Taking Luxury to New Heights

Demeter Space
Business Plan

V1.1.5

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Lewis Jones, CEO
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Founding Team

Lewis Jones, CEO

Jack Caldwell, VP of Product Engineering

Ben Gorr, VP of Space Engineering

Advisory Board

Paul Groepler

- Co-founded 7 successful ventures
- 4 beverage startups

Will Heltsley

- 10 years of executive experience at SpaceX

Eric Rothfus

- E&Y Entrepreneur of the Year
- General Partner at Alara Capital

Lester Jones

- Chief Economist at National Beer Wholesalers Association

Capital Needs

Phase I - $750k
[In-Space Research]
Phase II - $10m
[Research & Development]
Phase III - $20m
[Product Launch]
Phase IV - $35m
[Market Expansion]

Delaware "C-corp"
Operating in Pasadena, CA

Five Year ROI: 4.27x
Five Year IRR: 34%

*Data from NASA Science Directorate, Statista.com, Beverage Information Group's 2019 Liquor Report, and Distilled Spirits Council of the United States

Executive Summary

Demeter Space, Inc. develops technologies for fermenting beverages in space. With the mission of utilizing the zero-gravity environment of outer space for producing consumer products, Demeter will co-develop space-produced ultra-premium liquors with partner beverage production companies.

Market Opportunity

The $222b domestic spirits industry is a rapidly growing market, with intense competition among distillers to produce novel and uniquely differentiated products. However, current brands attempt to stand out with marginal factors like the shape of the bottle, the font of the product name, and how much the aging barrel had been charred. The market is ripe for disruption by a new and innovative method of production that breaks the mold of how an ultra-premium product is defined.

On the other hand, producing consumer beverages in space was not possible until very recently. In the last 15 years, it has become 10 times cheaper to send goods to orbit around Earth, and the current launch vehicles in development show that the cost will further fall by another factor of 100. ULA's Atlas V used to cost $11,125 per 1 kg of mass launched to orbit; now the cost is $1,410 with SpaceX's Falcon Heavy vehicle and the cost is projected to be $20 by 2023 with the SpaceX Starship vehicle in development today. Demeter has recognized this as an immense opportunity, and is spearheading the development of technologies that will enable ultra-premium beverages to be produced in space.

Technology

While no entity commercially produces space-fermented beverages, space production of liquor has been attempted in research experiments before. A research project conducted by CU Boulder in 2001 showed yeast cells produced different levels of proteins in zero-gravity. This was a key finding that showed the unique environment of outer space allows for new flavors to develop that are not currently possible on Earth. However, the lack of cheap access to space has so far prevented commercialization of this unique property of yeasts.

With the entirely new landscape due to the falling cost of access to space, Demeter is developing the Orbital Fermenter, a fermenter that can operate in outer space to produce beverages with the unique flavor of zero-gravity fermentation. By 2024, Demeter expects to have developed the capability to mass produce liquor in space at an affordable rate, and for Demeter-produced liquor bottles to be retailed at roughly $99 per bottle. The intellectual property will be patented as they are created, making the flavor of space into a unique feature of Demeter's products.

Business Model

Demeter is a space fermentation technology business. Demeter forms partnerships with industry leading alcohol suppliers and works with them to produce co-branded beverages in space by using their patent-pending Orbital Fermentation technology. This model allows Demeter's engineering team to focus on developing the space technologies for fermenting beverages in orbit, while using the partner's brand and marketing expertise to deliver a compelling product to market. Building a consumer facing brand is a difficult process; Demeter's approach allows for utilization of the pre-existing industry and rapidly reach market adoption, while still having control over the final product.

Capitalization Strategy & Funding Plans

Demeter is a rapid growth technology business with four rounds of financing planned. Phase I of the plan will raise $750k to conduct zero-gravity fermentation research on the International Space Station and produce a small quantity of space whiskey for analysis and tasting. Phase II will follow with the raising of $10m to begin development of the Orbital Fermenter and will complete with the testing of key technologies in space. The $20m Phase III will lead to the first production of space liquor products for the mass market with Demeter's partners. The final Phase IV will raise $35m to build new brands and scale the production process, leading to an exit in early 2027.

Current Status

Demeter has been in operation for 3 months. The team has built a fermentation research facility that is allowing rapid iterative development of yeast strains in preparation for research on the International Space Station, and has a patent-pending on a space fermentation process. Demeter is also currently establishing a contract with Nanoracks to install their fermentation research laboratory on the ISS.

Company Overview

The Vision

Demeter was founded in March 2020 to start a new age of consumer focused businesses in the space industry. In the past, space was a realm of national endeavors, with only world powers like the United States and the Soviet Union having the means to send satellites and astronauts to orbit. Even in the post-Moon-landing era, only giant government contractors and developed nations dared to explore the final frontier. Then, after decades of stagnation in the industry, a new generation of businesses funded by the successes of the internet revolution began changing the equation. Businesses like SpaceX, Blue Origin, and Virgin Galactic changed the public perception that even private businesses can develop space technologies, and the more recent 'NewSpace' businesses are developing a commercial space industry. Reusable spacecraft and massive telecommunication satellite constellations have changed the landscape of how the commercial world can benefit from space technologies.

The Demeter Team believes that there is another wave of innovations that is about to hit the industry. With the rapidly falling cost of accessing orbit, it has now become feasible to begin manufacturing consumer products in space and very soon, we may even see space-liners ferrying customers to space and back at a price point many middle-income households can afford. Our vision is to realize this "consumer space age," and we believe space produced liquor is the crucial first step.

Demeter Space's logo, the comet, is a nod to our vision for the future of the space industry. Like a shooting star falling to Earth, Demeter will be returning products from space for people on Earth to enjoy. The logo is also reminiscent of cornucopia, the ancient basket of prosperity, and the symbol of the Greek goddess Demeter. With modern technology, we believe the next step in humanity is sharing the harvest of the heavens with people around the globe.

Founding Team

Demeter Space was founded by a team of aerospace engineers with a common goal; to revolutionize the public perception of what's possible in space. While the founders are young, they have all proven themselves to be exceptionally talented and competent, with each having led engineering organizations and developed aerospace hardware at major engineering organizations.

