January 2025

Payload

THE ROCKET LAB REPORT

Sponsored by ROCKETLAB

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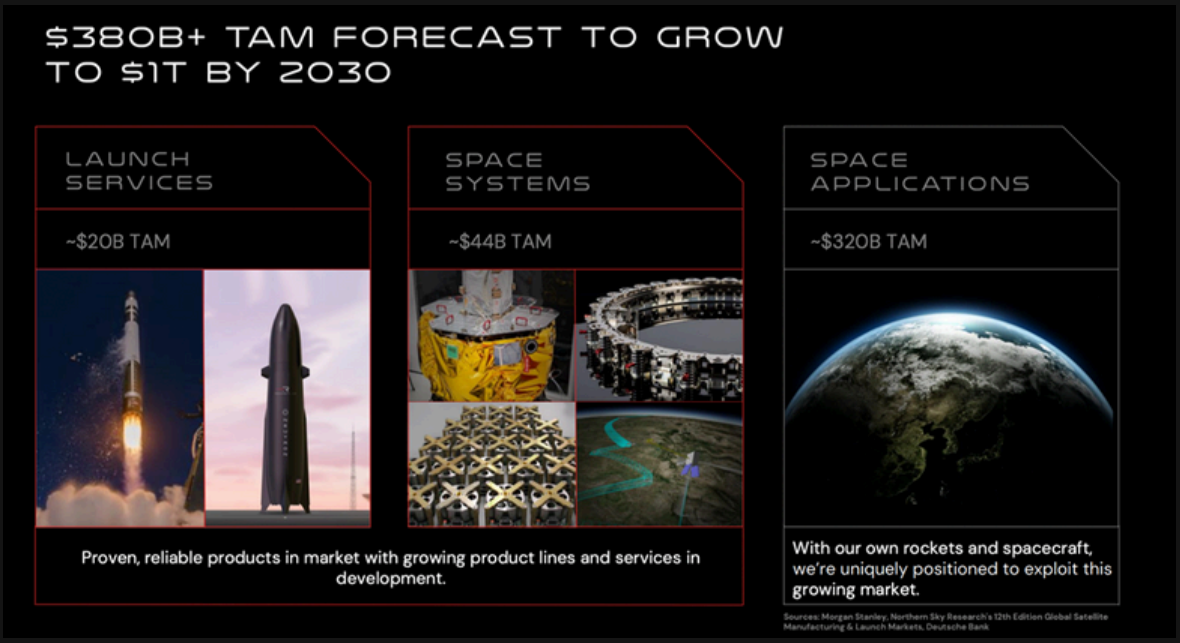
Rocket Lab Overview

Electron

Founded in 2006 by Peter Beck, Rocket Lab is an end-to-end space company providing launch services, satellite manufacturing, and components, positioning itself to soon expand into space-based data applications. The company was originally founded in New Zealand but moved its headquarters to California in 2013. Rocket Lab maintains large-scale operations in both countries.

I**n 2018,** the company reached orbit for the first time with its small rocket, Electron. Since then, Rocket Lab has successfully launched 50+ Electron missions, making it the world's second most prolific commercial launcher annually and the leader in small satellite launch services.

I**n 2020,** the company acquired spacecraft hardware manufacturer Sinclair Interplanetary, establishing its Space Systems division. Today, Rocket Lab employs more than 2,000 people and derives a majority of its revenue from its Space Systems division, which now encompasses complete spacecraft design and manufacture, satellite solar cells and arrays, separation systems, flight and ground software, radios, and more.



A move to data applications: Now, the company has set its sights on the final piece of the end-to-end space offering: data. Rocket Lab has announced plans to further diversify revenues by owning its satellite constellation and selling data. By owning and operating a constellation, Rocket Lab aims to unlock significant operational efficiency by designing and manufacturing satellites in-house, launching them in-house, and then generating high-margin recurring revenue from the data it beams back to Earth. The plan takes a page out of SpaceX's book, which now derives the majority of investor value through its Starlink business.

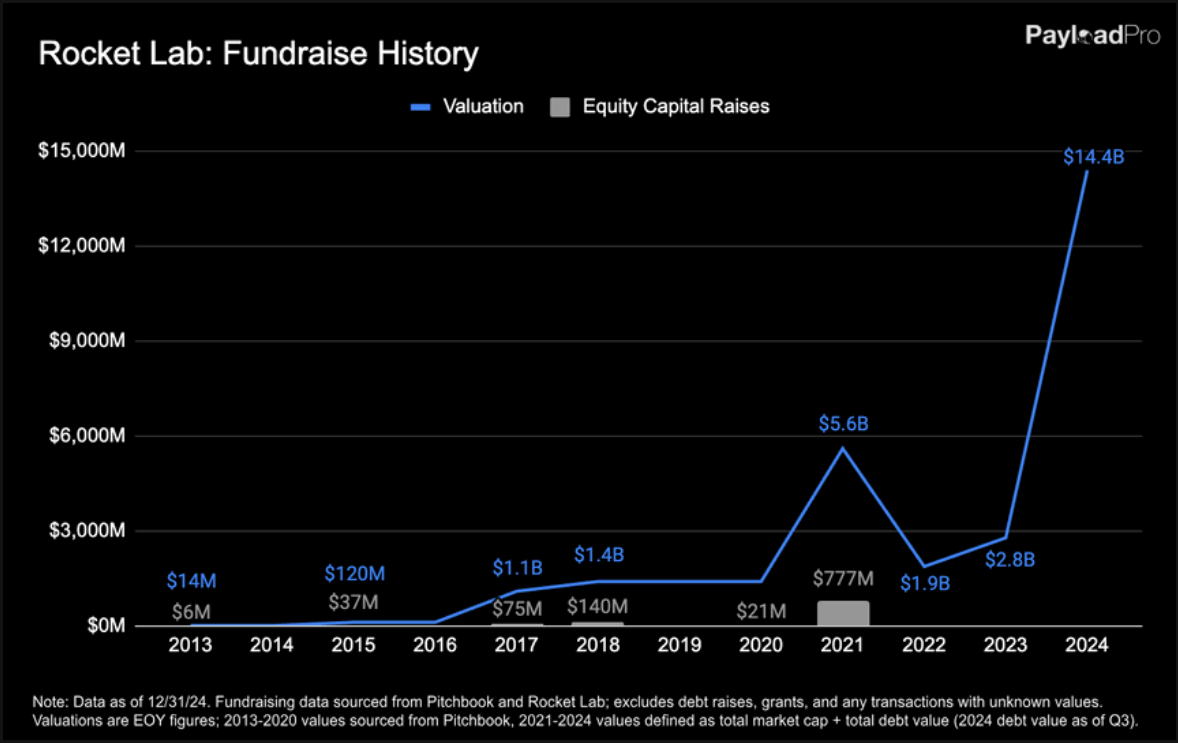
Neutron: Rocket Lab's next-gen 13,000 kg to LEO reusable rocket, Neutron, will be capable of mass deploying satellites, enabling the in-house constellation. The company is slated to launch Neutron in 2025. The rocket will compete directly with Falcon 9, expanding its customer base to larger operators and DoD missions.

Funding History

Rocket Lab's initial funding in 2006 came via a seed round led by entrepreneur Mark Rocket. In 2009, Rocket Lab reached suborbital space with a sounding rocket. Starting in 2013, Rocket Lab raised a series of venture capital rounds totaling ~$250M, helping to finance the development of its first orbital rocket, Electron.

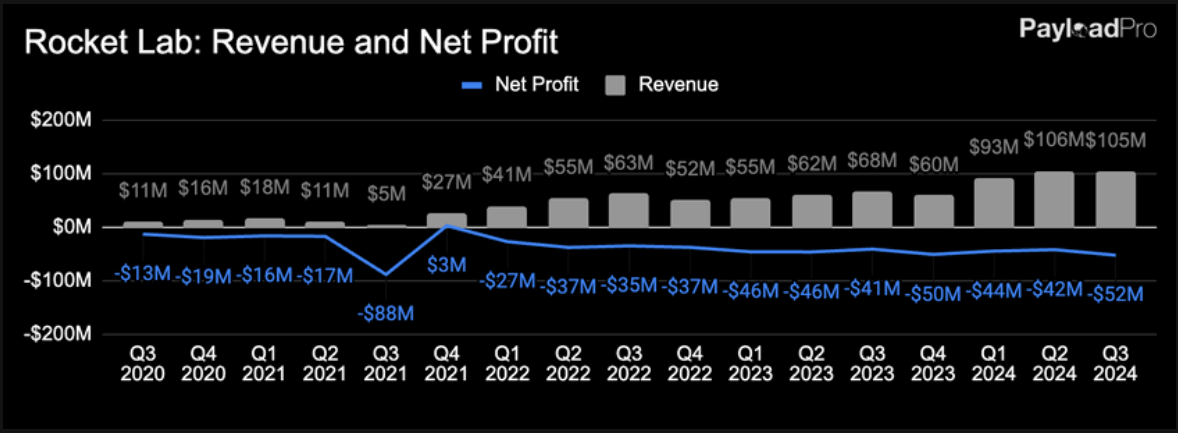
After achieving over a dozen successful Electron launches, Rocket Lab went public via SPAC merger in 2021, raising $777M. The liquidity reduced the need for Rocket Lab to raise additional financing until 2024. In February 2024, the company issued $355M in convertible notes.

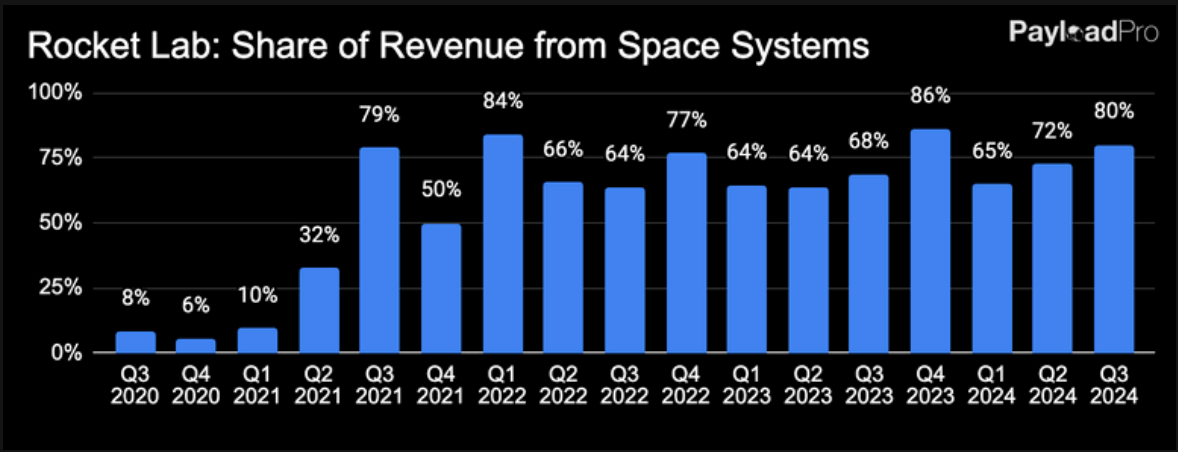
With revenue increasing and a path to profitability on the horizon, Rocket Lab has largely moved past immediate systemic financial risk as it now has reliable access to capital.



