



DUG Technology Ltd

ASX Code 'DUG'

Investor Presentation
June 2021

DUG in a nutshell



DUG is...

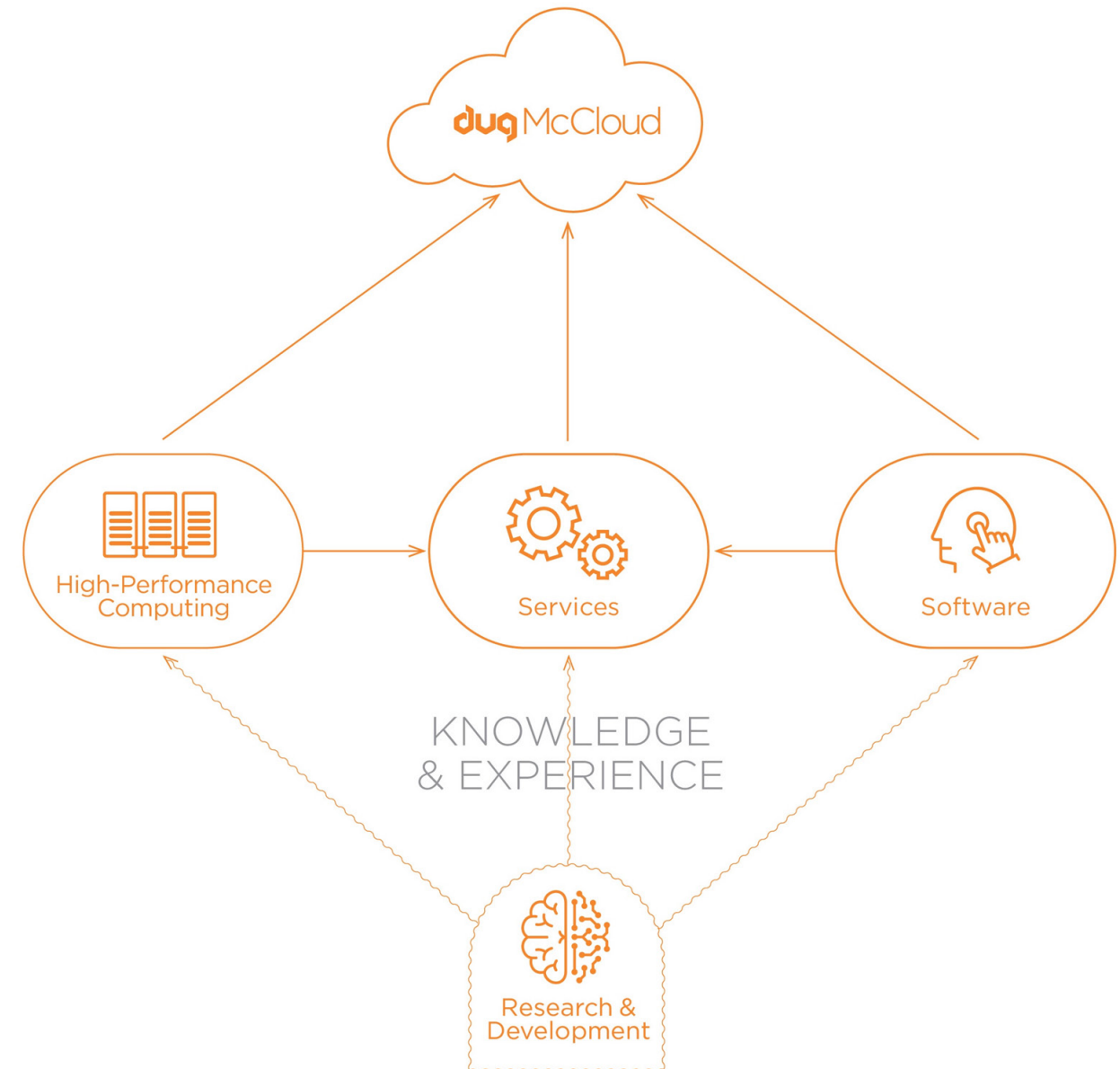
- software
- big compute
- big data
- numerical algorithms
- services

Delivered through...

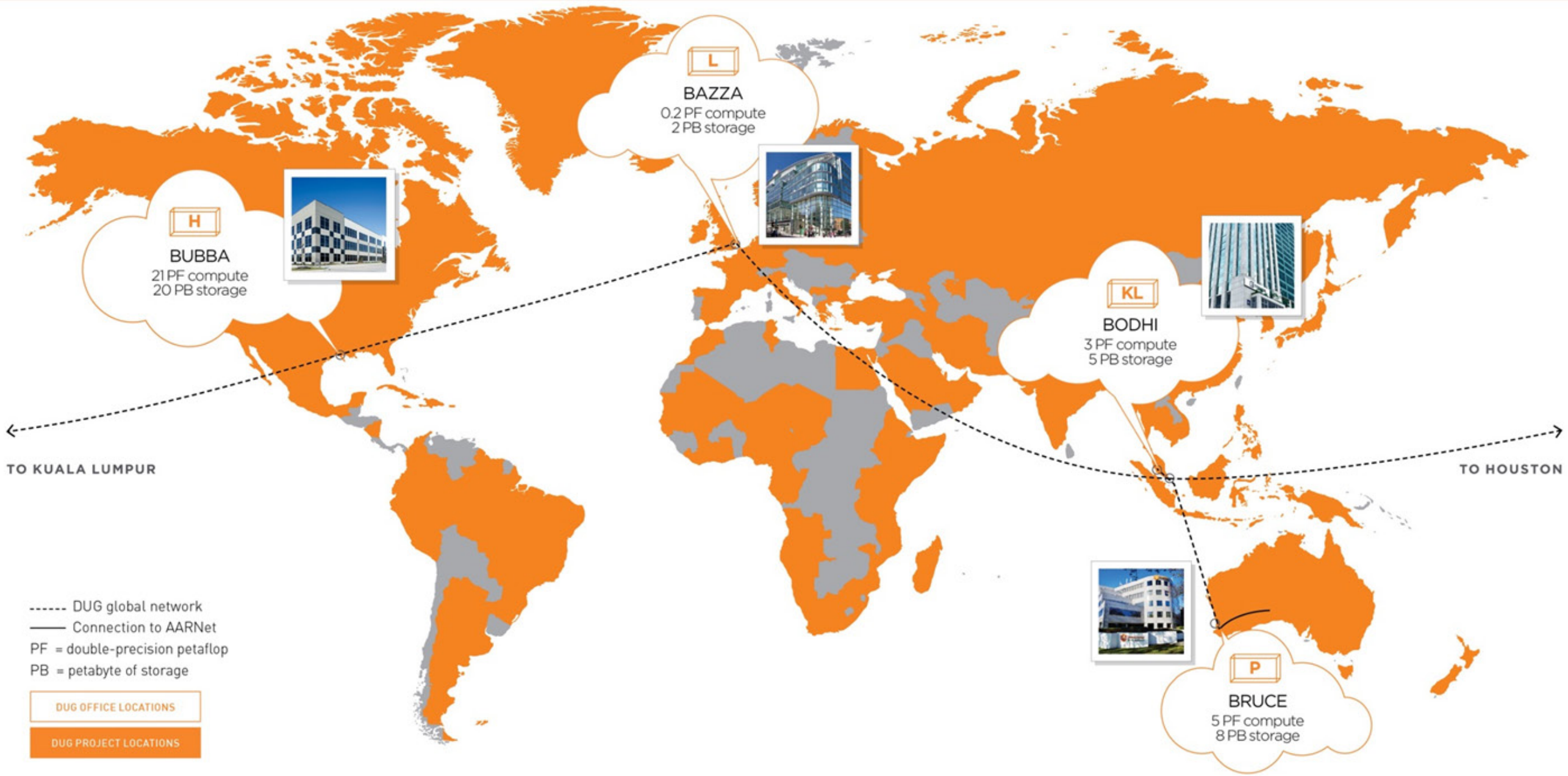
- 4 global offices and high-performance computing centres
- 29 petaflops of compute and 35 petabytes of storage
- c.300 staff

Delivered to...