Lewis Jones, Chief Executive Officer

Lewis brings a unique perspective over the aerospace industry, with engineering experiences at SpaceX, NASA Johnson Space Center, NASA Jet Propulsion Laboratory, and Millennium Space Systems, having worked on satellites, rockets, human-rated capsules, and a Mars mission. His aerospace engineering expertise has led to his induction into the Matthew Isakowitz Fellowship, a highly selective organization of young professionals with an exceptional prospect of becoming aerospace industry leaders. Lewis also has extensive management and leadership experience from founding the Caltech Rocketry Organization, PARSEC. As the founding president, Lewis not only

led the engineering effort of developing their metal 3D printed Valkyrie rocket engine, but also connected with the propulsion team at SpaceX to conduct design reviews of their liquid propellant rocket. Lewis holds a B.S. from Caltech for Economics and Mechanical Engineering, as well as a Project Management Certification from Caltech.

Jack Caldwell, Vice President of Product Engineering

Jack brings both technical and business talents to the team. His technical expertise on mechanical engineering design and analysis of high-pressure fluid systems is supplemented with his experience with independent research in biology, mathematics, physics, and robotics laboratory work. Beyond technical expertise, Jack brings a knack of finding and bringing in necessary players to get things done. After doing research his freshman year with Caltech's president, he employed their friendship to open him more up to the idea of Caltech having a rocketry team, an idea that had previously been rejected. Later, he helped the team foster relationships with donors, leading to him befriending and gaining direct financial support for the team from one of the world's top philanthropic families. He is pursuing a Mechanical Engineering Degree from Caltech but is taking time off to focus on Demeter Space.

Ben Gorr, Vice President of Space Engineering

Ben brings extensive satellite development experience, with an expertise in orbit evaluation, subsystem sizing and design, and payload development. As the program manager and chief engineer of Texas A&M's AggieSat program, he has managed and led the development of satellites for deployment to low Earth orbit. Prior to joining Demeter, Ben worked at Northrop Grumman Innovation Systems, working as a systems engineer for a guided munitions project. Ben also holds a patent on a controller for remotely operating robots, and is well versed in electrical engineering and circuit design. He recently graduated from Texas A&M University with his bachelor's in Aerospace Engineering. While he is currently pursuing a doctorate degree in advanced satellite robotics, he has agreed to lend his satellite development expertise as a part-time member of the team.

Advisory Board

Demeter Space is supported by an experienced advisory board with backgrounds in the aerospace industry as well as the liquor industry. The advisors also bring a variety of insights from their industries, from serial entrepreneurs at high-growth startups to executives of industry-leading organizations. The responsibilities of the advisors vary, but they all have regular conversations with the founding team to advise them on big picture decisions as well as more operational support such as reviewing documents and engineering designs.

Will Heltsley, Space Industry Expert

Will Heltsley provides support and insight to the team with 10 years of executive experience in the aerospace industry. As the current Vice President of Propulsion at SpaceX, Heltsley has been involved with all rocket engines, rocket launch vehicles, satellites, and spacecraft SpaceX has developed. He also has four publications through AIAA on expansion tubes and supersonic flow.

Heltsley has a BS in Mechanical Engineering from Caltech and a MS in Mechanical Engineering from Stanford University.

Paul Groepler, Beverage Entrepreneurship Expert

Paul F. Groepler brings over thirty-five years of professional experience in corporate and small company operations and growth, having worked for such Fortune 500 companies as Hughes Aircraft (Raytheon), Motorola, Sun Microsystems, Daimler-Benz, DELL Computer and IBM. Mr. Groepler has founded or co-founded seven successful ventures such as Technology Works, Cable HealthCare, Aeon Technology, Leapfrog Wireless, This Ol'Factory, a.o. He was fortunate enough to participate in the early stages and IPO's of Sun Microsystems and Dell. In addition to his technology background, Mr. Groepler was a Swiss fund manager for LB Swiss (Zurich) for 8 very successful years. Mr. Groepler has performed Research and Design consulting work for varied organizations ranging from the United Nations to the Max Planck Institute, and has applied for 14 patents (9 patented to-date). He was selected for special study by the National Science Foundation, and has a B.S. in Computing Science with an Electrical Engineering option from the Texas A&M under a full Air Force scholarship. He is currently in his final semester of graduate studies at MIT as a Masters in Course 14 (Economics) and Data Science. In addition to his technology startup background, Mr. Groepler has four beverage startups experience, first for Iclandia® an Icelandic bottle water play, followed by a vodka (IS Vodka), a tequila (Tequila Ambhar®), and a whiskey (9 Banded™). Mr. Groepler has also served as an angel investor with his own early stage portfolio, and was a partner consultant to Guggenheim Venture Partners in Austin, a large Venture Capital firm based out of Manhattan, NYC and a branch of the Guggenheim family.

Eric Rothfus, Technology Entrepreneurship Expert

With 18 years of start-up experience, Eric Rothfus is a serial entrepreneur with extensive engineering and operational experience. Eric has founded three successful ventures and has been an early employee in three others. In 2008 Eric co-founded Guggenheim Technology Partners, a $65 million venture capital firm specializing in technology turn-arounds. In 2011, he spun-out Alara Capital from Guggenheim. During his time in venture capital, he has occupied over 30 board seats on companies producing semi-conductors, semi-conductor process technology, telecommunications equipment, enterprise storage and database software and equipment, and various other types of software. Prior to directing venture capital firms, Eric was a co-founder of Agere as the initial CEO and CTO/EVP. Agere developed high-speed, mult-protocol network processors and was acquired by Lucent Technologies. Before Agere, Eric was a founder of Dazel Corporation where he held the position of VP of Engineering and VP of Internet Initiatives. At Dazel, he was responsible for the creation of the MetaWeb product line which led to Hewlett Packard's purchase of Dazel in 1999. In 2000, Eric was the recipient of the Ernst and Young Entrepreneur of the Year award. He holds a B.S. in Computer Science and Electrical Engineering from the Massachusetts Institute of Technology (MIT). His graduate study includes work at Cornell

University in wide-area networking for high-energy physics and distributed processing systems at the University of Texas at Austin.

Lester Jones, Alcohol Distribution Expert

Lester Jones serves as the Chief Economist for the National Beer Wholesalers Association, a national trade organization that represents the interest of America's 3,300 independent, licensed beer distributors that service every state. He has more than 20 years of experience in research, survey methodology and applied economics. He most recently served as Chief Economist at the Beer Institute, where he developed and executed research initiatives on America's beer industry. He also serves on the Board of the Responsible Hospitality Institute (RHI), a private, non-profit organization founded in 1983 and is the leading source for events, resources, and consultation services on the night economy.

