

alphaDIRECT MANAGEMENT SERIES

AUGUST 7, 2018

IN FOCUS: AN OVERVIEW OF LICELLA HOLDINGS LTD, ITS CORPORATE STRUCTURE AND MARKET STRATEGY.

This report focuses on Licella Holdings Ltd and provides an overview of their technology, corporate structure and market strategy.



Cat-HTR platform reactors at Licella's large pilot plant in Sydney, Australia. Source: www.licella.com.au

THE alphaDIRECT INSIGHT

Licella is a global leader in hydrothermal upgrading with its trademarked Catalytic Hydrothermal Reactor (Cat-HTR) platform. Through its unique partnership strategy, Licella is focusing on helping its partners fully leverage all aspects of their business by utilizing its proprietary Cat-HTR technology to convert low value products and waste streams into high value products, such as stable, non-acidic biocrude that is equivalent to conventional oil. We believe that Licella is a commercial pioneer in this technology and once the company's first commercial project goes into production during 2019, the platform can be used to convert a variety of different feedstocks into high value products. With a capital light licensing and royalty model, Licella will be able to offer their technology solution to other partners and pathway to broader commercial adoption by a variety of industries.

Licella Business Snapshot

HQ: Sydney, Australia

Founded: 2005

Full Time Employees: 28

ADA Sector: BioEconomy

Website: www.licella.com

*As of August 3, 2018



About alphaDIRECT Advisors

alphaDIRECT Advisors (ADA), a division of EnergyTech Investor, LLC, is an Investor Intelligence and publishing firm that creates and implements digital content and programs to help investors better understand a company's key drivers including industry dynamics, technology, strategy, outlook and risks as well as the impact they could have on the stock price. ADA's expertise encompasses a variety of sectors including Clean Transportation, Emerging EnergyTech, Energy Services, Smart Buildings, Solar, Water Value Chain and Industrial. ADA was founded by Wall Street veteran and research analyst, Shawn Severson, after seeing a significant shift in the investment industry that resulted in less fundamental research conducted on small cap companies and a significant decline in information available to all investors. ADA's mission is to bridge that information gap and engage companies and investors in a way that opens information flow and analytical insights.

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Participants

Dr. Len Humphreys, PhD
Chief Executive Officer
Licella Holdings Ltd

Dr. Len Humphreys was instrumental in the conception and development of Licella's technology and is the inventor of a number of patents around the Catalytic Hydro-Thermal process, Cat-HTR. Len is a chartered chemist and the former Director and Managing Director of several renewable energy companies including Novera Energy, a renewable energy company now listed on the AIM in the UK and also the ASX listed company IBA Health (now I-Soft), a healthcare IT software provider. In addition, Len held Managing Director and Regional President roles inside the European Invensys Group of companies. Invensys is one of the world's largest IT, process control and industrial process automation conglomerates. In Europe, Len was a senior executive inside the Mannesmann Group, the German multinational specializing in engineering, manufacturing and telecommunications; in particular he was CEO of the Hartmann and Braun process Analytical Division based in the UK.

Mr. Shawn Severson
Founder and CEO
alphaDIRECT Advisors

Mr. Severson is the founding partner and CEO of alphaDIRECT Advisors (ADA). He has over 20 years of experience as a senior research analyst covering the technology and cleantech industries. Prior to founding ADA, he led the Energy, Environmental and Industrial Technologies practice at the Blueshirt Group. Mr. Severson was frequently ranked as a top research analyst including one of the Wall Street Journal's "Best on the Street" stock pickers and multiple awards as Stamine's top three stock pickers.

ABOUT LICELLA HOLDINGS LTD

Licella™ is the global leader in hydrothermal upgrading. Hydrothermal upgrading is widely accepted as one of the most likely production pathways for producing advanced drop-in biofuels at scale.

Licella's proprietary hydrothermal upgrading platform, the Cat-HTR™ (Catalytic Hydrothermal Reactor), has been extensively tested and conservatively scaled up at the world's first large scale continuous-flow pilot plant. The Cat-HTR™ platform rapidly and economically converts low value and waste feedstock such as biomass residues, End-of-Life Plastic, used tires, used lubrication oil and lignite, into a stable biocrude or synthetic crude oil, which can be refined using conventional refinery infrastructure to a range of sustainable fuels and chemicals. With over AU\$75M invested already in the Cat-HTR™ platform, is the technology is now commercial-ready as Licella work with its strategic partners to build the world's first commercial-scale hydrothermal upgrading plants.

