

# Kleos Space S.A.

Australia / New space  
 Australian Securities Exchange  
 Bloomberg: KSS AU  
 ISIN: AU0000015588

Comprehensive  
 Update

**RATING**  
**BUY**

**PRICE TARGET**  
**AUD 5.00**

Return Potential 604.2%  
 Risk Rating High

## AN EXCITING ENTRANT IN THE NEW SPACE RACE

Kleos Space SA is an exciting player in the satellite-based Earth Observation Data as a Service (DaaS) segment. The EO market is worth at least €4.1bn with 6% average annual growth driven by falling satellite manufacturing and launch costs along with demand for faster and more precise geolocation data. In November 2020, Kleos launched its first 4-satellite cluster for the provision of radiofrequency data to end-users. A second 4-satellite cluster was launched in June 2021, a third launch is scheduled for January 2022 and contracts have been signed for a fourth launch in mid-2022. Kleos expects to have up to 20 4-satellite clusters. The DaaS model is very scalable, with data collected and processed just once, but resold many times. There are multiple potential revenue streams, including the maritime industry, law enforcement, civil aviation, insurance and others. In our view, Kleos has excellent prospects for a decade or more of strong growth. With commissioning of the first cluster now complete, the company has signed data agreements with 52 clients with an annualized run rate of €4.7m, and a strong pipeline > 220 prospects, of which 100 are in detailed contract discussions. A recent PIPE transaction provides Kleos with sufficient capital into 2023. A dramatic acceleration in revenue means that Kleos will be both profitable and free cash flow positive in 2022. Average EBITDA margins of 70+% and exceptional free cash flow drive our revised DCF valuation of AUD 5.00 (previously: AUD 1.18). We confirm our Buy rating.

**The €364bn Space Economy is experiencing a technological and market shift** The global space economy is in the midst of a shift to commercialization that has many years left. The theme for all end-users is the need for all types of geolocation data to aid governments, businesses and non-profit organizations in decision making. Decreasing satellite size, along with lower manufacturing and launch costs, are anticipated to generate a 3-fold increase in small satellites by 2030. Data analytics, the segment where Kleos is positioned, is the largest and fastest growing part of the space-based economy. p.t.o.

### FINANCIAL HISTORY & PROJECTIONS

	2019	2020	2021E	2022E	2023E	2024E
Revenue (€m)	0.60	0.18	0.10	21.09	40.31	60.39
Y-o-y growth	n.a.	n.a.	n.a.	n.a.	91.2%	49.8%
EBIT (€m)	-3.27	-3.07	-4.93	10.38	22.11	37.32
EBIT margin	n.a.	n.a.	n.a.	49.2%	54.8%	61.8%
Net income (€m)	-3.50	-4.87	-5.05	10.38	21.58	33.94
EPS (diluted) (€)	-0.03	-0.03	-0.03	0.06	0.11	0.17
DPS (€)	0.00	0.00	0.00	0.00	0.00	0.00
FCF (€m)	-5.48	-4.67	-8.36	5.12	16.59	28.10
Net gearing	43.9%	-61.8%	-49.8%	-49.8%	-63.8%	-72.8%
Liquid assets (€m)	0.29	10.79	7.10	12.58	32.13	67.04

### RISKS

Risks include, but are not limited to technological risk, execution risk, financing risk, shareholder dilution, loss of key personnel, competition risks, commercial and government contracting risk

### COMPANY PROFILE

Kleos is a "new space" technology specialist aiming to launch and operate nano-satellites in space to collect radio frequency (RF) signals for geospatial location. The company is a pioneer in applying RF technology from space for the maritime industry. Based in Luxembourg, KSS will sell the RF data as a service worldwide to government agencies, intelligence and maritime companies.

### MARKET DATA

As of 11/10/2021

Closing Price	AUD 0.71
Shares outstanding	177.5m
Market Capitalisation	AUD 126.0m
52-week Range	AUD 0.51 / 1.02
Avg. Volume (12 Months)	362,638

Multiples	2020	2021E	2022E
P/E	n.a.	n.a.	7.8
EV/Sales	0.0	0.0	3.5
EV/EBIT	n.a.	n.a.	7.0
Div. Yield	0.0%	0.0%	0.0%

### STOCK OVERVIEW



### COMPANY DATA

As of 31 Dec 2020

Liquid Assets	€ 10.79m
Current Assets	€ 11.44m
Intangible Assets	€ 0.00m
Total Assets	€ 16.90m
Current Liabilities	€ 5.05m
Shareholders' Equity	€ 11.86m

### SHAREHOLDERS

LTL Capital	16.8%
Magna Parva (founders)	14.1%
Cameron Family Holdings	10.9%
Management/Board	5.5%
Free Float	52.7%



**Strong growth in the €4.1bn (\$4.8bn) Earth Observation (EO) market** Within the global space economy, Kleos operates in the EO market, which is growing at 6% p.a. Long-standing global challenges of security and economic loss have created a commercial market hungry for affordable solutions to combat illegal activities on land, on the seas and in the air.

**Focus on the radiofrequency (RF) part of the communications spectrum** Using Kleos' own satellites, RF signals are collected and processed using the company's proprietary algorithms to create data products that are sold on a subscription basis. Kleos' geospatial intelligence (GEOINT) mapping locates and monitors human activity. The data are used in conjunction with other types of EO data to uncover hard-to-detect illegal activities. First Berlin estimates that the maritime industry, which will be Kleos' initial focus, is worth €426m (\$492m) in annualised revenue and is growing at 15% p.a.

**Best-in-class technology** Kleos specializes in the 4-satellite cluster for the provision of GEOINT and signal intelligence (SIGINT) data versus the more typical and less accurate 2-3 satellite cluster. The superior geolocation capabilities of Kleos' model will give the company a significant competitive advantage over the few other competitors in the RF space. The company has reported that the technology's capabilities have exceeded expectations.

**Data as a Service (DaaS) model has scalable revenue, high margins and exceptional cash flows** The DaaS model is basically *Collect and Process Data Only Once, but Resell Over and Over*. Kleos' eventual EBITDA margin under the DaaS model is projected to be 70+% with compelling cash flows. The company will be both profitable and free cash flow positive in 2022. Even assuming regular satellite replacement costs, seldom-seen levels of cash flow generation drive our discounted cash flow model and rating.

**Signed agreements on target and pipeline has > 220 vetted prospects** As of 30 Sept, Kleos has 52 signed data evaluation agreements worth €4.7m/yr plus another €2.9m under negotiation for a Jan 1 start date. The deal pipeline stretches over 5 continents with more than 220 vetted prospects that have submitted RFPs or RFIs. Revenue is tracking to dramatically accelerate in 2022, with double-digit revenue growth for the next 10 years.

**Fund raising now complete** In September, the company had a Private Investment in Public Equity (PIPE) transaction that raised €7.9m (AUD 12.6m). Two top-5 shareholders increased already substantial stakes and two prominent Australian investment funds are now new shareholders. With revenue generation now commencing, this should be the last equity financing round that Kleos will need to complete its satellite constellation. At end 3Q21, Kleos had €9.4m in cash on its balance sheet, enough to fund satellite launches until the company turns cash flow positive by year-end 2022 (FB estimate).

**Long lead times for satellite launches make existing players attractive acquisition candidates** Complex technology, years-long lead times and sponsorship hurdles required to execute a satellite constellation mean that existing satellite operators are getting acquired for lofty multiples. The most eye-popping of these is the \$850m equity SPAC valuation for Satellogic, with 17 satellites in orbit, no revenue in 2020 and only \$7m in revenue expected for 2021. Putting Kleos on the same plane, with its superior 4-satellite cluster technology platform and 12 satellites expected by January 2022 would give the company a valuation many multiples of the current stock price.

**Compelling Valuation** Kleos appears significantly undervalued at the current price of AUD 0.71. Kleos is also a great value using EV/2022 Sales (3.5X), EV/2022 EBIT (7.0X) or P/E (7.8X 2022 EPS of €0.06/AUD 0.09). Our Buy rating is confirmed with a revised price target of AUD 5.00 versus the previous AUD 1.18.



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## INVESTMENT CASE

### Earth observation (EO) market

The €4.1bn (\$4.8bn) EO market in which Kleos operates is the largest and fastest-growing subsector of the global space economy. Issues of national security, as well as economic costs of illegal activities on land and sea are driving the need for increasingly accurate and rapidly delivered data to assist in apprehending bad actors. Overfishing, illegal transport of goods under sanction, drug and human trafficking, ocean pollution and sea piracy are all areas of concern to different customers. Kleos will succeed by providing data that is more accurate and more frequent than the competition. Kleos' radiofrequency geointelligence/signal intelligence (GEOINT/SIGINT) product will pave the way for years of growth.

### Kleos' 4-satellite cluster model is best in class

Because of the difficulty in commissioning, no other satellite company has attempted the 4-satellite cluster, which is significantly more accurate than the one to three satellite technology used by competitors. Kleos' superior platform will allow higher pricing and solidify customer retention. With a planned constellation of up to 80 satellites, Kleos will surge to the head of the pack in terms of data "revisit rates" (frequency) and geolocation accuracy.

**Data as a Service (DaaS) revenue model** DaaS is basically "collect and process data once, but resell over and over". Revenue accelerates dramatically once a minimum number of satellites is in place, generating strong margins and cash flow. In a short time, Kleos' revenue is expected to increase manyfold from the 2022 level of €21m (FBe).

### Significant barriers to entry

Creating a constellation of satellites is a years-long endeavour requiring significant industry knowledge, specialized software and sponsorship of a country willing to provide a broadcasting license. Kleos has been working on its satellite model and software for more than 6 years, giving it a significant head-start on potential competitors. Recent lofty acquisition prices for satellite operators with low or no revenues indicate the exceptional take-out potential for players in the industry who are at the revenue-generation stage.

### Dozens of signed agreements and a deal pipeline with > 220 vetted prospects

Revenue generation commenced in 3Q21, and Kleos has 52 signed agreements for data provision to end-users with an ARR of €4.7m and is in negotiations for ARR of €2.9m. The pipeline has more than 220 vetted prospects that have submitted RFPs or RFIs, an exceptionally strong indicator of future revenue. With RFPs coming from a diversity of customers on 5 continents, we anticipate revenue acceleration over the next 18 months.

### Recent PIPE transaction of €7.8m (AUD 12.6m)

On 15 September, 2021, Kleos completed a Private Investment in Public Equity (PIPE) transaction in the amount of €7.9m (AUD 12.6m), which will set Kleos up until 2023. Two prominent Australian investment funds with sterling reputations for creating shareholder value, Perennial Value Investors and Thorney Investment Group, invested in the PIPE. Two top-5 existing shareholders also participated in the PIPE -- another strong show of support.

### Compelling valuation

Our DCF model showcases the benefit of the cash-rich DaaS model. On an EV/Sales metric, Kleos is trading at only 3.5X 2022 revenue and at 7.0X 2022 EBIT. Using a P/E method, Kleos trades (stock price: AUD 0.71) at just 7.8X 2022 EPS of €0.06 (AUD 0.09). We view Kleos as one of the most compelling small-cap investments we have seen in many years. Our recommendation is Buy, with a price target of AUD 5.00.



## SWOT ANALYSIS

### STRENGTHS

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- **Management team** Kleos' management team and Advisory Board has deep experience in the space and ISR (intelligence, surveillance and reconnaissance) industries. Management talent familiar with the challenges of space is difficult to find. Taking advantage of the growth opportunity requires swift action, which in turn requires an experienced management team.
- **Best in class technology** Kleos is the first commercial satellite operator to launch nano-satellites in clusters of four. This greatly improves data quality and geolocation accuracy and will give Kleos a competitive advantage. It is best-in-class technology that is not easily copied.
- **Proprietary software** Since 2017, Kleos has been developing signal processing and software tools for precision data delivery to customers. This is a significant barrier to entry, giving Kleos a years-long lead time over competitors. The provision of data and analytics is the fastest-growing segment of the space economy and Kleos has excellent positioning for years of strong growth.
- **Data as a Service (DaaS) Model** The scalable revenue from the DaaS model generates strong cash flows once the constellation is in place. With a dramatic increase in revenue in 2022, we project that Kleos will be both profitable and free cash flow positive in 2022, three years ahead of our previous estimate.

### WEAKNESSES

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- **Understaffed** Staffing has been lean to conserve cash during the initial build-out and launch. The company requires additional engineering, sales, marketing and management talent as it enters the commercialisation phase of its strategy. While the company is in the process of adding personnel, it will take some months before the team is fully in place.
- **Near-term need for capital** Satellite companies require regular infusions of capital to replace satellites that have aged out of service. This needs to be done regardless of the status of capital markets or other economic conditions. The recent PIPE completed in September 2021 sets Kleos up until 2023. If revenue does not ramp up as planned, the company will need to again access the capital markets for funding.
- **Untried business model** Kleos is a new company in a new industry, and has not yet generated any revenue. We expect meaningful revenues beginning January 2022, but the untried nature of the business model could mean additional bumps along the way, especially with contract pricing. Our earnings model therefore has very conservative assumptions on product pricing.
- **Outsourcing of commissioning process** As is common in the industry, Kleos has outsourced its satellite commissioning process. The vendor for the KSM cluster experienced delays in positioning the satellites, leading to a longer than expected time to revenue generation. Kleos may need to bring the commissioning service in-house at some future point, as other later-stage operators have done.
- **Independent Board** Kleos is starting to transition to an independent Board of Directors and has taken recent steps with new appointments. But more needs to be done. Additional independent members will become increasingly important as the company grows. We hope to see progress in this important area in the next 12-18 months.



## OPPORTUNITIES

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- **Satellite Data as a Service market is new** As a nascent industry, there are likely to be new customer groups that currently don't use maritime data, such as in the broader commercial market. These include off-shore wind farms, oil and gas platforms, cruise ships and large private boats/yachts. These are not currently factored into expectations, but are an untapped source of customers.
- **First mover advantage** There is a significant advantage in getting to market as fast as possible. Once signed, customers are "sticky" and rarely switch, since they would lose access to historical data. The superior accuracy of Kleos' data and its software platform are attributes that will be an advantage in attracting and keeping customers.
- **Speed of adding additional clusters** Each additional satellite cluster added to the constellation improves revisit rates, improves data quality and leads to superior geolocation accuracy, all contributing to higher contract rates. Our model uses existing cash flow to add clusters until the desired number of 20 is achieved in 2028. If revenue exceeds our target, satellites could be added faster than projected, leading to higher contract rates and a correspondingly higher valuation.
- **Customer retention** Once customers have used the product, retention is expected to be very strong. Customers that switch to another vendor lose access to the historical data, which is critical for establishing behaviour patterns and tracking of repeat offenders. "Sticky" customers are another factor in cash flow generation, since growth comes mainly from adding new clients or products.
- **Conservative modelling assumptions** We have taken a conservative approach on satellite purchase and launch costs, which are kept level throughout the projection period. Satellite manufacturing costs are widely expected to be lower over the next 5 years, so there is upside in the earnings projection.
- **Long lead times and technical expertise needed to create satellite constellations make existing players attractive acquisition candidates** Creating a satellite constellation requires technical expertise, broadcast licenses and years of planning. As a result, existing players with few satellites and/or revenues are being acquired for lofty multiples. Add in industry growth, Kleos' first-mover advantage in capturing customers, its proprietary software and best-in-class technology, and Kleos becomes an exceptionally attractive acquisition candidate.

## THREATS

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- **Commissioning risk** The satellite positioning process for a 4-satellite cluster is complex. The first cluster took longer than expected, resulting in delays in signing up paying customers. We expect the subsequent satellite launches to take less commissioning time due to the experience and learning gained with the first launch. However, if the second and third clusters also take several months for set-up, it could delay revenue generation.
- **Pricing risk** As a new entrant in a new industry, Kleos is still working with customers on what the eventual contract rates will be as clusters are added. The final prices could be less than the company envisions. We have taken a conservative approach to pricing in our model.
- **Fund raising risk** Potential commissioning delays mean Kleos may not generate sufficient revenue to fund satellite launches past 2023, and would need to again access the capital markets, with the potential for dilution for existing shareholders.



## VALUATION

We calculate the fair value of Kleos using a discounted cash flow model. Our model estimates free cash flow generated from 2021 to 2035 and discounts these FCFs back to the present value. The model has two phases: The Explicit Period covers the years 2021E-2035E. We have made assumptions on the most important model-relevant parameters (revenues, EBIT, capital expenditures and working capital). Terminal value cash flows cover the period from 2036 onward using a growth rate of 2.0%.