As NBWA Chief Economist, Jones tracks the economic factors that impact the beer distribution industry and alcohol policy decisions at the federal, state, and local levels. He evaluates and develops primary industry data, including economic impact, tax impacts, sales and volume data. In addition to his decade of work at the Beer Institute, Jones previously worked for Arbitron Company (Nielsen) in Columbia, Maryland, and the Regional Economic Studies Institute in Towson, Maryland. Jones has a Master of Science in Economics from the University of Delaware as well as a Bachelor of Arts in Economics from the University of Maryland Baltimore County.

Contact Information

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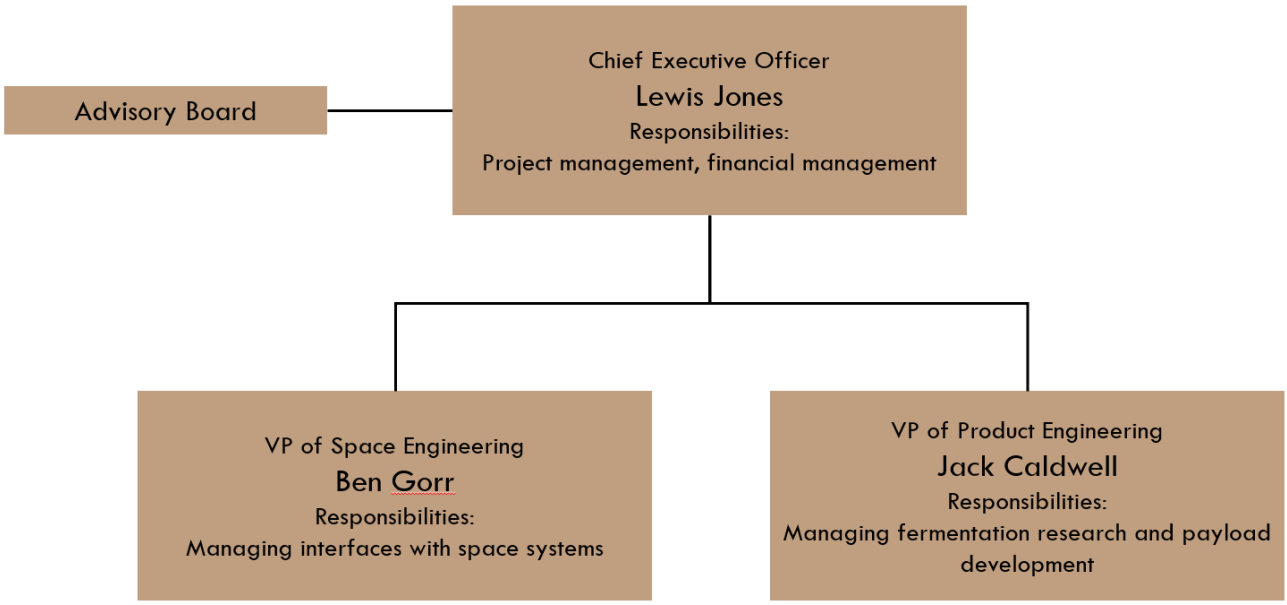
Organizational Structure



Near Term Milestones

- Contract signing with Nanoracks for ISS research payload delivery and recovery
- Critical Design Review (CDR) of ISS research fermenter
- Completion of hardware testing of ISS research fermenter
- Completion of yeast fermentation research campaign
- ISS research fermenter hand over to Nanoracks
- Successful production of historic space whiskey samples, and investor tasting session

Market Analysis

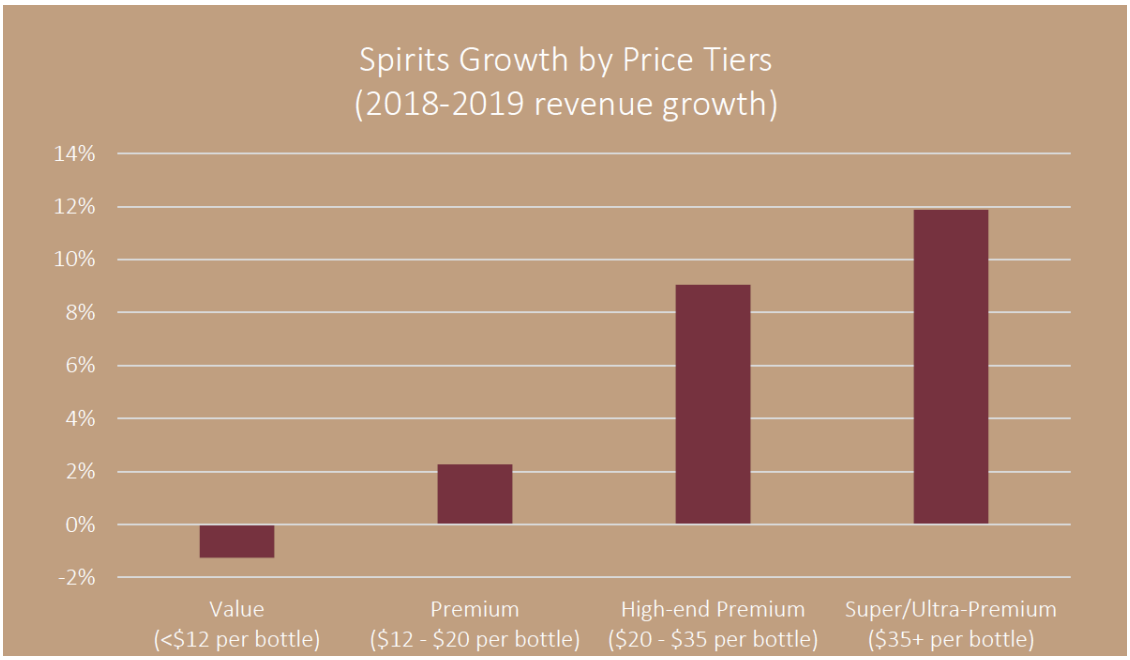
Alcohol presents a massive outlet for space products with its $1.4 trillion global market. Demeter's strategy focuses on developing a variety of liquor products for the large community of spirit consumers, with a plan to target marketing to the space and technology enthusiast communities.

Market Segmentation

The domestic $222b alcohol market is segmented into beers, wines, spirits, and other beverages, and is growing rapidly at a compounded annual growth rate (CAGR) of 7.9% (data from Statista.com). The spirits market holds 19% of the market in quantity, but represents 33% of revenue with $73.9b of expected revenue in 2020. The larger retail price per unit of spirits presents the ideal opportunity for initial market introduction of space-fermented beverages because the cost of producing beverages using space technologies are based on how much product is produced (if it costs more to make a unit of alcohol, the revenue per unit of alcohol also has to be high).