Financial Performance

Since going public, Rocket Lab has seen tremendous sales growth. In recent quarters, revenue has hovered around $100M, representing a meaningful uptick from the $40-70M range seen in 2022-2023. The company's Space Systems segment continues to drive the majority of revenue (73% YTD), as per the charts below. While this is consistent with leadership's vision for the company, Launch Services' relative share may increase shortly as Neutron is expected to come online in 2025.





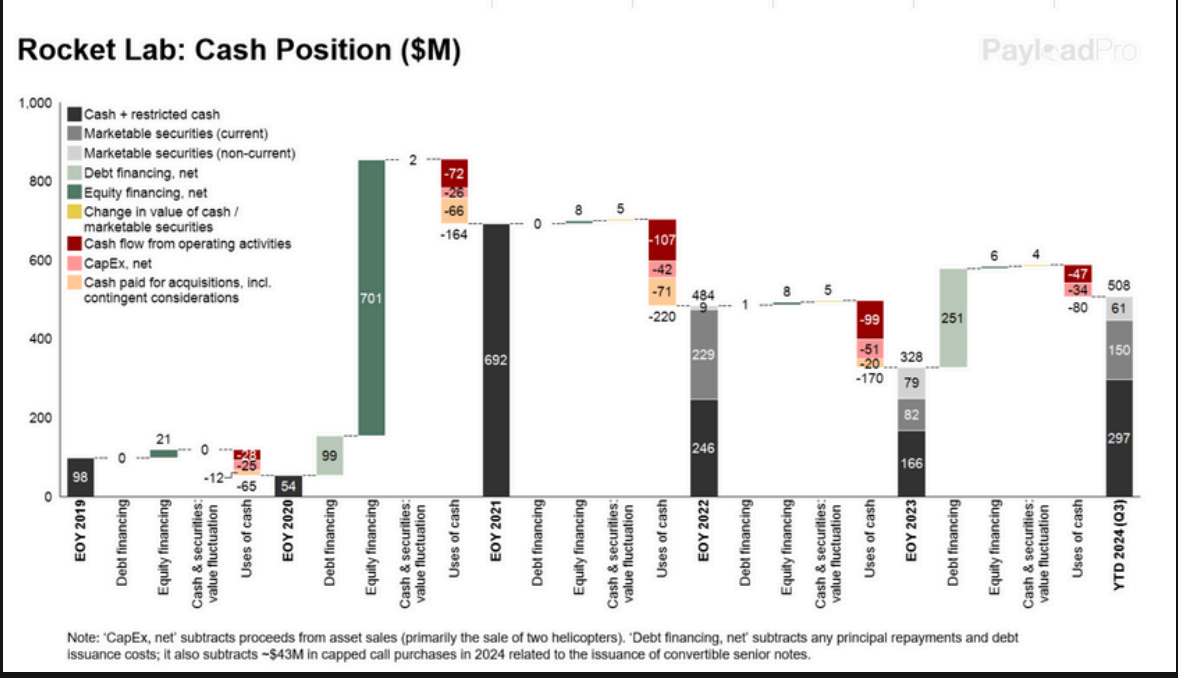
Gross margins as of 2024 Q3 YTD are 26.1% (~31% non-GAAP) overall. For Electron specifically, Rocket Lab currently achieves non-GAAP gross margins in the low 30s and aims to exceed 40% as it scales to two launches per month. Meanwhile, the Space Systems business sees GAAP gross margins between 25-35%, with merchant components generating non-GAAP gross margins north of 40%.

Financial Performance

However, Rocket Lab has not yet achieved profitability. Over the last two years, Rocket Lab has consistently incurred quarterly losses of roughly $40M to $50M. Long-term, the company hopes to achieve an operating margin in the mid-20s, targeting 45-50% of revenue for COGS, 10-12% for SG&A, and 15-18% for R&D.

Cash: With ~$700M in cash remaining at the end of 2021, Rocket Lab burned ~$200M in cash per year (or ~$50M per quarter, on average) in 2022 and 2023, largely in service of Neutron's development. YTD through Q3 2024, cash burn has slowed to roughly half that pace, driven partly by an absence of acquisitions. Notably, the company has consistently maintained a healthy liquidity buffer even as it continues to be cash flow negative. As of Q3 2024, cash balances are currently about $500M, including marketable securities.

Since going public, Rocket Lab has pointed to the successful launch of Neutron as a key catalyst for cash flow breakeven, expecting to achieve the milestone within the first year of the rocket's commercial operation. The company is also likely to scale back the magnitude of its organic R&D spend after Neutron comes online.



Note: 'CapEx, net' subtracts proceeds from asset sales (primarily the sale of two helicopters). 'Debt financing, net' subtracts any principal repayments and debt issuance costs; it also subtracts ~$43M in capped call purchases in 2024 related to the issuance of convertible senior notes.

Financial Performance

As seen in the chart on the previous page, Rocket Lab's cash outlays have involved a combination of organic growth and acquisitions. Inorganic growth has been driven by the acquisitions of Space Systems businesses. The company has focused on identifying 'pinch points' in the value chain where supply is constricted, targeting those areas for either in-house product development or acquisitions. Key purchases have included[1]:

- Sinclair Interplanetary: ~$17M: satellite hardware, primarily star trackers and reaction wheels (April 2020).
- Advanced Solutions Inc (ASI): $45.5M: space software, including mission simulation systems and GNC (October 2021).
- Planetary Systems Corporation (PSC): ~$65-80M: satellite hardware, primarily satellite dispensers and separation systems (November 2021),.
- SolAero (January 2022), $80M: space solar power technology

Rocket Lab's market cap at end of year 2024 was ~$13.6B. Considering several competitors have struggled to maintain solvency in recent years, the company appears financially healthy and on a positive trajectory. Rocket Lab's valuation remains well below SpaceX's reported valuation of ~$350B, representing an opportunity to close the gap as the number two launch leader.

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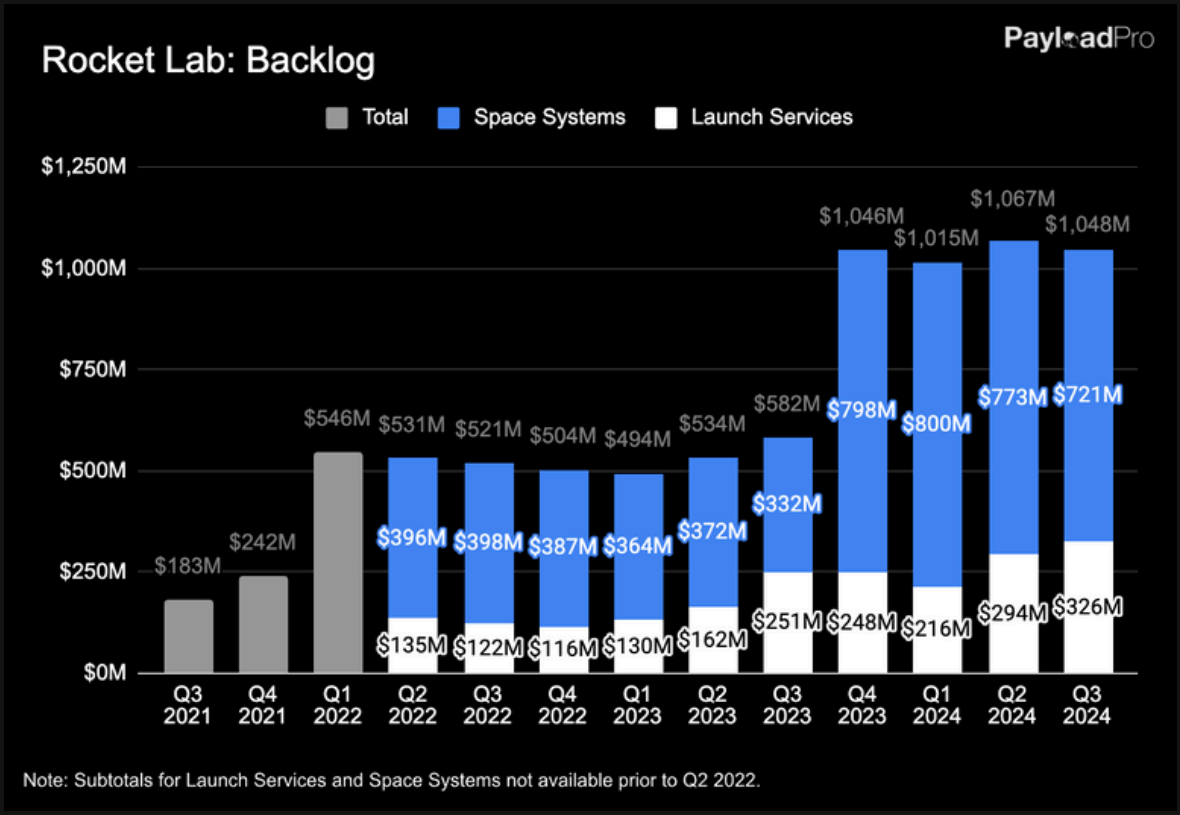
[1]
- Sinclair: Includes ~$12M cash purchase plus ~$5M total stock compensation (Outset Ventures)
- ASI: Includes $40M purchase price plus $5.5M of earned contingent compensation
- PSC: Includes $42M in cash plus ~1.72M shares (with additional ~0.96M shares as contingent compensation); share price opened at $14.29 on day of announcement

Business Lines



Space Systems

Rocket Lab generates a majority of its revenue from its satellite manufacturing Space Systems division. After years of in-house R&D and acquisitions, Rocket Lab now offers four standard spacecraft platforms, and multiple satellite components ranging from separation systems to radios and solar arrays, as well as bespoke spacecraft tailored to specific missions and customer requirements.

- The company has over 40 satellites in production backlog for customers like NASA, Space Development Agency (SDA), Varda, and Globalstar.
- Four Rocket Lab satellites have been launched or are in operation, including First Light, Pathstone, CAPSTONE, and Winnebago-1, with others having completed manufacture and now awaiting launch, such as the two science spacecraft for NASA's ESCAPADE mission to Mars.
- Rocket Lab is a vertically integrated satellite manufacturer that builds navigation, avionics, power, comms, and propulsion systems in-house.