The forecasted cash flows are discounted using a Weighted Average Cost of Capital (WACC) estimate, which is based on the estimated cost of debt and the company-specific cost of equity. The cost of equity estimate is calculated using a capital asset pricing model which adds the risk-free interest rate and the market risk premium and multiplies this sum by the company-specific risk factor. Although the stock trades in Australia, and is expected to have revenue out of the Americas, Kleos is a Luxembourg-based company, with access to European capital markets. We have therefore assumed the risk-free rate to be 0.2%, based on the long-term rate on government bonds that are considered to be effectively risk-free. The market risk premium is assumed to be 5.0%, based on many financial empirical studies. Our cost of capital is influenced by our 10-factor proprietary risk model, which ranges from 1 (least risky) to 5 (most risky). Kleos' risk factor score is 3.05, an average score for companies of similar size and profile. The company gets positive scores for quality of earnings, management strength, competitive position and regulatory/political uncertainty. Average to below average scores are assigned for corporate governance, balance sheet/financial risk, financial disclosure and share float. The weighted average cost of capital (WACC) for Kleos is estimated to be 15.45%, calculated as  $0.2\% + (5.0\% \times 3.05) = 15.45$ . The cost of debt is assumed to be 10%, and the company's tax rate is assumed to be 28% throughout. Because Kleos has virtually no debt and has signalled its intention to forego debt for the foreseeable future, the WACC calculation is completely reliant on the company's equity component.

Our cash flow calculations for the period 2022E-2024E assume a sharp increase in sales in 2022. We are expecting that customer additions will come on at a declining rate as the pipeline expansion slows by the end of 2023. As Kleos adds satellite clusters between 2022 and 2028 to achieve the maximum number of 20 clusters, the quality and quantity of its data will increase, which will allow the company to increase its contract rates with every additional cluster launched. This will drive double-digit revenue gains for the next 10 years.

Satellite purchase and launch costs are capitalised until the satellite is operational, which we assume to be six months after launch. Satellites are replaced at the end of their useful lives of 5 years. With 80 satellites in operation (20 4-satellite clusters), scheduled satellite replacement increases until it levels out at €9.3m per year towards the end of the projection period. With the growth in satellite technology, as well as improvements in launch vehicles, we have taken an extremely conservative approach to capital expenditures, since these are widely expected to decline sharply over time. For purposes of valuation, we keep total replacement cost per cluster at €3.1m for the duration of our model.

The enterprise value is comprised of an Explicit Period PV calculation of €345.3m, a Terminal Period PV calculation of €217m, giving an Enterprise Value calculation of €562.3m. To this figure we add the net cash of €7.3m (YE 2020 audited) to give total shareholder value of €569.7m. We then convert this figure into AUD, giving AUD 892.5m. Dividing this sum by 177.5 million diluted shares gives our fair value calculation of AUD 5.00 per share.



For comparison, we showcase the valuations of recent transactions involving operators of small satellite clusters. Transactions are based on a multiple of revenue and take into account the ability to launch additional satellites under a sponsoring country, the number of satellites in orbit, any proprietary software platforms, the growth potential of the target markets and future revenue expectations. We note that all of the companies below would not fare well under a discounted cash flow valuation due to continued expected net losses and weak cash flow generation. Despite having no revenue in 2020, Satellogic, an Argentinean satellite company with 17 satellites in orbit and anticipated revenues of \$7 million in 2021, was recently acquired by a SPAC for the eye-popping valuation of \$850 million. None of the companies in the upper table is currently profitable—hence the use of multiples of revenue for valuation rather than the more rigorous DCF method. Kleos is expected to be both profitable and free cash flow positive in 2022, with cash generation accelerating with each passing year. Given Kleos' exceptional cash flow generation, we believe using revenue multiples of 28-38 are appropriate, giving Kleos a valuation €590 to €801 million (\$682 million and \$926 million) on 2022 estimated revenue and €1.1 to €1.5 billion (\$1.3 to \$1.8 billion) on 2023 estimated revenue. The company's current market cap of AUD 126 million (€80.5 million) looks puny relative to the potential takeout valuation. The company is one of the most undervalued names in the space category.

**Figure 1: Recent Small Satellite Company Transactions**

Company	Acquiring SPAC	Transaction closing	Purchase price (\$k)	LTM revenue (\$k)	Purchase price as multiple of LTM	Current no. of satellites in orbit	Planned no. satellites in orbit
<b>SPAC Transactions</b>							
Spire Global	NavSight	17-Aug-21	1,600,000	61,500	26x	110	125
BlackSky	Osprey Tech	09-Sep-21	1,500,000	39,800	38x	6	30
Planet	dMT Tech Grp IV	4Q21	2,800,000	100,000	28x	200	N/A
Satellogic	CF Acq'n Corp V	1Q22	850,000	0	NM	17	300
<b>Acquisitions</b>							
exactEarth	Spire Global	14-Sep-21	161,200	17,000	9x	63	N/A

Source: First Berlin Equity Research, Bloomberg L.P.

**Figure 2: Kleos Valuation Comparison**

Valuation Multiple of Revenue	10x	25x	26x	27x	28x	30x	38x
Kleos 2022E Revenue (EUR)	€21,085						
Kleos 2022E Revenue (USD)	\$24,362						
<b>Valuation on 2022 Revenue</b>							
Kleos Valuation (EUR)	210,850	527,125	548,210	569,295	590,380	632,550	801,230
Kleos Valuation (USD)	243,616	609,040	633,402	657,763	682,125	730,848	925,741
Kleos 2023E Revenue (EUR)	€40,313						
Kleos 2023E Revenue (USD)	\$46,578						
<b>Valuation on 2023 Revenue</b>							
Kleos Valuation (EUR)	403,130	1,007,825	1,048,138	1,088,451	1,128,764	1,209,390	1,531,894
Kleos Valuation (USD)	465,776	1,164,441	1,211,019	1,257,596	1,304,174	1,397,329	1,769,950

Source: First Berlin Equity Research





## DCF MODEL

Figure 3: Discounted Cash Flow Valuation Model

DCF valuation model									
EUR '000	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E
Net sales	100	21,085	40,313	60,391	77,226	93,303	110,776	129,205	147,998
NOPLAT	-4,932	10,378	22,109	37,324	50,564	61,802	75,044	90,291	105,705
+ depreciation & amortisation	50	2,020	3,570	4,810	5,270	7,130	8,370	8,680	9,302
Net operating cash flow	-4,882	12,398	25,679	42,134	55,834	68,932	83,414	98,971	115,006
- total investments (CAPEX and WC)	-3,363	-7,276	-8,561	-10,653	-10,428	-10,379	-10,490	-10,581	-10,624
Capital expenditures	-3,390	-6,200	-7,401	-9,300	-9,302	-9,302	-9,300	-9,303	-9,306
Working capital	27	-1,076	-1,160	-1,352	-1,126	-1,077	-1,190	-1,279	-1,318
Free cash flows (FCF)	-8,245	5,122	17,118	31,482	45,406	58,553	72,924	88,389	104,382
PV of FCF's	-8,086	4,351	12,596	20,057	25,057	27,988	30,192	31,686	32,411

### All figures in thousands

PV of FCFs in explicit period (2021E-2035E)	345,354
PV of FCFs in terminal period	217,006
Enterprise value (EV)	562,360
+ Net cash / - net debt	7,322
+ Investments / minority interests	0
Shareholder value (EUR)	569,682
Shareholder value (AUD)	892,520
Fair value per share in AUD	5.00

WACC		Terminal growth rate							
		0.5%	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	
Cost of equity	15.5%	11.5%	8.03	8.23	8.46	8.70	8.97	9.28	9.62
Pre-tax cost of debt	10.0%	12.5%	6.98	7.13	7.29	7.47	7.67	7.89	8.13
Tax rate	28.0%	13.5%	6.12	6.23	6.36	6.49	6.64	6.79	6.97
After-tax cost of debt	12.8%	14.5%	5.41	5.50	5.59	5.69	5.80	5.92	6.05
Share of equity capital	100.0%	15.5%	4.81	4.88	4.95	5.03	5.11	5.20	5.30
Share of debt capital	0.0%	16.5%	4.31	4.36	4.42	4.48	4.54	4.61	4.68
		17.5%	3.88	3.92	3.96	4.01	4.06	4.11	4.17
Price target (AUD)	5.00	18.5%	3.51	3.54	3.57	3.61	3.65	3.69	3.74

\* for layout purposes the model shows numbers only to 2029, but runs until 2035

Source: First Berlin Equity Research



## THE GLOBAL SPACE ECONOMY

According to an estimate from the Space Foundation, the global space economy was worth \$424bn (€362bn) in 2020, with governments contributing 21% and commercial players 79%. The space economy grew at 2.2% in 2020, with the commercial space sector rising by 2.4%.

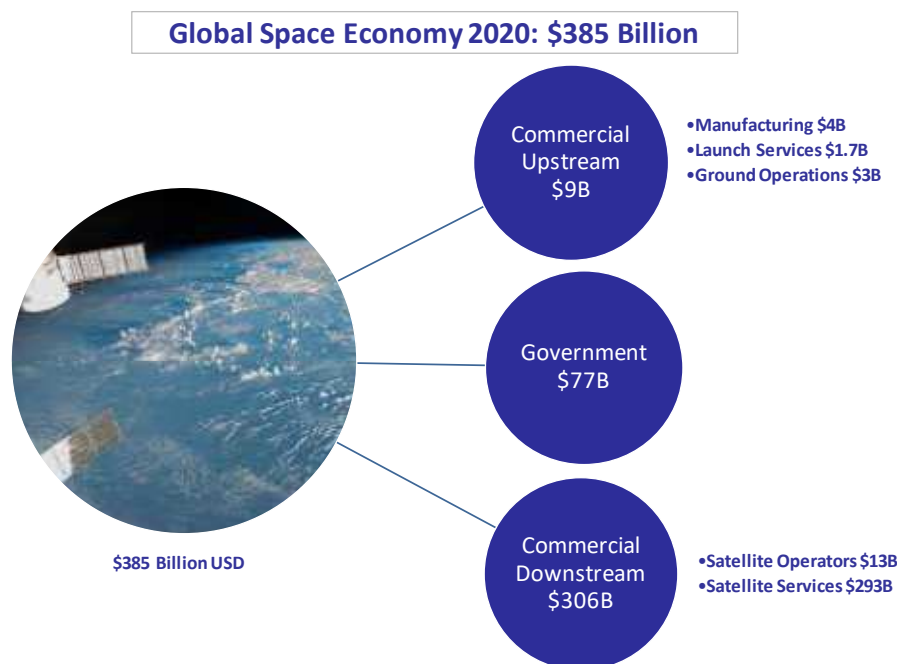
**Figure 4: Size of the Global Space Economy in 2020**

Segment	Amount	% of Total	Yr/Yr % Chg
Total	\$424bn	100%	2.2%
Government	\$87bn	21%	1.0%
Commercial	\$337bn	79%	2.4%

Source: First Berlin Equity Research, The Space Foundation

According to another estimate, this one from EuroConsult, the global space economy in 2020 was \$385bn (€343bn). The figure below indicates the different sectors as well as their contribution to the whole. While there is substantial deviation between these two estimates, the relative contributions of government versus commercial are quite similar.

**Figure 5: The Global Space Economy (EuroConsult)**

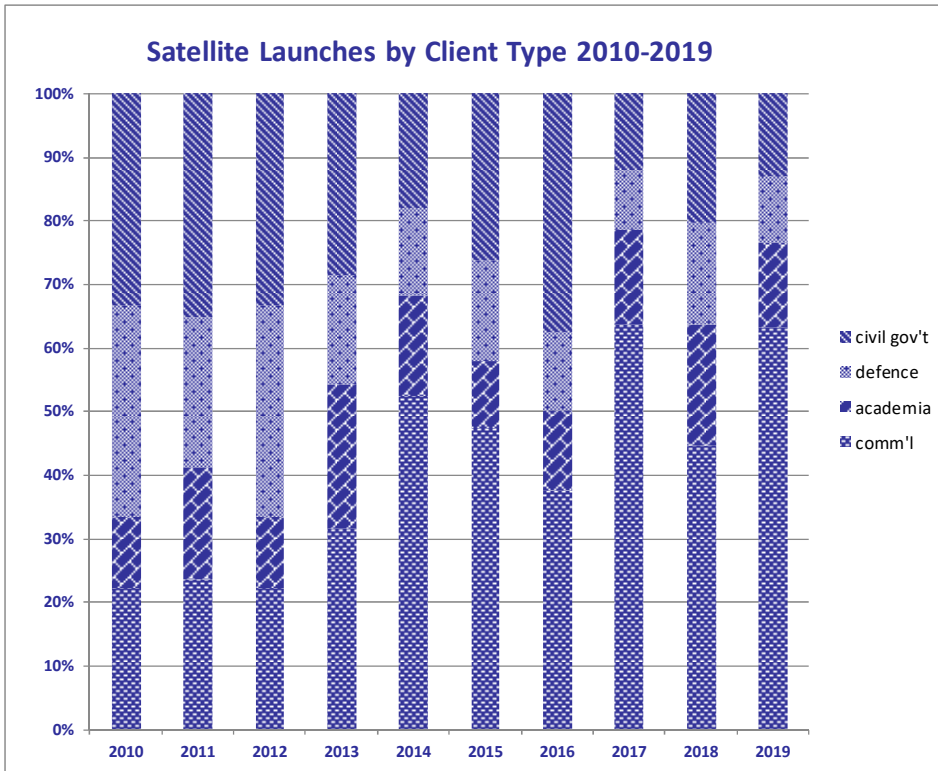


Source: First Berlin Equity Research, EuroConsult

Commercial upstream is any service related to either the manufacture of satellites or the provision of launch services and/or ground operations. The commercial downstream segment is the provision of data as well as satellite operations. Commercial downstream has overtaken the government sector as the biggest contributor to the space economy and its growth. The largest segment with the commercial sector is Satellite Services at \$293bn (€250bn). The figure below shows the change in commercial participation in satellite launches since 2011.



**Figure 6: Launched Satellites**



Source: First Berlin Equity Research, EuroConsult

As the space economy has added more commercial satellites, the government-related contribution has fallen as a percentage of the total. In 2010, civil government and defence combined totalled 67% of total launches. By 2019, that figure had fallen to roughly 23%.

**GROWTH DRIVERS FOR THE COMMERCIAL SPACE INDUSTRY**

There are four main growth drivers for the commercialisation of space: 1) lower costs to build satellites; 2) falling launch costs; 3) demand for higher resolution EO data; and 4) the need for analytics to process satellite data into a usable form for end-users.

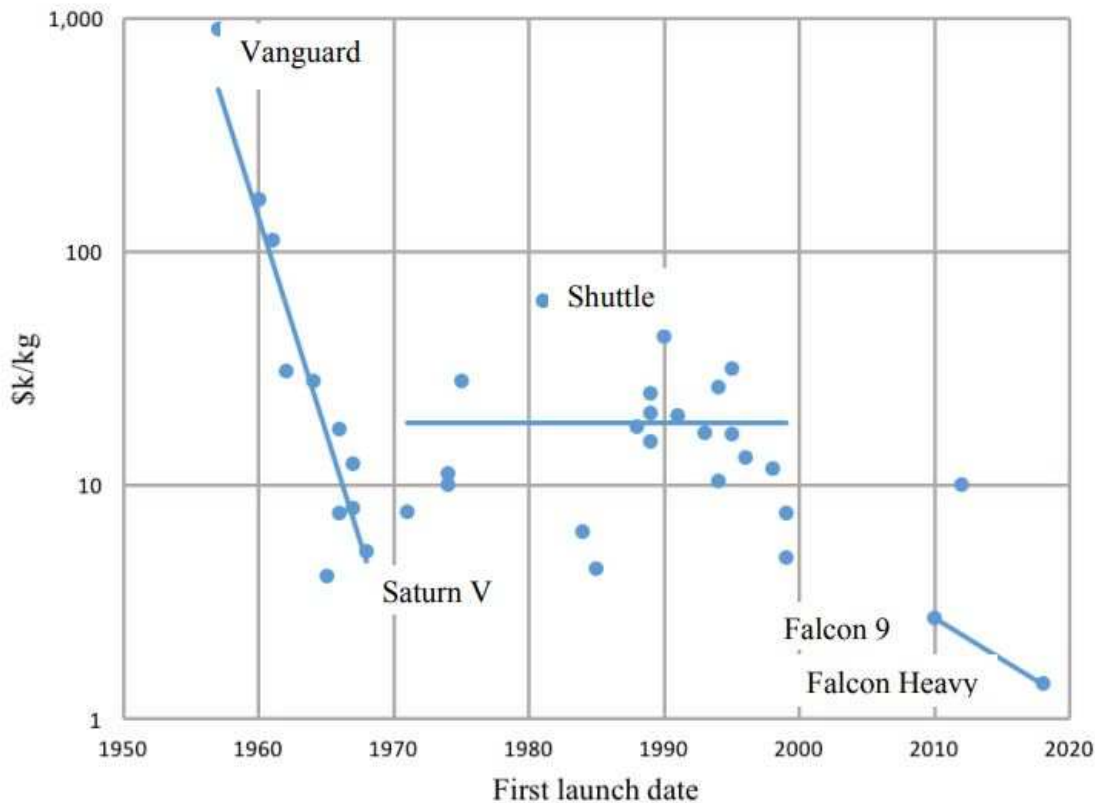
**Lower satellite manufacturing costs** Previously, launched satellites were the preserve of governments or corporations with deep pockets that tended to launch very large satellites on an infrequent basis. In 1999, Stanford University and California State Polytechnic University designed the first CubeSat for low earth orbit (LEO). This advance paved the way for the miniaturization of satellites that could be made with off-the-shelf components at a much reduced cost compared with the previous machines. The leaps in technology along with lower costs made it feasible for corporations, educational institutions and many other organizations to launch their own satellites. There has been a reduction in the size of launched satellites as commercial players have moved to smaller (small, mini, micro and nano) satellites.

