

# AJ LUCAS CORPORATE PROFILE

*April 2019*



**LUCAS**



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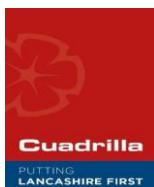
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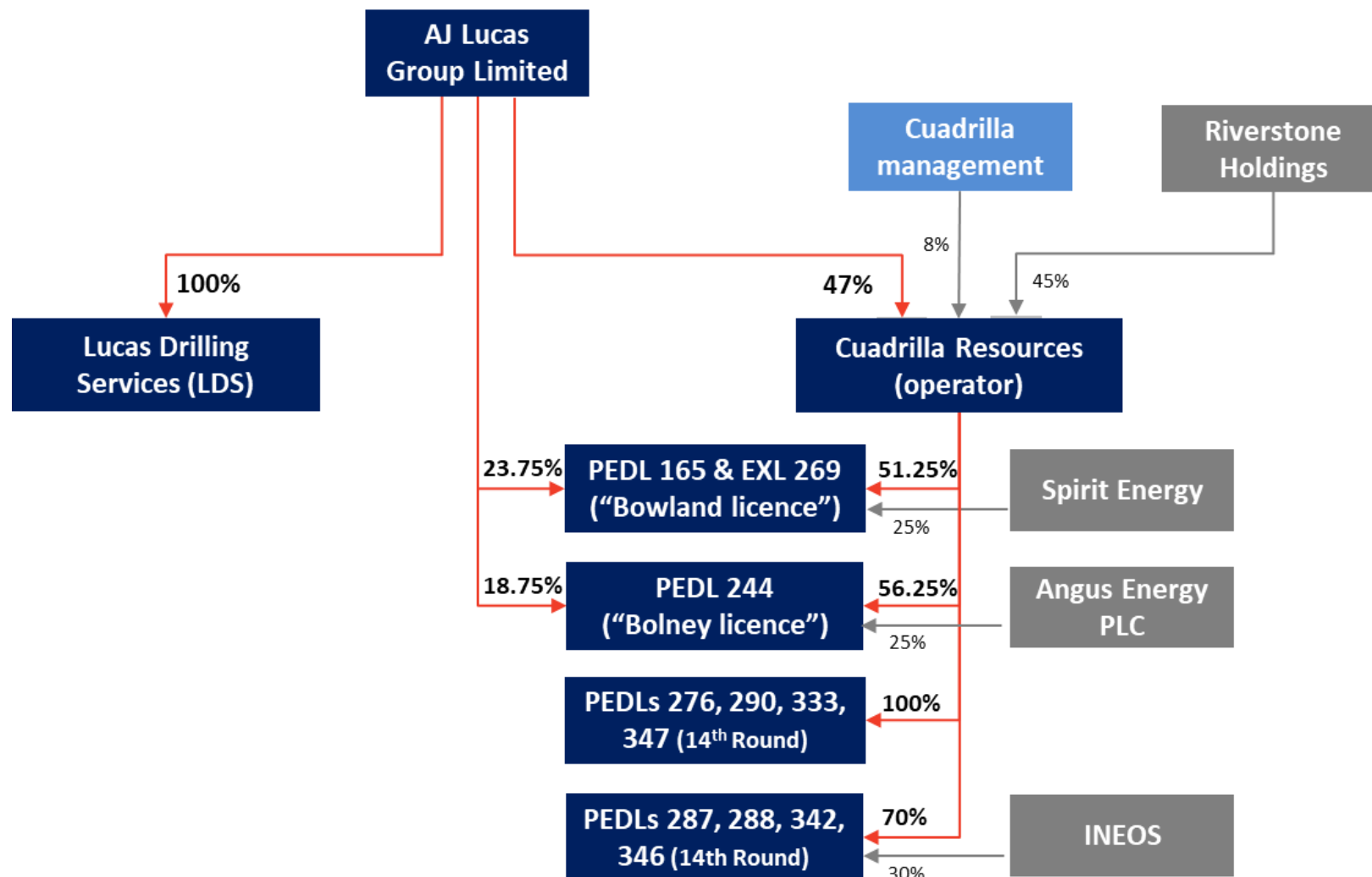
## 1. AJ Lucas Group overview