For more information, please visit:
www.licella.com

View a short video on Licella and the Cat-HTR platform at:
www.licella.com/our-story



Dr. Len Humphreys, CEO, Licella Holdings Ltd.

Shawn Severson: First, I'd like to thank you, Len, for taking the time to speak with us today. Today we'd like to cover an overview of Licella and a review of the corporate structure and market strategy. However, before we dig into the business, could you start by giving us a brief introduction of yourself?

Len Humphreys: Sure, Shawn, I'm delighted to. My name is Len Humphreys. I am originally from the U.K but I've been in Australia for about 22 years now and my background is as a Chartered Chemist. I have a PhD in Organic Chemistry from the UK and I've always been involved in high tech at very large corporates as well as a leader of technology development and globalizing technology and also applying technology in a lot of inventive ways. So, I guess I followed my dream and here I am with Licella today.

Shawn Severson: Thank you very much, Len. Can you provide us with a general overview of Licella - who you are, what you do, etc.?

Len Humphreys: Yes, of course. Licella is a global leader in a particular type of technology which we like to call platform technology and it's been the field of hydrothermal upgrading and we call our platform Catalytic Hydrothermal Reactor (Cat-HTR), which is our trademark that we use. So, what does that mean and how does it compare and contrast to other approaches? Before we go there, let's look at what our rationale is and what we are trying to do in our business model. We

are working with our partners globally and with an array of different feedstocks. The commonality in those feedstocks is that the business model of our partners is generally in distress or it's reaching its old age and needs some revitalization.

Licella tries first of all to complement our partners by taking certain product streams that they produce in their normal processes that are low valued or may have actually become waste. We then apply our technology, which we'll come back to in a minute, to convert the streams into high value products that our partners can then sell. So, let's go back to the technology.

Our focus is Hydro-thermal upgrading. You might wonder how that compares and contrasts to either methodologies of converting biomass waste, low-grade coal, 'end of life' plastics, or 'end of life' tires to use as raw material for high grade chemicals. Some may have heard of some of the older techniques like gasification and pyrolysis.

Both of those techniques are dependent upon just using a hammer, like heat, and in the case of gasification, converting the molecule back to gas and gluing the molecules back together from the gas to create something liquid that be used as a pure organic chemical. The case of pyrolysis is simpler - they try and crack the bigger molecules of these residue materials to create an oil. The problem with pyrolysis is that it's a reaction that can get out of control - you've created a lot

of ash and charcoal and ultimately convert biomass by pyrolysis, it's high in oxygen and unstable to ship.

So, our approach is hydro-thermal which is a much milder approach of taking these residue molecules, 'end of life' tires, 'end of life' plastics or biomass and mildly unpolarizing and unzipping them in the presence of near supercritical water. This is very mild compared to pyrolysis and gasification and hence you don't get the runaway reactions. In simple terms, this means that you get a much higher conversion rate from the feedstock to the oil and compared to pyrolysis, the products we make are stable. We get a stable bio-crude with a lower oxygen at a higher yield compared to retaining the carbon. In summary, it's all about retaining the carbon in a feedstock and making sure that that carbon represents itself in the final product.

That's a brief overview of what we do, how we compare the gasification and pyrolysis and what the technology does.

Shawn Severson: Thank you, Len, that was very helpful. Can you talk a little bit about Licella's corporate history, 2005 to current?

Len Humphreys: Yes, sure. Thomas Maschmeyer, myself and Ian Maxwell, who came over from Shell Catalyst, started the company in 2005 as a group. We saw a lot of people trying to use Hydro-thermal upgrading, but gave up because they started with a solid and

ended with a solid. Thomas and I got together and worked out how to start the process and what everyone else were doing wrong. When Thomas and I got together in 2005-2006, we addressed what needed to be done differently, which resulted in Licella. In 2007, we started to build the first continuous flow, the catalytic hydrothermal upgrading unit, which we call Gen-1.

In 2008, we raised 8 or 9 million dollars and we were going to build the first Generation One, called the Cat-HTR. The Cat-HTR went online in January 2008 and during that time we also formed two separate companies. The first company we formed was called Ignite Resources and the main purpose of the company was to look at upgrading low rank coal to high grade meteorological coal and oil. Additionally, we separately formed Licella to use the same technology on the Cat-HTR and to focus on everything that wasn't low rank coal, brown coal, or biomass, 'end of life' plastics, etc.