- 200 customers
- 48 countries



DUG's global footprint and capacity



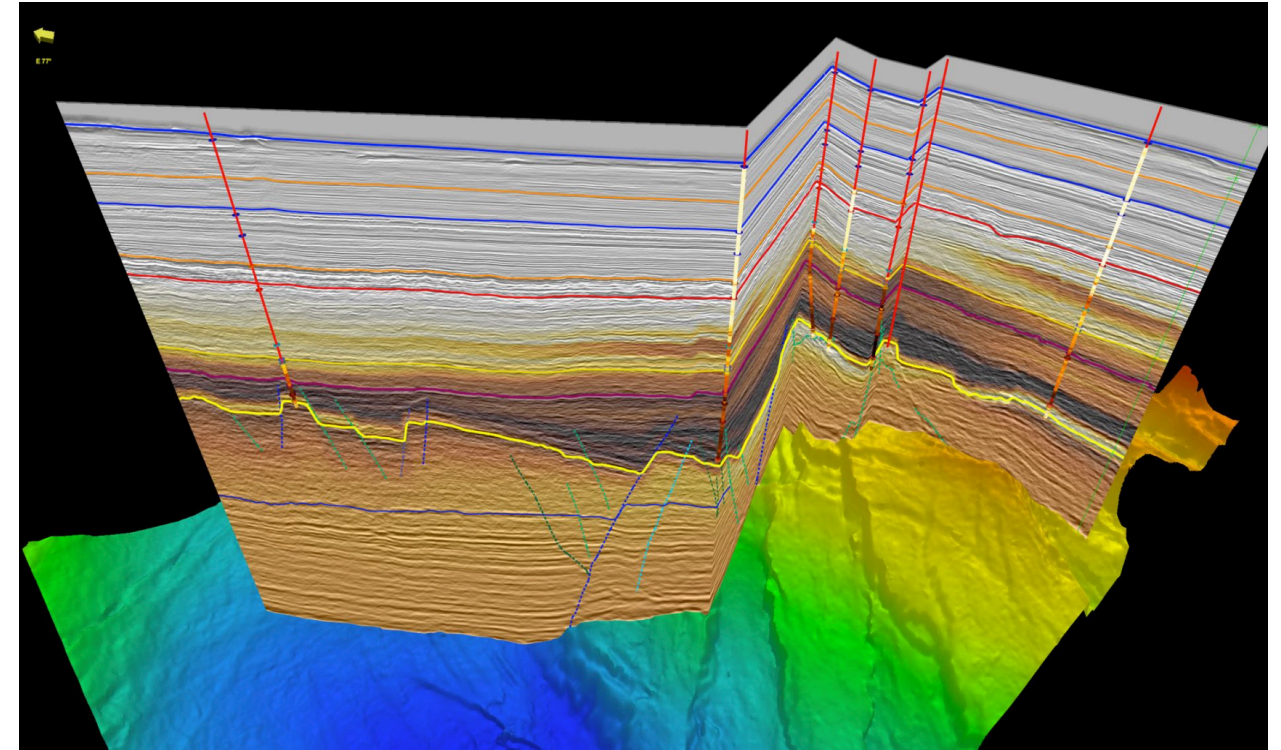
Recent ASX announcements

31 May	Settlement of patent litigation with PGS Australia Pty Ltd
26 May	Trading update
25 May	Media release – DUG Technology plan to build world's first carbon-free high-performance computing data centre in Geraldton
24 May	DUG Cool U.S. Patent Grant
17 May	CSIRO signs on for DUG McCloud
15 April	DUG Technology Ltd-Curtin University Media Release

Application software



- DUG Insight is a modern, intuitive and interactive software suite allowing random access, processing and visualisation of “Big Data”.
- Modules sit within a single interpretation / visualisation system, streamlining the user experience.
- All software has been thoroughly tested and engineered in order to run on huge machines, allowing for storage, processing and visualisation of any size dataset.
- DUG Insight is an integral part of DUG McCloud within the O&G industry but has users in radio astronomy as well. Ultimately, it is a scientific “Big Data” system.



- DUG's goal:

To make its clients successful on DUG's HPC.

- Background

1. Software writing used to be a much simpler affair as each CPU only ran a single compute task at a time. Hence most scientific compute programs were simple and logical in nature and could be written directly by the scientist who *owned* the algorithm.
 2. However, in order to efficiently use modern HPC architectures (for example CPU-, GPU- or KNL-based machines) programs are now complex and require a special set of coding skills to produce. DUG has teams of people with these skills, teams that have been built over the past 17 years.
 3. DUG also has a numerical algorithm research team comprised of physicists, mathematicians and an engineer.
- Hence DUG offers software and algorithm support to clients who use DUG's HPCaaS. This is a strong differentiator from other HPC vendors.
 - The cutting edge of scientific HPC is *interactive HPC* which is enabled by Domain Specific Languages (DSLs). DUG has been involved directly (together with Imperial College and Intel) in writing one of these and offers this service to clients as well.



“All areas of contemporary research require access to advanced computing capabilities such as big data, data science and HPC.”

Prof. Andrew Rohl, Head of School of Electrical Engineering, Computing and Mathematical Sciences, Curtin University

“At one end we have an innovative telescope that’s been operating in the Mid-West for the past six years, and at the other we have Australia’s investment in its high-performance computing network. In between, we have some of the brightest minds in astrophysics and supercomputing working with DUG, a world-leading software and computing company.

The fact that all of this has grown up in Western Australia is evidence that we can harness the best of innovation in academia and industry and do our part to fuel WA’s economic future.”

Prof. Steven Tingay, Curtin University/ICRAR

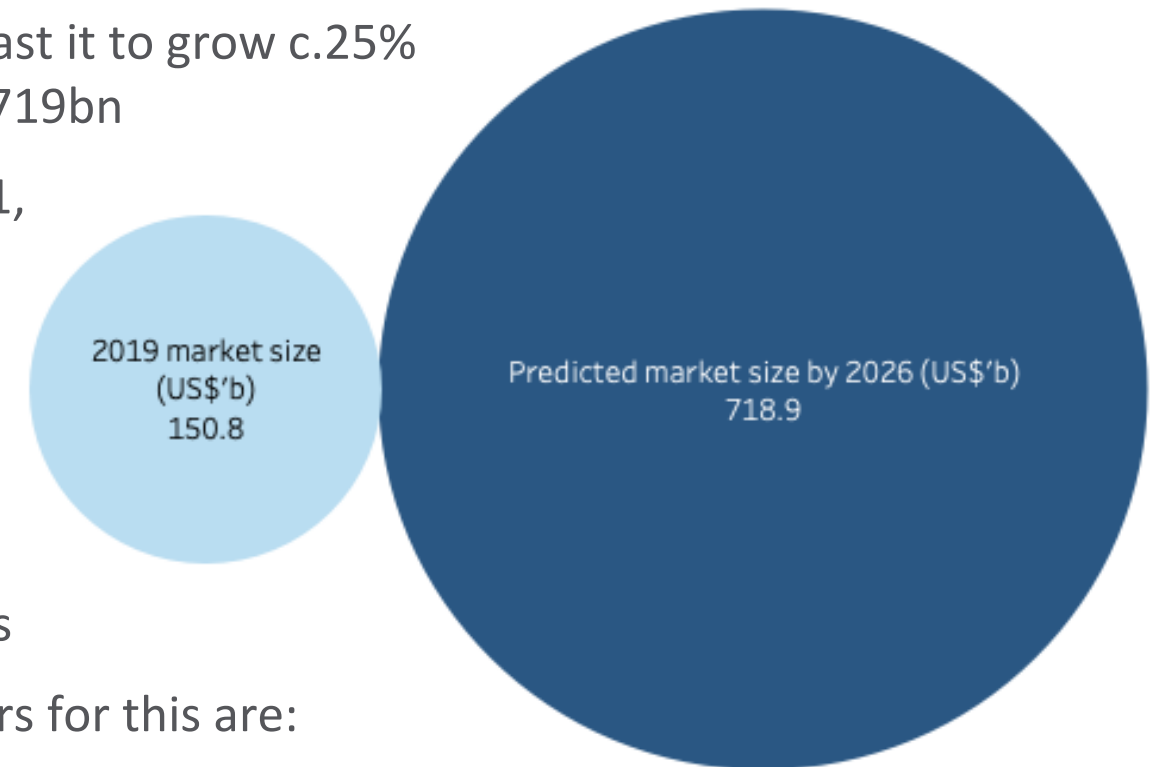
- CSO measures the HPC market as c.US\$151bn in 2019 and forecast it to grow c.25% per year from 2019 to 2026 for a predicted market size of c.US\$719bn
- DUG's HPC team completed 18 proof of concepts during H1 FY21, with 7 currently underway, outside of the O&G industry

- Industries evaluating DUG's HPC include:

Life sciences	Astrophysics	Healthcare
Radio astronomy	Medical research	Resources
Engineering firms	Climate and weather	Universities

- Growth in the HPC segment is led by client acquisition, the drivers for this are:

Proof of concepts / Evaluations Software optimisation and high-end support Brand recognition



HPC market size source (CSO): <https://www2.cso.com.au/mediareleases/37086/high-performance-computing-market-garner-usd-7189/>

HPC is a huge energy consumer and traditionally has a large carbon footprint. DUG plans to be carbon free in the near- to mid-term, with its new HPC campus

“Astronomers know all too well how precious and unique the environment of our planet is. Yet the size of our carbon footprint might surprise you.”