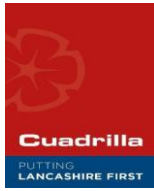
2. UK shale gas operations

3. Lucas Drilling Services (LDS)



# AJ Lucas Group corporate structure





1. AJ Lucas Group overview

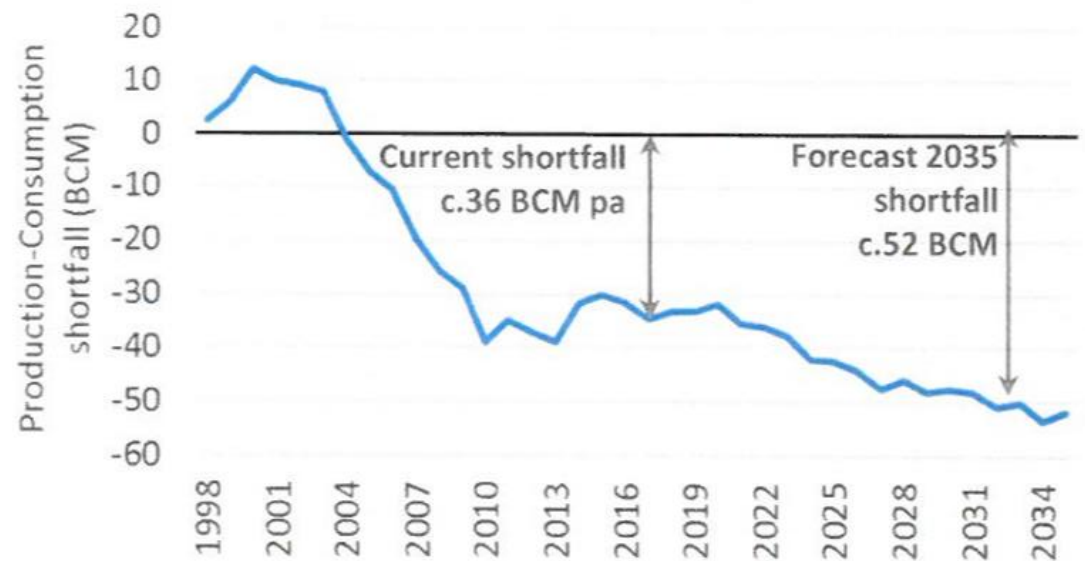
**2. UK shale gas operations**

3. Lucas Drilling Services (LDS)

# Natural gas is critical for UK energy needs . . .

- More than a third of the UK's energy comes from natural gas
- UK remains heavily dependent on gas for domestic, commercial and industrial use
- 80% of UK homes heated by gas – entrenched, high switching costs
- More than half of UK's gas demand is currently imported
- Natural gas demand for power generation set a new record on 23 Jan 2019 at 97 Mcm