Space Systems

Spacecraft Platforms

In addition to satellite builds, the company supports mission operations for EDF/MBIE, MethaneSat, an Environmental Defense Fund mission, as well as DARPA's Blackjack and Mandrake missions. Its flight software and guidance, navigation and control technology is included in the commercially-supplied Blue Ghost lunar lander that will launch to the Moon for NASA this week. There are over 1,700 satellites in orbit that use Rocket Lab technology. The company is working on $720M+ of spacecraft programs.

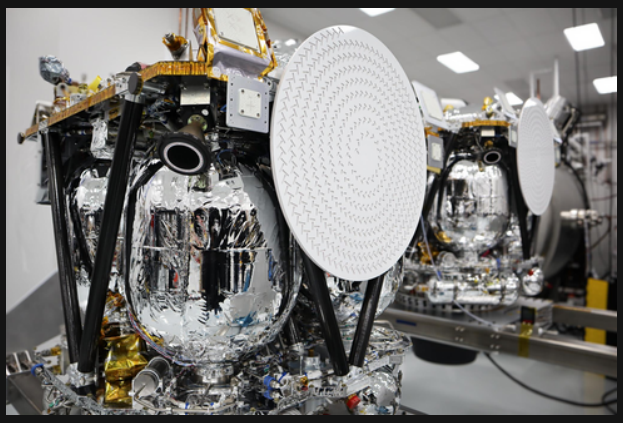
Photon: Rocket Lab's first spacecraft platform built was Photon. The spacecraft was built upon the existing capabilities of the Electron launch vehicle's Kick Stage. Rocket Lab launched its first Photon mission in Q3 2020.

- Photon has a mass of 200-300 kg and serves civil, defense, and commercial customers.
- It is optimized for responsive space and other challenging missions in LEO and is optimized to launch using an electron rocket.
- Future missions include NASA's LOXSAT, which aims to demonstrate a complete cryogenic fluid management system in orbit.

Explorer: Explorer is a space vehicle with hardened deep-space-capable avionics built for planetary destination missions like Mars, Venus, the Moon, and near-Earth objects (NEOs). Its high delta-V capability also makes it suitable for highly eccentric Earth orbits, GEO, Earth-moon Lagrange points, and Earth-sun Lagrange points.

- NASA used Explorer for the CAPSTONE mission that demonstrated the elliptical lunar orbit planned for use by the Lunar Gateway.
- In addition, the University of California, Berkeley's (UCB) Space Sciences Laboratory (SSL) selected Explorer for the ESCAPADE mission to Mars, which is set to launch on Blue Origin's New Glenn rocket in 2025/2026.

Rocket Lab partnered with MIT to use the platform for the first private mission to Venus. While the company won't be turning a profit on the Venus venture, it will help them qualify for future large government science missions coming down the pike.



Spacecraft built by Rocket Lab for NASA's ESCAPADE mission

Space Systems

Pioneer: Pioneer is a medium delta-V platform that supports large payloads, rideshare, and re-entry capability. It can support payloads up to 120 kg and launch on Rocket Lab's Electron and Neutron vehicles and third-party launch providers.

- Varda Space Industries is the primary customer of the Pioneer bus, having ordered four vehicles to demonstrate in-space manufacturing and return-to-Earth capabilities.
  - The company completed Varda's third spacecraft.
- The US Space Force has also ordered a Pioneer satellite for the Victus Haze TacRS (Tactically Responsive Space) mission, while Viasat selected the platform for their NASA CSP program demonstration mission.

Varda's Pioneer reentry capsule

Lighting: Lightning is a platform focused on applications with high operational duty cycles, such as high-power comms systems. The ~3 kW bus is designed with a 12+ year orbital lifespan in LEO, leveraging radiation-tolerant components and incorporating redundancy in critical subsystems.

- The Lighting design is used for the Globalstar commercial satcom systems and is the basis for Rocket Lab's $515M Space Development Agency contract for 18 satellites.

Space Systems

Satellite Components

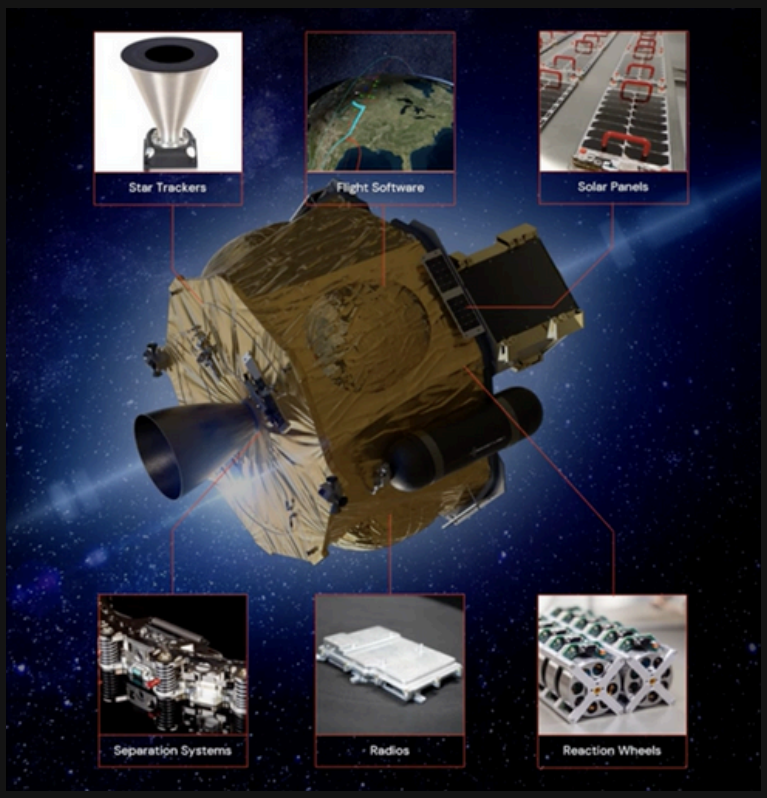


Image: Rocket Lab

Rocket Lab operates six satellite component manufacturing units after years of in-house R&D and the acquisition of four aerospace companies between 2019 and 2022. In addition to supplying the four Rocket Lab bus platforms, these units service satellite manufacturers worldwide. The company also produces many other components and subsystems in-house for their own spacecraft, including in-space propulsion with the Curie and HyperCurie engines and avionics.

Radios: Rocket Lab offers two software-defined radios for TT&C operations in the S-band and X-band frequencies that are suitable for both near-Earth and deep space missions. The company manufactures the Frontier-S and Frontier-X radios after entering an exclusive license agreement with the Johns Hopkins University Applied Physics Laboratory (APL).

Composite Structures: Rocket Lab has long-standing know-how with carbon composites, starting from the early days of Electron. Both Electron and Neutron are manufactured primarily with carbon fiber components. In addition, the company manufactures its spacecraft bus structures from carbon composite and offers services in the areas of design, product development, manufacturing, and analysis/testing.

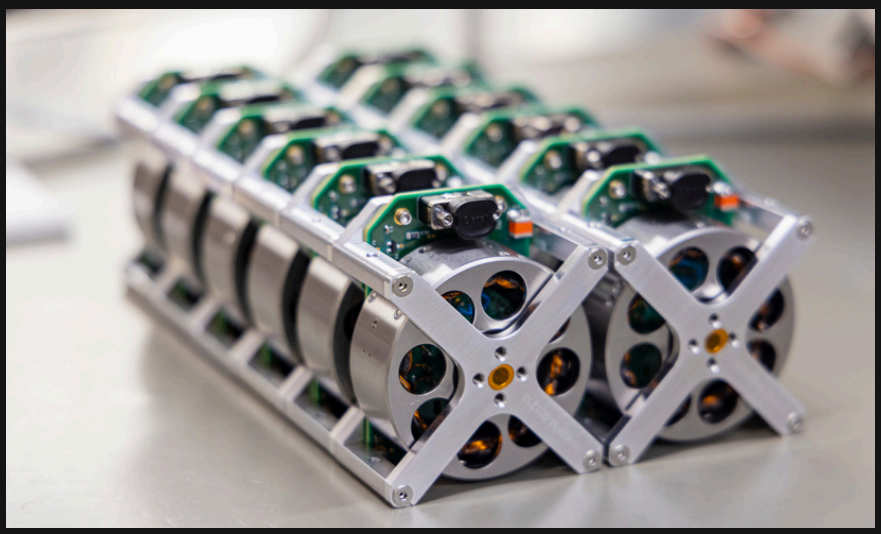
Space Systems

Space Software: In October 2021, Rocket Lab acquired Advanced Solutions, Inc. (ASI), a Colorado-based aerospace engineering firm delivering mission-proven space software, mission simulation, and testing solutions. ASI's software products have more than 240 cumulative years in space, and Rocket Lab offers three software products: SOLIS, MAX flight software, and MAX ground data system. Rocket Lab supplies Firefly's Blue Ghost lunar lander flight and ground software.

Separations Systems: The separation systems unit offerings combine Rocket Lab-developed products and tech brought over from the 2021 acquisition of Planetary Systems Corporation. The offerings include a CubeSat dispenser and mechanical and motorized satellite separation rings. The Rocket Lab separation systems have 20 years of heritage, with a 100% success rate.

Solar Cells and Arrays: Following the acquisition of SolAero in 2022, Rocket Lab launched its space solar solutions unit. Both space solar panels and space solar cells/CICs are offered, and more than 5 MW of solar cells have been manufactured to date. The company has signed solar supply agreements worth hundreds of millions, and while some production is geared toward its own buses, it also services third-party customers. Rocket Lab solar technology is currently used on significant commercial, civil and defense missions, including the James Webb Space Telescope, US Space Force Missile Warning Satellites, OneWeb constellation, Cygnus spacecraft, and more.

Star Trackers & Reaction Wheels: Rocket Lab's Star Tracker and Reaction Wheel unit results from the 2020 acquisition of satellite hardware manufacturer Sinclair Interplanetary. There are more than 140 Sinclair star trackers in orbit and more than 240 reaction wheels ranging in momentum from 3 mNms to 12 Nms.



Rocket Lab reaction wheels

Space Systems

Space Systems Use Case/Contracts

Government contracts:

- NASA: Rocket Lab is a go-to supplier for NASA smallsat launch and spacecraft manufacturing. Missions include the Solar Sail System, TROPICS, and PREFIRE.
- DoD: The DoD utilizes Rocket Lab for responsive launches, Space Force missions, and classified National Reconnaissance Office (NRO) payload deployments. The agency has also begun awarding space systems contracts, including:
  - A hefty $515M contract for designing, building, testing, and operating 18 Tranche 2 Transport Layer-Beta satellites for the Proliferated Warfighter Space Architecture.
  - VICTUS HAZE, which is a launch and spacecraft contract .