“Our study, released today in Nature Astronomy, estimated the field produces 25,000 tonnes of carbon dioxide-equivalent emissions per year in Australia. With fewer than 700 active researchers nationwide (including PhD students), this translates to 37 tonnes per astronomer per year.”

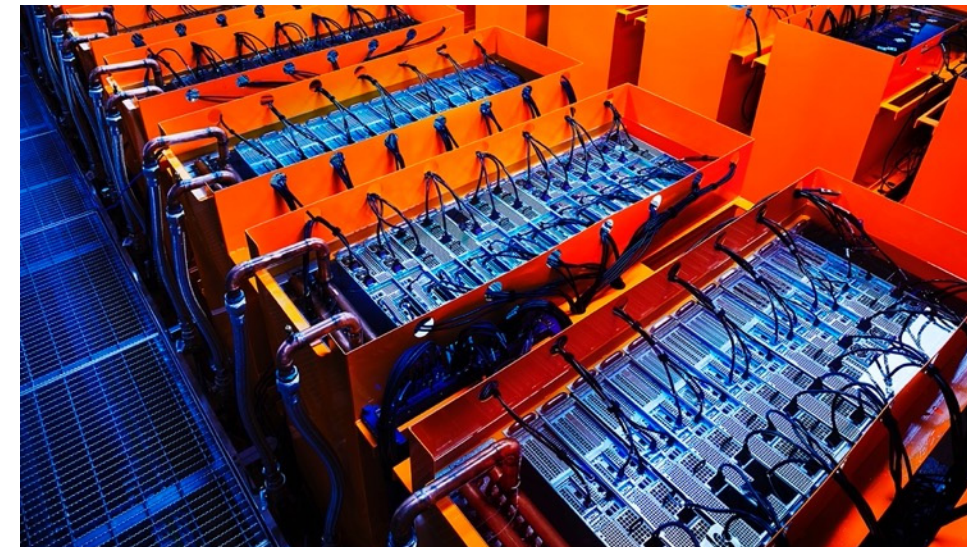
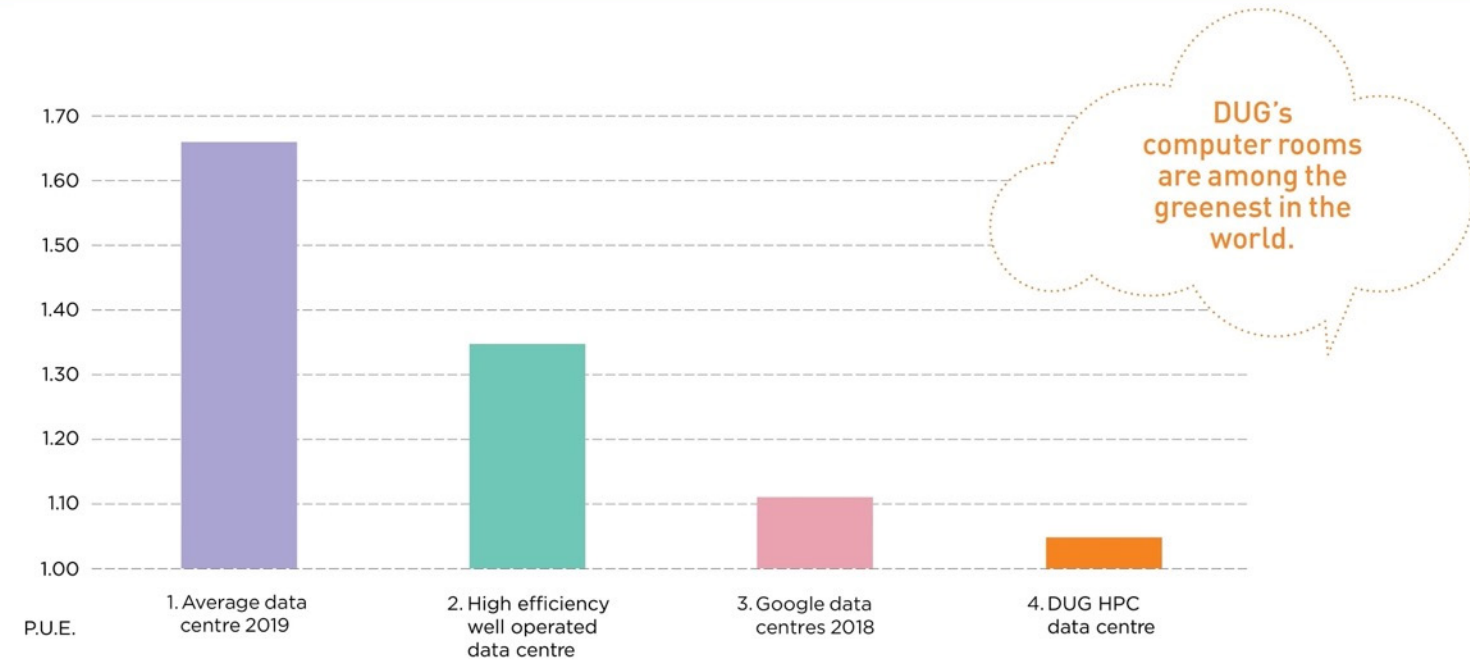
Stevens, A., Bellstedt, S., Elahi, P. & Murphy, M., 2020, 'The imperative to reduce carbon emissions in astronomy', Nature Astronomy, vol. 4, pp. 843-851.

- Being “green” is a *really, really big deal* both in the O&G industry and in all other industries
- This will attract significant global attention and work

Orange is the new green!



- DUG Cool – patented technology.
 - A reduction of c.51% in facility energy use compared to conventional computer rooms;
 - Significantly reduced hardware failure rates, thereby extending the useful life of computers and reducing maintenance CAPEX;
 - Streamlined modular system design to reduce maintenance, increase uptime and reduce computer room construction costs.
 - Data halls require no air-conditioning and are quiet compared to normal HPC-rooms.
- HPC demand is growing exponentially. Environmental consciousness is growing exponentially. Patented technology underpinning DUG's computer rooms being among the greenest on Earth, is a big deal.
- The goal is for the HPC campus in Geraldton to be triple green:
 - DUG Cool computer room technology.
 - Solar / Wind power generation.
 - Hydrogen-based energy storage system.



“Bruce”

Precedents – facilitating access to commercial cloud providers

- HPC is traditionally provided by government/public facilities.
- Precedents exist for HPC being increasingly provided by commercial facilities:

United Kingdom

- In February 2021, the UK Met Office announced a move to the Cloud with a £1.2 billion investment to capitalise on the power of commercial HPC.
- The European Open Science Cloud initiative seeks to broaden access to cloud technologies for academia, the public sector and business. This initiative brings together hundreds of organisations including commercial providers. Other initiatives such as the UKRI Cloud Working Group also assist researchers to engage with cloud services.

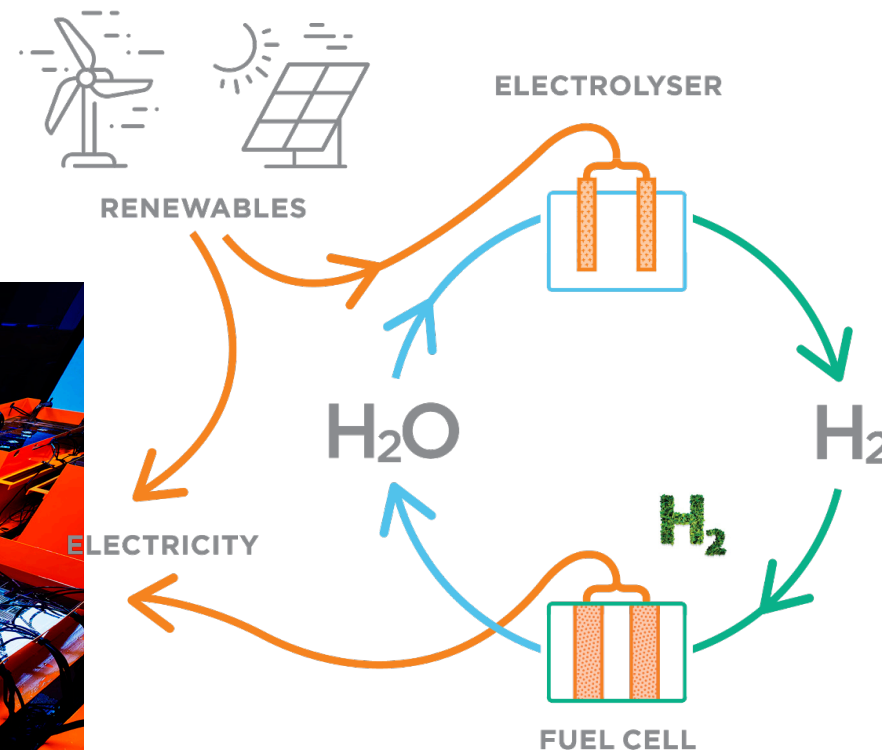
United States

- In mid-2019, CloudBank was founded by the National Science Foundation. It provided researchers with access to compute time from public cloud resources (such as those provided by AWS, Azure and Google).
- DUG is at the forefront of “riding the wave” of the commercialisation of HPC.

