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Markets in Transition | Episode 2
He Yiyong, Founder & CEO, LNG Easy

We continue our *Markets in Transition* series this week with He Yiyong, Founder & CEO of LNG Easy. David Greely sits down with He Yiyong to discuss how rising LNG supplies are spurring the development of retail LNG markets in China and developing countries – and how the pricing system for LNG needs to be adapted to meet the needs of these retail LNG markets.

He Yiyong (00s):
A larger amount of LNG is coming. I hope our industry collectively has the wisdom to make basic things right, so small guys like us can focus on penetrating LNG into the retail market.

Announcer (17s):
Welcome to SmarterMarkets, a weekly podcast featuring the icons and entrepreneurs of technology, commodities, and finance ranting on the inadequacies of our systems and riffing on ideas for how to solve them. Together we examine the questions: are we facing a crisis of information or a crisis of trust, and will building smarter markets be the antidote?
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David Greely (59s):
Welcome back to Markets in Transition on SmarterMarkets. I'm Dave Greely, Chief Economist at Abaxx Technologies. Our guest today is He Yiyong, Founder and CEO of LNG Easy. We will be discussing how rising LNG supplies are spurring the development of retail LNG markets in China and developing countries and how the pricing system for LNG needs to be adapted to meet the needs of these retail LNG markets. Hello Yiyong. Welcome back to SmarterMarkets.

He Yiyong (01m 29s):
Thank you very much for inviting me again.

David Greely (01m 31s):
Well, it's great to have you back on the podcast. In this series, which we are calling markets in transition, we are diving into the forces that are reshaping our markets and exploring what we need to be doing to make sure that our markets are fit for purpose. And the rise of LNG has certainly reshaped the natural gas market from a series of isolated regional markets into an increasingly global one. And now as LNG supplies continue to rise in the coming years, the question becomes how will these LNG supplies reshape energy markets in developing countries around the world. Many people argue that these LNG supplies will lead to the displacement of coal from power generation, much like rising supplies of natural gas did in the United States. However you see it differently and maybe that's a good place to start. Why do you see it differently?

He Yiyong (02m 24s):
Mainly because of economics, right. So gas in the United States is $2 plus minus MBTU. LNG today, you know, let's say $14, that's seven times of that. So it's just affordability issue. What natural gas has done in United States may not be able to repeat itself in developing countries due to a much higher cost structure for LNG.

David Greely (02m 49s):
And in the United States, Europe, Japan, Korea, natural gas has always been deeply connected with power generation. The Chinese market is very different. Could you describe the Chinese LNG market and how it developed for us?

He Yiyong (03m 05s):
Before I talk about that, maybe I just say something briefly about Japan. In the early 70s, you know, Japan has developed Indonesia, Malaysia and so on, and it was based on diesel replacement model. So they logically they fixed the price run about 14% of growing prices because at that peak value equivalent, LNG is cheaper than oil for power generation purposes. So Japan has never had any gas,

so it's always an LNG market that makes sense and then this market is model spread to Korea, Taiwan, Singapore, and so on. So now China, they have their first terminal in 2004 Dapeng Terminal. I think they had a very cheap LNG from Australia. I remember it's less than 6%. So even as 6% they brought the LNG to China, they quickly found out that he could not compete with Coal. So I think CNOOC and PetroChina really spend time to develop a alternative market for LNG, which I call retail market because that means the customers are not power generation companies, not fertilizer plants, not the other producers of something. So LNG is used by consumers directly at the final point of consumption in this sector. LNG is not competing with coal, it competes with LPG, diesel, gasoline, HFO and so on and that's why it has been successful because economics really work in China under this model.

David Greely (04m 32s):
And how big is this Chinese market?

He Yiyong (04m 35s):
I think, you know, it went as high, as big as the 30 million tons by truck and that's kind of the only way that LNG can really penetrate all the retail customers. The Chinese pipeline gas system, the Chung line takes seven steps down to the smallest distribution line and then wherever there is no pipeline gas network, they have the truck LNG. So basically within this system, LNG is everywhere. Every customer, no matter where they are, there is a way to reach them. They become really, really big. The main customers will not really power generation companies. The main customers are industry. There are two things in industry. One is distributed power generation. In some countries they are called captive power and then industrial heat processes you make furnace and boilers and then you have the commercial sector, you know, malls and hotels and restaurants. That's normally the domain of LPG, but they have kind of used LNG to completely phase out LPG in this commercial sectors.