During 2009, we were getting rather busy so we merged the brown side and the Cat-HTR Lignite together and hence, Licella as it is formed today came into life. In 2010-2011, we received various awards and raised a significant amount of money to build Generation 2. Generation 2, 10x the scale of Generation 1, came into life in 2011. We were then awarded numerous commercialization and acceleration grants in Australia which we successfully executed, resulting in Generation 3 which

is 10 times Generation 2 and came to life in 2012.

Most of our partnering started around 2011. During 2016, we linked up the most partnership of significance with Canfor Pulp, one of the world's largest pulp companies based out of Prince George, north of Vancouver, Canada. We are integrating the Cat-HTR where we take their hog waste, or material they don't use, and use that fiber and convert that to biocrude and integrate Cat-HTR into their KRAFT pulp mill. During 2017, we partnered up with Armstrong UK to use the Cat-HTR to chemically recycle 'end of life' plastics and 'end of life' tires, which brings us up to date.

The first commercialization of the technology will be focused on 'end of life' tires and 'end of life' plastics with our partner, Armstrong, at a worksite in the UK which will come online during 2019. Once you commercialize the platform itself for one type of material, such as the 'end of life' plastic or tires, you can use the same general platform for commercialization for applications as well.

Shawn Severson: Thank you, Len. Partnering is clearly a major part of the business model and also seems to be a key aspect of sourcing the feedstock strategy. In terms of your business model, can you expand on the importance of the partnership strategy and in particular, what is unique about your feedstock strategy?

Len Humphreys: Sure, Shawn. Let me give you an example of each of the two joint ventures, starting with the biomass. In the processes in creating pulp, everything else in the biomass feedstock is waste, residue or low value product. These bits of the tree that are not qualified enough to be made into the chips that can go into paper are called the hog waste or residual. The tree is put in the hogger which is like putting a big tree into a pencil sharpener and everything that comes off, the branches, the leaves and the bark is called the hog waste. So, we focus on the hog waste which is traditionally used for low grade fuel but we use it to make high grade chemicals and high-grade fuels as well.

In the backend of this process we produce a number of bi-products as well and take this material forok, use for the Cat-HTR along with the low value residues from the front end. So, we are complementing our partner's business models and improving the efficiency of the process by taking some of the biproducts materials from the backend and creating new revenue stream and increasing the efficiency of their core business. That is an overview of the biomass type approach that's particularly used together with Canfor.

When we go to 'end of life' plastics, and 'end of life tires' in the UK, the novelty there is around the word 'end of life'. End of life means that during the recycling process there are plastics that you just can't recycle anymore. Normally they would go to landfill and would just create

potential environmental issues. What we do is take 'end of life' plastics and convert them back to chemicals and do chemical recycling. We compliment physical recycling with the chemical recycling of the bottle parts and the plastic trays and pots what can't be recycled. As a result, we're adding to the global recycling economy by adding a picture called chemical recycling of the plastic to the physical recycling. This is something that companies around the world can't do on their own and this is the novelty around the feedstock and how we're trying to drive a lower carbon future in a safer environment both in chemical and physical recycling.

Shawn Severson: Thank you. That was very helpful. Now let's talk a little about the end products and really what we're looking at in renewable biocrude as well as talk about some of the properties that are unique like pyrolysis oils and other products.

Len Humphreys: Sure, Shawn. Let's talk about biocrude - you can take pyrolysis and you can add the residues that we were talking about from the kraft pulp mill and put the solid residues through a pyrolysis device. But the biproducts would be destroyed by the pyrolysis process. Cat-HTR does not destroy these by products.

Let us go back to the residue that you can put into the pyrolysis machine which is the hog waste and some of the work chip residues. The biocrude created from

pyrolysis compared to a biocrude created from Cat-HTR contains a lot more oxygen meaning that it's heavier and that the oil is unstable since the oxygen means that all those molecules get back together again to have a party and form of solid.