Within the spirits market, vodka and whiskey take the largest customers segments; vodka with a revenue of $18.8b (CAGR 8.3%) and whiskey with $16.0b (CAGR 8.1%). Data was collected from Beverage Information Group's 2019 Liquor Report and Statista.com's report on consumer market outlook for alcohol.

Each spirit is further segmented into value, premium, super-premium, and ultra-premium price points. While the cutoffs depend on the source of data, they lie roughly around <$12, $12-20, $20-$35, and $35+. The super/ultra-premium sector has shown the greatest growth in recent years according to the Distilled Spirits Council of the United States (DISCUS).



Growth of American-produced Whiskey Market in the U.S., Source: DISCUS

The super/ultra-premium market makes up roughly 20% of the whiskey market by revenue as of 2019, but this share is also expected to grow with the rising income of consumers; data from DISCUS shows similar trends for other spirits as well.

Target Market

Demeter's business model allows for multiple consumer product brands to be developed simultaneously, but all Demeter-related brands serve the ultra-premium spirits market, with strategic marketing to attract science and technology enthusiasts. This particular community of enthusiasts presents the ideal early adopter opportunity; they tend to be medium-high to high income earning individuals with many having a technical background or with experience in science and engineering occupations. They are also well connected by urban communities and tight networks, and are concentrated in a few states and cities where NASA and the aerospace industry's presence are strong.

There are roughly 22 million science and technology enthusiasts (representing $38.8b of alcohol consumption) in the US who may become early adopters of Demeter's products. This was calculated using data from the National Science Foundation's estimates of the number of Americans with technical occupations and degrees, with supporting data from the number of visitors to NASA centers. From these sources the team estimated there to be roughly 35 million adults with an interest in spaceflight. Using statistics from Beverage Information Group's 2019 report that 64% of Americans are beverage alcohol consumers, we arrive at the estimate of 22 million potential customers just in the space and technology enthusiasts group. Relative to the 126 million alcohol consumers in the US, this is nearly one-sixth of the domestic alcohol market, thus this group represent $38.8b of revenue. By initially focusing on this sector of consumers, Demeter will be able to target individuals most likely to adopt the products and gain a foothold to then expand to the larger market of all spirits consumers.

Sources

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Business Model

Demeter Space's business model is focused on utilizing the space fermentation technologies we develop to simultaneously build multiple brands across many product sectors. The business innovation that enables this is a product development process that utilizes partnering with established alcohol producers. By reaching out to alcohol producers and integrating Demeter's space fermentation technology within their production processes, we streamline the production of space fermented liquor products. While Demeter's partners will be focused on developing each product's sales strategies, each product that is produced using Demeter's services are co-branded between Demeter and the partner, allowing Demeter to retain control over the product.

Partnership with Alcohol Producers

By co-creating a product line with Demeter, alcohol suppliers gain a unique value proposition that is unavailable anywhere else; their product will be made in space.

The partner alcohol producers will retain the responsibility of other aspects of the alcohol production process besides fermentation. These partners will provide the raw materials for fermentation, and after Demeter ferments the product in space, the material is sent back to the partners to distill, package, and ship for sales. This particular business model has many advantages for both Demeter and its partners. Demeter will be able to focus its entire workforce on developing cheaper, faster, and higher quality fermentation technologies while established alcohol producers can utilize their vast production and sales capabilities to deliver the product to market. Demeter will also initially prioritize partnering with different alcohol producers to target different sectors of the spirits market. The goal is to have an ultra-premium space liquor for each market; space whiskey, space vodka, space gin, etc.

Co-branding

Co-branding is a key element of the partnerships that are created between Demeter and the alcohol suppliers. By developing Demeter's brand alongside the products, we become a de facto premium brand. "Demeter-produced" beverages will hold a certain place in the hierarchy of liquor prestige. A necessary aspect of this agreement is that Demeter will have a say over the product's branding efforts. Thus the product's branding and marketing will be developed in cooperation between the partner and Demeter.

Revenue Structure

Demeter's source of revenue is from the space fermentation service for the partner alcohol producer. Alcohol will be produced at an agreed upon rate, and a fraction of the revenue from sales of the product is collected by Demeter as revenue. Thus Demeter has an incentive to rapidly develop multiple product lines and target different product sectors (whiskey, vodka, gin, etc.) For each new product line that is developed, Demeter will likely partner with a different alcohol producer; this will allow Demeter to diversify its production and also quickly reach as many different markets that the partners specialize in.

Production Plan

Demeter's success is closely tied to the efficient and timely production of alcoholic beverages in orbit. This is a nontrivial challenge; something that requires careful development of the necessary technologies and research over many years. As a result, Demeter is taking the approach of outsourcing all aspects of the production process that can be completed with preexisting techniques to key partners. This allows Demeter's engineering efforts to be focused on developing new technologies, rather than "reinventing the wheel".

The spirit making process is made up of malting, mashing, fermenting, distilling, aging, and bottling. The first step in producing spirits is building the mash, the base material that will be fermented. Specific ratios of different grains or starches are mixed together and soaked in warm water. In this state the raw material begins germinating, converting starch into simple sugars that can be fermented. Once the starch has been converted, the resulting malt is boiled in pure water to draw out the sugar. The resulting mash is fermented by adding yeast in a carefully controlled environment. The product of the fermentation process is beer, with anywhere from 5-15% alcohol content. To make spirits, the beer is then distilled and the ethanol is separated out until the mixture achieves at least 40% alcohol content. This results in a clear spirit, often called a 'white'. Some spirits are in this form; vodka is simply distilled alcohol. For some products, further aging is necessary to achieve the ideal flavor. In this case, the white is aged in charred barrels for several years. The completed spirits can then be bottled and packaged, and then sent to distributors for sale.

Demeter has identified the fermentation process as the critical process that will be improved by conducting it in space. The production process will make use of the unique properties of zero-gravity fermentation to give the product its "100% fermented in space" distinction. For whiskey products, the aging process will be accelerated using ultrasonic perturbation to shrink the production process from years to months. All other aspects of the production process will be conducted by the partner alcohol producer.