**Falling launch costs** Reusable rockets developed initially by SpaceX have drastically reduced the cost to put a satellite into low earth orbit. From 1955 until the early 2000s, satellites could only be deployed on government rockets or the Space Shuttle at a cost of millions of dollars. As recently as 2011, it cost \$61,720/kg to launch a satellite into LEO from the Space Shuttle. The cost to launch a satellite into LEO on the SpaceX Falcon 9 rocket is



only \$2720/kg, a reduction of 23X. For a nano-satellite today, there are many commercial operators offering rocket launches, a factor driving down the launch cost to only \$27,200 for a 10kg unit. Our figure below shows the drop in cost per launch over time.

**Figure 7: Satellite Launch Costs 1955-2018**



Source: First Berlin Equity Research, NASA Ames Research Center

**Demand for higher resolution data** There is a seemingly insatiable demand for improved earth observation capabilities. Advances in technology have made data capture faster and more accurate, trends now making their way into the commercial market. Commercial players are finding increasing uses for data in areas as diverse as agriculture, energy, infrastructure, education, insurance, location-based services, natural resources, environment and others. Kleos has indicated that its second satellite cluster has twice the data capabilities of the first, due to technological advances. And the third will be substantially better than the second. The company is well-positioned to satisfy corporate, non-profit and government demands for data.

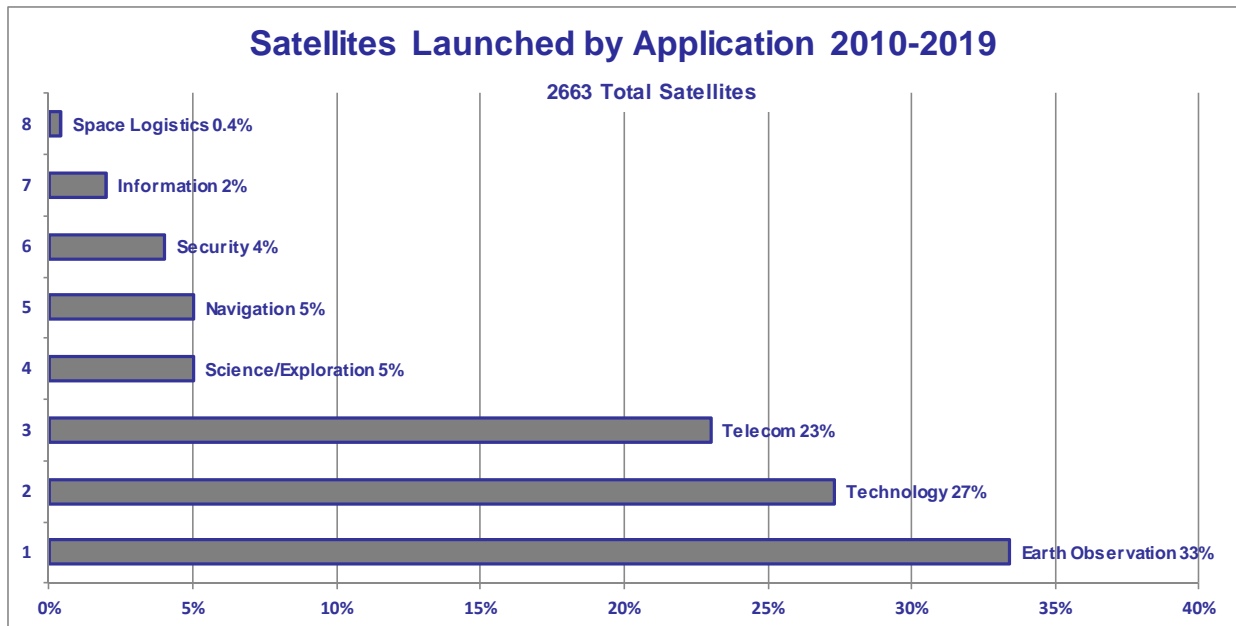
**Software and analytics** With so much higher resolution data being generated by greater numbers of satellites, there has been a corresponding need for analytics programmes to process the data to make it user-friendly. This has been an increasingly important part of the Earth Observation market, especially for smaller users. Customised software programmes make it possible for a company like Kleos to sell its data to a wide range of industries that can extract only what they need from the dataset.



## SATELLITES BY APPLICATION

There are various sectors of the space economy, with the biggest being Earth Observation. Our figure below shows the cumulative application of satellites launched since 2010.

Figure 8: Launched Satellites by Application



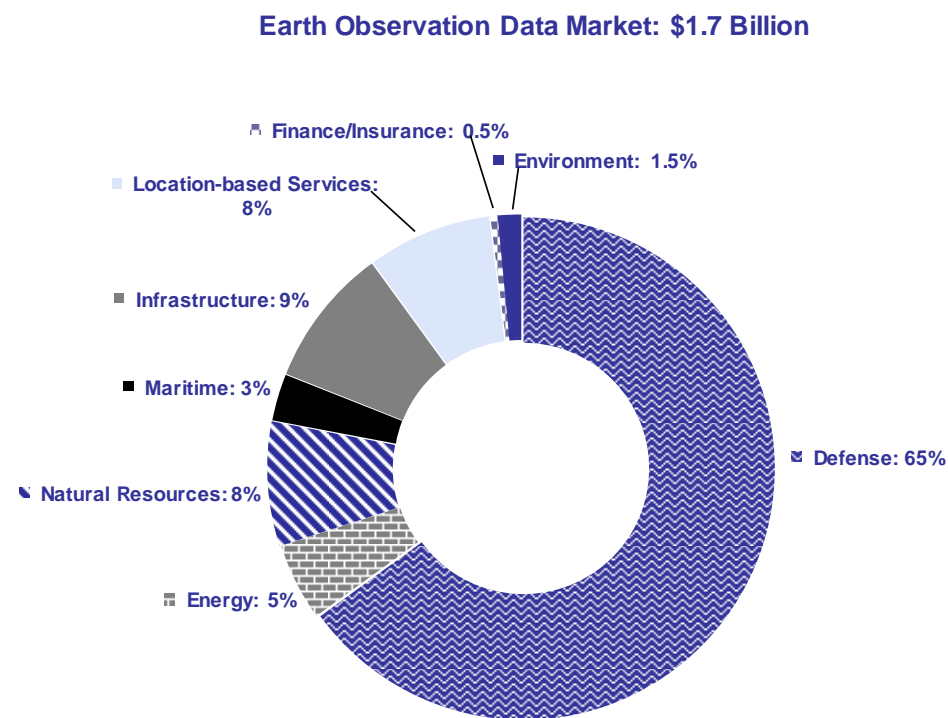
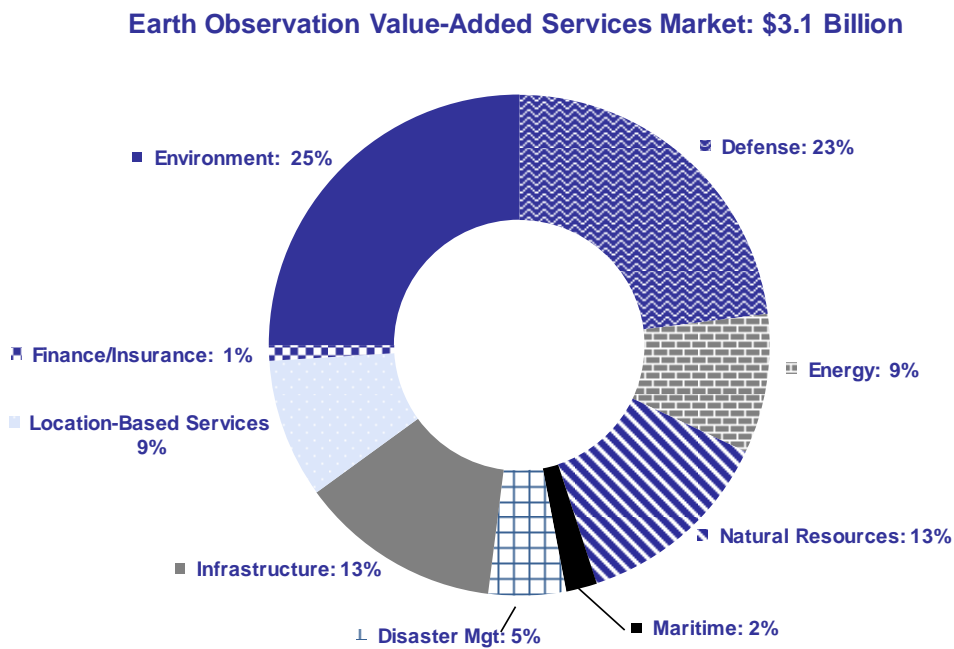
Source: First Berlin Equity Research, EuroConsult

## THE EARTH OBSERVATION MARKET

The Earth Observation (EO) Market uses a variety of technologies to observe activities or track signals emitted from earth. The EO Market, formerly the domain of governments, is increasingly a commercial market. As small and relatively affordable satellites have increased in both resolution and customisation, it has opened up affordable data capture to a growing number of industries that are finding uses for the data generated. The market can be subdivided into end-users that are interested only in data, and those that purchase value-added services requiring software and analytics that process the data. Not surprisingly, larger entities such as governments/defence departments almost always purchase a raw dataset, since they have their own internal analytics programmes.



Figure 9: Value of Earth Observation Market



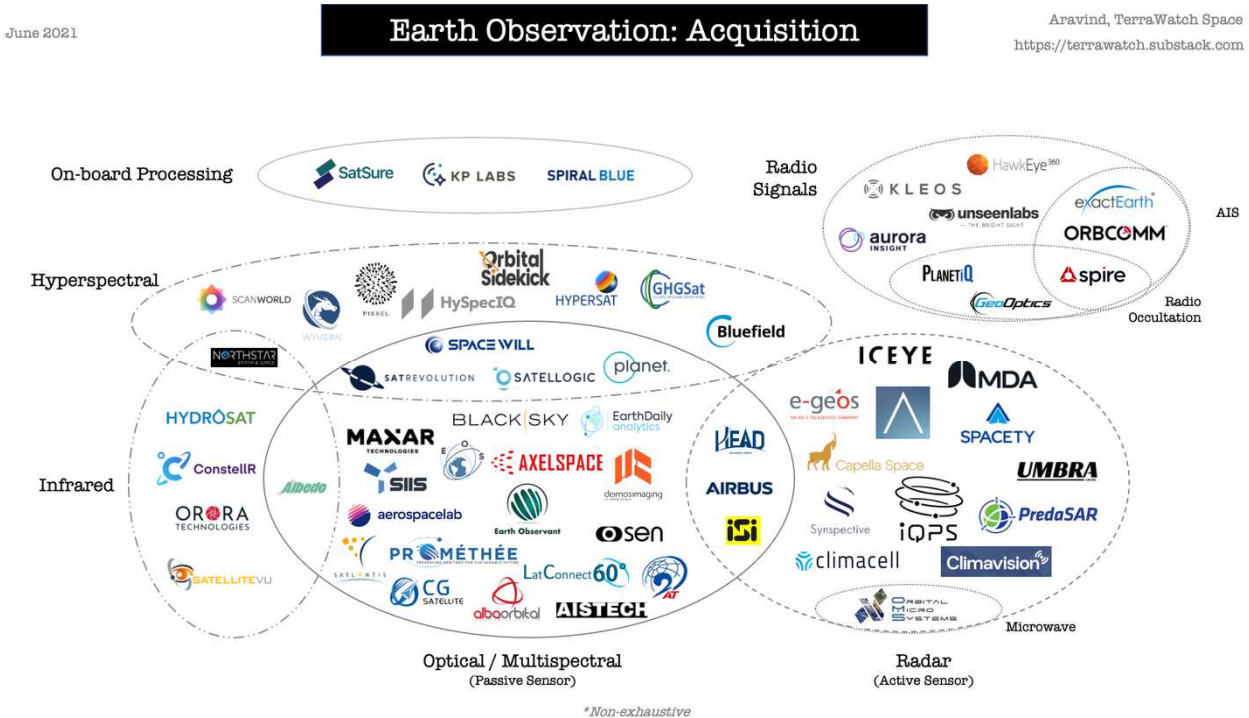
Source: First Berlin Equity Research, EuroConsult, figures for 2020

## EARTH OBSERVATION MARKET PARTICIPANTS

The €4.1bn (\$4.8bn) Earth Observation market is growing at around 5-8% per year. The players can be broadly categorized as either 1) Data Intelligence or 2) Data Acquisition/Dissemination. Intelligence includes companies that develop software for processing satellite data, or that provide data analytics programmes for a specific end use. Acquisition/Dissemination is the use of owned satellites to capture data which is then disseminated to end users for a fee—either one-time or sporadic use, or on a subscription basis. Some companies, such as Kleos, participate in both categories.

Below is a depiction of the different companies in the Data Acquisition/Dissemination category of the Earth Observation market. The most crowded segment is the optical camera/multispectral scanner segment. These companies are capturing visual data and reselling it to end-users in multiple industries. Many companies overlap into different categories.

Figure 10: Earth Observation Players



Source: First Berlin Equity Research, TerraWatch Space, 2021



## KLEOS' BUSINESS MODEL

### RADIOFREQUENCY SIGNALS AND GEOLOCATION MAPPING

Kleos' satellites detect and process radiofrequency (RF) signals. Basic functions that can be performed with RF signals include 1) geolocation, 2) signal emitter identification and 3) establishing vessel behaviour patterns. Kleos focuses on geolocation.

Geolocation uses *Time Difference of Arrival* (TDOA) combined with *Frequency of Difference of Arrival* (FDOA) to determine the location of an object on earth. Time of arrival (TOA) is the amount of time it takes for a radio signal emanating from a transmitter on earth to reach a receiver on a satellite. The time difference of arrival (TDOA) is the difference between the different TOAs of the data points from multiple satellites. Kleos' algorithms also incorporate frequency difference of arrival (FDOA), which measures changes in frequency that occur over distances when a signal is transmitted by a moving object. When used together, TDOA and FDOA greatly increase geolocation accuracy. This method of geolocation requires a minimum of three satellites to achieve the accuracy standard demanded by customers. We note that a cluster of four also provides redundancy if one of the satellites falls out of orbit or is destroyed.

End users often use Kleos' data to create a typical behaviour pattern for a ship. For example, vessels transporting illegal cargo may have many consecutive legal trips. If the ship deviates from established patterns and turns off its transponder, it can be a signal that this particular trip involves illegal activity. Historical data is one of the most valuable tools a geolocation operator can offer customers. It is also a reason why customers are "sticky", since moving to a new vendor equates to a loss of historical data.