Generally, pyrolysis is an acidic biocrude and it's unstable. And if you want to take that biocrude and integrate into the refinery, the refinery will need to take out that residual oxygen to make a final hydrocarbon fuel it's much more difficult to take that to refinery because A, transportation is difficult and B, you have to have a lot more hydrogen in pyrolysis oil to take out all the additional oxygen in there resulting in a more expensive to process. C is the conversion rate - we have a much higher efficiency of converting the import wood to a biocrude because we do not produce a lot of char in the middle, so we have a higher yield.

Shawn Severson: When do you expect the Cat-HTR technology platform to be commercially ready and how would you categorize the commercial availability for investors?

Len Humphreys: The good news is that the platform, once commercialized for one particular feedstock, is the same basic platform that works for all the different feedstocks. As I mentioned earlier, the first commercial project goes into production in 2019. The large industrial complex will use the application of chemical recycling of 'end of life' plastics back to oil.

Shawn Severson: Great, thank you. What would you say is your main competitive advantage and who would be competitors in the market today? Is there anyone with similar technology or someone that can achieve similar results in terms of biocrude, etc.?

Len Humphreys: I guess it goes back to looking at ways of converting a biomass into a biocrude. There is gasification which is very expensive and has a low conversion rate and the pyrolysis that is unstable and has inefficient power. Therefore, we are the real commercial pioneers and recognized as the leader in hydrothermal upgrading.

Now that we've explained to the world in 2004-2005 how hydrothermal works, it's great to say we have a few imitators and copiers but our greater advantage is that we'll be the first people in the world to commercialize hydrothermal upgrading.

Shawn Severson: Let's discuss your offtake partners in your long-term strategy. Can you explain your license and royalty income and how you connected with your offtake partners?

Len Humphreys: Once we have the commercialized platform ready in 2019, our model will be similar to the one with our current partners, Armstrong and Canfor. We will be the first to be commercialize in the UK and we look toward the licensing and royalty model by offering the initial license and royalty fee

to other parties to use in their processes. The model will be an upfront license fee combined with a royalty based on revenue which is a capital light model. Once we've done the basic heavy lifting of the commercializing in those fields, we roll forward with the capital light model and will look to other partners to license the technology and to pay royalty based on revenues around the world. This will be a geometric progression of income.

In terms of offtake partners, the exact percentage of those licenses will be available dependent on application and location. Our primary geographical market will be North America with the stimulus of the well-established RINS system where we are qualified and which puts the emphasis on the refiner or blender to comply with the REN obligations.

In California, regulations are coming together to pay some of that to the California system where their obligation would be on the blender, refiner and user as well. So, the markets we're working in are very stimulated toward the adoption of the products we make, whether it's a biocrude from biomass or a product from the chemical recycling of plastics.

In addition, geographic domains like China will be quickly behind because President Xi is now working hard on the environmental credentials of China and we're getting a lot of adoption from the Chinese government of this low carbon

emissions to start chemical recycling as well.

We're also talking to a lot of oil companies in Europe to cut their obligation in terms of the renewable energy directive that comes from the member states. The partnerships in Europe will largely be with refiners and we are in advanced discussions with the refiners in Europe for offtake for the first project in Wilton. We anticipate having a very significant announcement in the not-too distant future with a very high-profile participant who is a major refiner and is established in the world of renewable fuels as well.

Shawn Severson: I know we've discussed this a little bit already, but I wanted to talk about the two specific JVs, Canfor and then move on to Armstrong. Beginning with Canfor, how did that relationship evolve for integrating the Cat-HTR platform into pulp mills? Do you intend to take that strategy to other customers or partners in the pulp or lumber industry?

Len Humphreys: Let's start talking about how the Canfor relationship came together. The company is in a strategic review of their core businesses and they worked out that they needed to have some form of disruptive technology and a way to deal with their low value residues. Because of the concern that the world is moving away from paper and toward electronic devices - your iPads, iPods, your Samsung - we decided to scan the world to look for technologies that were at or near a commercial state and could be

utilized in their ambition to take some of their residues and slightly change their business model in order to have a new product offering.

Within two and half to three years of global review, Licella got involved and we came out on top of the pile having the most respected technology. We were able to provide Canfor with some of the best advantages with their residues and integration of their craft mill since the joint venture was formed and we're now moving on to the commercial pathway.

There are hundreds and hundreds of craft pulp mills around the world that have similar challenges to Canfor, such as many in Scandinavia, as well as major U.S, Canadian and Asian participants that are looking to utilize the same technology. Licella's focus and objectives are to make the processes more efficient and to provide our partners with a new revenue stream. We are very proud to say that we have no shortage of uptake and no shortage of partners.