Fermentation Process

The key differentiator of Demeter's ultra-premium spirits is that they are fermented in the unique environment of outer space. A research project conducted by the University of Colorado has shown that zero gravity provides a unique environment for yeast cells, resulting in a different fermentation process than on Earth. Demeter will partner with a rocket launch provider to fill excess capacity on their launches with Demeter's Orbital Fermenters. After the rocket is launched to low Earth orbit, the Orbital Fermenters release the yeast into the mash and controls the fermentation process over a one to five-day period in space. Following the fermentation process, the rocket is returned to Earth and the Orbital Fermenters are unloaded and sent to distillation.

Orbital Fermenter

The key technology that will be the main focus of Demeter's engineering efforts will be the development of the low-cost, highly reusable orbital fermenter. During phase I (research and development aboard the International Space Station), Demeter will develop a micro-gravity fermentation technique that makes use of the self-pressurizing process of the yeast cells to rapidly produce high alcohol content beer in space. The techniques and lessons learned from this research

will be used to develop the production scale Orbital Fermenter, capable of producing over 800kg of zero-gravity fermented beer in each flight. The chambers are sized to allow easy and rapid loading onto the launch vehicle, and will be capable of sharing capacity on the rocket with other Orbital Fermenters or satellites that may be part of the launch service. Even in unpressurized and uninsulated cargo holds, the Demeter Orbital Fermenters will be capable of self-regulating its internal environment to achieve the ideal fermentation condition for the mash.

The development of the Orbital Fermenter will follow an incremental and iterative process, with each fundraising round leading up to a major milestone. Phase I is focused on developing the necessary scientific understanding of the zero-gravity fermentation process. Then the Phase II period develops the first iteration design of the complete production scale Orbital Fermenter. This is followed by manufacturing and launch of this iteration of the Orbital Fermenter to space to verify all systems are functional in Phase III. Phase III will also be utilized to begin development of the Orbital Fermenter factory. Finally, Phase IV will be focused on optimizing the efficiency of the production process and will ultimately lower the cost of goods sold, enabling lower cost, mass-market ready production.

Intellectual Property

Demeter's approach to intellectual property protection focuses on aggressive patenting of developed technologies. To date, there have been no patents awarded for space fermentation technologies. By focusing on obtaining patents on the Orbital Fermenter technology, Demeter can position itself to contest other firms that may later attempt space fermentation. The team has already filed several preliminary patents to start securing our intellectual property.

Distilling and Aging Processes

After the in-space fermentation process, the beer that is produced must be distilled and aged to produce the final product. The distillation process is well understood and has been engineered to high levels of efficiency, and existing alcohol producers are well equipped to conduct the rest of the production process. Distilled whiskey is usually placed in charred aging barrels for years before being sold. However, similar levels of aging are possible by using ultrasonic perturbation of the whiskey inside the barrel. The vibrations cause the whiskey to be filtered in and out of the barrel and quickly transfer the oak flavoring to the spirit. While some members of the whiskey community see this as "cheapening" the aging process, the actual flavors produced are nearly identical and Demeter will work with its partners to quickly deliver the product to market using this technology in months rather than years it traditionally takes.

Partnership with Rocket Launch Provider

Rocket launches are currently rather inefficient; while launch vehicles are capable of sending a certain amount of mass to space, it is often difficult to completely fill their capacity with customer satellites. If they could fill every rocket launch to maximum capacity, they can charge much lower prices to their individual customers. Demeter is uniquely situated to resolve this problem by offering Orbital Fermenters that will be ready to fill up any excess capacity on rocket launches. By focusing on establishing key partnerships with a rocket launch provider, Demeter will not only gain access to even cheaper and rapid access to space, but will also allow the launch provider to capitalize on the increased efficiency of maximizing the capacity of every launch they conduct

Potential Risks in Executing the Production Plan

Like all business plans, there are some risks in our growth strategy. In this section, two risk factors that could most significantly alter the plans described in this document are discussed. The first risk factor is one that has a relatively low likelihood of occurring, but can have strong consequences in the planned timeline, and the second has a higher likelihood but a much smaller impact.

The first risk is that the cost of access to space in 2023 doesn't match what is projected by the rocket launch industry. Our estimate is based on the costs published by SpaceX for their Starship launch vehicle. While SpaceX has estimated their first commercial operation of Starship to begin in 2021, we allow a two-year margin in SpaceX's published timelines by planning our first production utilizing Starship starting in 2023. Furthermore, any delays in Starship development is not a strict issue in Demeter's development timeline, as it will just increase the amount of time available to prepare for market entry, and conduct further research on perfecting the flavor of Demeter's products. The only risk factor is the investor's return on investment timeline, which may be delayed by one or two years than is currently projected in this document.

The second risk is the potential of unwanted off-flavors being developed by the zero-gravity fermentation process. Since the zero-gravity fermentation process is still not completely understood, there is a chance that Demeter will find undesirable flavor cells in higher quantities in space liquors that are produced. Demeter's approach to this problem is simple. During the distillation process, it is possible to selectively remove the undesirable flavors from the final product. While this can potentially add further steps to the production process, there is plenty of margin on the pricing of our products to allow for this additional cost to be absorbed with minimal change in the retail price.

Demeter's founding team has accounted for other potential risk factors, including but not limited to, lower than expected demand, higher than expected cost and engineering effort for developing the Orbital Fermenter technology, and potential new competitors entering the market. The team has carefully compared the likelihood and relative impact of these risks and found that they were manageable in nearly all reasonable cases.

Environmental Effects of Space Production

While rockets may seem like a potentially large driver of greenhouse gas production and thus have adverse environmental effects, the actual impact of utilizing the vehicle for producing liquor is not as bad as it may seem. The space fermentation process incurs a carbon footprint of roughly 64kg of CO_2 per bottle of spirits produced. Compared to the annual American's carbon footprint of 16,000kg, the effect of Demeter's unique production process is miniscule from the perspective of a consumer.

Corporate Marketing and Sales Plan

Growth Strategy

Demeter's expansion in the spirits market is closely matched by its plan of incremental rollout of different products. The sales plan involves simultaneously developing multiple products to reach mass-market adoption. Demeter will start with a limited edition beverage that targets a niche market of high-income individuals with both an extreme desire for novel spirits and space paraphernalia. After initial market adoption and media coverage, Demeter's focus then shifts to producing ultra-premium whiskey that have a larger market demand to build the initial revenue base. Using this revenue and further investment, Demeter enters the final stage of growth in which ultra-premium beverages in other product groups are introduced to expand market share.