Commercial space applications:

- Small sat launch: Premier small launch option, providing reliable, flexible, and highly tailored launch services.
- Small sat manufacturing: Vertically integrated satellite design and manufacturing services.
- Component merchant: Offers a range of satellite components, such as star trackers and reaction wheels, enabling clients to enhance the functionality and reliability of their spacecraft.

Exploration and Reentry Missions

- Rocket Lab offers a range of products for interplanetary travel, including spacecraft builds, flight software, and launch services.
- The company also targets in-space activity and reentry missions such as Varda's commercial pharmaceutical processing.

Launch (Electron)

Electron

Electron, a small-lift orbital rocket capable of launching ~300 kg to LEO, is the first major product that Rocket Lab brought to market. Since its first mission in 2017, the vehicle has achieved 54 successful launches on 58 attempts (including HASTE), a success rate of ~93%. Electron launches from Māhia Peninsula in New Zealand and Wallops Island in Virginia.

The vehicle is powered by Rutherford engines; these are developed in-house by Rocket Lab and exclusively used on Electron. They are used on both the first stage (9 engines) and second stage (1 vacuum-optimized engine), with LOX and RP-1 as the propellants. Electron also flies with a third stage, the 'Electron Kick Stage' or the derivative Photon satellite bus, to deliver satellites to their target orbits more precisely.

Electron is notable for the speed and efficiency of its development.

- It cost only $100M (~$123M inflation-adjusted) to get Electron to orbit, putting the development costs on par with Falcon 1's $90M (~$131M inflation-adjusted).
- The vehicle also had an exceptionally short development timeline (2.8 years) and was the fastest commercially developed rocket to reach 50 launches (7.1 years after first launch).

Launch (Electron)

Rocket Lab has continually introduced improvements to Electron over its lifetime, increasing its payload capacity and exploring reusability. While not originally intended to be reusable, modifications to the rocket's design have allowed Rocket Lab to successfully recover the first stage via ocean landing several times.

In August 2023, the company reused a single preflown Rutherford engine for the first time. While an entire Electron booster has never flown twice, the company announced in April 2024 that a recovered first stage had returned to the production line for the first time and was earmarked for possible relaunch. Unlocking reusability is expected to improve Electron's profit margins by ~5%; however, ~40kg of payload capacity must be sacrificed in order to recover the booster.

An Electron booster

With a payload capacity at the lowest end of the market, Electron works best for customers that are willing to pay a premium to secure their dedicated vehicle and tailored service.

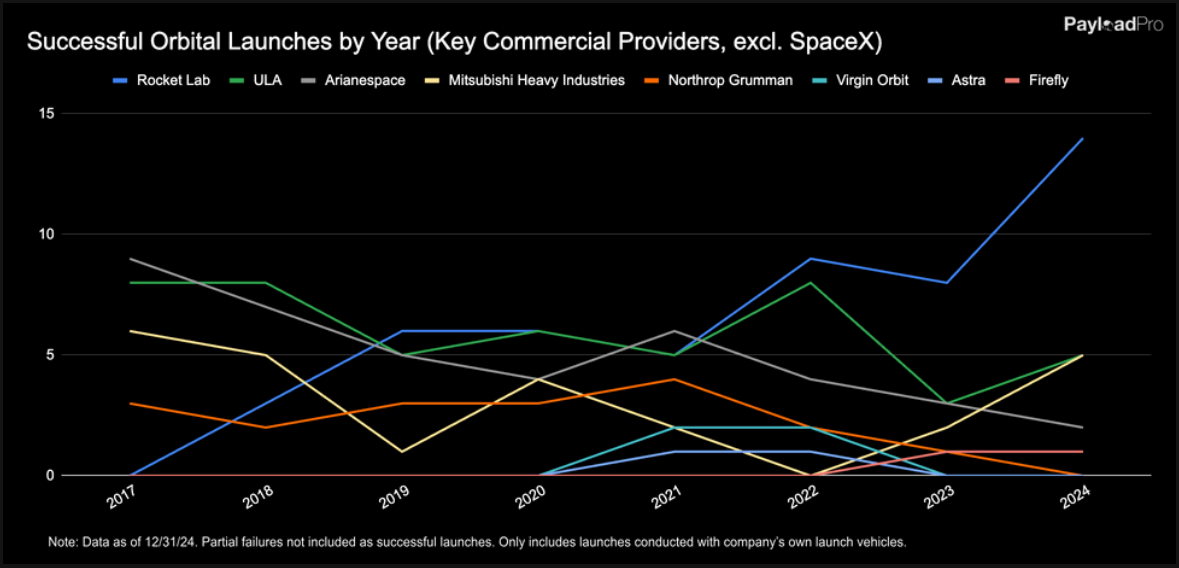
- The price of a typical Electron launch (~$8.4M, or ~$28k per kg) is about 4-5x the price of an equivalent rideshare on SpaceX's Falcon 9.
- For some customers, increased control over payload integration, launch timeline/logistics, and orbital destination is worth the extra cost.
- While launch volume has been stable and slowly growing, Electron remains demand-constrained.
- So far in 2024, revenue has reached a new high-water mark of ~$28M per quarter, on average. The company completed 16 total Electron launches in 2024 (including HASTE) and currently has 35+ Electron launches in the backlog.

Launch (Electron)

It's worth noting the traction that Electron has gained in the market relative to other competitors over the past several years. The vehicle has ramped up from 3 successful orbital launches in 2018 to 14 orbital launches and two HASTE launches in 2024.

Meanwhile, with the notable exception of SpaceX, essentially every other launch provider in the West has seen its launch volume decline and/or stagnate over that same period.

In 2024, Rocket Lab completed more successful orbital launches than all the other competitors in the stacked chart below combined; when it comes to a proven ability to achieve high launch volumes, the company is firmly cemented in second place in the market.



In 2023, Rocket Lab announced an alternate configuration of Electron known as HASTE (Hypersonic Accelerator Suborbital Test Electron), capable of launching payloads up to 700 kg on suborbital hypersonic trajectories.

- HASTE operates out of Rocket Lab's launch site on Wallops Island and generates higher profit margins than standard Electron launches.
- Rocket Lab has launched three HASTE missions through the end of 2024.
- As of 2025, Rocket Lab had publicly disclosed HASTE launch contracts with Leidos and Hypersonix, and in January 2025, the Company was selected by Kratos as a subcontractor to provide HASTE launches for the DoD's MACH-TB program.

While Electron has allowed Rocket Lab to accomplish certain objectives, there are some applications for which it lacks sufficient scale—especially large constellation deployments. That is the gap Neutron is set to fill.

Launch (Neutron)

Neutron

Neutron rendering

Since Rocket Lab went public in 2021, the company has been focused on developing its next-generation, medium-lift Neutron rocket. Rocket Lab's profitability and end-to-end space transportation, manufacturing, and data application goals are tied to Neutron coming online.

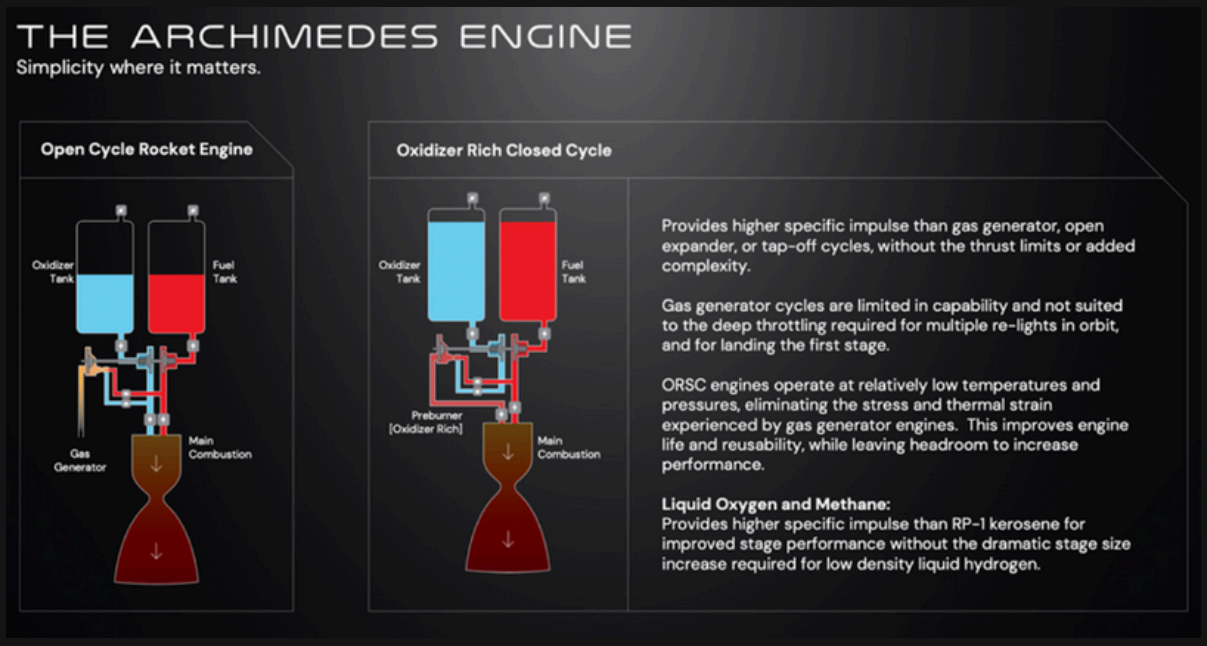
Launch (Neutron)

Neutron Specs

- **Mass transport:** 15,000 kg to LEO expendable. 13,000 kg to LEO reusable.
- **Reusability:** Neutron's first stage will land on a barge downrange and is designed to be reused up to 20 times.
- **Size:** The rocket is 43 meters tall and 7 meters in diameter, with a 5-meter fairing.
- **Material:** Rocket Lab built Neutron using a lightweight carbon composite material. The company recently acquired a large Automated Fiber Placement (AFP) machine, which will automate the carbon composite rocket production, saving more than 150,000 person-hours.
- **Hungry Hippo fairing:** Unlike traditional fairings appended to a rocket's second stage, Neutron's fairing is connected to its first stage. After the booster reaches a certain height, the hinged nose cone opens, and the second stage is deployed. The fairing then closes and remains connected to the booster through landing, reducing costs.
    - The first stage is designed to fly higher than typical to eliminate the need for fairing protection on the second stage.
- **Second stage:** The second stage is expendable. However, the cost of the second stage is likely less than $10M and 20% of the total rocket.
- **Engine:** Neutron's Archimedes engine is an oxidizer-rich closed-cycle fueled by methalox propellant.
    - Stage 1
        - 9 Archimedes engines
        - 165 klbf thrust at sea level
        - 329 s vacuum ISP
    - Stage 2
        - 1 Archimedes engine
        - 200 klbf thrust at vacuum
        - 367 s vacuum ISP

Launch (Neutron)

Archimedes hot fire



Launch (Neutron)

National security launch: Neutron falls under the National Security Space Launch (NSSL) vehicle classification. The Space Force recently opened up new NSSL contract opportunities, allowing Neutron to compete with New Glenn, Falcon, and Vulcan, which the DoD has already selected for the program, provided the rocket has a path to launch by Dec. 2025.

