about the report-writing exercise. The working group is meeting tomorrow in committee room B, and I understand that food will be provided, which seems to be very important to this group and to me as well. We'll be talking about the research document that's been put together by Dr. Massolin and Ms Zhang. That has been shared with members of the working group only. Once we have the meeting tomorrow, we will, I presume, be passing that on to everyone for their review. It's an awful lot of material. I was really happy with the way that you had created the first draft of that. It's a lot of material. I think everyone will find it to be something that they can move into strategic recommendations.

So, again, working group tomorrow. Thursday, December 12, from 12:30 to 1:30 to start giving direction to research on that report, so this is a first draft.

Would anybody like to move to adjourn? Ms Fenske. All in favour? Any objections? Carried.

Good night, everyone.

[The committee adjourned at 7:13 p.m.]