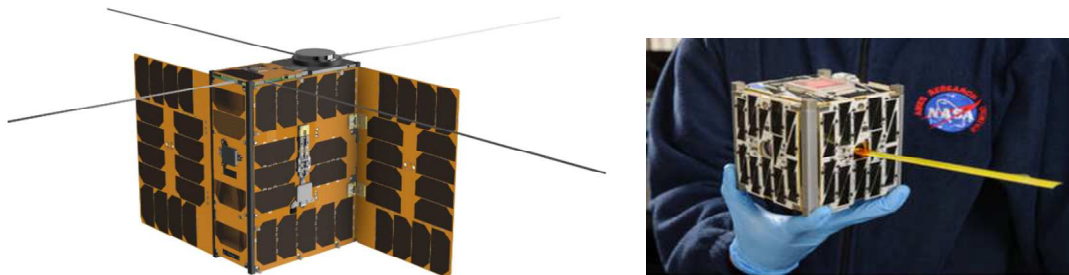
Maritime signals are transmitted on the International Telecommunication Union (ITU)-specified maritime frequency bands of the RF spectrum. Receiving these signals requires hardware and software that allows the signals to be received and digitized at the satellite and transmitted to the ground station. Calculating the position location of a RF-emitting object on the surface is mathematically very complex and requires the use of sophisticated software. Once the ground system has processed the information, it is able to calculate a location circle or ellipse, within which the RF-emitting object is likely to be.

### CONSTELLATION OF NANO-SATELLITES

A nano-satellite is generally considered any satellite weighing 1-10 kg. These are usually in a cube or rectangular shape, which reduces the cost of development, transport and deployment. Nano-satellites that are placed in low earth orbit between 250-1,100 km above the earth travel in circular or elliptical orbits at a speed of approximately 8km/second, allowing a complete circle around the earth in roughly 90 minutes. The rapid transit time allows between 14-16 orbits per day. At the conclusion of the satellite's operational life, a command is relayed to the on-board computer to re-enter earth's atmosphere, where the satellite burns up on re-entry, leaving no debris.

To give an idea of the comparative size of a nano-satellite, the figure below shows the Kleos Vigilance Mission (KSF) nano-satellite on the left compared with a standard CubeSat in the right overleaf. The standard size for a CubeSat is 10cm X 10cm X 11cm, referred to as 1U. Nano-satellites can be 1U – 6U in size—i.e., as small as a shoebox or as large as a small suitcase. Kleos' nano-satellite is 20cm X 10cm X 30cm without deployables.

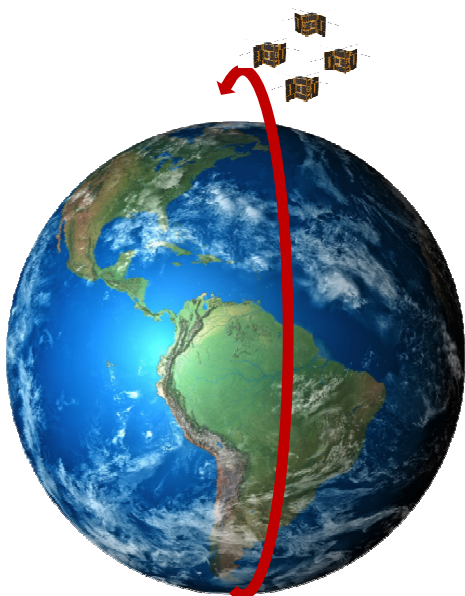


**Figure 11: Kleos Vigilance Mission Nano-Satellite**

Source: Kleos Space S.A.; NASA

Depending on functionality, it takes an estimated €0.2m to €4m to develop and place a nano-satellite into orbit. Because of the lower cost of deployment, replacing a failed nano-satellite launch is an insurable event. This should provide some reassurance to investors in the satellite space, since losing a nano-satellite does not mean a complete loss of funds.

Kleos owns and operates a constellation of nano-satellites in clusters of four. Each cluster is arranged in a pseudo-diamond pattern, with satellites deployed in two pairs in two different orbits. The satellites are roughly 100km apart, and each receives a signal from an RF transmitter at a slightly different time. Using TDOA and FDOA, proprietary software aggregates the 4 signals and comes up with a location that is correct to within a few hundred metres. The company has 2 clusters, or 8 satellites in orbit, with the KSM1 cluster currently operating. The KSF1 cluster is currently undergoing commissioning. Another 4-satellite cluster is due to launch in January 2022 and a fourth in mid-2022, which will give Kleos 16 satellites in orbit at that stage. The company has authorization from Luxembourg to launch up to 20 4-satellite clusters (80 satellites).

**Figure 12: Kleos' 4-Satellite Cluster Formation**

Source: First Berlin Equity Research, Kleos Space S.A.



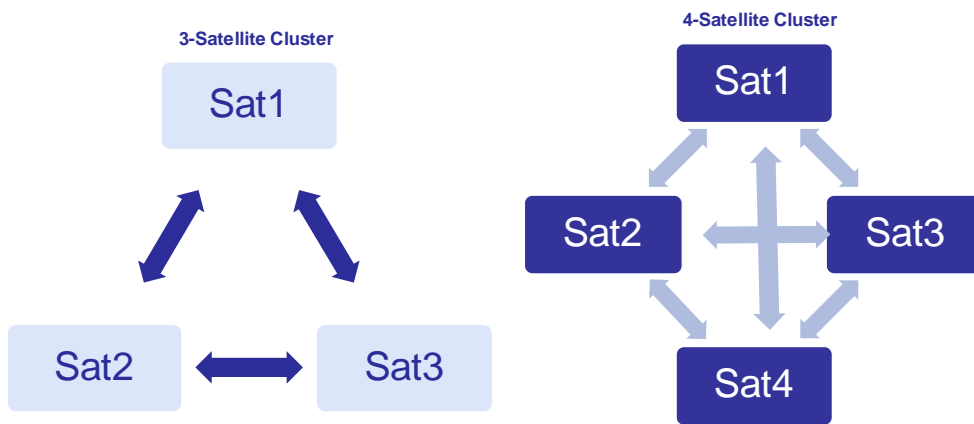
The satellites are equipped with sensors that detect radiofrequency signals emitted from transmitters, i.e., from VHF radios or X-band navigation radar. The data collected by the satellites is down-linked to Kleos’ network of contracted ground stations and is then processed by the company’s geolocation system and stored at a secure data centre. The dataset available to customers includes geolocation and raw RF data for the purpose of finding illegal human activity that is not easily detected by visual means. The GEOINT data is also relatively affordable for commercial customers. RF data is usually combined with other types of GEOINT data such as visual images.

**Geolocation with the Multi-Satellite Cluster**

A cluster of four satellites, all within range of each other, provides higher quality geolocation data than clusters with 2 or 3 satellites, since there are additional data points all contributing to the provision of more detailed and higher quality data. An early analysis of data from satellite clusters demonstrated that the superiority of the end result grows with each additional cluster added (Götz, P. and Daly, P.W. (eds.) 1998. Analysis Methods for Multi-Spacecraft Data. Noordwijk, Netherlands: ESA Publications Division). [http://www.issibern.ch/PDF-Files/analysis\\_methods\\_1\\_1a.pdf](http://www.issibern.ch/PDF-Files/analysis_methods_1_1a.pdf).

A cluster of three satellites has three data comparison points. A cluster of four satellites doubles the number of data comparison points. The figure below shows the complexity. Each double arrow represents two comparison data points.

**Figure 13: Data Comparison Points for Satellites in a Cluster Formation Using TDOA & FDOA Algorithms**



Source: First Berlin Equity Research

Kleos is the first commercial satellite company to launch its nano-satellites in clusters of four. The private company HawkEye 360 has launched clusters of three or fewer. We believe this gives Kleos; product a significant competitive advantage in terms of the geolocation accuracy. It does, however, increase the time needed to bring the cluster into the correct formation.

While receiving signals at the satellite is straightforward, transforming the signals into usable data is not. The satellite can receive a signal from a transmitter on the earth’s surface, but a single data point does not result in an accurate location. A geographic circle that could be a hundred kilometres in diameter is not particularly helpful in quickly finding lawbreakers. However, receiving signals on multiple satellites allows the application of TDOA geolocation techniques that can greatly narrow the circle of a likely location to within 300 metres of accuracy. Two satellites are better than one, three are better than two, and four are much



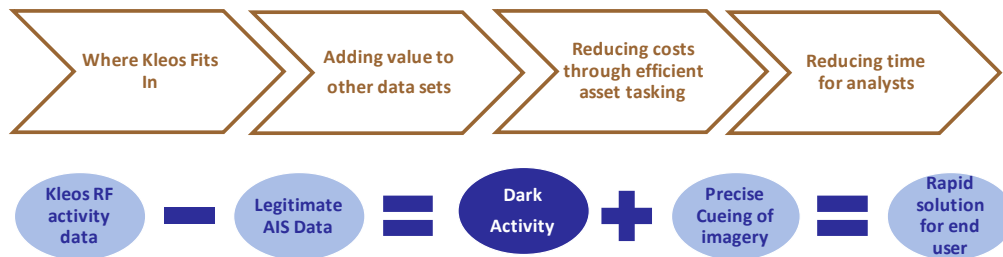
better than three. Kleos has developed its own proprietary software with algorithms for processing the data and pinpointing ship locations, which is then transferred to customers. This is a significant barrier to entry for satellite operators eager to enter the maritime space.

A recent technical White Paper on the Kleos Technology was presented at the GEOINT21 Symposium on 4 October, 2021 in St. Louis MO (USA). The paper indicated that the technology has significantly exceeded expectations for the company as well as its customers.

### PROPRIETARY SOFTWARE

The space based infrastructure of the 4-satellite cluster is supported by Kleos' proprietary ground based algorithms for processing the data. As discussed above, the algorithms combine TDOA and FDOA data points to arrive at a geolocation for a radio signal. The data is universally accessible by all customer analytic software platforms through the company's application programming interface ("API"). Once a contract is signed with Kleos, the API allows customers to begin receiving data within a day or two. With the capability of enabling customers to specify how much data and over what areas they wish to receive it from, the software license is exceptionally scalable to ensure customers get what they need when they need it. Customers are able to see a ship's vessel registry as well as its travel path. They can also track ships that rendezvous with other ships, something of particular interest for governments tracking vessels trying to evade sanctions by transferring cargo to another "legal" ship. The software also detects "dark ships", those that have turned off their vessel AIS registry signals and are trying to escape detection. Customers can filter out unnecessary signals to focus just on dark ships or on a narrow location, such as geofences for fishing or territorial boundaries for countries. When combined with other data sets, the information creates a full solution for detection of illegal activity, saving the end user time and money. Our figure below shows the value chain of the satellite RF data provided:

Figure 14: Kleos Position in the Space Data Value Chain



Source: First Berlin Equity Research, Kleos Space S.A.

### DATA AS A SERVICE (DAAS) MODEL

The DaaS model is unique in the satellite industry. Similar to the Software as a Service (SaaS) model, there is an initial build-out period where the product is developed. Once finished, the same data product can be sold to different groups of customers. Because historical geolocation data is one of the most prized features of the DaaS model, customers almost never switch once they sign, since they lose access to the historical data when moving to a new vendor. This recurring revenue aspect makes the model exceptionally lucrative for both companies and investors. We are projecting that Kleos' constellation of up to twenty 4-satellite clusters (80 satellites) will be complete around 2028. With the build-out



done and revenues continuing to grow, free cash flow accelerates since capital expenditures will be for satellite replacement only. EBITDA margins estimated to be 70+%, with exceptionally strong free cash flows in a growing industry, are rare. It makes the Kleos story a compelling investment.

## RADIOFREQUENCY GEOLOCATION MARKETS

### MARITIME RF GEOLOCATION MARKET

The maritime market is estimated by EuroConsult to be roughly \$100m. However, a space company like Kleos providing more accurate RF data opens up the market to new customers. We believe the maritime market has the potential to be as high as €426m (\$492m). There is a tremendous need for governments, intelligence agencies, non-profit organizations and commercial players to track illegal maritime ship activity. Illegal fishing, drug and arms trafficking, illicit shipments of goods forbidden under international sanctions, as well as prevention of terrorism, are on the list of serious global issues in need of solutions. Because of tracking difficulties, illegal fishing is decimating the world's fish stocks despite laws forbidding the activity. Governments as well as non-profit environmental groups are eager to intercept illegal fishing boats. Further, ninety percent of all commercial goods are transported by sea, and shipping companies are concerned about piracy. And all ships want to avoid collisions with illegally operating ships. The figure below shows the diverse users of RF data that can be combined with visual images to provide pinpoint accuracy and identification of rogue vessels.

**Figure 15: Global Maritime Geolocation Market**

Segment	TOTAL MARITIME MARKET SIZE (000s)			% of Total
	Number	Price €000s	Revenue €000s	
South American Countries	15	€1,075	€16,125	3.8%
US Government Agencies & Departments	50	€1,075	€53,750	12.6%
Asian Governments	35	€1,075	€37,625	8.8%
European Governments	20	€1,075	€21,500	5.1%
US Ocean Conservation	150	€77	€11,610	2.7%
European & Other conservation	161	€77	€12,461	2.9%
Shipping Companies	110	€100	€11,000	2.6%
Universities	150	€77	€11,610	2.7%
Other Commercial	1,000	€250	€250,000	58.7%
TOTAL MARKET SIZE (EUR)			€425,681	100.0%
TOTAL MARKET SIZE (US\$)			\$491,832	

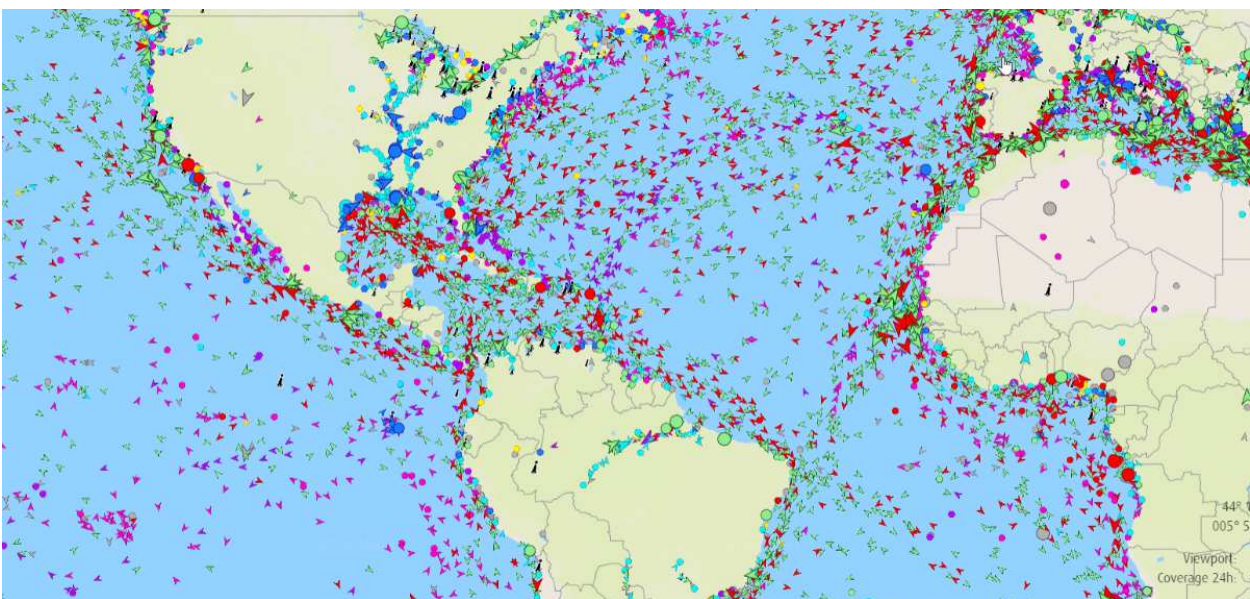
Source: First Berlin Equity Research

There is no one single source of information, whether terrestrial or satellite, providing a comprehensive vessel tracking solution. Visual images are costly and impractical when used alone, since they require significant analysis to filter out the many thousands of vessels operating legally. Until now, radiofrequency data was not sufficiently accurate to provide a near-pinpoint location. Searching for a ship in an area that could be hundreds of square kilometres has not been sufficiently accurate to allow law enforcement to reliably intercept rogue players. The reconnaissance industry has had a need for tighter search areas and faster latency (frequency) than has been possible with the two satellite cluster.