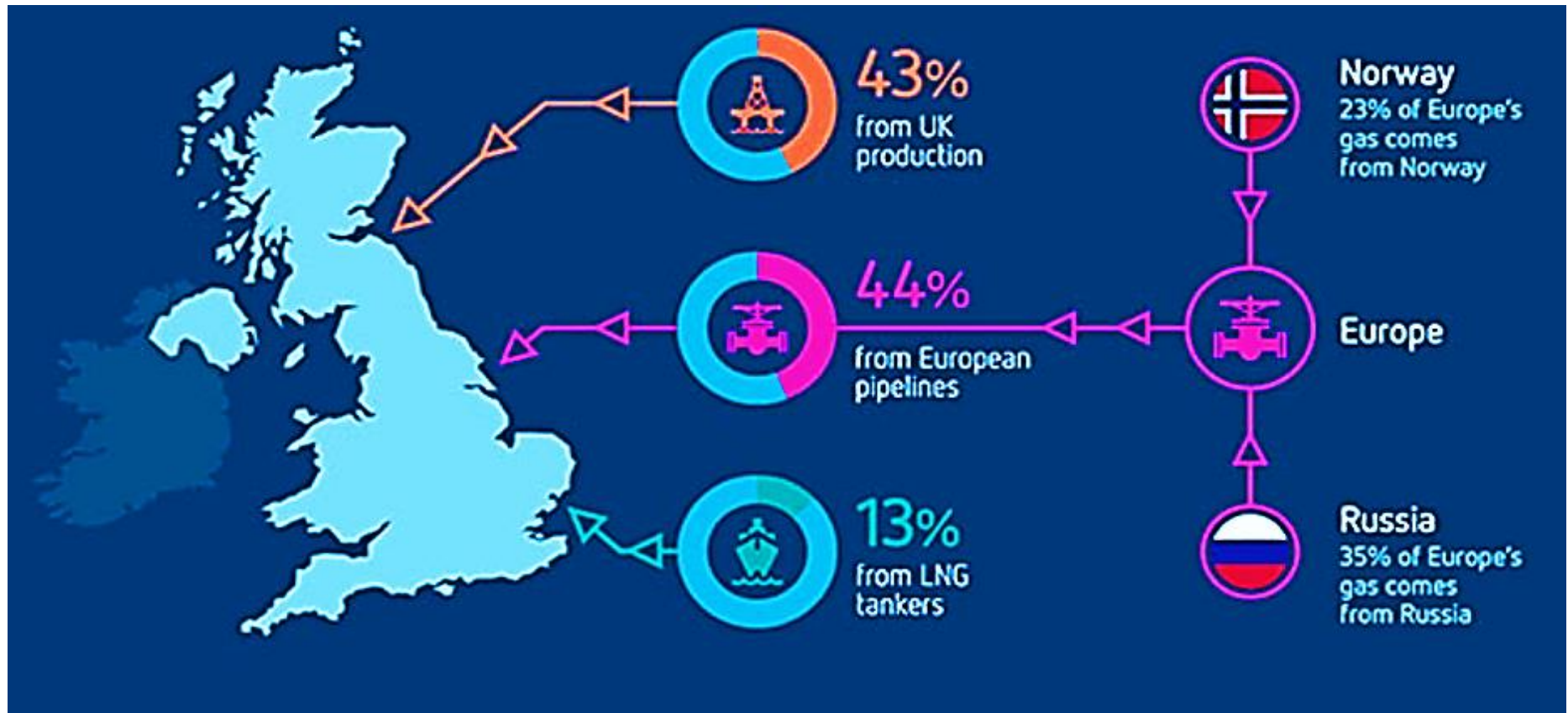
## Widening UK production-consumption shortfall<sup>1</sup>





## ... and reducing CO<sub>2</sub> emissions

- Analysis by the UK's Committee on Climate Change (CCC) and a joint study by Professor David Mackay and Dr Tim Stone estimate that UK shale gas could offer a circa 50% production emission saving compared to LNG and long distance pipeline supplies