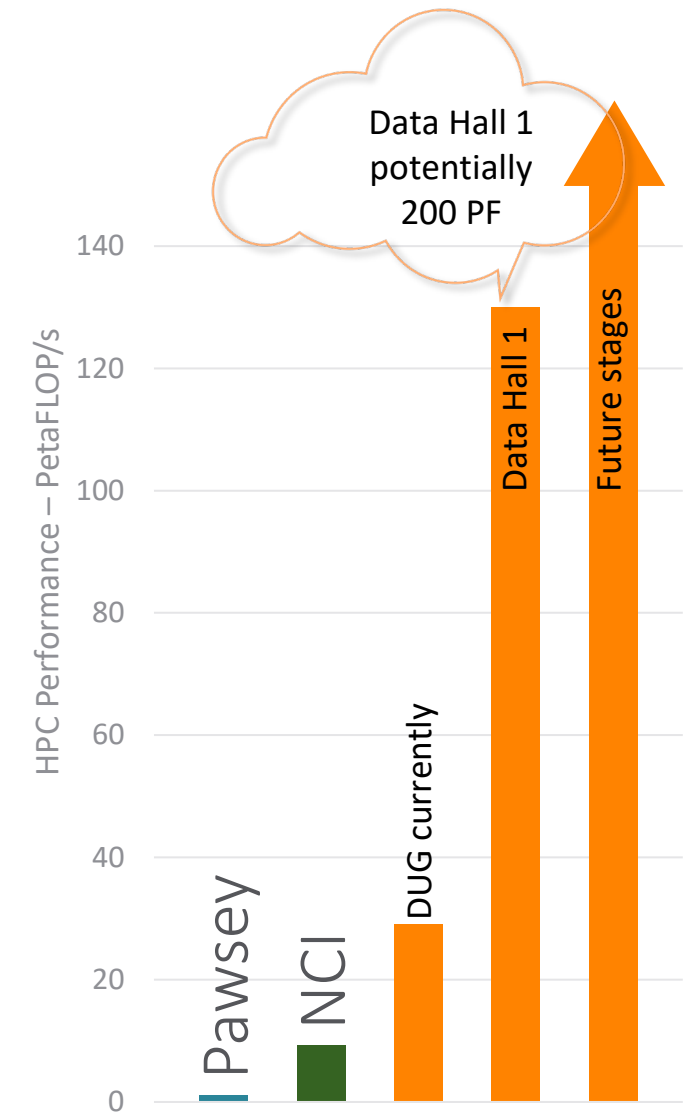
DUG's goal is to build a world-class HPC campus in Narngulu



- Complete Data Hall 1 in Q2 2022
- “Triple green”
 - DUG's patented “greenest computer room in the world” technology
 - Renewable energy (solar and wind)
 - Hydrogen “battery”



HPC Petaflop Chart



Why Mid-West and why in Geraldton?

- World-leading renewable energy resources in both wind and solar
- Strong desire for duplicate fibre connections
- Need space for renewable power generation (wind and solar)
- 3.5 msec from Perth (latency) – so readily accessible throughout Australia and Asia
- Readily available labour force and local TAFE
- “Normal” construction costs
- Political goodwill - big hydrogen push in the region

Deployment

- Long lead time data centre infrastructure built upfront
- Compute deployed opportunistically / JIT as demand dictates
- Additional compute deployed at 90% utilisation
- Low maintenance capex due to cooling solution
- Compute amortisation period of 5 years and 20 years on infrastructure

Capacity

- Current - 29 PF of compute and 35 PB of storage
- 4 high-performance computing centres
- Houston - Bubba ¼ populated, full capacity c.250 PF
- Geraldton - Data Hall 1 c. 200 PF c. 4,000 machines
- Ability to scale to 10 Data Halls providing >2,000 PF

JIT : Just in time

Potential Economic Scenario - Geraldton Data Hall 1 @ 200 PF *

USD'm

Revenue	224
EBIT	139
EBIT margin	62%
EBITDA	177
EBITDA margin	79%

Capital Expenditure	229
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Pay Back period in years	1.6
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*Notes

1. No guidance is provided on the timeline to achieve full capacity.
2. This is Data Hall 1 of 10 in Geraldton.
3. Based on current GPU technology. FLOPS/Space/Power of computer equipment increases continuously. Actual mix of compute will be determined by demand.
4. Assumes no grants to support the hydrogen solution.
5. Assumes current market conditions.
6. Revenues base on 3-year committed compute.

Revenue model



Software

- “Big data” storage, processing and visualisation software
- Use case – resources, radio astronomy and beyond
- Opportunities in medical
- Recurring revenue - annual lease
- EBITDA margin 53%



High-Performance Computing

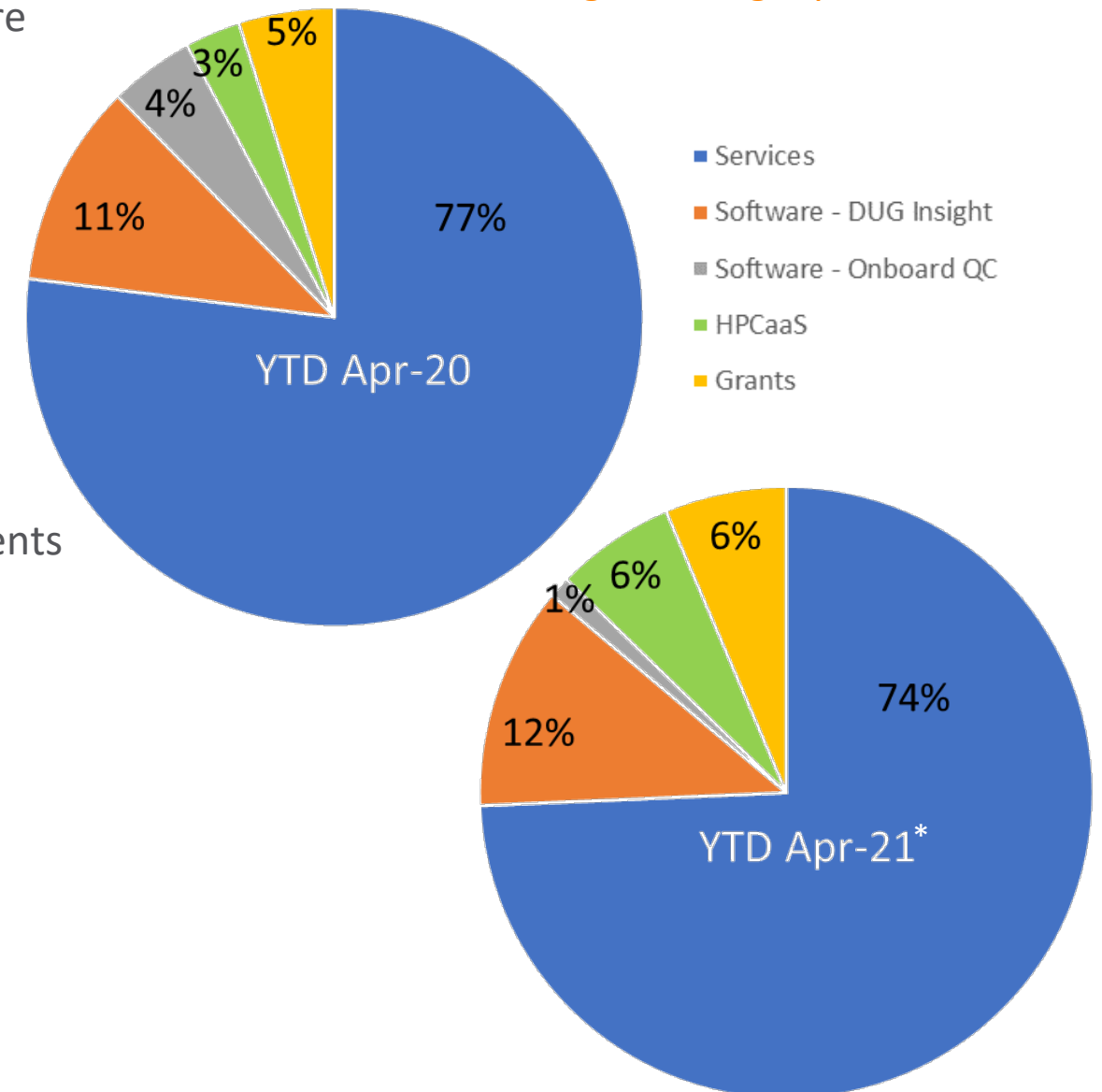
- Super reliable, green compute cycles and storage
- Recurring committed revenue
- Burst utilisation at 2x price point of committed
- Use case - sectors with numerical processing requirements
- EBITDA margin 41%
- Current revenue growth 92%