Launch Ramp

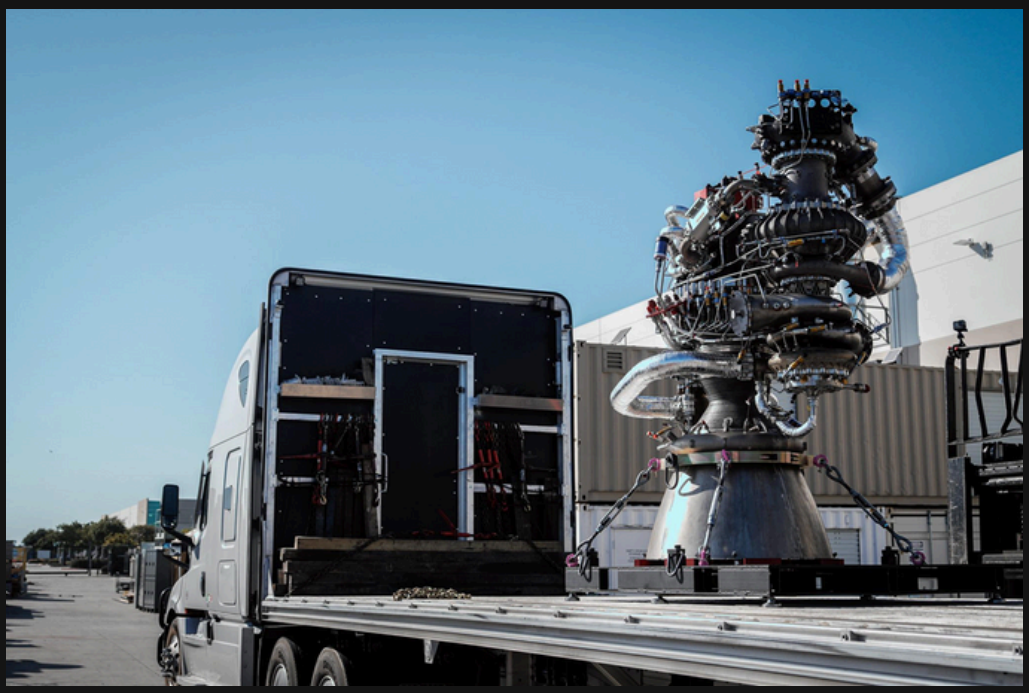
Can Rocket Lab launch Neutron by the end of the year? Management believes so.

Rocket Lab has publicly stated that it expects Neutron to launch by mid-2025, although that could easily be pushed to late 2025. So it goes with new rockets.

Scale: Management is planning for Neutron to scale as follows:

- 2025: 1 launch
- 2026: 3 launches
- 2027: 5 launches

The company will begin testing its propulsive landing systems on its maiden launch.



Archimedes engine

Launch (Neutron)

Progress

Rocket Lab is targeting an expendable Neutron development cost of $300M. The company has already completed:

- First full-scale carbon composite tank
- Structural and cryogenic testing of its carbon composite second stage
- Building multiple Archimedes engines and has begun hot fire testing campaigns
- Fairing assembly and integration 100% of the vehicle is in production, and the company is working toward the following:
- In the process of completing stage 1 build
- Neutron's launch site at Wallops is meaningfully progressing

Neutron Enabler

Neutron's 13,000 kg to LEO (reusable) capability enables Rocket Lab to:

- Target larger launch customers and compete with Falcon 9 on mass to orbit and cost
- Improve launch margins through reusability and improved fixed cost absorption
- Buy or build an in-house constellation
- Compete for national security launches and better serve SDA proliferated LEO needs

Neutron fairing construction

Launch (Neutron)

Neutron Demand

Due to a lack of alternatives, the current market dictates that satcom operators launch on a Falcon 9 rocket, even if the company competes directly with Starlink. An operational Neutron would allow operators to diversify their launch providers as long as Rocket Lab can offer a cost-competitive price.

Satellite operators: While Neutron can serve rideshare missions, Rocket Lab is primarily targeting the growing trend of LEO constellations that have replenishing needs. In Q3, the company announced it signed its first launch agreement for two launches with an undisclosed commercial constellation operator.

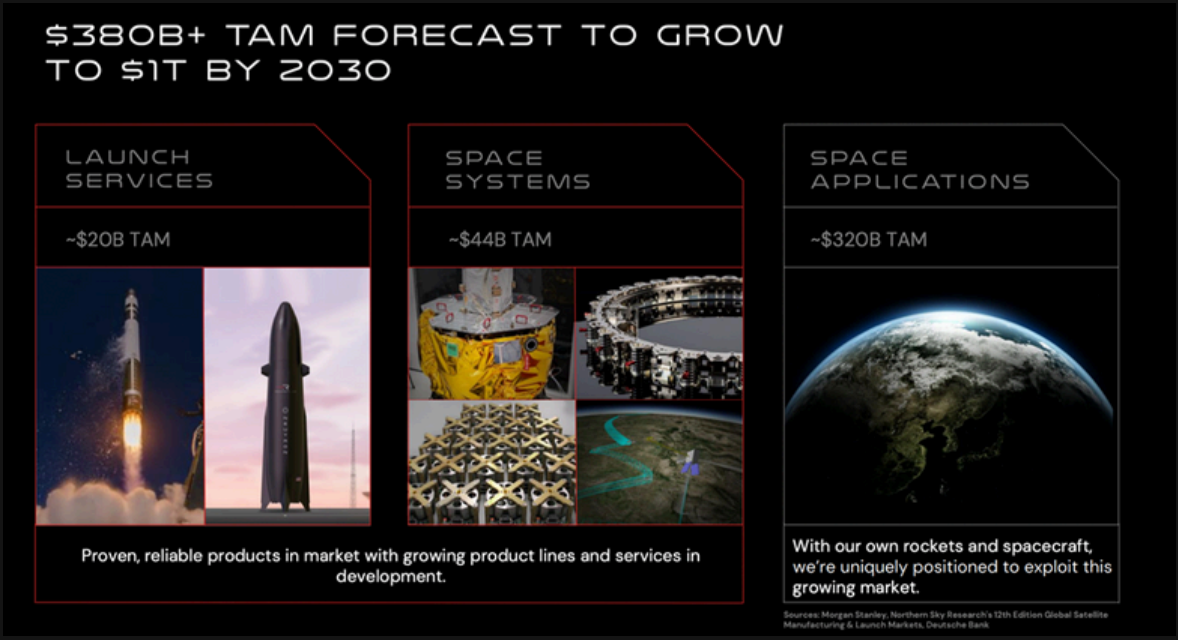
- **Replenishing:** Proliferated LEO constellations have created a demand boom for rockets. Instead of one or two GEO satellites, operators are now deploying dozens of birds to LEO. In addition, satellites in LEO have limited lifespans, often reentering the Earth's atmosphere within three to six years.
  - This dynamic will create recurring revenue opportunities for Neutron as satellite operators will have to continue replenishing their constellations.

SDA: The Space Development Agency's proliferated LEO approach represents a growing market for higher launch volumes beyond traditional national security needs. The company recently won a $515M contract to build SDA satellites. In addition to manufacturing satellites, Neutron could allow Rocket Lab to begin launching the birds as well.

In-house constellation: SpaceX set the model for leveraging an in-house rocket to deploy in-house satellites. The dynamic enables massive cost synergies and creates demand for a reusable rocket, which needs a high cadence to bring down marginal cost. Neutron would allow Rocket Lab to deploy its own satellites at cost, allowing it to break into a market far bigger than launch: data and space-based services.

NASA: Neutron could be used for NASA planetary missions to the Moon and Mars and other agency-backed science missions. In January 2025, Neutron was onboarded to NASA's VADR launch program.

The Future: Data Applications and Satellite Fleet



Rocket Lab has unlocked the entire value chain, from satellite components to turn-key satellite buses, launch, and mission operations. However, following the SpaceX playbook of vertical integrations, there is one final frontier: an in-house satellite constellation.

Neutron enables Rocket Lab to move into satellite constellations, thus expanding the company's addressable market.

Rocket Lab believes the total addressable market for launch is around $10B, and the TAM for spacecraft manufacturing and services is $20B. An in-house satellite constellation offers a strategic opportunity to tap into what Rocket Lab believes is a $320B space applications market.

A constellation also provides an excellent source of demand for a high Neutron flight cadence, improving overall efficiency, synergies, and profitability (think Falcon 9 🤝 Starlink)

With Rocket Lab's satellite manufacturing capabilities and the potential of Neutron, the company is well positioned to either develop or acquire its own space applications constellation. So how will Rocket Lab enter the market? Will they build a novel constellation, or will they buy existing infrastructure?

Data Applications and Satellite Fleet

Note this is Payload commentary. Rocket Lab did not provide input.

The answer is still being decided, but the easier route would be to buy.

Rocket Lab is well-positioned to access capital. With plenty of space companies facing dwindling cash reserves and struggling to raise the next round or access public market dollars, Rocket Lab could find a pretty sweet deal in the M&A markets.

Buying also makes sense operationally:

- The company's unique launch and build capabilities would result in significant synergies for a tuck-in acquisition.
- Buying (vs. building) also hedges the risk of setting up the infrastructure needed to develop and ramp up a novel constellation from scratch.
- Acquiring an established company would give Rocket Lab a good sense of market demand, mitigating the risk of building a product that customers don't need.
- The strategy could also allow the company to access valuable spectrum.

However, if valuations are too rich, Rocket Lab may elect to leverage its space systems divisions and satellite platform to build its constellation from scratch.

What data application segment could Rocket Lab look to break into? There are only two options: Earth observation and satcom. We believe the company will likely target a satcom tuck-in acquisition.

The company is likely shooting for a constellation that requires a couple of hundred LEO birds, with multi-thousand satellite mega-constellations likely outside the company's strike zone. Let's discuss:

Electron launch

Data Applications and Satellite Fleet (EO)

Earth Observation (EO)

Most imaging companies—with the exception of Planet Labs—maintain constellations with fewer than 50 satellites that need to be replenished every few years.

Advantages:

- Rocket Lab does not currently have a satellite bus optimized for EO services. Expanding into this segment would help add a data application service and an EO spacecraft bus.
- Both Electron and Neutron are a good fit for launching EO satellites.
- The EO market has clear demand and offers an easier path to revenue generation.