# Lancashire Bowland shale is ideal for commercialisation

BGS estimates Bowland shale holds 1,300Tcf gas in place

Shale located several thousand feet below aquifers

Shale thickness (>1 km) enables multiple horizontal wells at different levels

Quality of the reservoir clearly proven

Bowland shale ideally suited to hydraulic fracturing

Complex network of fractures created & excellent sand retention

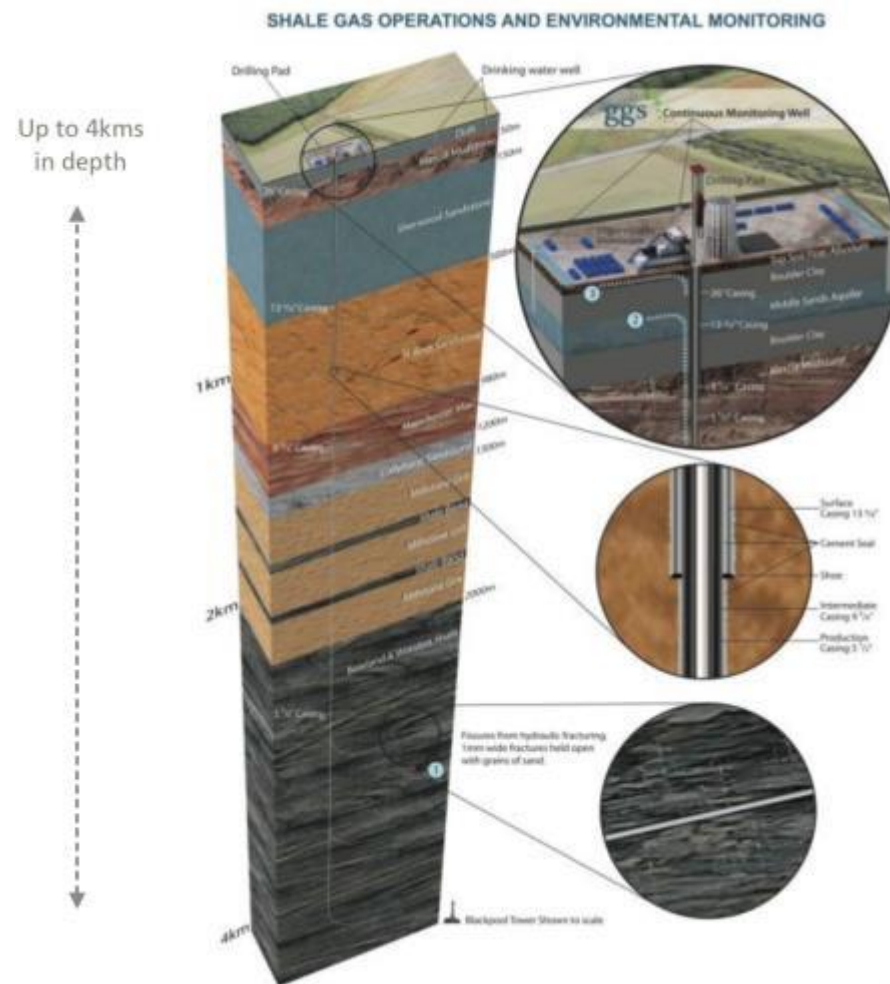
Thickness/spread of shale = multiple wells per production pad (cost efficiencies, reduced surface footprint)