He Yiyong (05m 31s):
And then they have the transport sector LCNG, using LNG as a source of feed gas for CNG stations and then they had the LNG fueling stations for trucks and long distance buses and finally they used LNG as a backup for pipeline gas network for the cities in laws of China, good gas pipeline connections but in the winter, the consumption is five to seven times bigger than the summer consumption. So the pipeline design is not enough to allow that kind of consumption. So they use a lot of LNG in the winter to inject. So that's kind of how the Chinese market works, which yes is very different from Europe and the US and Japan.

David Greely (06m 10s):
And how much more room does that have to grow?

He Yiyong (06m 13s):
I think there's kind of a, probably hitting a ceiling in China, it reached 30 million tons. Now it's going to 28 million tons. The reason is really because the network connections are getting better and better. Just don't forget one thing China does not expect high return on capital. So they are overbuilding all sorts of infrastructure. If there is a choice, they will lay pipeline for example, which is not necessarily a model for developing countries.

David Greely (06m 41s):
And why do you think this Chinese model of the truck market, the ISO container market, is the one that will play out in other developing countries?

He Yiyong (06m 49s):
For two reasons, right. On demand side, I still believe there is an added reason why LNG cannot be expected to play a big role in base low power generation because we used to have a competition for LNG in power coal, but now renewable is appearing in a picture. So if you look at Pakistan for example, has been such a rapid pit installation of rooftop solar. So cities like Karachi, they no longer had a low shedding, actually they have surplus power now they want to get rid of some power. I heard for example solar has also done similar things in South Africa. So South Africa has 160 days without low shedding because of solar. LNG used to have one competitor, which is coal. Now you had two and the second one is carbon free. I think the logic of why LNG is successful in China is even more prolonged in developing countries.

He Yiyong (07m 42s):
So that's one thing. The other thing is really all developing countries use a lot of liquid fuel. Most people don't realize how expensive liquid fuel is in most of these countries. So our calculation of the market survey around the world would be something like LPG 17%,

18% of brand HFO would be 22%, 23% of brand. These so is 26%, 27% of brand gasoline is about 30% of brand. So you see if you can buy bulk LNG at 10% or 11%, whatever, there's a large arbitrage between LNG and crow delivery because all these liquid fuel are so developing countries do not have the capacity to build large scale pipeline. China is different. They all build everything, high speed train, network pipeline, electricity, transmission legwork, blah, blah, blah. Everything. Most developing countries barely had enough to eat. They're suffering object, energy, poverty, the truck model is a faster model and less capital intensive.

David Greely (08m 41s):
And you mentioned Pakistan and South Africa. Are there other countries where you see that model being adopted today?

He Yiyong (08m 47s):
Bangladesh is another country where very limited pipeline infrastructure, they use a lot of gas for power generation, but they're finding the pain of switching the gas to LNG because business model really rely on a national market maker in Bangladesh it's called Petro Bangla, but the humongous the loss was like $5 million out of a FOREX reserve of $26 billion in 2023. So you can see LNG in import is a highly, highly heavy burden on the country because of the subsidies that they have to give just like Pakistan, Bangladesh use a lot of liquid fuel, LPG, a lot of diesel, a lot of HFO and so on and so that's where LNG will find very good economics.

David Greely (09m 32s):
You've said in China there is a very strong willingness to build infrastructure. I was curious what infrastructures needed to support the growth of this use of LNG and how rapidly is it being built not only in China but in these other countries.

He Yiyong (09m 47s):
I think this is not a bottleneck. They, you know, for simple reason LPG is everywhere in the global south, what do you need to consume LPG. So you need a truck because most, there's a mothership, daughtership, the daughtership comes to port, off load the trucks and then the trucks go to a consumer which has storage facilities and all re-gas facilities. In the case of cardiogenic LPG also there are, you know, pressurized LPG. So you have to reduce the pressure before consumption. So the whole chain is there and for LNG, it needs kind of almost exactly the same chain except that the equipment has to deal with minus 160 degree. So it is a fractionally more expensive. But you know, there are many, many advantages. I real obstacle is I think hybrid pricing model because LGA large part of it is not priced according to heat equivalent.

He Yiyong (10m 42s):
It generates all sorts of hurdles for a retail distribution model and the way that China is resolving this is because they had large national market makers like PCL, Petro China, Sinopec, CNOOC and then hosts of second tier guys and they also had a lot of pipeline gas import and domestic gas reduction. So kind of the even out the price impact. But if you had a country where it's kind of a poor country where is relying on 40% of LNG import in the gas mix, that's a very, very difficult proposition. I think the bottleneck is really not in infrastructure because LPG diesel, HFO, all this would need storage as aside and some kind of processing equipment as such. One more thing you said how much it can roll down, right, so three, six months.