Disadvantages:

- EO constellations generally don't demand a large number of satellites, limiting launching synergies with Neutron.
- Rocket Lab will be competing with its own Electron customer base.
- EO companies, such as Planet Labs, have struggled to turn a profit.
- The market size is limited compared to satcom. Would Rocket Lab care for a market that doesn't offer a massive market opportunity?
- Launch capabilities only make sense for companies with high-frequency launch needs, such as those in LEO with intensive coverage requirements.

Given the market dynamics, we don't believe Rocket Lab will target an EO company.

Data Applications and Satellite Fleet (Satcom)

Satcom can be broken down into two groups: broadband and ancillary connectivity.

Satellite Communications (Broadband)

Broadband satellite constellations like OneWeb, SpaceX's Starlink, and Amazon Kuiper offer fiber-like connectivity worldwide. Such constellations have significant up-front capital needs as a complete system requires hundreds of satellites before service can commence.

Advantages:

- Neutron can significantly reduce launch costs in a similar manner to SpaceX's Falcon 9 for Starlink.
- Rocket Lab already has the Lightning satellite platform that can meet the needs of communication satellites.
- The broadband market ranks as one of the world's largest markets and will only grow as the world increasingly moves online.

Disadvantages:

- There is intense competition from industry giants such as SpaceX, Amazon, OneWeb, and Telesat, which are either government-backed or have immense resources available.
- A new system would be years behind competitors and have low spectrum priority compared to incumbent networks.

Speculation on possible potential acquisition (note this is pure speculation and should be viewed purely as a thought exercise)

- No viable potential acquisitions were identified at the current market valuation and Rocket Lab cash on hand.

Data Applications and Satellite Fleet (Satcom)

Satellite Communications (Ancillary Connectivity: In-Space / Direct-to-Device / IoT / Secure Comms)

While mega-cap companies dominate the satellite communications broadband market, other targeted satellite communications services, like relay, DTD, IoT, or secure comms, may be more viable.

Advantages:

- The Lightning platform can be leveraged for different satellite communication services.
- The early-stage and mid-stage ventures in the field have valuations within the reach of Rocket Lab.
- Similar to broadband deployment, the constellation can benefit from the lower launch cost offered by Neutron.
- The non-broadband satcom market still offers a large addressable market
- Many companies with spectrum rights need more in-house, vertically integrated launch services to fully monetize them.

Disadvantages:

- Even peripheral satcom plays could be within Starlink striking distance. For example, Starlink is growing its space relay and direct-to-cell capabilities.
- Direct-to-mobile communication presents a complex regulatory landscape, posing substantial execution risk.

Rocket Lab integrates Kineis satelittes

Data Applications and Satellite Fleet (Satcom)

Brainstorming Potential Acquisitions

Note this is pure speculation from the Payload team and should be viewed as a thought exercise. Rocket Lab provided no input on the brainstorm.

- Kepler Communications (In-space optical relay network): Kepler is the only company building a dedicated space relay network to connect LEO satellites to the ground via RF and optical inter-satellite links.
  - With the proliferation of LEO and the plan for multiple space stations, this market segment has seen high demand.
  - Kepler has access to Ku-band spectrum and has raised $175M, positioning it as a potential target for Rocket Lab.
  - In addition, it has proven optical link capability, and the two companies share a connection with the SDA program.

- Spire Global (IoT & data analytics services): Spire Global is one of the few IoT and data analytics companies with yearly revenue of >$100M and an operation constellation of satellites.
  - Its market cap of approximately $250M makes it suitable for a Rocket Lab acquisition.
  - However, their spacecraft are CubeSats, which does not fit with Rocket Lab's space business.

- Globalstar (IoT & direct-to-cell): Globalstar is the only direct-to-cell provider (excluding SpaceX and Inmarsat) that has significant revenue.
  - Globalstar's market valuation of $3.8B, putting it on the expensive end of Rocket Lab's range.
  - Globalstar is using the Lightning satellite platform for its next-generation system, which could make it an appealing acquisition in the future.
  - Globalstar has access to valuable L-band and S-band spectrums.
  - Globalstar's strong partnership with Apple can guarantee immediate revenue.

- Eutelsat (LEO & GEO comms): Eutelsat is OneWeb's parent company and a GEO satellite comms operator. Eutelsat is currently focusing on the deployment of OneWeb's Gen 2 system and is a member of the European SpaceRISE consortium building the IRIS² constellation for the European Commission.
  - Rocket Lab could utilize the Lightning platform for the OneWeb Gen 2 and the IRIS² constellation.
  - OneWeb already has access to high-priority Ku- and Ka-band spectrum.
  - Rocket Lab positions itself as a major player in the EU space ecosystem by entering the IRIS² program.
  - Notably, Eutelsat has a market cap of ~$1B and $3.5B of debt.

Rocket Lab Differentiator

Rocket Lab's strategy is to control the entire value chain of space services, from the supply chain of components to complete satellite buses, launch, and data. The Rocket Lab differentiator can be broken down into two segments, the launch side and the space systems side, both of which, when combined, unlock the potential for a LEO constellation.

Launch Business

Developing a rocket is no easy task; however, reaching production scale and operating as a reliable launch business is an even bigger endeavor. Aside from SpaceX, Rocket Lab is the only launch company currently launching more than 10 rockets per year.

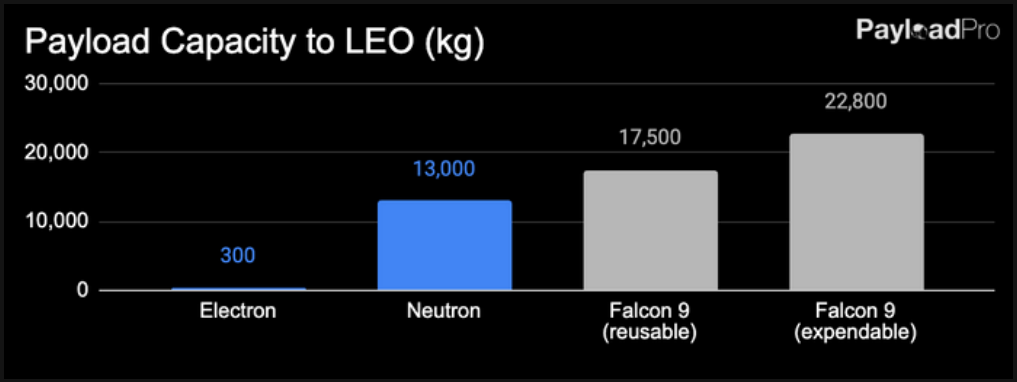
- **Customer acquisition:** Rocket Lab has built trust with commercial companies and governments, creating a customer base for Neutron.
- **Operation edge:** Rocket Lab has a proven track record in launch pad turnaround, integrating payloads, and reliably managing launches with minimal delays at multiple pads. No company other than SpaceX is launching at Electron's cadence.
- **Neutron booster reuse:** Reuse will juice Neutron's margins, helping keep the price tag low and increasing its competition in the market.
- **Neutron:** Neutron will enable Rocket Lab to enter the medium launch market. The rocket will also allow the company to operate an in-house constellation, unlocking the full synergies of an end-to-end space space business.

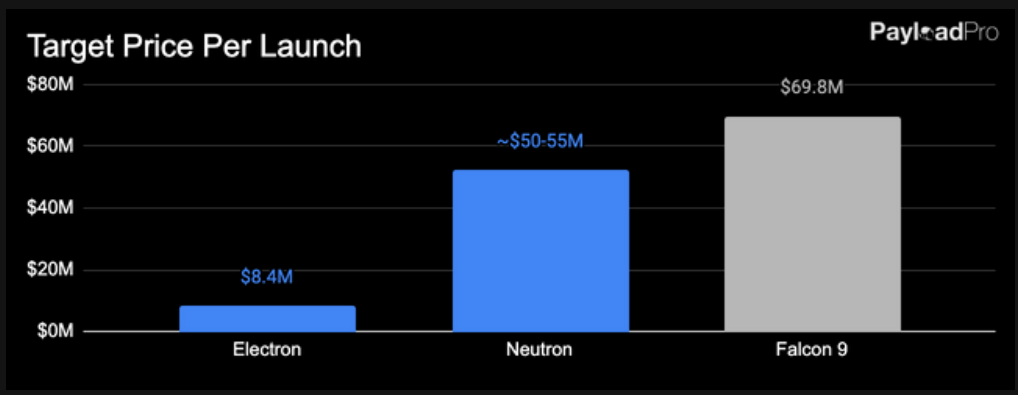
Spacecraft Business

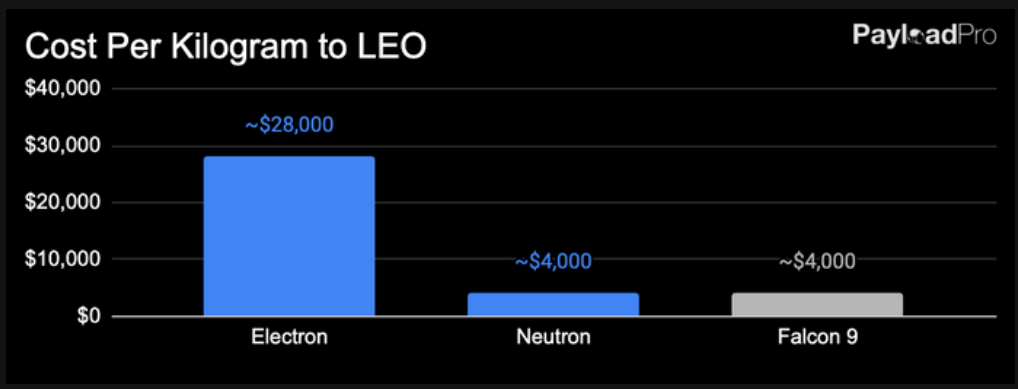
The aerospace industry is known for its long lead time, complex supply chains, and difficult acquisition procedures. Rocket Lab is focused on solving these challenges by vertically integrating its satellite business.

- **In-house supply chain:** Rocket Lab has an in-house supply chain of satellite components that minimizes the number of third-party vendors required for their satellite buses.
- **Component vendor:** Rocket Lab offers its satellite components and software commercially, creating additional revenue streams while increasing its product heritage.
- **Full service:** The vertical integration allows for end-to-end Design + Build + Launch + Operations services.
- **Boundless potential:** Rocket Lab's space systems offerings can be combined to meet almost any spacecraft and constellation need, allowing the company to bid on contracts ranging from commercial satcom to deep space probes to landers.