Close proximity to local and national gas pipeline infrastructure

UK natural gas prices at substantial premium to US

Excellent gas quality with high methane and no impurities

## Representative Lancashire Bowland shale geology

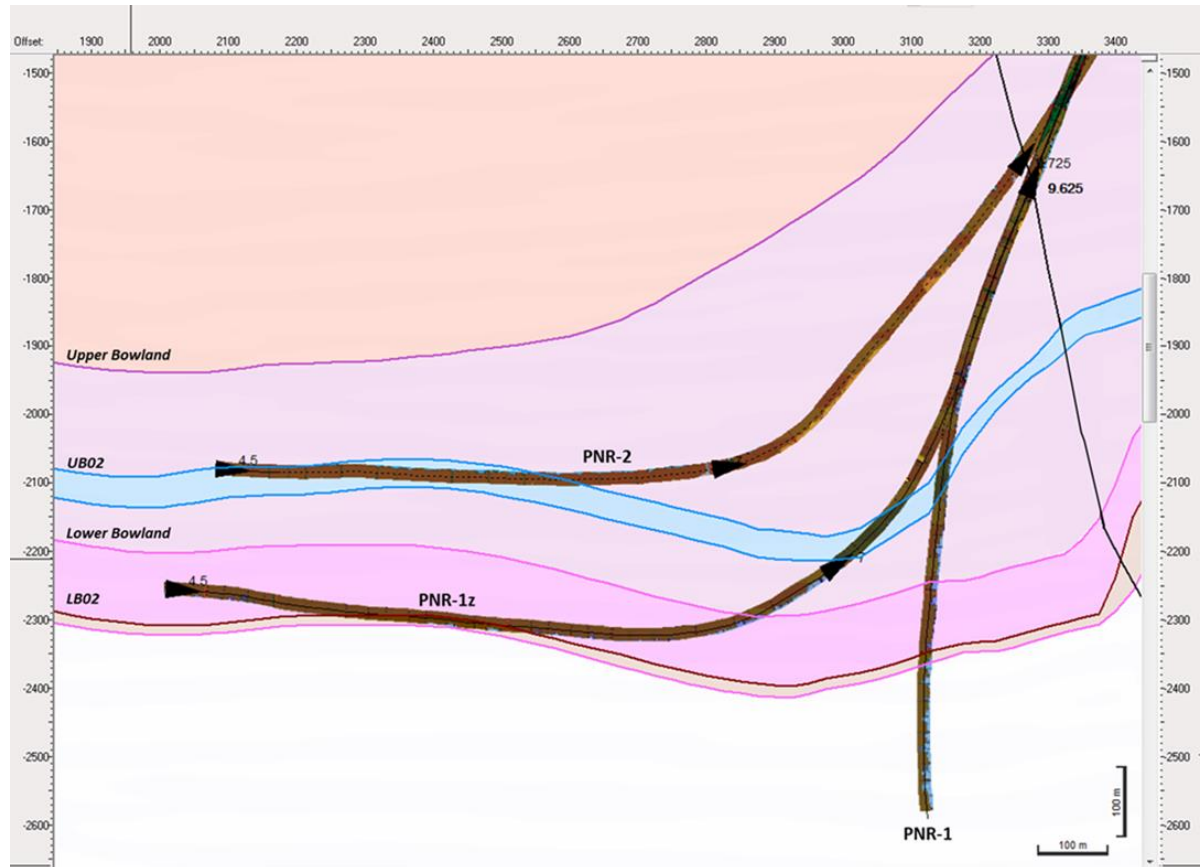


Source: Cuadrilla



# UK's first horizontal shale wells successfully drilled

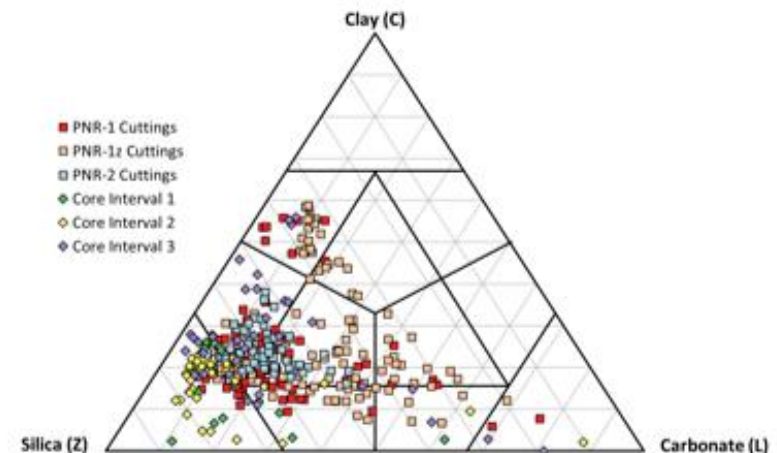
- Vertical pilot well drilled through Upper & Lower Bowland shale to a depth of 2,614m
- >300metres core samples taken from shale
- 6 prospective production zones, high graded
  - 3 in upper Bowland shale
  - 3 in lower Bowland shale
- First horizontal well (PNR-1z) drilled for 780m in Lower Bowland Shale
- Second horizontal well (PNR-2) drilled for 750m in Upper Bowland Shale