Marketing Plan

Demeter will make extensive use of online marketing, specifically by making advertisements starring famous space icons such as astronauts, tech magnates, and actors. A potential example of the latter would be the production of an advertisement starring Tom Hanks. The star of the movie Apollo 13, Hanks is an avid space and technology enthusiast and would boost the visibility of Demeter's brand within the space enthusiast community, as well as the general public. This is clearly an expensive marketing plan. Demeter's approach is then to attract high-profile investors in the middle to later stages of development. If a celebrity can be collected as an investor in the business, they can improve the chances of a higher return by participating in marketing campaigns.

Demeter's brand will be carefully tailored to attract attention from space and technology enthusiasts, while also attracting attention from the general public as a premier luxury brand. Naturally, Demeter's products are space-themed; but it is equally important to ensure the brand does not turn away non-space enthusiasts. The goal is to use the novel production technique and exotic branding to redefine luxury in the alcohol industry.

Apollo – Example Ultra-premium Whiskey for Mass Market

An example product that Demeter and a partner liquor supplier may co-develop is Apollo, an ultra-premium whiskey. Named after the historic NASA program that put the first man on the Moon, this product is marketed to reach the space and technology enthusiasts community. Priced to meet a retail price of $99, with the product being 100% fermented in space, Apollo delivers a truly ultra-premium experience.

Our projection based on data from IWSR shows that a product in this price range with such a differentiator can reach an annual production rate of a hundred thousand cases per year ($69m in annual revenue).

Apollo – Mass Market Ultra-premium Whiskey	
Cost of Goods Sold – Per 375ml Bottle	
Bottle	1.500
Printing/Label	0.750
Cap	1.250
Space Launch	30.556
Raw Material (Mash and Yeast)	0.500
Production Processes (Distillation, Aging, etc.)	0.813
Transportation	0.050
Taxes, liability, other additional costs	0.45
TOTAL COGS	$36.74
Margin	$21.07
Sale Price (to distributor)	$57.81
Estimated Retail Price	$98.99

Demeter Space can develop multiple brands with similar levels of production rate as Apollo with its Orbital Fermenter technology.

Value Proposition and Positioning

There are three key elements to the unique values proposition offered by Demeter-produced spirits; the novelty offered by the in-space production process, a unique flavor from zero-gravity fermentation, and an exotic packaging and branding.

Fermented in Space

The most important element of Demeter's space liquors is that they are all fermented in space. This is an unprecedented value proposition, and an indisputable distinguishing factor from anything else on the market. For the target communities of space and technology enthusiasts, owing a piece of ultra-premium item that came from space is an irresistible proposition.

Unique flavor of zero-gravity fermentation

It's important to note that the unique production process of space liquors isn't just a marketing gimmick. Research by University of Colorado aboard the International Space Station has shown that yeast operate differently in zero-gravity. While more research is necessary to determine the exact effects of the environment on fermentation, Demeter will make use of the process to produce new flavors, while distilling any unfavorable outcomes from the final product. (Source for CU Boulder's research: https://science.nasa.gov/science-news/science-at-nasa/2001/ast21sep_1)

Exotic packaging and branding

Rapidly establishing Demeter-produced liquors as an ultra-premium brand will take a unique approach to marketing and sales. Demeter will work with its partners to develop exotic bottle designs will be radically different from anything else on the market in order to make the products impossible to ignore. The goal is to be leaps and bounds beyond what has been imagined before and deliver an exotic experience that is simply unforgettable.

Distribution/Sales Strategy

The initial focus of Demeter will be on the domestic market, with expansion into foreign markets after success in North America.

Most states in the US have a three-tier distribution system, the remains of the prohibition-era push to increase the cost of alcohol in US markets. The supplier/producer of alcoholic products must sell to a distributor, who must then sell to a retailer who then finally sell to consumers. This leads to a significantly marked up product by the time it is retailed, with the final consumer price being roughly twice what the supplier sold the product at. This mark-up is further propagated by the increasingly monopolistic nature of the middle-man distributors, with only a few distributors claiming power over the entire industry.

To navigate this landscape effectively while ensuring the lowest distribution costs, Demeter will be relying on its alcohol producer partners to utilize their pre-existing networks and to aid in releasing the products in markets where demand is highest; California, Texas, Florida, and New York.

Capitalization Strategy & Funding Plans

Demeter has four phases of growth to incrementally increase its operational capacity and exit by 2027. At this point in time, Demeter is in the process of raising the Seed Round of $750k to begin developing the first space hardware for testing on the International Space Station.

Phase I: Fundamental Research (Q3 2020 – Q3 2021)

Seed, $750k

Demeter's focus during Phase I is rapidly producing the first ever space-produced whiskey. By utilizing the International Space Station's commercial operations node, Demeter will physically send a research payload to orbit and produce samples of space whiskey. With this "minimal viable product," we will demonstrate that its proprietary zero-gravity fermentation technologies work, and will also collect valuable data to further develop the technology for production.

Allocation Plan:

Space Hardware Development – 12%
Research Fermenter Launch and Recovery from the ISS – 53%
Payroll – 12%
General Administrative – 9%
Working Capital – 14%

Key Milestones:

- Contract signing with Nanoracks for ISS research payload delivery and recovery
- Critical Design Review (CDR) of ISS research fermenter
- Completion of hardware testing of ISS research fermenter
- Completion of yeast fermentation research campaign
- ISS research fermenter hand over to Nanoracks
- Successful production of historic space whiskey samples

Phase II: Production R&D (Q4 2021 – Q3 2023)

Series A, $10m

With the first fermentation in space, Demeter's focus shifts to developing the key mass production technologies to meet the demands of the market. The $10 million investment for Phase II will be used to expand the engineering team and develop the Orbital Fermenter technology further to prepare for production.

Key Milestone:

- Critical Design Review of Orbital Fermenter
- In-space testing of critical hardware and technology prototypes
- Formation of partnership with whiskey production corporation

Phase III: First Generation Products (Q4 2023 – Q3 2025)

Series B, $20m

The funding for Phase III will be used to begin production of the first product line for sale. This phase focuses on building the first production Orbital Fermenters and begin production of the limited edition whiskey, followed by an ultra-premium whiskey for a wider market. The partner alcohol producer for developing the whiskey product line will be heavily involved in this phase as Demeter begins delivering products to the market.

