The refined approach

Once the exclusive domain of supermajors, fuel refining is now attracting a handful of juniors companies targeting niche opportunities. By **MARK STORY**

With a transport fuels production shortfall of 175,000 barrels of oil per day driving up Australia's imports bill and current accounts deficit, juniors are looking to process petroleum and other feedstock to meet some of this need.

Darwin Clean Fuels (DCF), Stuart Petroleum and Central Petroleum are all aiming to produce diesel from petroleum, while Australian Renewable Fuels, a spin-off of oil and gas producer Amadeus Energy, is already producing biodiesel from animal fats.

Northern exposure

DCF is proposing to design, build and operate a $US350 million ($A468 million) 50,000bopd condensate processing facility near Darwin's East Arm Port to produce high quality, low-emission transport fuels.

The project capitalises on Darwin's proximity to Timor Sea and North West Shelf gas fields. Production of low-sulphur condensates in the region is already high and is set to grow dramatically as new gas developments come online.

Infrastructure advantages include Darwin's natural deepwater port, new bulk liquids facilities at East Arm Port, the new transcontinental AustralAsia Railway linking Australia's northern and southern coasts, and the new Darwin Business Park. The new plant will be located next to the new Vopak fuel terminal and Natural Fuel's biodiesel plant.

DCF's plant will supply high quality petrol, diesel, jet fuel, liquefied petroleum gas and marine bunker fuel to the Northern Territory markets, replacing the 16,000 barrels per day currently imported from Singapore that the majors will struggle to sustain once new Australian Standards for clean fuels kick-in in 2009.

But DCF also aims to export to other parts of Australia and to the United States' West Coast, where stringent environmental standards for fuel quality are already in place.

Unlike other smaller oil producers like Stuart or Central, DCF is less sensitive to the price of crude and more wired to the differential between the price of condensate and value of transport fuels.

"Our main attention is on the refinery margin, the difference between the cost of condensate and value of the yield," said DCF executive director David Hunter.

"Typically we need to achieve a net refining margin of $US6 a barrel.

Australian Renewable Fuels' Piction refinery

The company's business model is a case of necessity being the mother of invention.

When your acreage is in the heart of Central Australia and the cost of using pipelines provided by the majors is prohibitive, entering refining becomes a no-brainer.

Gas sells at around $3.50 per gigajoule, but costs $1.20-plus a gigajoule in exploration and production costs, plus $2.60 a gigajoule to transport to market from Central's blocks.

While selling gas from Central Australia via a pipeline is not commercially viable, the acreage's petroleum potential is excellent, according to Heugh, an honours graduate geologist who did a temporary stint as a bus driver in 2001 so he could dedicate his daylight hours to working the company up.

Various independent geologists and the NT Geological Survey have reported abundant gas potential in Central Australia following extensive re-evaluations made on a new database. Based on these findings, Heugh established the company's commercial model around the ability to produce low-sulphur diesel, jet fuel and naphtha.

Pre-feasibility findings prepared by consulting mechanical engineers Holt Campbell Payton on a 10,000bopd plant support Heugh's plan to develop a GTL plant near Alice Springs.

The proposed plant could produce 7000bpd of diesel and 3000bpd of naphtha, and pre-feasibility findings suggest that a mix of diesel, jet fuel and naphtha would be most appropriate to give marketing flexibility. To be viable over a 20-year life cycle, a proposed "small-scale" GTL plant would require 600,000 billion to 1 trillion cubic feet of gas feedstock. Based on independent geologist reports that the Amadeus Basin has up to 10Tcf in recoverable resources, a larger plant producing up to 50,000bpd could be viable, according to Holt Campbell and Payton.

Assuming independent geologists and government reports are correct, Heugh claims the Amadeus could be one of the world's most prospective unexplored basins areas. And with over 200,000 square kilometres of ground spread across several NT basins, the company doesn't have to rely on the Amadeus alone.