Rocket Lab Economics







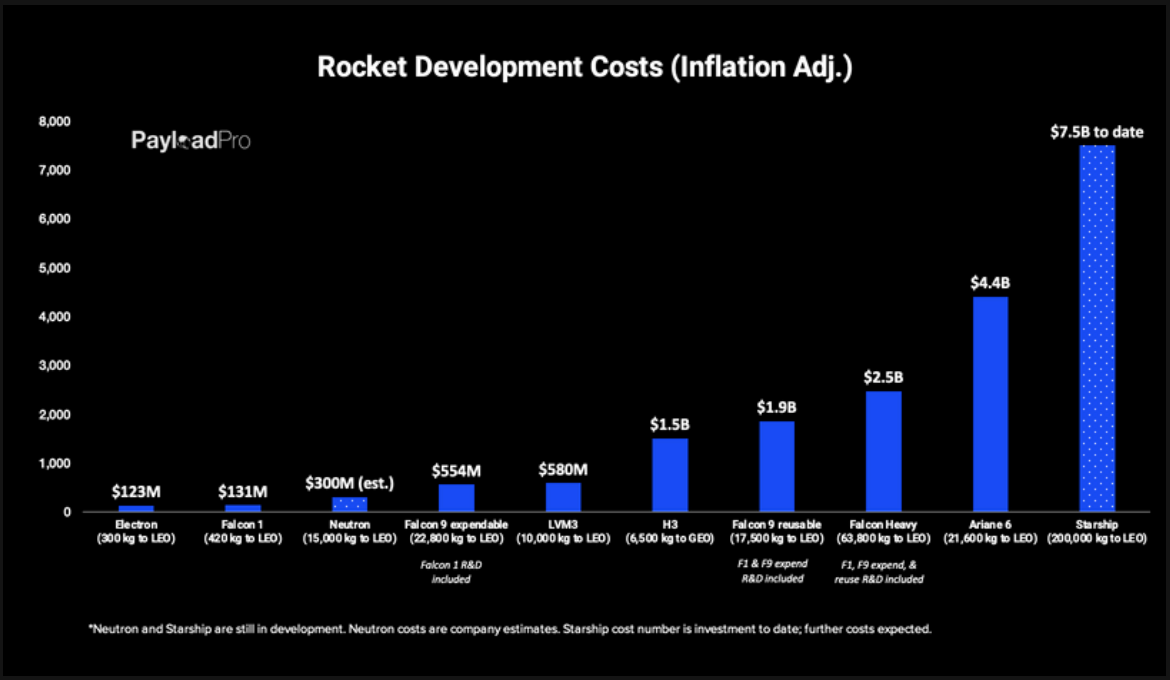
- Electron: ~$8.4M per launch price tag, equating to ~$28,000 per kg. Since 2017, Electron's launch price has increased from $5M to $8.4M. Gross margins for Electron are currently in the 30s, but the company aims to exceed 40% as it scales to two launches per month.
- Neutron: Rocket Lab is targeting a $50M to $55M launch price tag, equating to ~$4,000 per kg and targeting 50% margins on launch in the first few years. Falcon 9: Booster reusability has reduced internal costs significantly. SpaceX has been able to push Falcon 9 launch margins to ~70%, according to Payload analysis.

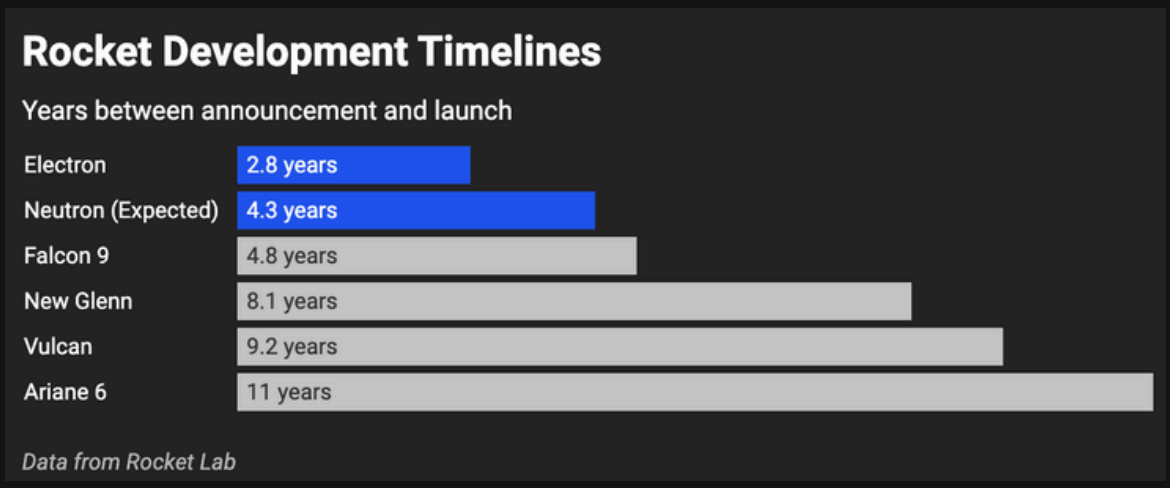
Rocket Lab Economics

So, can Neutron compete with Falcon 9? Absolutely.

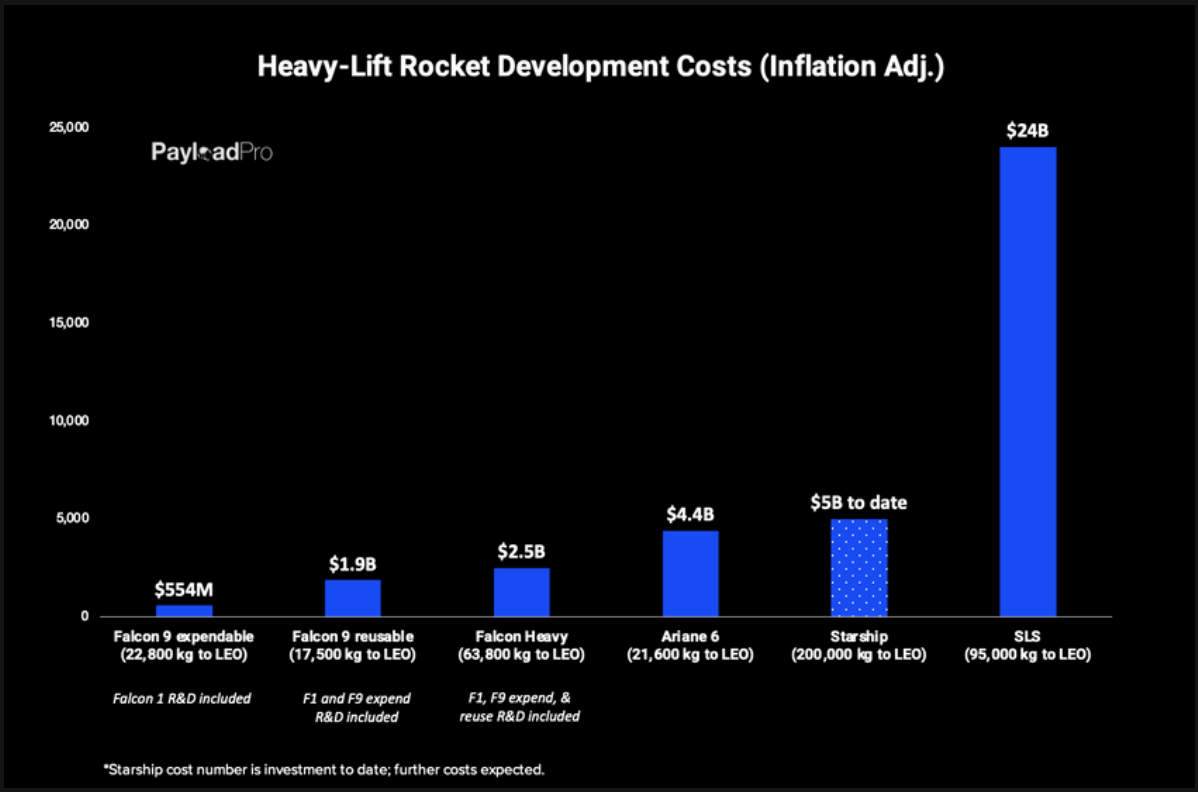
With a price per kg in the same ballpark as Falcon 9—and given Rocket Lab's history of launch reliability—Neutron should garner plenty of demand from satellite operators, particularly from satcom companies that are hesitant to fly on Falcon 9 because their product competes directly with Starlink.

R&D





R&D



Electron and Neutron: Rocket Lab spent $100M ($123M inflation adj.) to get Electron to orbit, putting the development costs on par with Falcon 1's $90M ($131M inflation adj.).

Rocket Lab plans to spend just $300M to develop a 15,000 kg to LEO (expendable) Neutron. The development costs would be less than the cost to build Falcon 9 expendable, and significantly less than H3, Ariane 6, and Vulcan. It cost ULA $5-7B to develop the Vulcan rocket, which has a higher capability but lacks reusability.

Getting from expendable Neutron to first stage recovery and then reusability, could add hundreds of millions more to development costs. SpaceX spent $1B to develop Falcon 9 reusability. Numerous factors are driving Rocket Lab's capital efficiency:

- The company emphasizes hardware-rich development, rapid iteration, and early-stage hardware testing.
- The company's Electron flight heritage is helping inform efficient Neutron development.
- Rocket Lab is constantly under intense scrutiny as a public company, which has incentivized strong financial discipline. Any bill exceeding $30,000 requires approval from Peter Beck (CEO) or Adam Spice (CFO)

Neutron is Rocket Lab's final major R&D push and is expected to drive company-wide profitability within six months of servicing paying customers.

Selectivity

Spacecraft manufacturing is a notoriously difficult business, with many small sat providers struggling to keep costs under control, which has led, in part, to a wave of consolidation:

- In 2018, Boeing bought Millennium Space Systems
- In 2020, RTX bought Blue Canyon Technologies
- In 2024, Lockheed Martin bought Terran Orbital

In an effort to manage large ramp-up costs, Rocket Lab generally targets high-value and high-margin contracts. Competitors offering low-cost, low-power satellite buses often encounter reliability issues, while Rocket Lab aims for high-capability, high-cost solutions that align with long-term government needs.

Furthermore, Rocket Lab's vertically integrated approach allows the company to maintain a high margin on contracts.

Rocket Lab's CEO Sir Peter Beck

Facilities

Electron boosters

Production Facilities

Long Beach Headquarters (Long Beach, CA)

Rocket Lab's Long Beach facility houses its Space Systems division and its new Engine Development Center. The Space Systems division includes designing, manufacturing, and developing spacecraft like the Photon satellite platform and other satellite components. The engine department supports Rutherford engine manufacturing and Archimedes engine R&D and manufacturing.

Auckland, New Zealand

Rocket Lab's Electron rocket assembly and integration facility is located in Auckland, New Zealand. The company assembles Electron at this facility and tests Rutherford engines at a dedicated private propulsion test complex in a rural area around an hour from Auckland. Rocket Lab's vertically integrated approach allows it to manufacture a majority of the components in-house, streamlining production and reducing costs.