Services

- Traditional business - seismic processing and imaging
- Turnkey projects using DUG’s staff, software and HPC
- Master service agreements - stream of projects
- Commoditised product
- Current EBITDA margin < 5%

Revenue transition to higher margin product lines



* YTD Apr-21 is based on unaudited revenue

DUG is increasing its sales capacity:

- Training of existing sales force (c.16 people globally) in new product lines
- Shifting sales force to an account management structure with product champions for support
- Added regional sales leaders
- Adding new sales people into all offices as we are able to identify and hire them
- Commission structure is being changed to encourage the sale of Software and HPCaaS relative to Services

Success – Equinor case study

- Equinor is a c. US\$60bn market cap energy company
- They are known as an early adopter of quality, innovative new technology
- After an exhaustive evaluation period Equinor signed on to DUG McCloud and now:
 - Use the DUG Insight software suite in multiple offices
 - Use DUG's HPCaaS from multiple offices
 - Run projects and manage data using DUG's services
- DUG displaced the existing major third-party cloud provider and the incumbent software provider
- This win validates DUG's place in the industry and ability to win competitive tenders



Industry diversification case study – Harry Perkins Institute



- Landmark medical research client signed in October 2020, validating DUG's industry expansion strategy
- The Harry Perkins Institute of Medical Research is one of Australia's leading medical research institutes investigating diseases affecting the community
- The institute has more than 250 researchers located on three hospital campuses in Perth
- The deal provides access to high-performance computing (HPC) cycles to boost the research output of the institute
- HPC and storage capability is needed to conduct analysis using genomics and other bioinformatics heavy technologies. Bioinformatics combines biology, computer science, information technology, mathematics and statistics to analyse and interpret biological data
- DUG HPCaaS helps the institute fast track the development of new discoveries and treatments, and provide international and local pharmaceutical and biotechnology companies the facilities to trial the latest drugs and treatments



Industry diversification case study – SKA

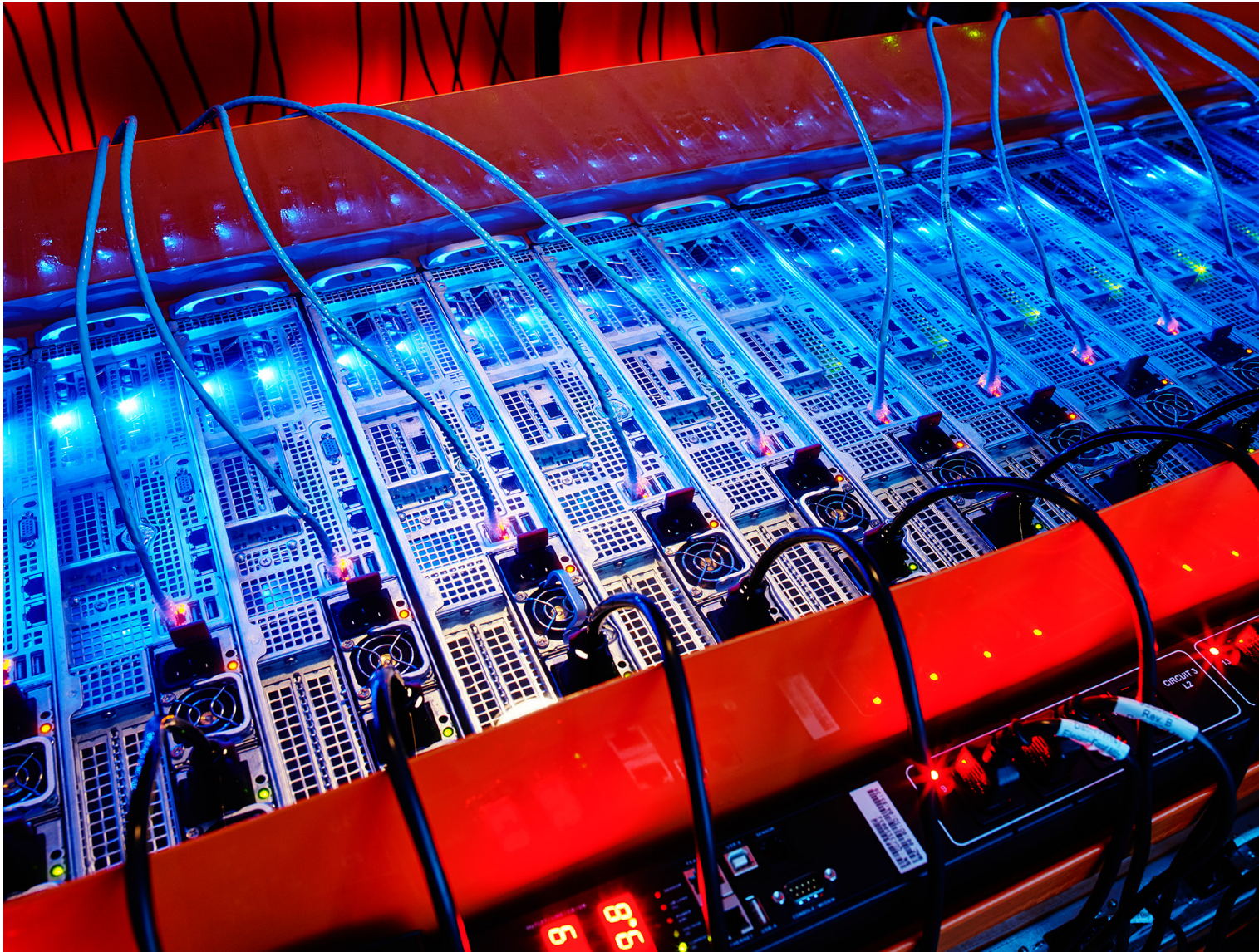


The Square Kilometre Array (SKA) project is an international effort to build the world's largest radio telescope, with sites in Western Australia and South Africa. With a multi-billion dollar budget SKA represents a huge leap forward in both engineering and R&D in radio astronomy.

- SKA has been capturing data using the Murchison Widefield Array (MWA) telescope for two years, amassing a backlog of data that they have been working through using the Pawsey Supercomputing Centre.
- DUG HPC experts worked on academic code used to process the MWA data for two weeks and achieved run-times that were **125x faster**. This allowed a team from the International Centre for Radio Astronomy (ICRAR) to process their data backlog in a day, using a fifth of DUG's Perth machine, 'Bruce', they had previously managed to process a sixth of their total backlog in two years.
- This collaboration is set to deliver transformational changes to the industry, allowing for the highest resolution images in the history of radio astronomy – accomplishing this will require a large amount of HPC power.



Staying connected



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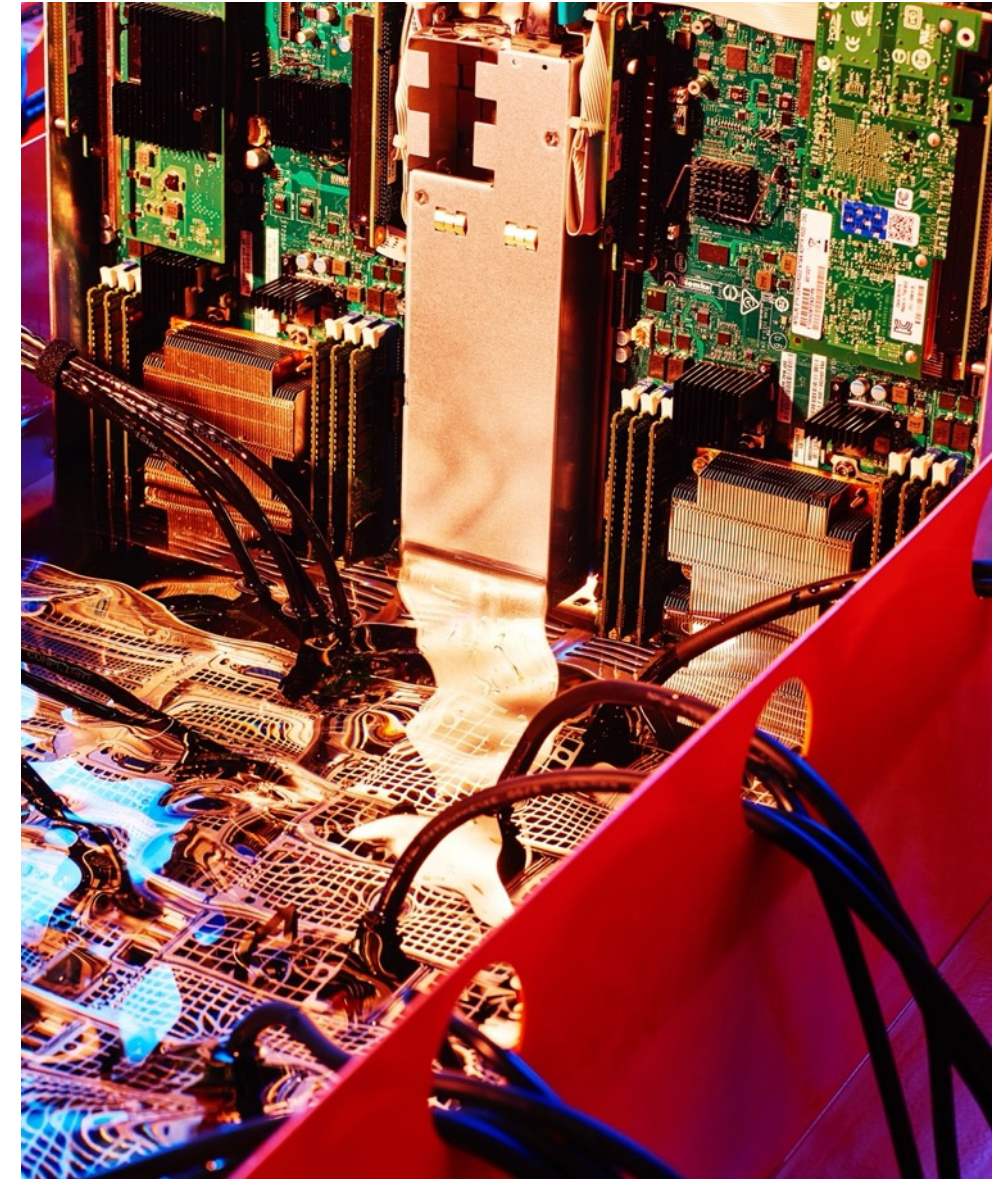