David Greely (11m 32s):
And so I wanted to get into the pricing aspect of it. Where do you see the obstacles of how pricing is done for helping these retail markets grow?

He Yiyong (11m 41s):
I'm looking at it from a really bottom up level, right. So our hands are always dirty because we are plugged into these countries and then we are looking up, you know, see what should be done and the time will come when LNG is over supplied, then the producers or the traders would listen to us more. At the moment I think it's difficult because they are, it's kind of a sort of a tug of war for a retailer, the best pricing formula is a slope to CP. CP is contract price published by Saudi Aramco for LPG. All the buyers in the world for consumers of LPG, they can say I'm Myanmar so I will therefore I'm $120 plus CP. I'm Vietnam, Vietnam is a $90 plus CP. The Chinese terminals are because they can allow large ships, they say okay, we are $60. So there are traces between a big Chinese terminal in Vietnam, so China buys it for CCP plus 60 and they are shipping it to Vietnam for CP plus nine.

He Yiyong (12m 42s):
So this whole system is really logical. If we had a slope on the hit equivalent basis for LNG, we can win because LNG is a inherently better fuel because what all of the safety accidents you hear about the natural gas, but 99.99% is LPG is never LNG is very safe in

strength, cyclically safe and then you know, it has less emission, you know 15% less has less of the non CO2 emission and all that. But first and foremost we are at the 400 million tons of LNG today going to 600 million tons. LPG is a product of refining as a byproduct. Of course in the United States there is some associated gas as well. But this stop is not growing because crew production is not being invested, let's put it that way because Exxon recently pulled out a big study saying that the natural depletion rate of crew is 18% instead of seven 8%, which is normally protected by people.

He Yiyong (13m 42s):
So you had a shrinking crew stop and then therefore you had a shrinking deliveries market but you had a growing LNG pie. So it's natural that LNG should grow in more and more competitive, but at the moment it's very funny. I will give you an example. JKM is $13-$14. In terms of brand slope is 18%, but how do you compete as a LNG bunkering player with 18% slow? Because in Singapore, bunkering is priced at 115% of ultra-low sofa fill. So that works on a slope of maybe 13%, but now suddenly in the spot market the slope has increased to 18-19%, which means LNG as a shipping field is our way and the ship owners look at only economics. So for them is a pure hit value equivalent. Once the calculation doesn't work, they go this way or that way. Very simple. So that's a perfect example. We have a lot of LNG growing, a lot more coming but we had a very high slope at spot market at the moment. So unless you are buying a 12% brand at a long-term contract, then you can continue to offer your LNG to the LG bunking market, but otherwise you can't. That's one example of why the pricing system is hindering the expansion of market share for LNG.

David Greely (15m 02s):
Yeah. And when you said you would like to be able to price relative to like an LPG price, is that a similar logic to what you brought up with what Japan had done many years ago of saying, hey, we are trying to get people to replace diesel with gas for power generation, so we are going to price the gas coming in as LNG relative to the diesel that they are currently using and so similar logic you are trying to displace LPG, so price, the LNG relative to that?

He Yiyong (15m 31s):
So hit equivalent between crew and LNG is about 16.5 17%. So at 14% it gives good incentive to switch to LNG. That's the logic and I think if we are at the verge of a new era in LNG and people had the producers, all the market makers here today should really think about new benchmarks or you can have a 100% spot market. I think the trouble now is really you had maybe 65% index to oil and then you have 35% spot and the sport is driven by TTF, which is the original gas hub price. That is the difficulty. It's of course if you had a big book you can trade your benefit but if you are a small consumer it is not going to help you by the time we speak. I just looked this up, we had about 180 players in LNG. That is not a liquid market.

He Yiyong (16m 20s):
Not at all. You can't increase, you would like to go to a diesel selling situation where you have thousands of buyers and you go to LPG, maybe you had at least you know 300 buyers. 180 buyer is not a liquid market and most of these players are concentrated in China, Japan and a few certain countries. Let's say you had 30 players in China, that's one country and then you take them out, you are down to 150 plan, the market is non-liquid enough today it was designed for wholesale market pontoon and I am of the belief that point to point market is kind of coming to a another that and end, but I think it needs a new market to help it along, especially if we had to absorb all the new volumes, then the market had to kind of go into a break bowel smaller player mode liquid to liquid distribution or you know liquid fuel replacement in the retail market. If my market we always right, pricing has to kind of change somehow.