Source: Cuadrilla

# Bowland shale's outstanding rock quality

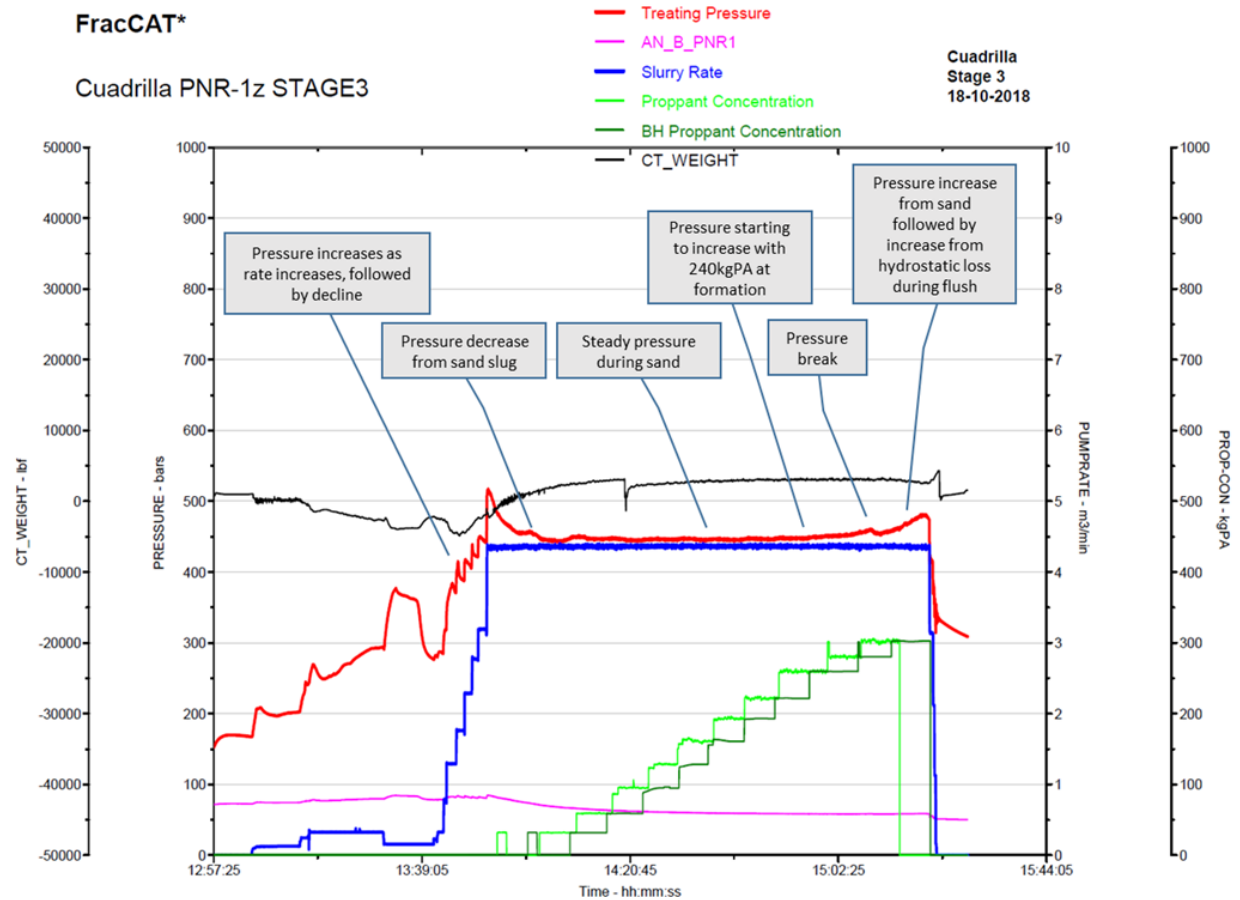
- Core samples subject to detailed lab analysis
- Quartz-rich, brittle rock – excellent properties for fracturing
- Highly naturally-fractured shale
- Gas content comparable to Preese Hall exploration well (PH-1) at 40 scf/tonne
- Gas composition comparable to PH-1 at 96% methane
- Minimal gas processing required (no  $H_2S$ , low  $CO_2$ )