The International Maritime Organization governs requirements for ships above a certain size and weight. Ships are required to use the Automatic Identification System (AIS), a tracking database that receives regular information from a ship giving its identity, type, position, course, speed and navigational status of a vessel. It shows exactly where a registered ship is at any given time. With crowded seas, the information is intended to prevent collisions and fix the location of distressed vessels. Ships are required to have the ability to both transmit AIS signals as well as receive signals from other ships. Close to shore, the AIS signals are transmitted to ground receivers. Farther out on the open water, the AIS signals are collected by satellite. There are multiple databases, both commercial and government, that track all ships using the AIS system.. Nevertheless, even registered ships may turn off their AIS tracking devices if they are engaged in illegal activities and want to evade detection, especially registered commercial fishing vessels that try to sneak into forbidden fishing grounds. Illegal vessels that do not use AIS transponders at all do not show up on the AIS system. Culprits include vessels attempting to transport drugs or goods under sanction for countries such as Iran and North Korea. These vessels can easily hide in busy shipping routes, where the possibility of a collision with an unmarked ship is high. Even when they are detected, unmarked ships are often gone by the time regulatory authorities arrive at the last known location. While illegal vessels may forego the use of transponders, they still use other radio frequency signals for weather reports and for communications. These are the signals that Kleos' satellite network is designed to pick up. Kleos' proprietary software filters out the AIS signals to zero in on those rogue players authorities most want to find. The Kleos product is intended as an important supplement to the AIS system, and offers a valuable option for those wanting to track and intercept illegal activity.

To give an idea of how crowded the seas are, the figure below from an AIS data provider gives a snapshot of legal ship activity. Each tiny triangle represents a ship. The crowded seas show how rogue operators are able to escape detection in busy shipping lanes. Many organizations, including governments, have been frustrated that the data on illegal ships arrives too late to make a meaningful impact. Kleos' DaaS product has the potential to change that dynamic by bringing better geolocation data and faster transmission times to those working to intercept illegal activity.

**Figure 16: Snapshot of Marine Vessels May 2021**



Source: First Berlin Equity Research, FleetMon 2021



## Maritime Customer Types

**Government Customers** Under the United Nations Law of the Sea (1982), each country has a designated Economic Zone of Exclusion (EZE) 200 miles off its coast. These are considered sovereign waters for the purpose of fishing, oil and gas exploration and national security. Countries typically aggressively challenge any intrusions into their EZE. Overfishing is of particular concern. World fish stocks are dwindling and are forcing fisherman and seafood companies to look further afield to find new fishing grounds. Countries such as Peru and Chile have many small fishermen who rely on these coastal waters for their livelihoods. South American governments are expected to be some of Kleos' first customers for its data products. Recently, commercial fishing boats from Japan and China have been spotted illegally fishing in waters off the coasts of Peru and Chile. Unfortunately, due to lags in the receipt of geolocation data, it has been difficult for these governments to be proactive in intercepting these vessels. Kleos' data would be a welcome addition to current data sources, since it will allow the tracking of these vessels well before they arrive in South America, making mobilisation and seizure a possibility. Kleos has also signed partnership agreements with former military officials in Peru and Chile to guide them in signing those governments as customers. Currently, both countries are participating in Kleos' data validation pilot projects.

Further north, the U.S. government alone has the potential to generate at least €54 million in maritime contract revenue over the next 7-10 years. Kleos will benefit from the exceptionally decentralized nature of U.S. government departments and agencies, which often do not share data, and have their own budgets. Of particular concern to the U.S. is the potential for incursion by nefarious operators into U.S. waters, or into adjacent countries. The U.S. Coast Guard (USCG), a branch of the military as well as part of the Dept. of Homeland Security, is responsible for patrolling coastal and inland waters. Seventeen districts have the responsibility for separate geographic areas, each with its own budget and data needs. In his 2018 report to Congress, USCG Commandant Admiral Karl Schulz stated that a strategic priority for the Coast Guard was improving maritime intelligence capabilities, using either internal or external resources. Aside from the USCG, other agencies with an interest in Kleos' product include the Drug Enforcement Agency (drug trafficking); the Bureau of Alcohol and Firearms (illegal weapons/arms trafficking); the Federal Bureau of Investigation (intelligence); the Central Intelligence Agency (intelligence); the Department of Energy (offshore oil wells); the Bureau of the Interior (illegal use of federal lands); the U.S. Army Corps of Engineers (coastal lands), National Oceanic and Atmospheric Administration, U.S. Customs and Border Protection, and many others. Kleos has hired two former U.S. government officials to help the company make inroads into what is likely to be the company's single biggest customer. Kleos is in an excellent position to capitalize on this new DaaS market. The earliest customers participating in the company's data evaluation contracts have been governments, which have indicated they want as much data as Kleos can provide, both in terms of revisit rates and geographic coverage. Our contract rates are estimated to be at the highest level, with an average of €1.075 million/yr.

**Environmental Groups** We believe that non-profit organizations dedicated to ocean and environmental preservation will be important users of Kleos' data. Environmental groups are increasingly taking on the global fishing industry, which has continued to overfish despite regulations worldwide forbidding the practice. Many governments tend to focus on issues deemed more urgent and haven't devoted resources to the problem. In the U.S., there are 200+ groups dedicated to ocean preservation and a like number in Europe and Australia. Many of these organizations are as large as corporations and have the resources to purchase a data product, especially one that could make a substantial difference in combating overfishing. We have factored in fewer than the world-wide total of environmental groups in our market estimate, since many are smaller non-profits that are not realistic market participants for Kleos' products. Contract rates are projected to be €77,400/yr.



**Commercial Shipping** Cargo shipping accounts for 90% of global trade, with 161 international shipping companies operating on the world's waterways. Manufacturing companies participate in just-in-time shipping practices, meaning delays are costly. Shipping piracy is an issue in certain parts of the world, and shipping companies want data to help them identify suspicious vessels well before they pull alongside the ship. Kleos data allows interested parties to take a proactive approach to avoid pirates or be able to take a defensive position. Shipping companies are likely to want broader coverage than the basic product, and our estimated contract rate is €100,000/yr.

**Universities** In the United States, there are 96 colleges and universities that offer marine biology programmes, and additional universities in Europe and Australia. Increasingly, the focus of the research has been on ocean degradation due to warming water, industrial pollution and runoff, plastic waste and overfishing. Kleos can provide the data needed for faculty research and teaching. Contract rates would be at a minimal level of €77,400/yr.

**Other Commercial** There are many deep-pocketed corporations with a need for maritime RF data. These include energy companies with offshore oil and gas platforms, firms relying on the oceans to transport critical goods, the cruise ship industry, seafood processors and many others. This segment has the potential to be very lucrative, contributing nearly 60% of the market potential.

## LAND-BASED RF GEOLOCATION INTELLIGENCE MARKET

The world-wide land market has even more commercial potential for Kleos than the maritime market. Space is unaffected by control of airspace above territories and is out of reach of most defensive systems. Small satellites are hard to detect and the asset being detected has no knowledge of its adversary. There are many land-based uses for radiofrequency geospatial/geolocation data: border defence and security, law enforcement, disaster relief, civil aviation, corporate intelligence and security, insurance and others. The table below shows a large number of potential customers for Kleos' RF data product with a potential market size of €2.2 billion (\$2.6 billion). Certain of these areas are particularly suited for RF data: government border defence and security, civil aviation, and search and rescue, all of which cover very large areas where finding an intended target is enormously difficult.

**Figure 17: Land-Based RF Market Size**

TOTAL LAND-BASED MARKET SIZE (000s)				% of
Segment	Number	Price €000s	Revenue €000s	Total
Government Border Control	150	€1,075	€161,250	7.2%
Civil Aviation	360	€200	€72,000	3.2%
Search and Rescue	500	€77	€38,700	1.7%
Law Enforcement (USA)	384	€77	€29,722	1.3%
Law Enforcement (Rest of World)	600	€77	€46,440	2.1%
Disaster Relief	50	€77	€3,870	0.2%
Insurance	100	€200	€20,000	0.9%
Corporate Security and Intelligence	7,500	€250	€1,875,000	83.4%
TOTAL MARKET SIZE (EUR)			€2,246,982	100.0%
TOTAL MARKET SIZE (US\$)			\$2,596,163	

Source: First Berlin Equity Research



## Land Customer Types

**Government Border Control** Government defence and security/border control has become an urgent issue worldwide. Illegal migration is a major political issue as well as a humanitarian crisis. In addition, governments worry about terrorists and drug traffickers crossing borders undetected. People have the ability to hide in wide open spaces and Kleos has the capability to find them wherever they are. The key advantage of being able to cover large areas (millions of km<sup>2</sup>) and not be affected by surface obscuration (smoke, clouds, mist, foliage) makes the Kleos technology stand out from the rest. Governments desire maximum revisit rates and broad coverage. Our forecasted contract rate is €1.075 million/year.

**Civil Aviation** Civil aviation has data needs for aircraft tracking. The loss of Malaysian Airlines Flight 370 in 2014 showed that even with the most sophisticated aircraft systems in place an airliner can disappear. The option to have wide area surveillance from space is extremely attractive to the operators and the authorities alike. There are roughly 310 airlines worldwide, and approximately 50 freight carriers. Data coverage needs will vary, with the largest airlines requiring global coverage and regional airlines needing coverage for a finite area of interest. Our weighted average contract rate is €200,000/yr.

**Search and Rescue** Every nation has a moral responsibility and commitment under international rules to provide search and rescue and crisis response. The areas of responsibility can be enormous with a wide area surveillance beyond the capability of many existing systems. Affordable space-based location capabilities provided by Kleos offer a solution that would otherwise be unaffordable. Contract rates are assumed to be € 77,400/yr.

**Law Enforcement** Large- and medium-sized law enforcement agencies in the U.S. and in major world cities have a need for RF data to coordinate officer deployment where it is most needed. Currently the use of wide area space surveillance for non-defence activities is beyond the technical expertise and affordability of law enforcement agencies, many of which are operating at a regional or city level. Recent acts of urban terrorism on virtually all continents have made the availability of rapid data an urgent need. There are 384 metropolitan statistical areas (MSAs) in the U.S., and 600 large cities in the rest of the world with a need for RF data. These agencies will need frequent revisit rates, but require a small geographic area, so would not need an expensive data package. Our forecasted rates are at the lowest level of €77,400/yr.

**Disaster Relief** There are an estimated 350 major disasters that occur worldwide every year. Disaster relief is provided by both governments and non-profit organizations, who are likely to purchase data packages with the lowest revisit rates and varied geographic coverage. Our forecasted contract rate is therefore €77,400/yr.

**Insurance** Insurance companies want RF data for countering risk and Kleos data is invaluable to the insurance market. Insurers want to track threats in the vicinity of assets as well as ensure that limitations they put in place on routing and positioning are adhered to. In every case it is desirable that the target of attention be unaware of the sensors tracking it. Insurance companies will be a mix of global and regional coverage, and our average rates are forecast to be €200,000/yr.

**Corporate Market** The corporate market has the potential to contribute €1.875 million or 85% to the total land-based RF market. Corporate intelligence spans both security issues for facilities and personnel as well as market intelligence (e.g., number of vehicles on the road, agricultural activity, etc). Corporations are hungry for solutions to problems with high economic cost and will pay for information that helps them reduce risk or sell more products. The largest companies will likely purchase global coverage (with low revisit rates), while others will want only local coverage. Average corporate rates are forecast to be €250,000/yr.





## PIPELINE AND PRODUCTS

### PIPELINE

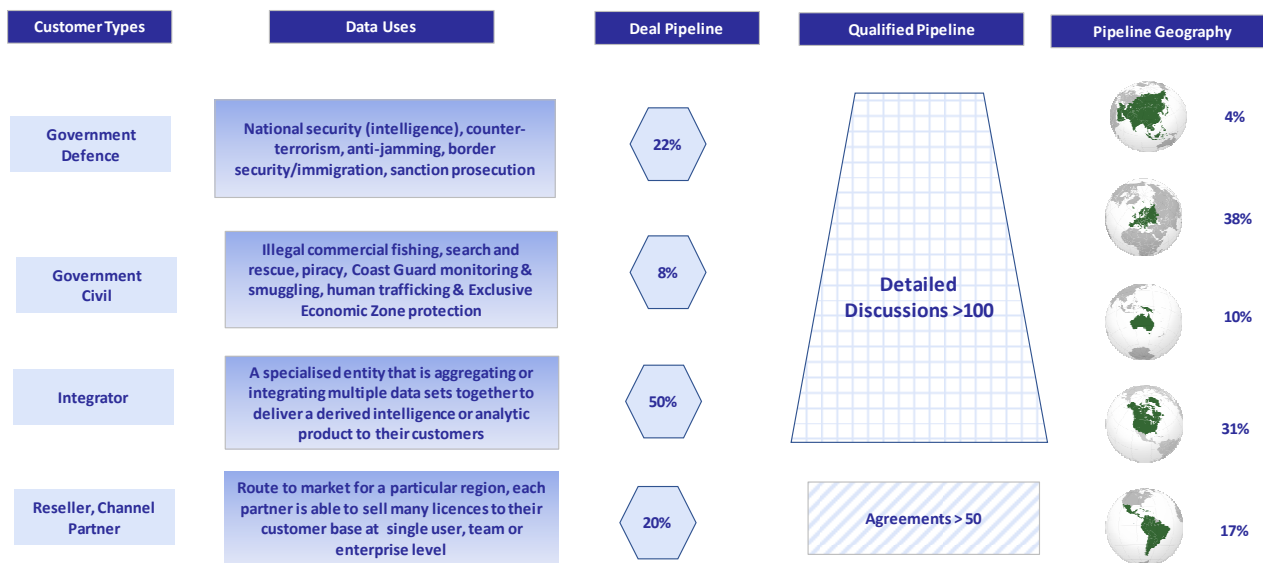
The diverse potential customer types give Kleos a large and addressable market. We think that the government defence segment will be among the early adopters signing direct contracts. There is also an active “integrator” market that aggregates multiple datasets and resells them to commercial customers. This is expected to be one of Kleos’ most important customer groups. The integrator has a list of existing customers, thereby saving Kleos the expense of creating a large marketing team covering large geographic areas. We note that the process for government and commercial contracting is very different. It would be expensive for a company like Kleos to develop separate marketing groups for government and commercial customers. Reselling data to integrators is a logical step at this stage of Kleos’ commercial development.

Kleos’ end user is typically an analyst working for government military operations in a surveillance, intelligence or reconnaissance role. For other commercial applications, it will typically be an analyst assigned to security or surveillance. An example would be analysts at environmental groups that monitor ship activity with the aim of notifying law enforcement if illegal fishing is observed, or analysts in the maritime insurance industry monitoring ship activity to identify potential pirates. The goal is always to find the needle in the haystack as quickly as possible and pass the information up to decision makers who have the ability to intercept rogue operators.

Kleos has a broad global reach. Its pipeline comprises more than 220 verified customers in Europe (38%), North America (31%), South America (17%), Asia (4%) and Australia (10%). The company is in detailed discussions with more than 100 potential customers, and has 52 signed data agreements with an ARR of €4.7m. In addition, 5 large customers are in negotiations with a combined ARR of €2.9m. The data evaluation contract provides clients with free access to the data for a period of two months, after which the contract switches automatically to a recurring subscription. Governments are expected to be among the earliest adopters, and we noted in our Maritime section that governments want the greatest geographic coverage at the highest possible frequency. This makes them very lucrative customers—they want as much data as they can get and are willing to pay for it. The company is already receiving Requests for Proposal (RFPs) from large potential clients, which are sent out when there is serious intent to engage in a contract. There are also numerous Requests for Information (RFIs), which are the precursor for RFPs. Kleos has current paying customers in both the U.S. and South America. The company recently announced a partnership with the Japan Space Imaging Corp. (JSI), which will promote Kleos’ subscription data products for its customers. With a coastline of more than 18,480 miles (29,740 km), Japan has a significant need for data to boost coastline security measures. A diverse customer base will lessen the risk of heavy revenue concentration in a single region or with a limited number of customers. The figure below shows Kleos’ excellent pipeline positioning.



Figure 18: Kleos' Customer and Geographic Diversity



Source: First Berlin Equity Research; Kleos Space S.A.

## PRODUCTS

The company is selling its radiofrequency data on a subscription basis to governments, intelligence agencies, commercial customers and non-profit organizations seeking ways to better locate ships operating illegally. Data is sold in 1 million square kilometre increments. Contract rates will increase with a broader geographic area or more frequent revisit rates (or both). More sophisticated customers will use their own software to process the raw data, while other customers will want Kleos' analytical package. The company also offers the option of multiple data frequencies (such as hourly, daily, weekly, etc.) as well as specific geographic locations along with bulk discounts for larger datasets. The following figure shows the exponential increase in transmissible data that comes with each additional operating cluster. As each additional cluster comes on-line, customers will have the option of adding on more frequent data or a geographic coverage area for a higher contract rate.