He Yiyong (17m 23s):
Yeah and I wanted to ask you a little bit about some of these connections between the broader LNG market, which to a large extent was designed to kind of support LNG to a pipeline to a power generation station, you know, whether it was in Europe, Japan, Korea, Singapore, etc. What do you need to do to be able to allow this retail infrastructure to plug into in some sense this infrastructure that was built for kind of a different purpose in a way you mentioned like mother daughter ships and how difficult is that to make those connections?

He Yiyong (18m 00s):
I think the main thing is that you need to land LNG in liquid for, because at the moment we had online term those and we had FSI use FSI use would work perfect for a pipeline model. For example, Bangladesh, the FSI use are 15 kilometer away from shop impossible to send LG to shop because more than three kilometer pipeline, it make it almost impossible to handle with the pressure loss and all that. This fundamentally how does, where did LG come from, gas is $2 in the United States we spend you know, 115% and we hub to pipe it

towards like perfection plant and then we spend between $2.5 to $3 make it into LNG and including the storage facility and then we can sell it on FOB basis. So it would take $2 to Asia, one and a half dollars to Europe, something like that, right?

He Yiyong (18m 48s):
If you are going to sell it as a liquid, then you don't remove anything because as a liquid it has mobility premium, it has storage premium because LNG is only the size of LNG strings 600 times compared to gas, right. So impossible to store gas you can store LNG. So by reassessing the LNG back to gas, you lost that storage premium right away upon arrival and you lost the mobility because then you are limited to pipeline. If the customer is 10 meter away from pipeline, you know, tapping PO is not cheap. The injection point is not cheap. We were just talking to somebody in Malaysia, they are saying one injection point is $1.25 million one injection. So okay, you know maybe 500 meters it doesn't really matter. But the point is that it takes the mobility away from the gas when you turn it. So I think the key issue is really not the infrastructure all this because all the liquid fuel people are used to it. These people are used to trucking diesel around people are used to consuming diesel. LPG is a liquid fuel, it's a product and therefore a liquid fuel gasoline is a liquid fuel. Just keep the LG in liquid form you will do really, really well. My company has a patent on the technology which we are applying for a US patent production on that. So IP protection. So just keep it in the liquid form.

David Greely (20m 12s):
And is it difficult at all to keep it in liquid form when it's going from one of these massive LNG tankers and then you are trying to get it down into these smaller units that you can put on a truck?

He Yiyong (20m 24s):
The Chinese on-land terminals, I think in Tianjin for example, there is one receiving terminal I think 250 truck loading base. So every day they can load massive amount of trucks and that's where the LNG importers in China make money because they get much higher margin from selling LNG than selling pipeline gas and they have let you in a secret. The difference between LNG and pipeline gas is $4 in China and it's much higher in Europe because TTF is what it is. But if you are driving a LNG truck in Europe, you go to a pump, you buy the LG as a fuel for your truck, it costs more than $20. So in Europe the gap between LNG and pipeline gas is more than 10. So now India is developing rapidly. You ask which country this model would be suitable. India is developing nicely along this way.

He Yiyong (21m 14s):
And if you look at these countries including India, that could take a LNG as liquid fuel replacement for LPG, how big a market do you think that could be eventually?

He Yiyong (21m 26s):
Basically, you know, in all the poor countries, what do they use, they use LPG, they use firewood and they use animal dung. So animal dung and firewood is terrible, terrible for the environment and terrible for health. It's just kind of absolute worst stuff. I mean you can look this up any the UN website and they're trying to fight it. I am not talking only replacing LPG, you know, let me get back to Pakistan. They import about 1.9 million tons of LPG, but the total liquid fuel market is 20 million tons. Our calculation is 37.5 million households in Pakistan. So average we say, you know, they use very low figure compared to the Chinese figure, let's say 12 to 15 MMBTU per year. That's really, really low, low figure. We are talking about 7 million tons market for rest. So it's not small because Pakistan now imports about 7 million tons reduced from 9 million tons for power generation for fertilizer plants and for some privileged connected housing societies. But the trouble there is really when you had a country like Pakistan, Bangladesh, Thailand, gas rich market, initially the pipeline gas is always $2. So now suddenly you are asking the customer to pay like six times. So what the heck, you can see the indigestion right there, right. So I turn the question many US producers, they kind of promote a certain point of view. I always ask them, imagine US consumers need to use $12 LNG. Just imagine that.

David Greely (22m 59s):
It's hard to when we have prices that are $2 and in some areas that went negative recently.