Appendix H1 FY21 Financials

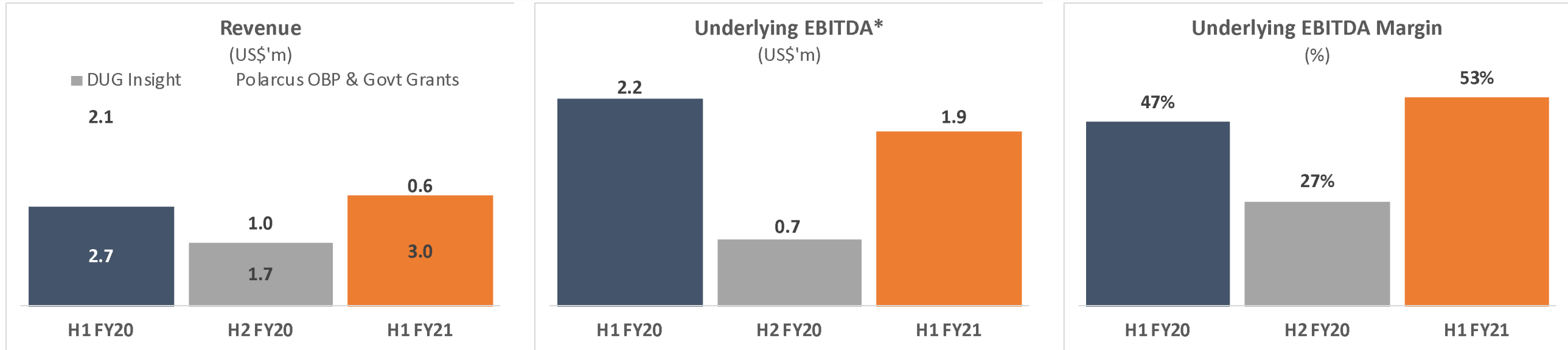
H1 FY21 highlights



- DUG listed on ASX in August 2020
- Revenue at US\$24.2m with EBITDA of US\$4.2m
- DUG Insight Software revenue growth 12% year-on-year
- HPCaaS revenue growth 86% half-on-half
- Committed compute and storage revenue up 213% half-on-half
- Margin improvements in Software and HPCaaS segments
- Compute capacity increased from 18 to 29 double-precision petaflops
- Storage capacity increased from 27 to 35 petabytes
- Development of DUG Insight – Astrophysics, bringing leading edge visualisation to the Astrophysics industry
- Oil price recovery and stabilisation has bolstered the outlook for the Services business

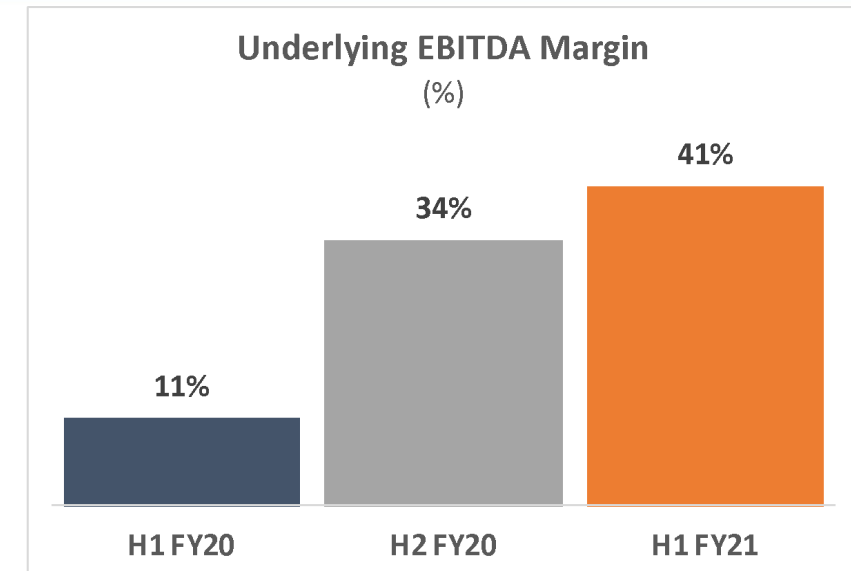
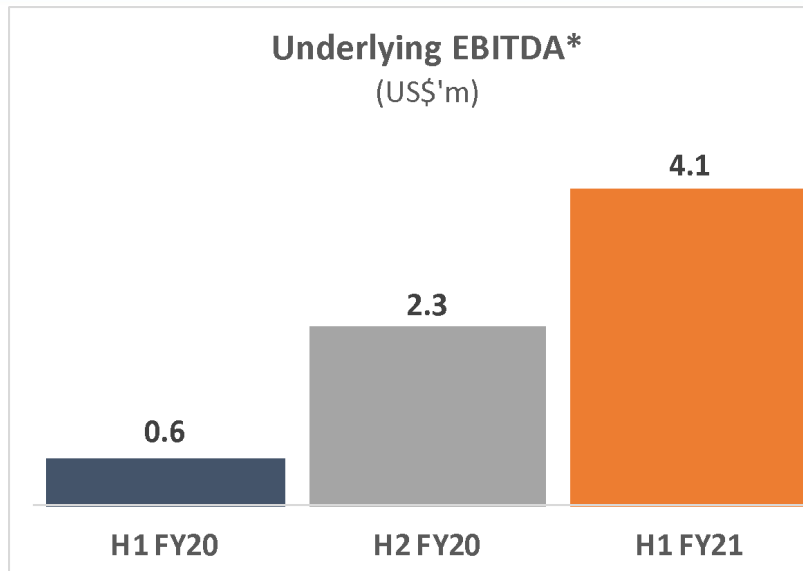
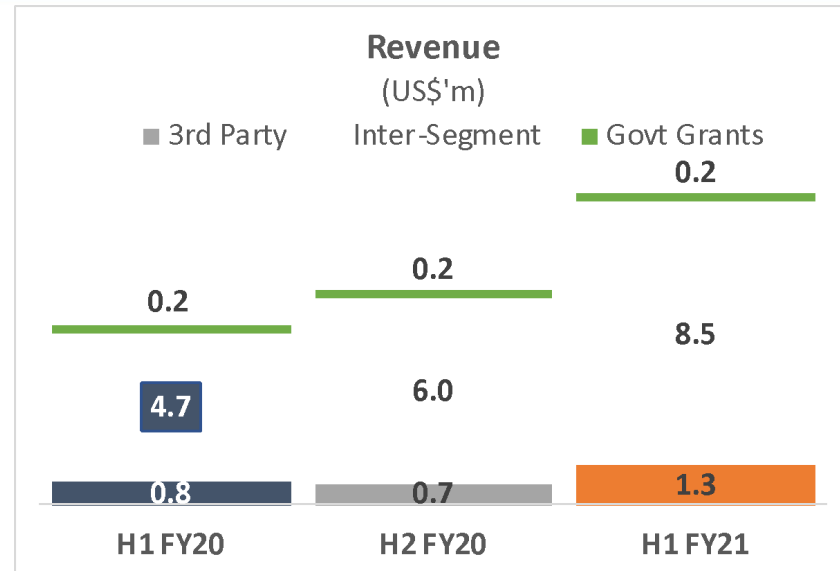