Figure 19: Kleos Data Collection Capacity

Satellite Mission Designation	Mission Name	Launch date	Cumulative data collection capacity in million km <sup>2</sup> / day	Area of interest revisit rates
KSM1	Scouting Mission	07-Nov-20	15	2.1
KSF1	Polar Vigilance Mission	29-Jun-21	134	3.4
KSF2	Polar Patrol Mission	Jan-2022	253	4.7
KSF3	Polar Observer Mission	Mid-2022	372	6.0

Source: First Berlin Equity Research, Kleos Space S.A.



Guardian LOCATE has data refined by Kleos' proprietary algorithms and is delivered to the customer in a form readily compatible for further analysis.

Guardian UDT (user data type) is a user-defined customised data set. It typically focuses on specific areas of geographic interest and can be further refined by ground station location, security level and by degree of desired processing.

## COMPETITIVE POSITION

### FIRST MOVER ADVANTAGE

The provision of radiofrequency data to commercial customers is a fairly new market. The maritime segment relies on radiofrequency signals for geolocation, while most other satellite companies are offering visual geolocation. Visual signals alone do not differentiate between legal ships and those operating illegally. Kleos' RF product, which filters out legal ships, can be combined with visual data to provide end users a more complete picture of illegal activities. A few private U.S. companies with satellite DaaS strategies are focusing on a number of different industries, including the maritime industry. The superior capabilities of Kleos' proprietary software as well as the geolocation superiority of the 4-satellite cluster gives Kleos a first-mover advantage in signing up and more importantly, retaining customers. The figure below gives an overview of the competitive landscape.

Figure 20: Kleos' Competitive Positioning



Source: First Berlin Equity Research, Kleos Space S.A.

### COMPETITORS

The closest competitor to Kleos is HawkEye 360, a privately-funded company based in the U.S. HawkEye has 9 satellites in three, 3-satellite clusters. Like Kleos, HawkEye uses radiofrequency data (rather than visual pictures) for geolocation and has a proprietary software programme similar to Kleos'. HawkEye serves more industries than Kleos, and its maritime product is very similar. Kleos' biggest advantage over HawkEye is the geolocation accuracy of its 4-satellite clusters, which provide superior geolocation accuracy over HawkEye's 3-satellite formation. In the end, EO data sets are complementary with other types of data, and there is room for both companies to rapidly grow in this new industry.



The figure above shows other technologies used by competitors offering earth observation data. Spire, which recently acquired exactEarth, offers an AIS-only product for tracking legally-operating ships. Spire's product does not have the capability of tracking so-called dark ships nor can it track legal ships that have turned off their AIS transponders. Capella and IceEye operate in the radar space, which does not have the specificity of either optical or RF. Maxar, BlackSky, Planet (formerly Planet Labs) and Satellogic all offer visual geolocation products. While these are useful in some situations, they are not helpful by themselves in finding illegal shipping activity. In sum, Kleos is very competitively positioned in the RF segment with its best-in-class technology and large planned constellation.



## ADDENDUM

### INTERNATIONAL REGULATORY FRAMEWORK FOR SATELLITES

Space activities are regulated by the United Nations. Almost all countries have signed the UN Convention governing space. A UN agency, the International Telecommunication Union, or ITU, is responsible for establishing international guidelines that determine how radio frequency spectrum is shared between different services and between countries. The ITU oversees fixed and mobile radio services, satellite systems, radio and TV broadcasting, radio-navigation, meteorological monitoring, space research as well as amateur radio and space activities. The goal is to ensure peaceful shared use of increasingly crowded skies and airwaves. The ITU creates the Master International Frequency Register (MIFR), which allocates broadcast spectrum slots to each participating country. The MIFR confers international recognition of the bandwidth allocation, and protects against signal interference. Each country then bestows as many airwave licenses as it desires on its own government agencies or to commercial operators. The ITU meets every three to four years.

A satellite operator is required to obtain the permission of a country that is willing to sponsor it and has broadband width available for commercial operators. Each country participating in the UN Convention is required to supervise entities launching objects into space under its sponsorship, including any damage that could be caused by falling debris or other problems. Luxembourg is the sponsor for Kleos Space S.A. The sponsoring country, or State, is required to register the satellite with the United Nations, which maintains a database of all satellites launched into space. Further, UN regulations stipulate that satellite operators are required to notify the ITU of the radiofrequency used, and to mitigate space debris at the end of the satellite's useful life. This latter item is typically accomplished by sending the satellite into Earth's atmosphere, where it disintegrates on re-entry, leaving no debris.

### SPACE DEBRIS

With more than 2,600 satellites currently in LEO in 2019 and another 3,200 decommissioned satellites still in orbit, there is an increasing amount of junk accumulating in space. The table shows both operational and non-operational satellites.

**Figure 21: Operational Satellites in Space (2019)**

	# Sats	Operating satellites	% of Total Orbiting
<b>Operating Satellites</b>			
Commercial Satellites	1,440	54.0%	24.5%
Government	436	16.4%	7.4%
Military	339	12.7%	5.8%
Combination Commercial & Other	206	7.7%	3.5%
Civil (university, research)	133	5.0%	2.3%
Other	112	4.2%	1.9%
Subtotal	2,666	100.0%	45.4%
Non-Operational Satellites	3,200	----	54.6%
<b>TOTAL SATELLITES IN ORBIT</b>	5,866		100.0%

Source: First Berlin Equity Research, Union of Concerned Scientists



Earlier LEO satellites were not required to have self-destruct functions, as are satellites launched now. Without ongoing adjustments, a satellite may drift out of its nominal orbit and could possibly collide with another satellite. The ITU now requires all satellites launched into LEO to have a decommissioning plan to take them out of orbit and back to earth, where they burn up on re-entry. Even so, with the huge number of satellites being launched, this will be a future area of growing concern to LEO operators.

Satellites can be “stacked” in the same orbit at different altitudes. Currently, the most significant issue for satellite operators is not always other satellites, but fragments of natural interplanetary material (such as meteoroids, rocks or ice chunks) or small pieces of debris from rocket stages. Even dust-grain sized particles can cause significant damage to a satellite. The Inter-Agency Space Debris Coordination Committee (IADC) is a coalition of 13 government space agencies around the world that coordinate efforts (and sell the service) to track space debris, a process termed “space situational awareness” (SSA). The largest of these agencies is the U.S. Space Surveillance Network, which is currently tracking more than 500,000 pieces of debris. However, satellite operators have complained about the quality of the data offered by the US Space Surveillance Network, since it uses old computers with outdated algorithms, resulting in many false positives. It is expensive to move a satellite out of its flight path to avoid an oncoming object, and satellite operators have eagerly welcomed more precise SSA services. In the last 5-6 years, a number of commercial operators have entered the SSA segment. Their subscription services track the trajectory of space debris greater than 5cm and notify satellite operators if it appears that a piece is on a path to collide with a satellite. Satellites have capabilities of manoeuvring out of the way of an oncoming object, given enough time to adjust the flight path. Companies such as LeoLabs, Analytical Graphics, Lockheed Martin and Spire provide SSA subscription services to satellite operators.



## FINANCIAL HISTORY AND OUTLOOK

### COMPANY HISTORY

The precursor to Kleos was Magna Parva (MP), a space company started in 2005 by Andrew Bowyer (current Chief Executive Officer) and Miles Ashcroft (current Chief Innovation Officer). With management expertise and technological know-how in the space sector, the two men formed Magna Parva as a private company dedicated to space projects. Over time, they saw the benefit of placing 4-nano-satellite clusters in space for the maritime industry. In 2017, Magna Parva legally transferred its proprietary software to a new company called Kleos. In return for the software transfer, Magna Parva would receive royalty payments based on future profits generated by Kleos. In 2018, Kleos commenced its IPO listing on the Australian Securities Exchange under the symbol KSS. The first satellite cluster launch, termed the “Kleos Scouting Mission”, or KSM, was delayed due to Covid-19 restrictions, with the launch finally occurring in November 2020. The KSM cluster was intended to show proof of concept, and to work out the technical bugs common to new technologies. Satellite commissioning by GomSpace has proceeded more slowly than anticipated, due to the complexity of the 4-satellite cluster. A second 4-satellite cluster, the Kleos Polar Vigilance (KSF1) mission was launched in June 2021, and a third cluster, Kleos Polar Patrol (KSF2) is scheduled for January 2022. Kleos is currently using ISI Space for commissioning on its satellites. We note that Magna Parva, owned by the two senior managers of Kleos, is the company’s second largest shareholder

### INCOME STATEMENT

#### Revenue Assumptions

The company’s and First Berlin’s original 2021 revenue projection of €10.9m was too optimistic on the start date. However, as previously discussed, an outstanding pipeline and detailed discussions with more than 200 potential customers has led us to dramatically increase our revenue projections for the short-term and the long-term. In our table below, we show our expectations for contract additions and revenue growth for Kleos from 2022-2027. The company currently has 52 customers that have signed data evaluation contracts. These contracts commenced 1 November 2021, and provide customers with free use of data until 31 December 2021. After that, the revenue changes to a recurring subscription model based on data usage increments of 1 million square kilometres. We divide the customers into small data users, medium data users and large data consumers. Kleos’ management has indicated that the 52 data evaluation customers are small data consumers and are not expected to move to higher data-usage categories. For the single satellite cluster currently operating, base monthly rates for the 52 small data usage customers average €6,450 (USD \$7,500), or €77,400/year (USD \$90,000/year). Kleos is in final negotiations with five large customers who will have an average base monthly rate of €41,567 (USD \$48,333) or €498,800/year (USD \$580,000/year), reflecting the desire for maximum geographic coverage and revisit rates. Revenue generation for both large and small customers is expected to commence 1 January 2022. We expect that there will be rapid conversion of the pipeline over the next three years, since customers have been eagerly awaiting the proof of concept of Kleos’ 4-cluster satellite geolocation model. As more clusters are added, customers will have the opportunity to upgrade their contracts for more frequent revisit rates or a broader geographic coverage or both. All of the large data consumers and a portion of the medium consumers are expected to upgrade to higher usage rates in the following year as each cluster is added, a factor which is driving our rate increases. We anticipate that the January 2022 launch will be operational in July 2022, with a corresponding bump in rates of 5-30% in 2023 for those customers adding additional data capabilities. Another assumption is an approximate 45% conversion rate for the pipeline of 223 vetted customers, or an additional 95 customers added in 2022 beyond those already announced.



Figure 22: First Berlin Estimate for Customer Additions

Customers and Pricing	2021	2022	2023	2024	2025	2026	2027	2028
<b>Cumulative # of Customers</b>								
Small	0	52	55	58	60	62	64	66
Medium	0	85	115	140	165	190	215	240
Large	0	15	30	45	55	64	73	81
<b># Customers Added/Year</b>								
Small	0	52	3	3	2	2	2	2
Medium	0	85	30	25	25	25	25	25
Large	0	15	15	15	10	9	9	8
<b>Annual Subscription Price (€000s)</b>								
Small	77	77	77	77	77	77	78	79
Medium	116	116	151	159	165	169	171	174
Large	479	479	623	748	824	882	947	1,016
<b>Revenue (€000s)</b>								
Small	0	4,025	4,257	4,489	4,644	4,799	4,978	5,185
Medium	0	9,869	17,357	22,245	27,266	32,081	36,666	41,748
Large	0	7,192	18,699	33,657	45,316	56,423	69,132	82,272
<b>TOTAL</b>	0.0	21,085	40,313	60,391	77,226	93,303	110,776	129,205

Source: First Berlin Equity Research

### Expense Assumptions

Expenses are expected to increase significantly in the next three years, which we view as essential. In our view, Kleos is understaffed, and needs to add engineers and mid-level management, especially in the U.S. While the company has signed sales and marketing individuals for various regions around the world, it will need a more significant build-out to realize the potential in North and South America.

Initially, cost of goods sold is projected to be 10% of revenue, dropping to an eventual 4% of revenue. Included in the category are mission, ground station and security operations, insurance for satellites in orbit and data hosting. These costs do not increase commensurate with revenue, a feature of the DaaS model; hence the increase in gross margin over time.

Personnel and administrative costs will be in a build-out stage until 2024, when we expect them to be fully built out. Costs will increase modestly as revenue increases. Sales and marketing expenses are mostly commissions paid to internal sales people as well as resellers, and are a constant 11.5% of revenue. Depreciation for each launched cluster begins when the satellite has finished commissioning and is transmitting data to customers. Each 4-satellite cluster has an assumed €3.1m build-and-launch cost, with a 5-year satellite life. Once the constellation is complete, depreciation remains at a fixed level of €9.1m/yr. Changes to the build-and-launch cost would change the depreciation figure.

Even with significant investment in both satellites and in its administrative capabilities, we expect that Kleos will be profitable in 2022 as well as free-cash flow positive—a remarkable achievement for its first year of revenue generation.



**Figure 23: Selected Financial Data**

in €000s	2020A	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E
<b>Sales</b>	176	100	21,085	40,313	60,391	77,226	93,303	110,776	129,205
<i>Yr/Yr % Change</i>	<i>n.m.</i>	<i>n.m.</i>	<i>n.m.</i>	91.2%	49.8%	27.9%	20.8%	18.7%	16.6%
<b>EBITDA</b>	-3,023	-4,882	12,398	25,679	42,134	55,834	68,932	83,414	98,971
<i>EBITDA Margin</i>	<i>n.m.</i>	<i>n.m.</i>	58.8%	63.7%	69.8%	72.3%	73.9%	75.3%	76.6%
<b>EBIT</b>	-3,066	-4,932	10,378	22,109	37,324	50,564	61,802	75,044	90,291
<i>EBIT Margin</i>	<i>n.m.</i>	<i>n.m.</i>	49.2%	54.8%	61.8%	65.5%	66.2%	67.7%	69.9%
<b>EPS (diluted)</b>	-€0.03	-€0.03	€0.06	€0.11	€0.17	€0.18	€0.22	€0.27	€0.32
<i>Yr/Yr % Change</i>	<i>n.m.</i>	<i>n.m.</i>	<i>n.m.</i>	94.7%	50.3%	4.6%	22.2%	21.4%	20.3%

Source: First Berlin Equity Research and Kleos Space S.A.

As of 2020, Magna Parva has been entitled to a software dividend to compensate the company's owners (Andrew Bowyer and Miles Ashcroft) for the transfer of the proprietary software developed by Magna Parva to Kleos. The dividend of 2.5% commences when cumulative EBIT turns positive, which we anticipate will be 2023. The dividend is then calculated based on EBIT in each following year. This is a financing cost with a finite term that ends in 2030.

## BALANCE SHEET

As a company with a lean infrastructure, low expenses and no debt, Kleos has an uncomplicated balance sheet. The company's costs for satellite design, build and launch are capitalized under property, plant and equipment. The company has no inventories and no cost of goods sold. As previously discussed, capitalized satellite costs begin depreciating over a 5-year schedule once they are operational - ie, transmitting data. Management expects the standard 30-day turnaround time for both receivables and payables, and these items grow commensurate with revenues. Including losses for the current year, Kleos will have approximately €16m in deferred tax assets that it expects to begin using as soon as the company generates profits in 2022. The main assets that build on Kleos balance sheet will be cash and capitalized satellites and launch costs.

As a small-cap company listed on the Australian Securities Exchange (ASX), Kleos is not required to file a complete set of quarterly financial statements. Instead, the company issues a quarterly cash flow statement. Using the year-end audited 2020 financial statements, we can construct with reasonable accuracy the main components of Kleos' balance sheet, which are cash and capitalized satellite launch costs. As of the end of 3Q/21, cash on hand was €9.4m, enough to fund operations and satellite launches through 2023. Our financial summary table above shows Kleos will be free cash flow positive in 2022, and has no further need for financing. We estimate capitalized satellite costs on the balance sheet at the end of the 3Q/21 to be €7.7m, which are for the KSM1 and KSF1 launches.

## PIPE transaction

On September 15, Kleos announced it had completed a Private Investment in Public Equity (PIPE) transaction, selling 14.8m shares at a price of AUD 0.85, a 9.6% discount to the 30-day volume weighted average trading price. A PIPE is done at a price below the existing trading price of the stock. For every 5 shares purchased, 3 warrants were issued with an exercise price of AUD 1.20 and an expiration date of September 2024, or 8.894m new options. Two investors were existing shareholders, while two were prominent Australian investment Funds Perennial Value Management and Thorney Investment Group. It is a ringing endorsement of Kleos' investment potential that large existing shareholders were willing to add to their holdings, along with these two new investment funds. Kleos' total diluted share count, including unexercised options, is now around 198 million shares.