Key Milestone:

- First mass-production of whiskey in space
- Introduction of Limited-Edition Space Whiskey to market
- Introduction of Ultra-Premium Space Whiskey for mass market

Phase IV: Second Generation Products (Q4 2025 – Q1 2027)

Series C, $35m

This final round is for developing other product lines with the Orbital Fermenter technology. While Phase III will provide enough funding for Demeter to begin to establish itself as the premier luxury space whiskey brand, expanding to other sectors such as vodka and gin is necessary to establish Demeter as an ultra-premium space spirits brand. The Series C round will be used to rapidly increase Demeter's yearly production rate and secure it as a cultural icon that redefines luxury.

Key Milestone:

- Introduction of space-produced vodka product
- Introduction of space-produced gin product
- Expansion of Space Whiskey products to international markets
- Begin development of space wine production technologies
- Investor Exit by Acquisition

Demeter Space

Demeter Space

Seed Round Gantt Chart

v1.1.4

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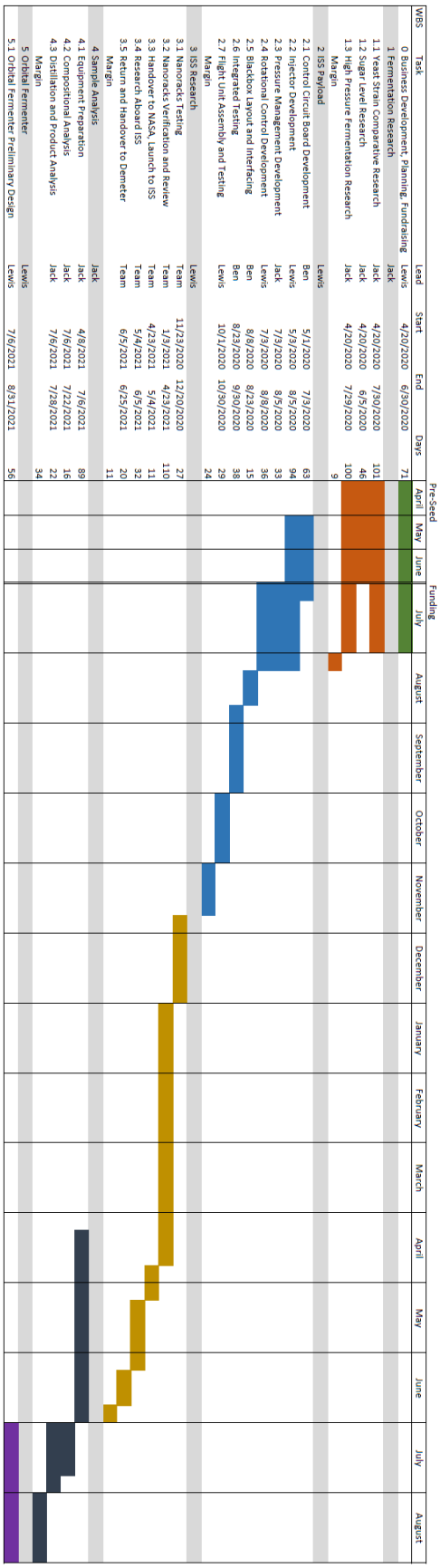

WBS	Task	Lead	Start	End	Days
0	Business Development, Planning, Fundraising	Lewis	4/20/2020	6/30/2020	71
1	Fermentation Research	Jack			
1.1	Yeast Strain Comparative Research	Jack	4/20/2020	7/30/2020	101
1.2	Sugar Level Research	Jack	4/20/2020	6/5/2020	46
1.3	High Pressure Fermentation Research	Jack	4/20/2020	7/29/2020	100
	Margin				9
2	ISS Payload	Lewis			
2.1	Control Circuit Board Development	Ben	5/1/2020	7/3/2020	63
2.2	Injector Development	Lewis	5/3/2020	8/5/2020	94
2.3	Pressure Management Development	Jack	7/3/2020	8/5/2020	33
2.4	Rotational Control Development	Lewis	7/3/2020	8/6/2020	36
2.5	Blackbox Layout and Interfacing	Ben	8/8/2020	8/23/2020	15
2.6	Integrated Testing	Ben	8/23/2020	9/30/2020	38
2.7	Flight Unit Assembly and Testing	Lewis	10/1/2020	10/30/2020	29
	Margin				24
3	ISS Research	Lewis			
3.1	Nanoracks Testing	Team	11/23/2020	12/20/2020	27
3.2	Nanoracks Verification and Review	Team	1/3/2021	4/23/2021	110
3.3	Handover to NASA Launch to ISS	Team	4/23/2021	5/4/2021	11
3.4	Research Aboard ISS	Team	5/4/2021	6/5/2021	32
3.5	Return and Handover to Demeter	Team	6/5/2021	6/25/2021	20
	Margin				11
4	Sample Analysis	Jack			
4.1	Equipment Preparation	Jack	4/8/2021	7/6/2021	89
4.2	Compositional Analysis	Jack	7/6/2021	7/22/2021	16
4.3	Distillation and Product Analysis	Jack	7/6/2021	7/28/2021	22
	Margin				34
5	Orbital Fermenter	Lewis			
5.1	Orbital Fermenter Preliminary Design	Lewis	7/6/2021	8/31/2021	56

*This is a simplified Gantt chart for ease of viewing.

v1.1.5 6/29/20

5 Year Return on Investment

Demeter Space, Inc.

(Expressed in thousands, except share and per case amounts

SUMMARY

Demeter Space, Inc. is developing technologies to produce liquor in space. With the mission of utilizing the zero gravity of outer space for developing consumer products, Demeter will offer space fermentation services to co-develop ultra-premium liquor products with partner beverage production companies.