Software performance



- DUG Insight revenue increased by 12% yoy
- Growth has been driven by new licensing deals as part of DUG McCloud contract awards
- Actively pursuing opportunities to grow DUG's software suite:
 - Working in conjunction with Professor Steven Tingay, WA Scientist of the Year (2020), to bring leading edge visualisation to the astrophysics industry
 - Exploring other industries where DUG's deep software knowledge and expertise can be leveraged

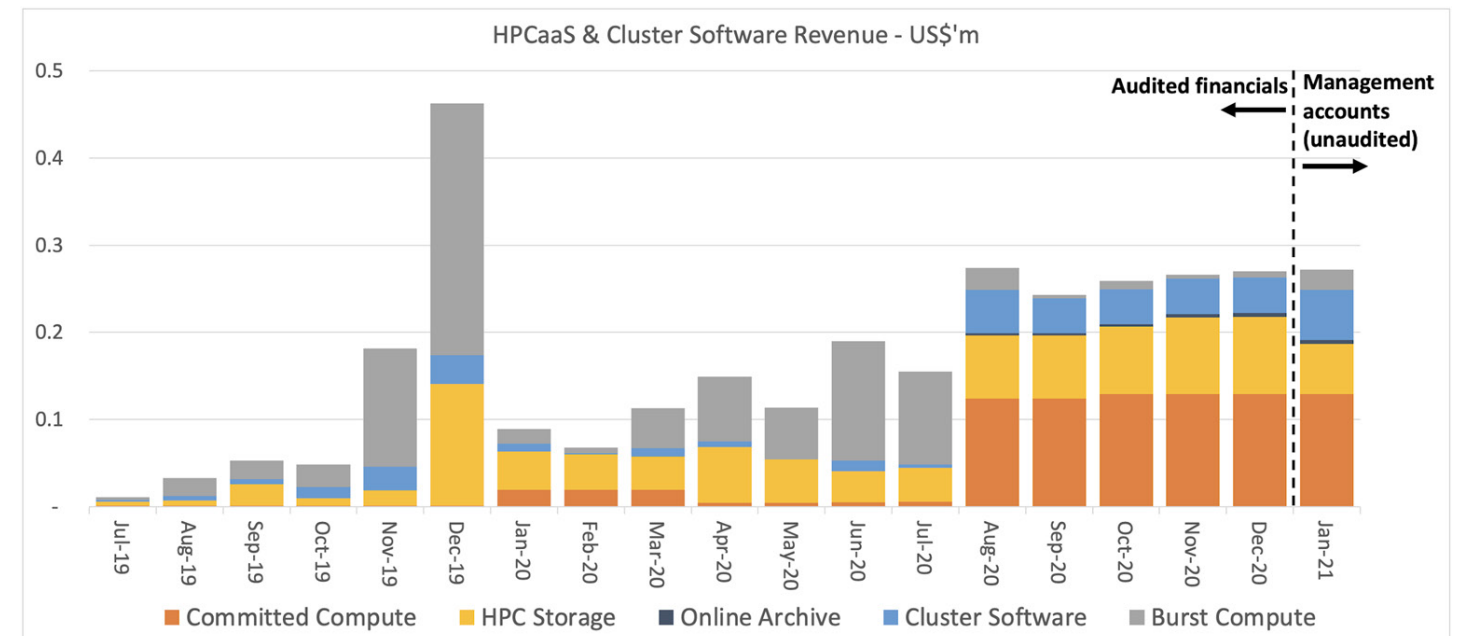
HPCaaS performance



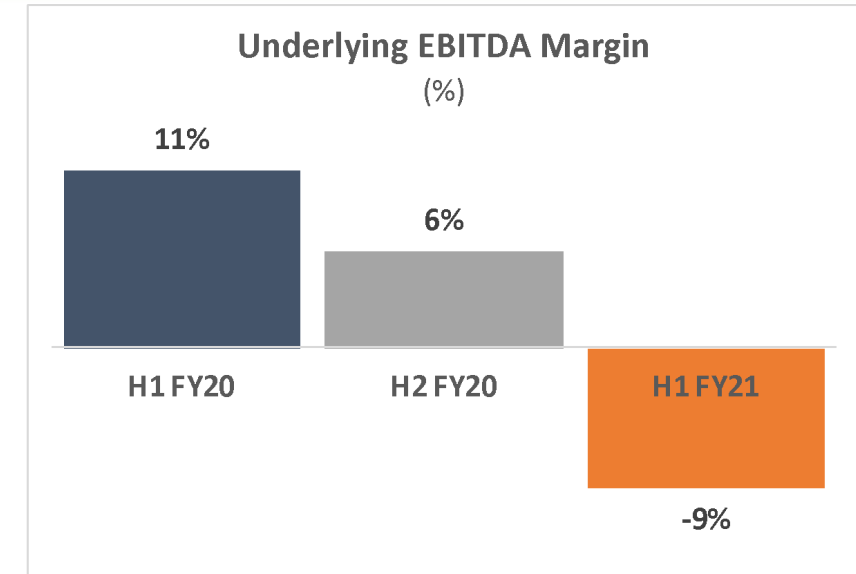
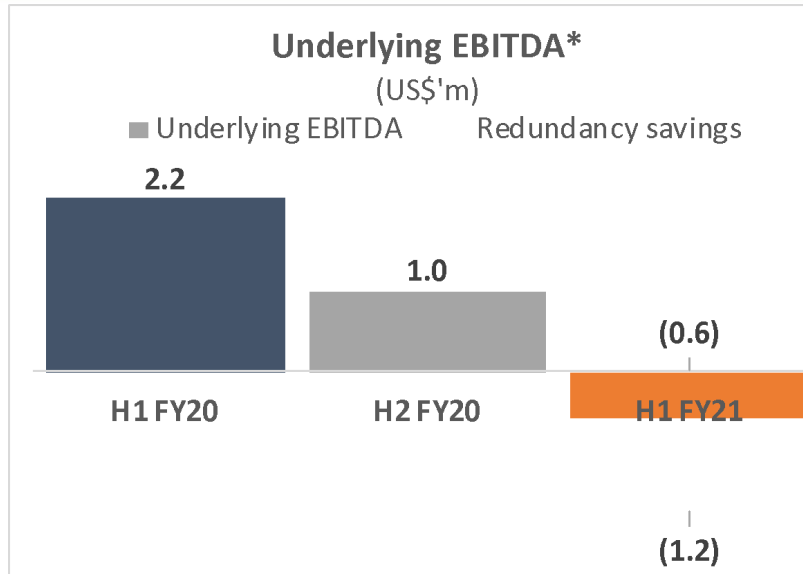
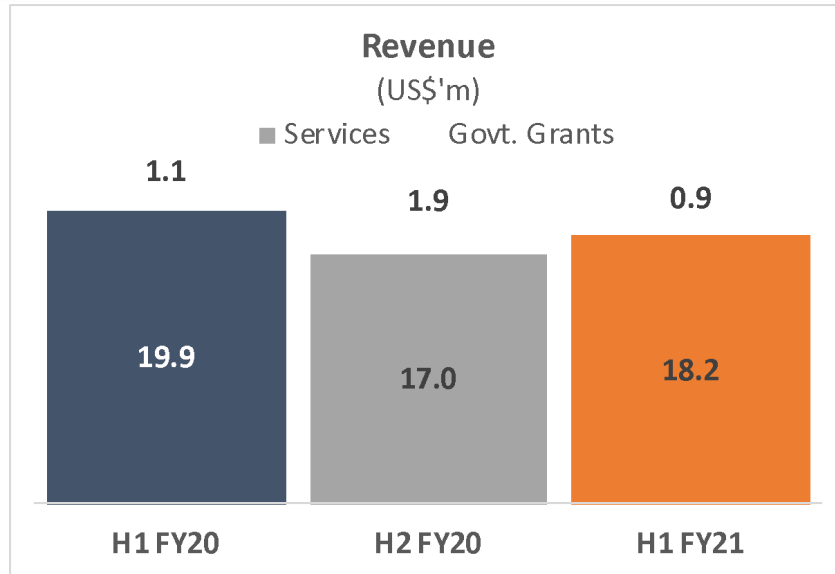
Key HPCaaS signings H1 FY21:

- Equinor
- Harry Perkins
- INPEX
- UWA School of Population and Global Health
- Optic Earth

- HPCaaS revenue up 86% hoh
- Committed Compute and Storage revenue up 213% hoh
- Non O&G revenue up 168% hoh
- US\$1.1m contracted revenue from Feb-21 to Jun-21