Source: Cuadrilla

# Textbook fracture effectiveness

- The shale surrounding PNR-1z was hydraulically fractured between Oct and Dec 2018
- PNR-1z was completed with 41 separate sliding sleeves, allowing fracture fluid to be pumped separately through each sleeve
- Sleeve 3 was hydraulically fractured to plan (illustrated on right) – a textbook injection
- Pressure characteristics during fracturing were analogous to US shale gas well fracturing operations
- Bowland shale is ideally suited for fracturing

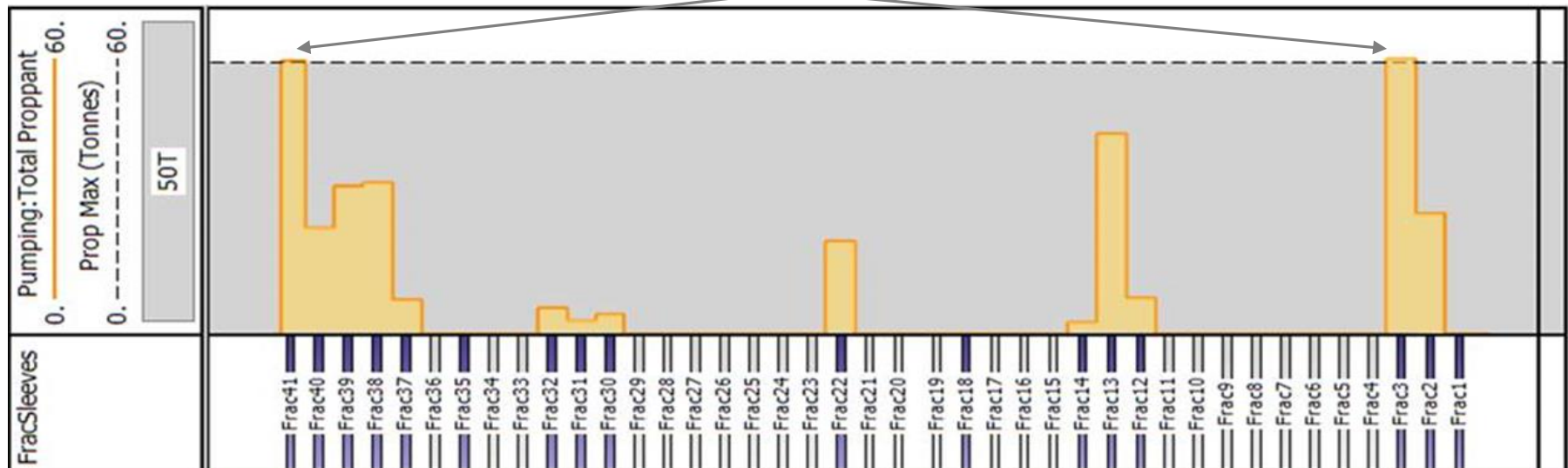


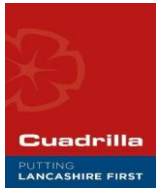
*Job pumped as designed with 375m³ (2,360 bbl) slickwater and 50.8t (112,000 lbs) S100 sand at 4.2m³/m slurry + 0.15m³/m coil rate (26.4 + 0.9 bpm) into a single sleeve*

# Intentionally conservative seismicity regulations

- Hydraulic fracturing effectiveness significantly inhibited by highly conservative Traffic Light System (TLS)
  - 'Red light' set at just 0.5 on the Richter Scale – sand could not be injected after red light trigger
  - Initial plan to inject 50 tonnes of proppant (sand) into each sleeve, i.e. 2,050 tonnes in total
  - Only 2 of 41 sleeves (stages) successfully fracked and embedded with 50 tonnes of sand
  - In total only 278 tonnes of sand successfully embedded into fracture network (13% of design)