Demeter Space

Return Scenario			
Investment (in 1000's)	**$30,750**		Return
	ROI	4.27x	$ 131,389
	IRR	34%	

Free Cash Flow

Pro Forma (in thousands $US)	2020e	2021e	2022e	2023e	2024e	Total
Revenues (Net Sales)	-	-	-	317	12,087	12,405
# Cases Sold (Product 1)	-	-	-	64	1,212	1,276
# Cases Sold (Product 2)	-	-	-	-	1,212	1,212
Excise Tax & COGS	-	-	-	79	2,738	2,818
OPEX	641	1,780	2,880	4,589	10,219	20,109
Gross Margin	0%	0%	0%	25%	23%	23%
Income Before Taxes	(641)	(1,780)	(2,880)	(4,351)	(870)	(10,522)
Taxes	-	-	-	-	-	-
After-Tax Income	(641)	(1,780)	(2,880)	(4,351)	(870)	TV by Revenue Comp
Capital Expenditures	(42)	(500)	(500)	(1,500)	(7,000)	
Depreciation	-	(54)	(99)	(244)	(930)	
Free Cash Flow Firm	(683)	(2,334)	(3,479)	(6,095)	(8,800)	(21,391)

Terminal Value (TV):	$	131,389
Present Value of TV:	$	81,822

All values in thousands $US, except case sales

Assumptions

Beta: 1
Small CAP: 3.0%
Dividends: 0%
Market Risk Premium: 4.8%
Risk Free Rate: 7.0%
Tax Rate: 28.6%
Terminal Growth Rate: 2.00%

Terminal Value Comparables

Revenue: 10.87
EBITDA: 23.5
PE: 31.5

Capital Raise Plan				Exit Strategy
Q2 2020	Q3 2021	Q3 2023	Q3 2025	7 years after Series A
Seed	Series A	Series B	Series C	Acquisition by Public Company
Convertible Note	Equity	Equity	Equity	
$750k	$10m	$20m	$35m	

Demeter Space

Seed Capital Deployment Plan

Seed Capital Deployment Plan	v1.1.5
Capital Goal	$750,000
Seed Fundraising Period	July 2020
Est. Series A Fundraising Period	August 2021

Phase I Milestones	
Milestone 1:	Laboratory Fermentation Research
Milestone 2:	ISS Fermentation Research
Milestone 3:	Historic Production of Space Whiskey

Demeter Seed Round Allocation Plan					
Item	Description	Quantities	Estimated Cost	Uncertainty	Max Cost
CEO (Lewis)	Salary	12 months	$40,000	0%	$40,000
VP of Space (Ben)	Salary	12 months	$13,000	0%	$13,000
VP of Product (Jack)	Salary	12 months	$40,000	0%	$40,000
NanoRacks ISS Research	Cost of sending and recovering payload from the ISS	1 launch/recovery	$400,000	5%	$420,000
Fermentation Ground Testing	Hardware development and capital cost	4-6 iterations	$10,000	20%	$12,000
ISS Test Article	Hardware development and capital cost	1 flight hardware	$30,000	30%	$39,000
Flight hardware testing	Space qualification testing cost	1 qual campaign	$50,000	30%	$65,000
Results Analysis	Biochemical analysis of returned payload	1 analysis campaign	$3,000	10%	$3,300
Patent/Law	Patent filing, incorporation, other costs	-	$30,000	20%	$36,000
Office/equipment/tools/etc.	General administrative expenses	-	$25,000	10%	$27,500
Software Tool Licenses	SolidWorks, ANSYS, and other tools	-	$42,000	5%	$44,100
		TOTAL	$683,000	MAX TOTAL	$739,900

Demeter Space

Demeter Space

Statement of Income

v1.1.5
6/29/2020

Statement of Income (Expressed in thousands US$, except per case amounts)	2020e	2021e	2022e	2023e	2024e
Case Price	-	-	-	4,986	4,986
Cases Sold	-	-	-	64	2,424
Net Sales	-	-	-	317	12,087
Cost of Sales	-	-	-	78.61	2,709.09
Excise Taxes	-	-	-	0.50	19.20
Transport and Other Cost	-	-	-	0.26	9.89
Total Cost of Revenue	-	-	-	79	2,738
Gross Profit	-	-	-	238	9,349
Operating Expenses					
R&D and Engineering	493	1,400	1,850	2,500	5,000
Marketing	-	-	600	1,300	1,500
General	148	380	430	710	1,010
Total Operating Expenses	641	1,780	2,880	4,510	7,510
Earnings Before Income Taxes	(641)	(1,780)	(2,880)	(4,272)	1,839
Income Taxes	-	-	-	-	-
Net Income	(641)	(1,780)	(2,880)	(4,272)	1,839
EBITDA	(641)	(1,780)	(2,880)	(4,272)	1,839

NOTE: This model is for planning purposes and has not been audited.

Demeter Space

Statement of Cash Flows

v1.1.5
6/29/2020

Statement of Cash Flows (Expressed in thousands US$, except per case amounts)	2020e	2021e	2022e	2023e	2024e
Net Income	(641)	(1,780)	(2,880)	(4,272)	1,839
Depreciation	-	(54)	(99)	(244)	(930)
Operating Adjustments					
Accounts Receivable	(58)	(160)	(259)	(384)	166
Inventory	-	-	-	-	-
Accounts Payable	-	-	-	-	-
Income Taxes Payable	-	-	-	-	-
Other Current Liabilities	(42)	(500)	(500)	(1,500)	(7,000)
Net Change in Working Capital	(100)	(660)	(759)	(1,884)	(6,834)
Cash from Operations	(741)	(2,494)	(3,738)	(6,401)	(5,925)
Investment Adjustments	-	-	-	-	-
Financing Adjustments					
Preferred Stock	-	10,750	-	20,000	-
Paid-in Dividends	-	-	-	-	-
Cash from Financing	-	10,750	-	20,000	-
Beginning Cash	755	14	8,270	4,532	18,131
Change in Cash	(741)	8,256	(3,738)	13,599	(5,925)
Ending Cash	14	8,270	4,532	18,131	12,206

NOTE: This model is for planning purposes and has not been audited.

Demeter Space

Balance Sheet

v1.1.5
6/29/2020

Balance Sheet (Expressed in thousands US$, except per case amounts)	2020e	2021e	2022e	2023e	2024e
Assets					
Cash	14	8,270	4,532	18,131	12,206
Receivables	-	-	-	-	-
Inventory	-	-	-	32	1,209
Total Current Assets	14	8,270	4,532	18,163	13,415
Property, equipment	42	542	1,042	2,042	3,042
Other	-	-	-	-	-
Total Assets	56	8,812	5,574	20,205	16,457
Liabilities					
Revolver	-	-	-	-	-
Accounts Payable	750	-	-	-	-
Income Taxes Payable	-	-	-	-	-
Other	-	-	-	-	-
Total Liabilities	750	-	-	-	-
Shareholder's Equity					
Common Stock	-	-	-	-	-
Preferred Stock	-	10,750	10,750	30,750	30,750
Paid-In Capital	-	-	-	-	-
Retained Earnings	(694)	(1,938)	(5,176)	(10,545)	(14,293)
Total Shareholder's Equity	(694)	8,812	5,574	20,205	16,457
Total Liabilities and Shareholder's Equity	56	8,812	5,574	20,205	16,457

NOTE: This model is for planning purposes and has not been audited.