He Yiyong (23m 05s):
What about inflation rate one about hardship, everything in essence LNG sellers asking developing countries to do it's hard. China has won a third way and is successful and therefore I think the developing countries will, especially the big populations like India, what 1.4 billion people, very congested Bangladesh, 170 million people Indonesia 170 million with Vietnam 100 million, Pakistan, 240 million. These guys should take this model because if we are lucky to replace 10%, 20% of the liquid fuel with LNG, we will have much less CO2

consumption will be much safer. We will take a lot of the knocks and SOS away and financially everybody's better off that. I think that's the kind of the deal.

David Greely (23m 55s):
And I wanted to go back to a piece on the pricing with you and you talked about at the retail level having an LPG plus kind of pricing model would work well, you know, if you look at how the LNG on the tankers is priced soften index to a legacy benchmark like A TTF as you mentioned or even a brand, how do you see the pricing system for LNG on tankers needing to evolve?

He Yiyong (24m 20s):
I think again, hit equivalent is the most logical. That's how Japan started. I think the trouble is really, let's say before the sport market, it was a 100% crew indexation based on value equivalent. That is a sense that that's a world that makes sense. That's the classical world, but the whole world is pushing to one sport. For the very recent that power generation has ceased to be a base load business for LNG to power. If you look at the European system is an auction system with a supply curve. So you know, the first two kick in is always the solars and you know, the nuclear, the hydro, you know the wind and then finally you had the most expensive part of the supply curve kicking in that's gas/LNG. It's a marginal based supply, therefore how do you sign a long-term contract?

He Yiyong (25m 11s):
And then the other important market for Europe, which is the hitting market, there's hit pounds, there's electrification and all these things happening. So the heating part of it is becoming less important. So let's move to a developing country. The base law concept also is difficult because base law basically means that the government has to commit to a certain rate for the power $0.12 cents $0.10 or whatever, $0.12 power. Basically you need $9, $10 a DES basis and how does it work out today? It can't. So you know, I think, you know, from my point of view, it seems that we are going to a spot market more and more. We need to arrive there quickly and then we should have a genuine LNG on water pricing system. So everything is marginally cost. That is a better system than the current hybrid system. Also because current LNG prices basically driven by TTF, which is a regional gas up price.

He Yiyong (26m 15s):
I cannot emphasize this enough, A lot of people try to confuse this subject, but I said, okay, gas is water, LNG is ice. How you make ice from water, a lot of power, different supply chain, different storage method. So don't tell me ice and water should have the same pricing. This is a very fundamental point and maybe people try to kick the can down the road, but we had to face it because LNG and larger amount of LNG is coming. I hope our industry collectively has the wisdom to make basic things right. So small guys like us can focus on penetrating LNG into the retail market. We are always lost because, you know, we don't know what to say. I mean, I'm not a stupid guy, but I'm not a PhD on pricing. Even if I'm a PhD on pricing, I don't have the financial means to hedge all these things, then maybe the answer is not using it. We continue to use this so we continue to use LPG and so on, right? It's a very, very fundamental obstacle I will say.

David Greely (27m 19s):
I wanted to thank you for sharing your thoughts on this market with us, how it's developing, what it needs to develop further that ability to have a more on the water pricing system and I wanted to take a step back with you and say, if we get the infrastructure right, if we get the pricing system right, what do you believe the LNG market could look like in 20 to 30 years and what do we need to be doing now to get it there?

He Yiyong (27m 45s):
If those two conditions are right, I think LNG will sell itself because fundamentally is a very good fuel. It's the best fossil fuel. It beats coal in terms of emissions, 25% saving against diesel. So 15% saving against LPG, no Nox and so, I mean this is the main pollutants in cities, supply and demand. I think, you know, fundamentally, I think this will be more LNG reservoirs, crude deliveries. Everything we do its own work. It will be a tower, you know, the energy will flow by itself. I think we have a crop system now the reason is LNG has a point-to-point arteries. This is what we have arteries, but you need to find wanes to penetrate the body, the human body. We have all these small little connections so blood can go into the whole body. This is what we need now and the current pricing system actually prevents building this up because if you build that up and then you know you always cool because you know your slope is our way or something, and then you, you have six months, you can't sell against LPG. Nobody would put money down because on a heated value basis, we are good. Price is good, everything is good, that intrinsic value is there. But I think seriously pricing is a very, very, very important issue.

David Greely (29m 06s):
Thanks again to He Yiyong, Founder and CEO of LNG Easy. We hope you enjoyed the episode. We will be back next week with another episode of Markets in Transition. We hope you will join us.

Announcer (29m 20s):
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