Shawn Severson: Before moving on to Armstrong, in terms of the technology aspects, I'm curious to know what you learned as you were conducting these joint ventures and working with the joint ventures partners. Are you going to be able to share or market the data from what you learned through this process to other potential customers?

Len Humphreys: What we can share is the actual outcomes: the latest conversions,

the yield we make as well as show the quality of the oil, the upgrading pathway and we can demonstrate the economics. We have quite an advanced techno-economic model that we pass through with a decade of trials, providing our partners with ready designs, proof of construction, operational manuals, as well as techno- economical models that demonstrate the financial and technical benefit of our technology not just by itself but in comparison to other technologies as well. Because we have a full suite of technological models with results and outcomes to share with potential partners, this makes it compelling for them to adopt this approach.

Shawn Severson: Thank you and moving on to Armstrong, can you give us some background on them and the evolution of that relationship?

Len Humphreys: Armstrong Energy is actually one of the largest renewable energy players in the UK with a very large portfolio of managed projects and finance in the U.K and across India as well. Their business has always been developed in renewable, sustainable technology and one of the key managers and the founders of Armstrong is an early investor in Licella. He believed in us and our technology. We have maintained a long relationship with Armstrong and we recently got together with them to look at what would be the most logical application for the initial platform in the U.K. The answer is 'end of life plastics,' and 'end of life tires'. So, we developed the

thinking of the application with Armstrong Energy in the UK and formed the joint venture by creating the commercial unit in the UK.

Shawn Severson: Lastly, what do you consider the biggest risks or challenges to the business today as you scale and move towards commercialization. What are the biggest external and internal factors that you think that investors need to consider?

Len Humphreys: That's a great question. I think we actually asked ourselves that same question about six years ago and the answer was that we needed diversity. We didn't want to be dependent on one particular feedstock or on just one brand of biomass. We therefore became involved in a brand called Lignite and also looked at diversity into 'end of life' plastics and 'end of life' tires.

What we have tried to do is to make our general business model robust and enduring to have a wide cross section of feedstocks that we can use. So, if the platform was a true platform, it could take biomass, brown coal and Lignite to get a high-grade coal and oil and also 'end of life plastics,' 'end of life' tires. We tried to make sure that our model was robust so that if something happened to the coal sector we could flex our model to focus on biomass and the future because many countries are looking at converting biomass to high grade chemicals and oils.

We did flex our model to look at the new genre which is a circular economy by

looking to how we could fit in with physical recycling and hence, we used the platform for chemical recycling. What started five or six years ago as we took a step back and looked at this exact question to ensure that our model was robust and that we satisfied the commercial risks, it resulted in our current platform with a massive diversity of feedstocks and are not singular-point dependent on one partner.

We've talked about Armstrong which is one partner in one particular feedstock and we've talked about Canfor, which is one partner in another particular feedstock. We're developing partners in Lignite and have worked with one of the largest refiners called Idemitsu. In conclusion, we have a very diverse group of partners and are not singularly dependent on one although we love them all and appreciate them all. Our business model is weatherproof.

Shawn Severson: Great, thank you very much for your time today, Len. It's been a great introduction to Licella and we're definitely looking forward to additional subjects and conversations with you.

Len Humphreys: Thank you, Shawn. We appreciate it.

SHAWN SEVERSON FOUNDER AND CEO

Mr. Severson founded *alphaDIRECT* Advisors (ADA), a division of EnergyTech Investor, LLC, in 2016 after seeing a significant communication and information gap developing between companies and the financial community. Mr. Severson has over 20 years of experience as a senior research analyst covering the technology and cleantech industries. Previously, he was Managing Director at the Blueshirt Group where he was the head of the Energy, Environmental and Industrial Technologies practice. Prior to the Blueshirt Group, Mr. Severson was at JMP Securities where he was a Senior Equity Research Analyst and Managing Director of the firm's Energy, Environmental & Industrial Technologies research team. Before joining JMP, he held senior positions at ThinkEquity, Robert W. Baird (London) and Raymond James. He began his career as an Equity Research Associate at Kemper Securities. He was frequently ranked as a top research analyst including one of the Wall Street Journal's "Best on the Street" stock pickers and multiple awards as Stamine's top three stock pickers.



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