### Options, warrants and diluted share count

As of 31 December 2020, Kleos had 160.2m shares outstanding, not including options and warrants. The 2H21 financial statement indicated that 2.485m options had been exercised as of 31 July 2021. Including options issued in the PIPE transaction, there are now 20.9m options and warrants outstanding. The unweighted diluted share count is 198.4m shares, while the weighted average share count for year-end 2021 is calculated to be 181.6m shares. For the purposes of market capitalization, the number of shares is 177.5m. Our financial model assumes that all options and warrants will be exercised on or before the expiration date. Our figure below gives details on the outstanding options and warrants.

**Figure 24: Schedule of Options and Warrants**

<b>KLEOS OPTIONS/WARRANTS SCHEDULE</b>		<b># Shares/Options</b>
Basic share count at 31 Dec 2020		160,203,436
<b>Options expiring 17 August 2021 @ AUD 0.30</b>		
Weimin Chen	500,000	exercised
LTL Capital	760,000	exercised
Bradley Saxby	560,000	exercised
Others	665,000	exercised
<b>Options expiring 12 September 2022 @ AUD 0.40</b>		
Rimoyne Pty Ltd	200,000	
Evolution Capital Advisors	750,000	
<b>Options expiring 19 December 2022 @ AUD 0.40</b>		
Evolution Capital Advisors	475,000	
<b>Warrants expiring 18 Feb 2023 @ AUD 0.38</b>		
Winance	3,319,125	
<b>Warrants expiring 6 July 2023 @ 0.38</b>		
Winance	2,285,381	
<b>Options expiring 17 July 2023 @ AUD 0.50</b>		
Evolution Capital Advisors	2,600,000	
Elsie Cameron Foundation	2,000,000	
Others	400,000	
Shares from 15 Sept 2021 PIPE	14,823,529	
<b>Options expiring September 2024 @ AUD 1.20</b>		
Options from 15 Sept 2021 PIPE	8,894,117	
Share count for market capitalization calc.	177,511,965	
Diluted shares @ 31 Dec 2021	198,435,588	
Wtd. avg. diluted shares @ 31 Dec 2021	180,111,704	

Source: First Berlin Equity Research, Kleos Space S.A.



## CASH FLOW

Our table below shows our expectations for parameters including operating cash, capital expenditures, free cash flow and ending cash on hand.

**Figure 25: Selected Cash Flow Parameters**

€000s	2020A	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E
Operating cash flow	-3,509	-4,974	11,322	23,989	37,402	39,640	49,438	59,861	70,785
CAPEX	-1,158	-3,390	-6,200	-7,401	-9,300	-9,302	-9,302	-9,300	-9,303
Free cash flow	-4,667	-8,364	5,122	16,587	28,102	30,338	40,136	50,561	61,483
Cash flow investing	-1,158	-3,390	-6,200	-7,401	-9,300	-9,302	-9,302	-9,300	-9,303
Cash flow financing	15,161	4,674	364	2,955	6,812	0	0	0	0
Net cash flow	10,495	-3,690	5,486	19,542	34,914	30,338	40,136	50,561	61,483
Ending cash on hand	10,788	7,098	12,584	32,126	67,040	97,379	137,515	188,076	249,559

Source: First Berlin Equity Research, Kleos Space S.A.

An important implication of the DaaS model is that cash flows accelerate dramatically once the satellite build-out is complete. We are projecting a cash balance of €250m by 2028. While this might seem like a typographical error, it shows the benefits of the DaaS model, wherein the capital expenditures and depreciation remain the same while revenue continues to climb. Kleos' first satellite cluster, the KSM, cost about €4.2m to design, build and launch, and has an expected 3-year operating life. The follow-on KPV satellite build-and-launch cost was €3.1m, and has an expected 5-year operating life. The satellites are designed and built by an outside vendor, and costs are capitalized until the satellite is operational. In our model, we have assumed a 6-month commissioning period. Our model uses a staggered launch approach, with a new cluster launched June 1 and December 1 of each year. Revenue and depreciation for the June 1 launch commences January 1 of the following year, while revenue and depreciation commence on the following June 1 for the December launch. Preparation for the launch means 2/3 of the capital expenditures are paid out 6-12 months prior to revenue generation. We have used a build-and-launch cost estimate of €3.1m per cluster, which we expect will decrease over time, but have not factored into the model yet. From 2024-2028, we project 3 cluster launches per year (2 in June and 1 in December) to get to the operational figure of 80 satellites. Since the number of satellites will not increase beyond 80, except for replacement overlap, capex levels out towards the end of the decade while revenue continues to increase. The free cash flows generated under such a model are very strong beginning in 2025, and are driving our valuation and rating.

**Figure 26: Satellite Launch Schedule**

Satellites Launched by Year	2021	2022	2023	2024	2025	2026	2027	2028
Satellites launched by year	8	8	8	12	12	12	12	12
Total Satellites in orbit	12	20	28	40	52	64	76	80
Satellites operational full year	0	8	16	20	32	44	44	52
Satellites operational partial year	4	4	4	8	4	4	8	8
Decommissioned satellites	0	0	0	4	0	0	8	8
Total satellite operation months	24	120	216	288	408	552	576	672
Capital expenditures (000s)	3,390	6,200	7,401	9,303	9,307	9,302	9,304	9,302
Depreciation (000s)	0	2,020	3,580	4,813	5,282	7,149	8,388	8,706

Source: First Berlin Equity Research, Kleos Space S.A.

In 1Q2021, Kleos paid down the short term debt from the Winance Investment fund in the amount of €3.46m. In September, the company completed a PIPE in the amount of €7.8m (12.6m AUD), bringing net cash from investing to €9.1m for 2021.



## THIRD QUARTER RECAP

**Income Statement** Kleos had no revenue in the 3Q21, contrary to our original expectation of revenue in the 2H21. Commissioning on the KSF1 cluster, launched 30 June 2021, is underway. The company indicated they are fixing a software issue from the KSF1 cluster, and commissioning is expected to be completed by 1 January 2022. The company's and First Berlin's original 2021 revenue projection of €10.8m was too optimistic on the start date. However, as previously discussed, an outstanding pipeline and detailed contract discussions with more than 200 potential customers has led us to dramatically increase our revenue projections for the short-term and the long-term. With signed contracts in place, our confidence in the hockey-stick projection has grown.



Figure 27: Updated Forecasts

Revised 2021-2027 (€000s)	2020A	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E
Revenue	176	100	21,085	40,313	60,391	77,226	93,303	110,776	129,205
Y/Y % Change	<i>n.m.</i>	<i>n.m.</i>	<i>n.m.</i>	91.2%	49.8%	27.9%	20.8%	18.7%	16.6%
Sales, Genl & Admin Exp	1,417	2,380	3,353	7,135	9,621	11,738	13,902	16,062	18,347
Y/Y % Change	<i>nm</i>	67.9%	40.9%	112.8%	34.8%	22.0%	18.4%	15.5%	14.2%
Personnel Expenses	1,286	2,475	2,952	3,265	3,382	3,475	3,564	3,656	3,747
Y/Y % Change	<i>n.m.</i>	92.5%	19.3%	10.6%	3.6%	2.8%	2.6%	2.6%	2.5%
Depreciation & Amortization	43	50	2,020	3,570	4,810	5,270	7,130	8,370	8,680
Y/Y % Change	<i>n.m.</i>	<i>n.m.</i>	<i>n.m.</i>	76.7%	34.7%	9.6%	35.3%	17.4%	3.7%
EBITDA	-3,023	-4,882	12,398	25,679	42,134	55,834	68,932	83,414	98,971
Margin	<i>n.m.</i>	<i>n.m.</i>	<i>n.m.</i>	63.7%	69.8%	72.3%	73.9%	75.3%	76.6%
EBIT	-3,066	-4,932	10,378	22,109	37,324	50,564	61,802	75,044	90,291
Margin	<i>n.m.</i>	<i>n.m.</i>	<i>n.m.</i>	54.8%	61.8%	65.5%	66.2%	67.7%	69.9%
Net Income	-4,868	-5,051	10,378	21,578	33,944	35,496	43,385	52,681	63,384
Margin	<i>n.m.</i>	<i>n.m.</i>	49.2%	53.5%	56.2%	46.0%	46.5%	47.6%	49.1%
EPS	-€0.03	-€0.03	€0.06	€0.11	€0.17	€0.18	€0.22	€0.27	€0.32
Y/Y % Change	<i>n.m.</i>	<i>n.m.</i>	<i>n.m.</i>	<i>n.m.</i>	50.3%	4.6%	22.2%	21.4%	20.3%
Capital Expenditures	1,158	3,390	6,200	7,401	9,300	9,302	9,302	9,300	9,303
Y/Y % Change	<i>n.m.</i>	192.8%	82.9%	19.4%	25.7%	0.0%	0.0%	0.0%	0.0%
Free Cash Flow	-4,667	-8,364	5,122	16,587	28,102	30,338	40,136	50,561	61,483
Y/Y % Change	<i>n.m.</i>	<i>n.m.</i>	<i>n.m.</i>	<i>n.m.</i>	<i>n.m.</i>	<i>n.m.</i>	32.3%	26.0%	21.6%

Former 2021-2027 (€000s)	2020A	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E
Revenue	176	10,800	22,500	33,000	43,400	54,750	65,250	75,750	87,000
Y/Y % Change	<i>n.m.</i>	<i>n.m.</i>	108.3%	46.7%	31.5%	26.2%	19.2%	16.1%	14.9%
Sales, Genl & Admin Exp	1,417	1,200	1,360	1,836	2,479	3,346	4,417	5,521	6,901
Y/Y % Change	<i>n.m.</i>	-15.3%	13.3%	35.0%	35.0%	35.0%	32.0%	25.0%	25.0%
Personnel Expenses	1,286	4,600	7,200	9,800	14,210	20,178	25,223	31,024	36,919
Y/Y % Change	<i>n.m.</i>	257.7%	56.5%	36.1%	45.0%	42.0%	25.0%	23.0%	19.0%
Depreciation & Amortization	43	2,137	4,117	5,767	7,417	6,930	6,807	6,600	6,600
Y/Y % Change	<i>n.m.</i>	<i>n.m.</i>	92.7%	40.1%	28.6%	-6.6%	-1.8%	-3.0%	0.0%
EBITDA	-3,023	3,546	11,000	17,333	22,194	25,652	29,266	31,980	34,962
Margin	<i>n.m.</i>	32.8%	48.9%	52.5%	51.1%	46.9%	44.9%	42.2%	40.2%
EBIT	-3,066	1,409	6,883	11,566	14,778	18,722	22,460	25,379	28,361
Margin	<i>n.m.</i>	13.0%	30.6%	35.0%	34.1%	34.2%	34.4%	33.5%	32.6%
Capital Expenditures	1,158	6,000	6,000	6,000	6,600	6,600	6,600	7,080	7,080
Y/Y % Change	<i>n.m.</i>	418.1%	0.0%	0.0%	10.0%	0.0%	0.0%	7.3%	0.0%
Free Cash Flow	-4,181	-3,228	1,848	7,366	10,330	12,951	15,335	16,491	18,432
Y/Y % Change	<i>n.m.</i>	<i>n.m.</i>	<i>n.m.</i>	298.6%	40.2%	25.4%	18.4%	7.5%	11.8%

Source: First Berlin Equity Research, Kleos Space S.A.



## **EXPECTED NEWSFLOW**

4Q2021/Full Year 2021 earnings release on or about 31 March, 2022

Update on commissioning of second satellite cluster

Information about the number of customer additions, RFPs issued

Launch of the third satellite cluster in January 2022

Information on infrastructure build-out and important personnel hires



## MANAGEMENT

### Chief Executive Officer and Founder

#### Andrew Bowyer

Mr. Bowyer is the Co-Founder of Kleos Space S.A., and is also the Co-Founder and Director of Magna Parva. He has 14 years of experience in delivering complex Space contracts, including missions to Mars and Mercury. Mr. Bowyer possesses extensive commercial and business development skills centred around major space mission providers, including the European Space Agency. Mr. Bowyer has a Bachelor of Science in Project Management from Leeds Beckett University, UK. His 50% ownership stake in Magna Parva equates to 12.5m Kleos shares, and his stock holdings outside of Magna Parva total 4.375m shares. Combined, he owns 16.875m shares, or 8.7% of the company.

### Chief Revenue Officer

#### Eric von Eckartsberg

Prior to joining Kleos, Mr Eckartsberg was Senior Director of Worldwide Vricon Sales at Maxar Technologies. Prior to Vricon's acquisition by Maxar in 2020, Mr. Eckartsberg held the position of President of Vricon, where he also previously held the positions of President and Chief Revenue Officer. He has held other management positions at RedSeal Networks, Digital Reasoning Systems, Perceptive Pixel, Oracle and Visual Sciences. Mr. Eckartsberg holds an M.P.A. in Public Administration from the Harvard Kennedy School and a B.A. from Colgate University.

### Chief Operating Officer

#### Herbert Krämer

Mr. Krämer is the founder of APUS Solutions Sarl, a space consulting company. Prior to that, he held high level global management positions at RBC Investor and Treasury Services, including Head of Global Accounting, Director of Owner Fund Accounting Technology Lab, Director of Product Management Fund Accounting, COO, Switzerland, and Head of Structured Funds/Hedge Funds. He has also been a consultant for ABN AMRO Asset Management. Mr. Krämer has an M.B.A. from the University of Liverpool.

### Chief Financial Officer

#### Iain Hackston

Mr. Hackston holds the professional designations Chartered Financial Analyst (CFA) and Chartered Professional Accountant (CPA, Canada). Previous positions include Senior Advisor to Portland Advisors, Finance Director of Ingenia Polymers and Director of Financial Planning and Analysis for O3B Networks. In addition, he is the Founder and Owner of Everlong Management. Mr. Hackston holds a MSc in International Accounting and Finance from the London School of Economics and Political Science, and a Bachelor's Degree in Communications from Carleton University, Canada.

### Chief Technology Officer

#### Vincent Furia

Mr. Furia was previously Space Operations Director at Spire Global, a nano-satellite operator based in the US. He has more than 8 years of management experience and 15 years of experience in software and systems engineering at Harris Corp. and RT Logic. Mr. Furia has a Bachelor's Degree in Mathematics from Carnegie Mellon University.

### Chief Innovation Officer and Founder

#### Miles Ashcroft

Mr. Ashcroft is a Co-Founder of Magna Parva and Kleos. He has more than 25 years of technical experience delivering ground breaking and high value space engineering hardware to multiple international space agencies. Prior to founding Magna Parva, Mr. Ashcroft held



management and technical leadership positions at R&D start-ups, as well as automotive, motorsport (F1), aerospace and space companies. He has a Bachelor of Aeronautical Engineering (Honours) from Salford University and is a CEng (Chartered Engineer), MRAeS (Member of the Royal Aeronautical Society), FRAS (Fellow of the Royal Astronomical Society) and is an inventor/co-inventor on eight granted patents. His 50% ownership stake in Magna Parva equates to 12.5m Kleos' shares, and his stock holdings outside of Magna Parva total 4.375m shares. Combined, he owns 16.875m shares, or 8.7% of the company.

#### **Director, Kleos Space Inc. (USA)**

##### **Karyn Hayes-Ryan**

Ms. Hayes-Ryan is a former member of the intelligence community and was a senior executive with the U.S. Department of Defense. She has held senior executive roles in the National Geospatial Intelligence Agency and National Reconnaissance Office. Ms. Hayes-Ryan has extensive experience in Federal Acquisition Regulation and procurement. She is the CEO and Founder of KHR Impacts, and is a Principal with Deep Water Point. Ms. Hayes-Ryan has a BS/BA in Foreign Service and Political Science from Pennsylvania State University, and a Master of Science in Engineering from George Washington University.

## **BOARD OF DIRECTORS**

#### **Peter Round**

Mr. Round is an RAF Air Commodore and an expert in EU defence Issues and military affairs. Previous positions include Managing Director of PKR Solutions Ltd and Capabilities Director of the European Defence Agency. He has led multiple multi-million pound contracts within the British Defence industry. Mr. Round is widely acknowledged to be an internationally renowned strategic executive with experience in the US, EU and NATO. Mr. Round holds a MA degree in Defence Studies from King's College, London, and a BSc from the University of Manchester. He is President Elect of the Royal Aeronautical Society, London.