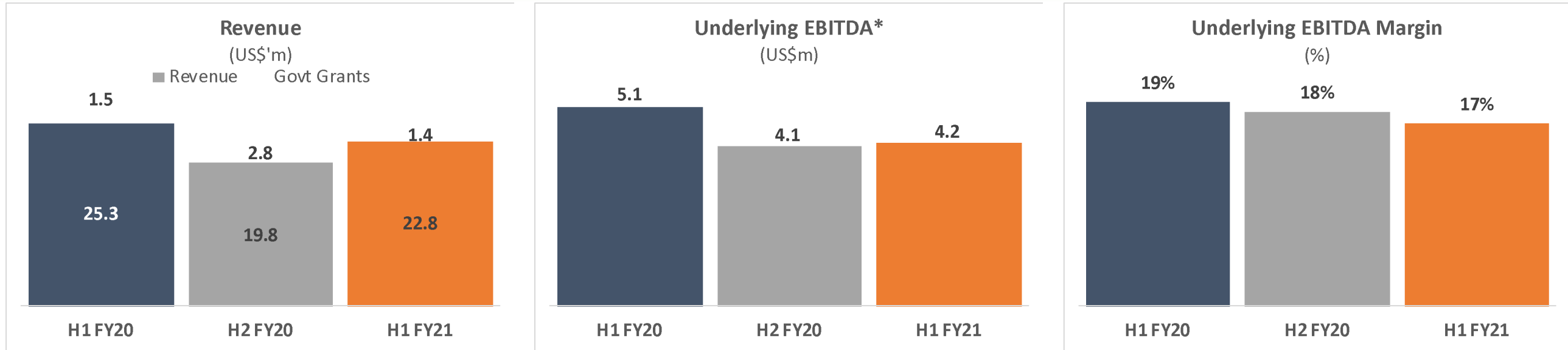
Services performance



- Sustainable business with oil price recovery and stabilisation
- Revenue growth of 7% hoh
- Increasing levels of activity and proposals – industry is waking up
- Redundancies implemented in Dec-20 reduced headcount by c. 10% to right size this division. Expect annual cost savings of c. US\$2.4m

Brent Crude Price Per Barrel US\$





- Strong performance in midst of current economic turmoil
- Revenue of US\$24.2m down year-on-year, due to diminishing revenue from the Polarcus On Board Processing (OBP) deal and falling Services revenue. Revenue excluding government grants is up 15% half-on-half, with revenue growth across all segments
- Underlying EBITDA steady at US\$4.2m with an EBITDA margin of 17%

Profit and loss



US\$'m	H1 FY21	H2 FY20	Change (hoh)	H1 FY20	Change (yoy)
HPCaaS	1.3	0.7	0.6	0.8	0.5
Services	18.2	17.0	1.2	19.9	(1.7)
Software	3.3	2.1	1.2	4.6	(1.3)
Government grants	1.4	2.8	(1.4)	1.5	(0.1)
Total Revenue	24.2	22.6	1.6	26.8	(2.6)
Employee Benefits	15.1	14.5	0.6	15.9	(0.8)
Other Operating Costs	4.9	4.0	0.9	5.8	(0.9)
Total Operating Costs	20.0	18.5	1.5	21.7	(1.7)
Underlying EBITDA	4.2	4.1	0.1	5.1	(0.9)
Depreciation and Amortisation	3.8	4.4	(0.6)	4.8	(1.0)
Underlying EBIT	0.4	(0.3)	0.7	0.3	0.1
Underlying NPAT	(0.9)	(1.0)	0.1	(2.5)	1.6
Non-recurring and listed company costs	(1.7)	-	(1.7)	-	(1.7)
Non-recurring finance costs related to IPO	(1.8)	(4.8)	3.0	-	(1.8)
Statutory NPAT	(4.4)	(5.8)	1.4	(2.5)	(1.9)

- DUG has increased its focus on Software and has successfully broadened to include HPCaaS. All provided through our DUG McCloud platform.
- HPCaaS revenue up 86% half-on-half and DUG Insight revenue up 12% year-on-year
- Pre-COVID, year-on-year revenue comparison reflects the impact of delayed projects in Services
- Earnings base has proved resilient with marginal improvement in the half-on-half underlying EBITDA
- Research and development is fully expensed within the underlying EBITDA
- Underlying EBITDA excludes non-recurring costs relating to redundancies within the Services segment and bad debt write-offs. Listed company costs are excluded due to not being incurred in comparative periods
- Underlying NPAT excludes one-off finance expenses and transaction fees relating to the IPO in August 2020 and the pre-IPO in February 2020

Balance sheet



US\$m	31-Dec-20	30-Jun-20
Cash	14.7	12.0
Trade and other receivables	12.8	10.7
Current assets	27.5	22.7
Fixed assets	25.5	22.7
Right of use assets	11.8	12.3
Long-term receivables and other	7.6	7.0
Non-current assets	44.9	42.0
Total assets	72.4	64.7
Trade payables	2.4	3.0
Other payables and accruals	2.5	2.3
Lease liabilities	2.2	2.3
Loans and borrowings	0.3	15.7
Current liabilities	7.4	23.3
Loans and borrowings	18.6	24.4
Provisions and others	0.2	0.2
Lease liabilities	13.2	13.0
Non-current liabilities	32.0	37.6
Total liabilities	39.4	60.9
Net assets	33.0	3.8
Share capital	39.2	5.5
Retained earnings	(0.9)	(1.0)
Reserves	(5.3)	(0.7)
Total equity	33.0	3.8

- Fixed assets reflect the net book value of compute, storage, network and data room infrastructure
- DUG builds long-lead time data centre infrastructure upfront, with short lead-time items (compute and storage) added just-in-time as demand dictates
- US\$5.5m invested in H1 FY21 to increase compute and storage capacity, mainly in the Houston facility
- Net debt, excluding lease liabilities, down from US\$28.1m to US\$4.2m, with the main reductions from:
 - Convertible notes of US\$15.4m converted to equity at IPO
 - CBA revolving facility repayment of US\$6.0m
- Debt facilities:
 - Maturity date on US\$17.8m term debt facility extended to January 2022
 - Discussions underway regarding further extension/amortisation
- Capitalised for growth with cash of US\$14.7m
- The Loan Funded Share Plan can introduce US\$8.3m of cash to DUG which is not recorded on the balance sheet

US\$m	H1 FY21	H1 FY20
Underlying operating cashflow	0.6	1.2
Non-recurring cash items	(1.3)	-
Statutory net cashflow from operating act	(0.7)	1.2
Capital expenditure	(5.5)	(0.3)
Other investing	0.5	-
Net cash used in investing activities	(5.0)	(0.3)
Net IPO proceeds	16.6	-
Proceeds from borrowings	-	2.4
Repayment of borrowings & interest	(6.6)	(1.2)
Repayment of lease liabilities & interest	(1.6)	(2.0)
Net cash flows from financing activities	8.4	(0.8)
Net increase in cash and equivalents	2.7	0.1
Cash and equivalents at beginning of half	12.0	2.0
Cash and equivalents at end of half	14.7	2.1

- Underlying operations are cash generative
- Invested US\$5.5m in increasing compute, storage and networking capacity in the Houston facility
- Net IPO proceeds of \$16.6m after payment of transaction fees

Segment profit and loss



US\$m	H1 FY21					H2 FY20					H1 FY20				
	CONSOL	Software	HPC	Services	ELIM	CONSOL	Software	HPC	Services	ELIM	CONSOL	Software	HPC	Services	ELIM
External customers	22.8	3.3	1.3	18.2	-	19.8	2.1	0.7	17.0	-	25.3	4.6	0.8	19.9	-
Inter-segment	-	-	8.5	-	(8.5)	-	-	6.0	-	(6.0)	-	-	4.7	-	(4.7)
Government grants	1.4	0.3	0.2	0.9	-	2.8	0.6	0.2	2.0	-	1.5	0.2	0.2	1.1	-
Total revenue	24.2	3.6	10.0	19.1	(8.5)	22.6	2.7	6.9	19.0	(6.0)	26.8	4.8	5.7	21.0	(4.7)
Employee benefits	15.1	1.1	3.5	10.5	-	14.5	1.1	2.7	10.7	-	15.9	1.2	3.0	11.7	-
Other operating costs	4.9	0.6	2.4	10.4	(8.5)	4.0	0.9	1.9	7.2	(6.0)	5.8	1.4	2.1	7.0	(4.7)
Total operating costs	20.0	1.7	5.9	20.9	(8.5)	18.5	2.0	4.6	17.9	(6.0)	21.7	2.6	5.1	18.7	(4.7)
Underlying EBITDA	4.2	1.9	4.1	(1.8)	-	4.1	0.7	2.3	1.1	-	5.1	2.2	0.6	2.3	-
Underlying EBITDA %	17%	53%	41%	-9%		18%	27%	34%	6%		19%	47%	11%	11%	
Non-recurring and listed company costs	(1.7)	(0.1)	(0.7)	(0.9)	-	-	-	-	-	-	-	-	-	-	-
Statutory EBITDA	2.5	1.8	3.4	(2.7)	-	4.1	0.7	2.3	1.1	-	5.1	2.2	0.6	2.3	-

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