"By value-adding and having a large acreage, we can effectively emulate the majors," Heugh said.

"We've got enough acreage to keep a junior explorer on the ground for 150 years before they touch the sides."

While the company isn't talking with any refineries, three majors, all with significant on and offshore positions, have already expressed interest in the GTL side of the equation.

While the majors like Central's ability to offer whole-of-basin farm-in opportunities, they all want a larger GTL plant, according to Heugh.

Continuing high oil prices will make GTL sustainable, according to Heugh, who claims that various refineries buying GTL zero-sulphur fuel will pay a premium over conventional diesel of up to $A8-10 more per barrel to blend a low-sulphur product.

Were the price of oil to fall below $US35/bbl, he says the GTL option would largely dry up.

"The cut-off point for a 10,000bopd plant would be $US35-40/bbl. Above this point we can make a plant viable. We'd need to get up to 50,000bopd to get down to $US30/bbl break-even point depending on the funding options."

For a proposed $A600 million 10,000bopd plant to proceed, Heugh's next job is to prove up sufficient gas reserves.

On the other side of the NT-South Australia border, Cooper Basin operator Stuart Petroleum is moving to develop a niche diesel

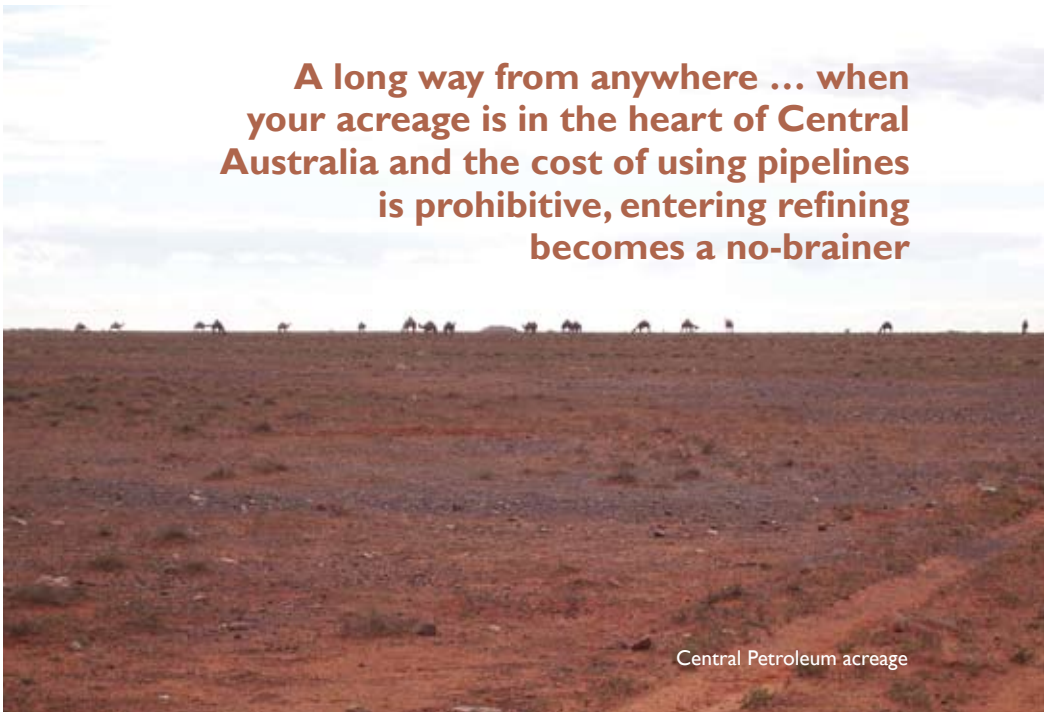
"There is also an environmental bonus that goes with using condensate as the feedstock. Because there is so little residual oil in condensate, the Darwin project will not need to include secondary units in the process configuration. Initial calculations suggest this will result in 75% pro-rata lower greenhouse-gas emissions than conventional conversion refineries."