Neutron Production Facility (Wallops)

Rocket Lab is building a production facility in Virginia for its Neutron rocket. This facility will be responsible for the rocket's production, testing, and integration. Once completed, the Virginia facility will significantly expand Rocket Lab's manufacturing capacity, supporting the development of the Neutron program and increasing launch cadence.

+ Rocket Lab operates a total of 8 production facilities, which also includes a solar power production facility in Albuquerque, a flight software company in Denver, separation system facilities in Maryland, and star tracker production in Toronto.

Launch Facilities

Rocket Lab conducts its Electron rocket launches from two primary locations: Launch Complex 1 in New Zealand and Launch Complex 2 in Wallops. These launch sites provide Rocket Lab the flexibility to support different customer needs and access a wide range of orbits.

Launch Complex 1 (Māhia Peninsula, New Zealand)

This site has been the base for most of Rocket Lab's missions, offering flexible launch windows and the ability to support rapid turnaround between launches. 90%+ of Electron flights have flown out of the Māhia Peninsula. Launch Complex 1 is a private orbital launch complex, the world's first, meaning it is owned and operated by Rocket Lab instead of Rocket Lab being a tenant of a shared government or state run launch site such as Cape Canaveral or Vandenberg Air Force Base. This gives Rocket Lab 100% of the launch site's availability and provides additional flexibility over range operations.

Launch Complex 2 (Wallops Flight Facility, VA)

Located at NASA's Wallops Flight Facility in Virginia, Launch Complex 2 is Rocket Lab's US-based launch site for Electron. The site allows for the responsive launch of US government assets and supports customers with specific orbital needs better suited to US East Coast launches. The site is part of the Mid-Atlantic Regional Spaceport which sits within the NASA Wallops Flight Facility.

Launch Complex 3 (Wallops Flight Facility, VA)

Rocket Lab is building Neutron's pad at Launch Complex 3. The company has installed a water tower, two propellant tanks, and power. Launch mount installation is underway and scheduled for completion by the end of 2024. Neutron's launch pad features tubing and umbilicals running up from below, offering better protection for the umbilicals.

Neutron pad construction

Market Analysis/Industry Comps

Launch Competition

The Electron rocket, designed for small payloads, represents Rocket Lab's offering in the small-lift category. In contrast, their forthcoming Neutron rocket is poised to compete in the medium-to-heavy-lift segment.

Small launch: The electron launch vehicle is the second most frequently launched rocket in the country, and it is years ahead of its competition in the category.

- Firefly Aerospace's Alpha rocket: The company has launched five Alpha flights since 2022, one was a complete failure, two ended up in lower orbits than planned, and two were full successes. Alpha has a higher mass to LEO capability than Electron (1,030 kg vs. 320 kg) but is still a couple of years away from reaching Electron's launch cadence.
- Other companies like ABL Space Systems and Astra face a precarious future in commercial launch.

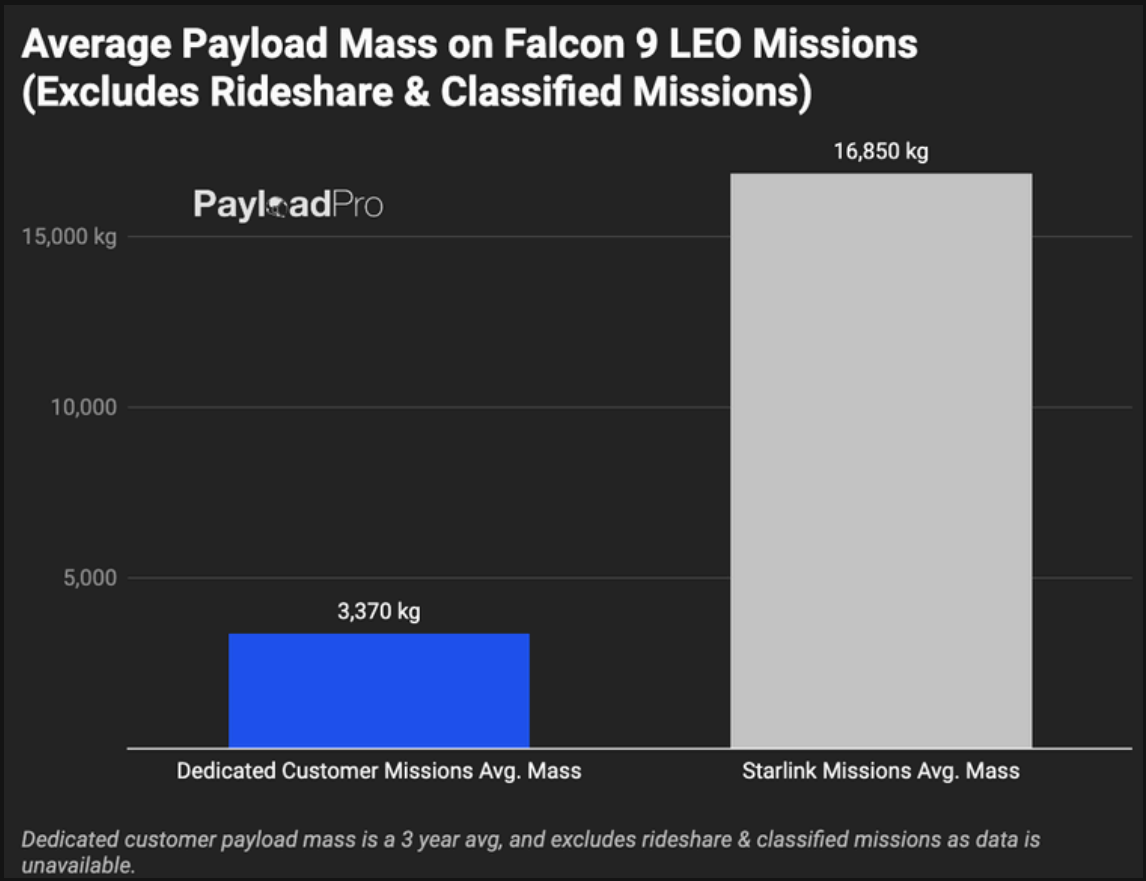
Medium to heavy launch: As the company prepares to bring Neutron to market, it faces stiff competition among established players in the medium-to-heavy-lift segment, such as SpaceX with its Falcon 9, which dominates the market, and the Vulcan Centaur by ULA, which has long-standing relationships with government and defense customers.

- V**ulcan Centaur:** ULA is trusted for high-value government missions but faces commercial challenges due to higher costs driven by the lack of reusability. At around twice the price of a Neutron flight, the two rockets compete in different markets.
- **Ariane 6:** Similar to Vulcan, Ariane 6 is not reusable, resulting in a higher price per launch. The rocket will also likely primarily serve the European market, putting it outside of Neutron's direct strike zone.
- Other companies, like Relativity Space, face a precarious launch future.

Falcon 9: SpaceX's Falcon 9 dominates the medium-lift market, launching over 100 times a year with high reliability. Starlink competitors often have no other choice but to launch on Falcon 9, presenting an opportunity for Neutron.

- Falcon 9 can launch 17.5 tons to LEO in a reusable configuration, which is often a higher capability than the customer needs. As a result, customers often underfill the payload mass despite paying full price. At 13 metric tonnes to LEO, a lower capacity, lower-cost Neutron flight could align better with customer needs.
- At $50M per launch, Neutron would cost less than Falcon 9's $70M price tag, although SpaceX could elect to reduce the price to match Neutron.

Launch Competition



New Glenn, Falcon Heavy, and Starship

New Glenn, Falcon Heavy, and Starship represent a very different class of rockets than Neutron. They are best used for either specific interplanetary missions or mega-constellation deployment. These high-capability rockets often do not make sense for the needs of most satellite companies, however. Take Starship for example:

- Starship can lift over 100T to LEO. For a satellite operator to utilize Starship, they would have to spend years building and storing a large number of satellites before the single, massive deployment—-tying up significant working capital.
- Most non-mega constellation satellite operators would elect incremental deployment to match their satellite production rate better.
    - Similar to when Airbus introduced its widebody A380, the narrowbody A320s didn't disappear. In fact, narrowbody planes are far more popular than widebody planes today.

Space Systems Competition

Large Primes

While growing, Rocket Lab's space systems production capacity is still smaller than that of industry giants like Airbus or Lockheed.

- **Airbus Defense and Space:** Airbus Defense and Space is a leading European player in satellite systems, with a vast product portfolio, including OneSat and Eurostar. However, as a legacy European space manufacturer, they lack some of the agility in the small satellite market and access to large DoD contracts.
- **Lockheed Martin:** Lockheed Martin has built a strong reputation as a reliable contractor in the defense and space sector. They also have the scale to compete for all satellite contracts. The company bought Terran Orbital, an SDA bus manufacturer.
  - **Terran Orbital:** Offers end-to-end satellite design, manufacturing, and operations focusing on LEO applications. They compete directly with Rocket Lab in the small satellite market, particularly with their Photon-like satellite solutions.

Small Sat Manufacturers

- **Blue Canyon Technologies:** Blue Canyon is a small sat manufacturer specializing in CubeSats and nanosat builds. Raytheon recently acquired the company, bringing additional resources to allow Blue Canyon to compete in larger-scale projects.
- **York:** York's satellite buses offer lower-cost and rapid production options well-suited for large-scale constellation projects.
- **Apex:** Apex is focused on flexible, cost-efficient satellite designs for small satellites and constellations.

The competitors are more specialized and have a less diversified (or integrated) portfolio than Rocket Lab, including lacking launch services.

Components

- **Redwire:** Redwire is a leader in space infrastructure, focusing on niche markets such as components, space robotics, and solar power systems.
- **Solar panels:** For the solar panel business, Rocket Lab competes primarily with Boeing's Spectrolab and Azur Space.

Final Thoughts

Electron

Rocket Lab's thesis centers on becoming a fully integrated space infrastructure company, controlling every step from satellite production and launch to space-based data services, thus capturing significant value across the space value chain.

The company's end-to-end approach leverages its capabilities in small- and medium-lift launches (with Electron and the forthcoming Neutron rocket), vertically integrated satellite manufacturing, and plans to break into the $320B data applications market. By pursuing this model, Rocket Lab aims to establish a resilient, high-margin business that is not reliant on external vendors or fluctuating launch demand.

With Neutron, Rocket Lab will expand into the medium-lift segment, potentially competing with SpaceX's Falcon 9, allowing the company to address larger satellite deployments, national security missions, and proprietary constellation builds. In-house satellite constellations, particularly in satcom, offer Rocket Lab the opportunity to transition from being a launch services provider to a data business, capturing recurring revenue from customers who rely on continuous data flows. This strategy mirrors SpaceX's Starlink model as Rocket Lab targets a larger market and higher valuation.

In a highly competitive and capital-intensive industry, Rocket Lab has differentiated itself through its launch reliability, cost control measures, and diversification approach as an end-to-end space business.