2 successful fracks with embedding of targeted 50 tonnes of sand

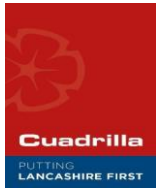




# Natural gas flow despite minimal sand injection

- Less than 14% of proppant (sand) design quantity was injected into the shale
- The stages that were hydraulically fractured proved that the shale has excellent mechanical properties for both fracturing and sand retention
- Natural gas flowed to the surface from the few stages of fully and partially fractured shale, reaching a peak production rate of more than 200,000 standard cubic feet per day (scfd) and a stable rate of over 100,000 scfd
- Initial sampling confirms gas has very high methane content (mid to high 90%), no H<sub>2</sub>S, and could be delivered to the local gas grid with minimal treatment
- Our preliminary scaling up of the PNR-1z flow results yields a flow range of between 3 and 8 million standard cubic feet per day gas for a 2.5km lateral section with all stages effectively hydraulically fractured
- All the indications are that the Bowland shale is comparable with US gas producing shale plays





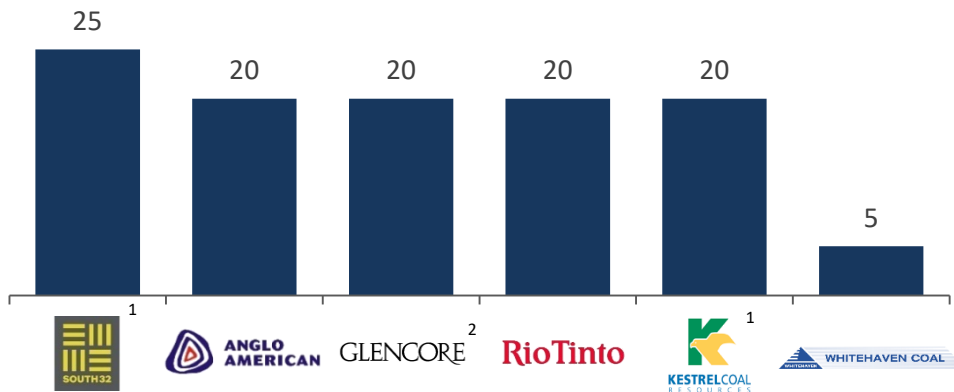
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## LDS overview

- Leading provider of integrated drilling services to Australia's coal sector, predominantly metallurgical coal
- Long-term relationships of up to 25 years with top tier global coal operators
- Market leader in directional, large diameter, and exploration & development drilling, including mine degassing and sampling
- Strong incumbency advantage as Lucas processes, managers and staff are well integrated into each site, with significant financial and time costs for the customer when changing drilling provider
- Excellent safety record and reputation

### Length of relationship (years)



### Financial metrics

A\$m	FY16A	FY17A	FY18A	HY2019
Revenue	79.6	73.4	124.7	76.2
Underlying EBITDA	11.4	2.7	19.7	13.1

1. Includes period where relationships were maintained with former owners or parent companies

2. Currently preferred status driller in tendering process



# AJ Lucas Group financial overview

## Summary balance sheet as at Dec 2018 (\$Amm)

## Share register as at Feb. 2019

	\$m		\$m
Cash	12.4	Payables & accruals	28.6
Debtors	24.8	OCP loans	62.4
WIP	27.8	Kerogen loan	46.5
PP&E	28.0		
UK shale assets	177.9		
<b>Total Assets</b>	<b>271.1</b>	<b>Total Liabilities</b>	<b>143.5</b>

Shareholder	No. of shares (mm)	% ownership
Kerogen Capital	399.9	53.3%
Paul Fudge	54.1	7.2%
OCP	44.6	5.9%
RodDCO Property Holdings	40.5	5.4%
Next 6 largest shareholders	88.5	11.8%
<b>Total – top 10 shareholders</b>	<b>627.7</b>	<b>83.7%</b>