Diesel and dust

Far south of Darwin, in Australia's harsh interior, junior explorers Stuart and Central are planning projects predicated on sidestepping major refineries and high-priced infrastructure, while value-adding through a low cost entry into the fuels market.

While Central is the only explorer in Australia with a profound interest in gas-to-liquids (GTL), managing director and co-founder John Heugh suspects other juniors in the Cooper Basin, especially those furthest away from the Santos pipeline, will follow Central's lead.

A long way from anywhere … when your acreage is in the heart of Central Australia and the cost of using pipelines is prohibitive, entering refining becomes a no-brainer



Central Petroleum acreage

Storage tanks at Stuart Petroleum's Worrior project

refinery using locally produced oil.

With the larger refineries primarily interested in the volume end of the market in metropolitan areas, managing director Tino Guglielmo told *Petroleum* the hurdles in catering for the existing shortfall were essentially logistical.

SA has no operating petroleum refinery, and with the booming resources industry driving up fuel consumption in the Cooper Basin, Guglielmo sees a low-risk business opportunity.

He claims the company's proposed $26 million, 100 million litre a year diesel refinery will complement the state's expected major uplift in demand. "Around 100 million litres of diesel represent around 10% of the state supply," explained Guglielmo.

Anticipating that new mining projects in the Cooper Basin could push the region's

Condensate, oil, gas or animal fat – diesel can be made from many different feedstock

diesel demand up to about 185 million litres annually within the next three years, Stuart has now completed the engineering design for the refinery.

"We are now working on the enabling commercial agreements," he said. "The agreements yet to be finalised are: the logistics of moving large quantities of crude and finished products, the final sales agreements and some additional refinery feedstock.

"Currently around 10-12 months away from entering production, the [diesel refinery] plant should reduce stock-outs, which happen two to three times a year and take the heat off peak usage."

Guglielmo says Stuart will enjoy a healthy refining margin, and producing and selling diesel locally will offer two-way transportation benefits from moving finished product to market and feedstock to the refinery.

Fat of the land

Further south, Amadeus Energy spin-off, Australian Renewable Fuels, set up its first operating plant in Adelaide early this year. A second biorefinery is now operating in Picton, near Bunbury in Western Australia.

AR Fuels chief executive Darryl Butcher says the jury's out on exactly how big the biodiesel industry is going to get. Assuming new feedstock can be produced competitively in large scale and oil prices stay relatively high, he believes biofuels could be a material contributor to diesel supply globally.

The company's business model is directly linked to the fat industry. Animal fats and used cooking oils are being converted into clean-burning, non-toxic and biodegradable diesel fuel.

Five years ago when Butcher said he was entering this sector, his colleagues in mining thought he was loopy and brokers just rolled their eyes.

When he first entered the biofuels market, virtually no low-grade fats were used as biodiesel feedstock. And while the company has incurred teething problems and delays at its Adelaide and Picton plants (both of which produce 45 million litres per annum), Butcher claims the company's low cost, low-grade feedstock model has been proven commercially viable.

With 85% of the operating costs caught up in fat and methanol, Butcher says the "bigger is always better" model doesn't apply to biodiesel.

The logistics associated with getting product-in and product-out dictate optimal plant size. The wider the draw and delivery ratios, the less effective a plant becomes.

In addition to building a third Australian plant in Brisbane in partnership with waste management provider Transpacific Industries Group, AR Fuels wants to transpose its model and technology offshore and has announced plans to build two 275 million per year biodiesel plants in the US and one in Austria.

What has forced Butcher to re-think the company's previous focus on the Australian market is the Federal Government's recent decision to scrap biodiesel's tax-free status.

Butcher said Austria was a world leader in the adoption of biofuels and was in the heart of Europe, a region with clear expansion potential and a functioning carbon trading market, while the US market offered enormous room for growth. P