#### **David Christie**

Mr. Christie is an independent Board member with 20 years' experience as senior legal executive. Over the past 20 years Mr. Christie has served as a senior executive in London, Russia and New York at Renaissance Capital Bank, Deutsche Bank and Simmons & Simmons Lawyers; and in Australia at Minter Ellison Lawyers and recently iSelect Ltd. (ASX:ISU). He is a Co-Founder and COO of Wilson A.I. as well as Amplifir Pty Ltd. Mr. Christie holds a BA / LLB Law from the University of Canberra, an LLM in International Law from the University of Edinburgh, Scotland and is a Graduate of the Australian Institute of Company Directors.

#### **Padraig McCarthy**

Mr. McCarthy is an independent Board member who is currently a Partner at the private equity firm NewSpace Capital and is an independent Non-Executive Director and Audit Committee Chair at storage company Shurgard. He was previously CFO and a member of the Executive Committee at global satellite leader SES. His 23 years spent at SES include the CFO role at SES Astra and other business and finance positions. Mr. McCarthy will be Chair of the Audit and Risk Management Committee at Kleos.

#### **Management Member of the Board:**

Andrew Bowyer





## Advisory Board

### James Quella

Mr. Quella is an experienced Wall Street financial executive whose previous positions include Senior Managing Director of Blackstone Private Equity, Managing Director & Senior Operating Partner of CSFB Private Equity Partners LLC, Managing Director of DLJ Merchant Banking, Vice Chairman of Mercer Consulting, Chairman of Michaels Cos., Inc and other executive level management and financial advisory positions. In addition, he is a member of the Board of Directors of Dun & Bradstreet Holdings, Inc. and CC Neuberger Principal Holdings II. Mr. Quella has an M.B.A. in finance from the University of Chicago Graduate School of Business.



## SHAREHOLDERS & STOCK INFORMATION

Stock Information	
ISIN	AU0000015588
WKN	BHQVJN1 DE
Bloomberg ticker	KSS AU
No. of issued shares	177.5
Transparency Standard	ASX Exchange
Country	Australia
Sector	Space
Subsector	Satellites

Source: Börse Frankfurt, First Berlin Equity Research

Shareholder Structure	
LTL Capital	16.8%
Magna Parva (Founders)	14.1%
Cameron Family Consolidated Hldgs	10.9%
Management/Board	5.5%

Source: Bloomberg, Kleos Space S.A.



## INCOME STATEMENT

EUR '000	2020A	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E
<b>Revenues</b>	<b>176</b>	<b>100</b>	<b>21,085</b>	<b>40,313</b>	<b>60,391</b>	<b>77,226</b>	<b>93,303</b>	<b>110,776</b>	<b>129,205</b>	<b>147,998</b>
Cost of goods sold	0	0	2,109	3,830	4,529	5,329	5,878	6,425	6,719	6,956
<b>Gross profit</b>	<b>176</b>	<b>100</b>	<b>18,977</b>	<b>36,483</b>	<b>55,861</b>	<b>71,897</b>	<b>87,424</b>	<b>104,351</b>	<b>122,486</b>	<b>141,042</b>
Personnel costs	1,286	2,475	2,952	3,265	3,382	3,475	3,564	3,656	3,747	3,836
Other operating income	0	0	0	0	0	0	0	0	0	0
Other operating expenses	0	0	0	0	0	0	0	0	0	0
<b>EBITDA</b>	<b>-3,023</b>	<b>-4,882</b>	<b>12,398</b>	<b>25,679</b>	<b>42,134</b>	<b>55,834</b>	<b>68,932</b>	<b>83,414</b>	<b>98,971</b>	<b>115,006</b>
Depreciation and amortisation	43	50	2,020	3,570	4,810	5,270	7,130	8,370	8,680	9,302
<b>Operating income (EBIT)</b>	<b>-3,066</b>	<b>-4,932</b>	<b>10,378</b>	<b>22,109</b>	<b>37,324</b>	<b>50,564</b>	<b>61,802</b>	<b>75,044</b>	<b>90,291</b>	<b>105,705</b>
Net financial result	1,261	119	0	531	933	1,264	1,545	1,876	2,257	2,643
Non-operating expenses	541	0	0	0	0	0	0	0	0	0
<b>Pre-tax income (EBT)</b>	<b>-4,868</b>	<b>-5,051</b>	<b>10,378</b>	<b>21,578</b>	<b>36,391</b>	<b>49,300</b>	<b>60,257</b>	<b>73,168</b>	<b>88,033</b>	<b>103,062</b>
Income taxes	0	0	0	0	2,447	13,804	16,872	20,487	24,649	28,857
Minority interests	0	0	0	0	0	0	0	0	0	0
<b>Net income / loss</b>	<b>-4,868</b>	<b>-5,051</b>	<b>10,378</b>	<b>21,578</b>	<b>33,944</b>	<b>35,496</b>	<b>43,385</b>	<b>52,681</b>	<b>63,384</b>	<b>74,205</b>
<b>Diluted EPS (in €)</b>	<b>-0.03</b>	<b>-0.03</b>	<b>0.06</b>	<b>0.11</b>	<b>0.17</b>	<b>0.18</b>	<b>0.22</b>	<b>0.27</b>	<b>0.32</b>	<b>0.37</b>
<b>Ratios</b>										
Gross margin	100.0%	100.0%	90.0%	90.5%	92.5%	93.1%	93.7%	94.2%	94.8%	95.3%
EBITDA margin on revenues	-1715.6%	-4882.3%	58.8%	63.7%	69.8%	72.3%	73.9%	75.3%	76.6%	77.7%
EBIT margin on revenues	-1740.1%	-4932.2%	49.2%	54.8%	61.8%	65.5%	66.2%	67.7%	69.9%	71.4%
Net margin on revenues	-2762.6%	-5051.2%	49.2%	53.5%	56.2%	46.0%	46.5%	47.6%	49.1%	50.1%
Tax rate	0.0%	0.0%	0.0%	0.0%	6.7%	28.0%	28.0%	28.0%	28.0%	28.0%
<b>Expenses as % of revenues</b>										
Personnel costs	729.8%	2475.0%	14.0%	8.1%	5.6%	4.5%	3.8%	3.3%	2.9%	2.6%
Depreciation and amortisation	24.5%	50.0%	9.6%	8.9%	8.0%	6.8%	7.6%	7.6%	6.7%	6.3%
Other operating expenses	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Y-Y Growth</b>										
Revenues	-70.7%	-43.3%	20985.1%	91.2%	49.8%	27.9%	20.8%	18.7%	16.6%	14.5%
Operating income	n.m.	n.m.	n.m.	113.0%	68.8%	35.5%	22.2%	21.4%	20.3%	17.1%
Net income/ loss	n.m.	n.m.	n.m.	107.9%	57.3%	4.6%	22.2%	21.4%	20.3%	17.1%



## BALANCE SHEET

€000s	2020A	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E
<b>Assets</b>										
<b>Current assets, total</b>	<b>11,437</b>	<b>7,106</b>	<b>14,605</b>	<b>35,439</b>	<b>72,004</b>	<b>103,726</b>	<b>145,183</b>	<b>197,181</b>	<b>260,178</b>	<b>334,605</b>
Cash and cash equivalents	10,788	7,098	12,584	32,126	67,040	97,379	137,515	188,076	249,559	322,441
Short-term investments	0	0	0	0	0	0	0	0	0	0
Receivables	649	8	2,022	3,313	4,964	6,347	7,669	9,105	10,620	12,164
Inventories	0	0	0	0	0	0	0	0	0	0
Other current assets	0	0	0	0	0	0	0	0	0	0
<b>Non-current assets, total</b>	<b>5,467</b>	<b>8,119</b>	<b>12,557</b>	<b>16,926</b>	<b>22,469</b>	<b>26,760</b>	<b>29,158</b>	<b>30,556</b>	<b>31,294</b>	<b>31,368</b>
Property, plant & equipment	5,467	8,119	12,557	16,926	22,469	26,760	29,158	30,556	31,294	31,368
Goodwill & other intangibles	0	0	0	0	0	0	0	0	0	0
Other assets	0	0	0	0	0	0	0	0	0	0
<b>Total assets</b>	<b>16,904</b>	<b>15,225</b>	<b>27,163</b>	<b>52,365</b>	<b>94,473</b>	<b>130,486</b>	<b>174,342</b>	<b>227,737</b>	<b>291,472</b>	<b>365,973</b>
<b>Shareholders' equity &amp; debt</b>										
<b>Current liabilities, total</b>	<b>5,047</b>	<b>967</b>	<b>1,905</b>	<b>2,037</b>	<b>2,334</b>	<b>2,592</b>	<b>2,837</b>	<b>3,083</b>	<b>3,319</b>	<b>3,546</b>
Short-term debt	3,466	0	0	0	0	0	0	0	0	0
Accounts payable	747	133	1,071	1,203	1,501	1,758	2,003	2,249	2,485	2,712
Current provisions	0	0	0	0	0	0	0	0	0	0
Other current liabilities	834	834	834	834	834	834	834	834	834	834
<b>Long-term liabilities, total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Long-term debt	0	0	0	0	0	0	0	0	0	0
Deferred revenue	0	0	0	0	0	0	0	0	0	0
Other liabilities	0	0	0	0	0	0	0	0	0	0
<b>Minority interests</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Shareholders' equity</b>	<b>11,857</b>	<b>14,258</b>	<b>25,258</b>	<b>50,329</b>	<b>92,138</b>	<b>127,894</b>	<b>171,505</b>	<b>224,654</b>	<b>288,153</b>	<b>362,428</b>
Share capital	21,868	39,177	40,602	51,206	60,100	60,100	60,100	60,100	60,100	60,100
Capital reserve	265	-8,903	-9,965	-17,614	-19,696	-19,696	-19,696	-19,696	-19,696	-19,696
Other reserves	0	0	0	0	0	0	0	0	0	0
Treasury stock	0	0	0	0	0	0	0	0	0	0
Loss carryforward / retained earnings	-10,276	-15,327	-4,950	16,629	50,573	86,069	129,454	182,135	245,519	319,724
<b>Total consolidated equity and debt</b>	<b>16,904</b>	<b>15,225</b>	<b>27,163</b>	<b>52,365</b>	<b>94,473</b>	<b>130,486</b>	<b>174,342</b>	<b>227,737</b>	<b>291,472</b>	<b>365,973</b>
<b>Ratios</b>										
Current ratio (x)	2.27	7.35	7.67	17.40	30.84	40.01	51.17	63.96	78.39	94.37
Quick ratio (x)	2.27	7.35	7.67	17.40	30.84	40.01	51.17	63.96	78.39	94.37
Net debt	-7,322	-7,098	-12,584	-32,126	-67,040	-97,379	-137,515	-188,076	-249,559	-322,441
Net gearing	-61.8%	-49.8%	-49.8%	-63.8%	-72.8%	-76.1%	-80.2%	-83.7%	-86.6%	-89.0%
Equity ratio	70.1%	93.6%	93.0%	96.1%	97.5%	98.0%	98.4%	98.6%	98.9%	99.0%
Book value per share (in €)	0.07	0.08	0.14	0.27	0.46	0.64	0.86	1.13	1.45	1.83
Return on equity (ROE)	-41.1%	-35.4%	41.1%	42.9%	36.8%	27.8%	25.3%	23.4%	22.0%	20.5%
Days of sales outstanding (DSO)	1,344.2	30.0	35.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Days inventory outstanding	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Days in payables (DIP)	-85.2	-9.8	-59.4	-40.6	-39.9	-40.0	-39.5	-39.2	-38.6	-38.0



## CASH FLOW STATEMENT

€000s	2020A	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E
<b>EBIT</b>	<b>-3,607</b>	<b>-5,170</b>	<b>10,378</b>	<b>21,048</b>	<b>30,565</b>	<b>20,428</b>	<b>24,968</b>	<b>30,318</b>	<b>36,477</b>	<b>42,705</b>
Depreciation and amortisation	43	50	2,020	3,570	4,810	5,270	7,130	8,370	8,680	9,302
<b>EBITDA</b>	<b>-3,564</b>	<b>-5,120</b>	<b>12,398</b>	<b>24,618</b>	<b>35,375</b>	<b>25,698</b>	<b>32,098</b>	<b>38,688</b>	<b>45,157</b>	<b>52,006</b>
Changes in working capital	0	27	-1,076	-1,160	-1,352	-1,126	-1,077	-1,190	-1,279	-1,318
Other adjustments	55	119	0	531	3,380	15,068	18,417	22,363	26,907	31,500
<b>Operating cash flow</b>	<b>-3,509</b>	<b>-4,974</b>	<b>11,322</b>	<b>23,989</b>	<b>37,402</b>	<b>39,640</b>	<b>49,438</b>	<b>59,861</b>	<b>70,785</b>	<b>82,188</b>
Investments in PP&E	-1,158	-3,390	-6,200	-7,401	-9,300	-9,302	-9,302	-9,300	-9,303	-9,306
Investments in intangibles	0	0	0	0	0	0	0	0	0	0
<b>Free cash flow</b>	<b>-4,667</b>	<b>-8,364</b>	<b>5,122</b>	<b>16,587</b>	<b>28,102</b>	<b>30,338</b>	<b>40,136</b>	<b>50,561</b>	<b>61,483</b>	<b>72,882</b>
Acquisitions & disposals, net	0	0	0	0	0	0	0	0	0	0
Other investments	0	0	0	0	0	0	0	0	0	0
<b>Investment cash flow</b>	<b>-1,158</b>	<b>-3,390</b>	<b>-6,200</b>	<b>-7,401</b>	<b>-9,300</b>	<b>-9,302</b>	<b>-9,302</b>	<b>-9,300</b>	<b>-9,303</b>	<b>-9,306</b>
Debt financing, net	1,215	-3,466	0	0	0	0	0	0	0	0
Equity financing, net	13,946	8,140	364	2,955	6,812	0	0	0	0	0
Dividends paid	0	0	0	0	0	0	0	0	0	0
Other financing	0	0	0	0	0	0	0	0	0	0
<b>Financing cash flow</b>	<b>15,161</b>	<b>4,674</b>	<b>364</b>	<b>2,955</b>	<b>6,812</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FOREX & other effects	1	0	0	0	0	0	0	0	0	0
<b>Net cash flows</b>	<b>10,495</b>	<b>-3,690</b>	<b>5,486</b>	<b>19,542</b>	<b>34,914</b>	<b>30,338</b>	<b>40,136</b>	<b>50,561</b>	<b>61,483</b>	<b>72,882</b>
Cash, start of the year	293	10,788	7,098	12,584	32,126	67,040	97,379	137,515	188,076	249,559
<b>Cash, end of the year</b>	<b>10,788</b>	<b>7,098</b>	<b>12,584</b>	<b>32,126</b>	<b>67,040</b>	<b>97,379</b>	<b>137,515</b>	<b>188,076</b>	<b>249,559</b>	<b>322,441</b>
<b>EBITDA/share (in €)</b>	<b>-0.02</b>	<b>-0.03</b>	<b>0.07</b>	<b>0.14</b>	<b>0.21</b>	<b>0.28</b>	<b>0.35</b>	<b>0.42</b>	<b>0.50</b>	<b>0.58</b>
<b>Y-Y Growth</b>										
Operating cash flow	n.m.	n.m.	n.m.	111.9%	55.9%	6.0%	24.7%	21.1%	18.3%	16.1%
Free cash flow	n.m.	n.m.	n.m.	223.8%	69.4%	8.0%	32.3%	26.0%	21.6%	18.5%
EBITDA/share	n.m.	n.m.	n.m.	94.0%	56.7%	32.5%	23.5%	21.0%	18.7%	16.2%

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Category		1	2
Current market capitalisation (in €)		0 - 2 billion	> 2 billion
Strong Buy <sup>1</sup>	An expected favourable price trend of:	> 50%	> 30%
Buy	An expected favourable price trend of:	> 25%	> 15%
Add	An expected favourable price trend of:	0% to 25%	0% to 15%
Reduce	An expected negative price trend of:	0% to -15%	0% to -10%
Sell	An expected negative price trend of:	< -15%	< -10%

<sup>1</sup> The expected price trend is in combination with sizable confidence in the quality and forecast security of management.

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Report No.:	Date of publication	Previous day closing price	Recommendation	Price target
Initial Report	2 May 2019	AUD0.26	BUY	AUD0.43
...	↓	↓	↓	↓
2	17 October 2019	AUD0.26	BUY	AUD0.46
3	26 October 2020	AUD0.58	BUY	AUD0.75
4	17 November 2020	AUD0.69	BUY	AUD1.15
5	3 February 2021	AUD0.59	BUY	AUD1.15
6	11 March 2021	AUD0.60	BUY	AUD1.18
7	Today	AUD0.71	BUY	AUD5.00

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