

PLD Space

Alejandro Serrano
Philip Moscoso
Ezequiel Sánchez



On October 7, 2023, at 02:05 CET, the MIURA 1 rocket lifted off from El Arenosillo base in Huelva, Spain, and successfully completed a suborbital flight. It was the first privately funded European launch vehicle to achieve this milestone (see **Exhibit 1**). The mission's success demonstrated to the world that PLD Space—the company that had designed, manufactured, tested, and launched the rocket—was technologically ready to tackle its next mission: developing, manufacturing, and launching MIURA 5, a much larger rocket capable of regularly carrying and deploying commercial satellites into orbit (see **Exhibit 2**).

For Ezequiel Sánchez, the company's executive president, it was time to address two questions that had been on his mind for some time: first, what should the future business model look like? Should PLD Space be solely a rocket manufacturer and operator, or should it focus on developing and marketing satellite-based services, as the giant SpaceX had done with its Starlink satellites? Second, what should their manufacturing strategy be: should they follow industry practice and specialize in one part of the process, or continue with the vertical integration that seemed to have worked well with MIURA 1? Sánchez knew that the answers to these questions would go a long way toward determining the company's future.

Company history

As a teenager, Raúl Torres, from Elche (Spain), was passionate about model rockets. His dream was to build a rocket and guide it into orbit.¹ He designed his own models using pipes from his father's

¹At the age of 15, Raúl Torres wrote in an Internet forum:

I hope that one day we'll be able to guide a rocket built by Spaniards into orbit. The problem with these systems is that they won't be cheap. That's why we need to come together to form a larger rocketry group that will allow us to do something significant. Personally, I'd love to see it happen; it's my dream and, well, I'll try to make it happen, even if it takes a lot of effort.

This case was prepared by Professors Alejandro Serrano and Philip Moscoso, and Ezequiel Sánchez, CEO at PLD Space. December 2024.

All of the material contained in this document has been provided by the company unless otherwise stated.

IESE cases are designed to promote class discussion rather than to illustrate effective or ineffective management of a given situation. This case was recognized by the European Foundation for Management Development (EFMD) as the best publication in the 2024 Case Writing Competition in the category of "Bringing Technology to Market."

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plumbing workshop and bought online the materials that he mixed to make the fuel. “One day, Civil Guard officers came to my home because they thought I was making explosives,” Torres recalls. By the time he was 22, the biology student had designed a scale model combustion engine for his rocket. Looking for someone to develop the project he found Raúl Verdú, an industrial engineering student and a Formula 1 enthusiast, who soon came on board. Verdú remembered Torres telling him: “I’m going to show you something that goes much faster than a race car.” They immediately began working at his home. In 2011, The two 20-somethings decided to turn their hobby into a career and start a rocket company: PLD Space was born.

Lacking funds, they sought outside support. There were many, many failed attempts. Verdú commented:

I remember when we participated in the forum from which Wake Up Spain later emerged.² Of the ten projects presented, all but ours received funding. But we didn’t give up: In 2013, we finally received the investment support of just over 20 companies around Elche and a loan of €250,000 from the NEOTEC program of the CDTI.³

With the money they had raised, just over €1 million, they successfully developed a reusable liquid propellant engine for spaceflight, and in 2015 they built Europe’s first private rocket engine test stand at Teruel airport (Spain).

In 2016, they won their first contract with the European Space Agency (ESA), and in 2018 they received new funding from the GMV Group.⁴ In the same year, they partnered with the company Aciturri Aeronáutica and the technology investment fund JME Ventures,⁵ which together with other investors contributed a total of €17 million. The Series B funding round was closed in 2021, raising an additional €25 million.

A year later, they successfully completed the MIURA 1 full static fire test at a company facility in Teruel.⁶ In October 2023, after a launch aborted due to a minor technical error, they successfully passed their most important milestone to date: MIURA 1 climbed to an altitude of 46 kilometers, demonstrating to the industry that PLD Space had the technical capability to tackle its next objective: to inject satellites into Earth orbit. PLD Space’s achievement attracted a great deal of media attention around the world.⁷

By 2024, the company had secured total financing of €155 million, employed 250 people and had three main facilities: the 12,500 m² headquarters in Elche, which included test laboratories and the rocket factory; a 154,000 m² test site at Teruel airport; and a 15,765 m² launch base under construction in Kourou, French Guiana, for the launch of MIURA 5.

² Wake Up Spain is a forum for Spanish economic and political actors to discuss the major challenges facing the country.

³ NEOTEC is a public funding program of the CDTI, a Spanish government agency that supports the creation of new technology projects.

⁴ GMV is a Spanish multinational active in the space sector, among others.

⁵ JME Ventures is a Madrid-based investment fund that invests in early-stage European start-ups.

⁶ This test closely mimics actual rocket launch conditions: The engine burns propellant throughout the test as if it were actually taking off, but the rocket is secured by restraints to prevent actual liftoff. The navigation system is programmed to behave as if the rocket is in flight. The test allows the behavior of the rocket during flight to be analyzed.

⁷ In the three weeks following the launch, 3,800 news stories about the flight were published worldwide. In Spain, Sánchez, Torres, and Verdú appeared in November 2023 on *El Hormiguero*, a popular national prime time television program.



A new model for the space industry

Traditionally, the space sector was driven by the governments of a small number of countries. In the last 20 years, however, it had undergone a shake-up, mainly at the hands of the visionary entrepreneur Elon Musk, CEO of SpaceX, who had achieved a series of milestones unimaginable just a few years earlier. In 2012, SpaceX made the first private flight to the International Space Station.⁸ The company immediately began putting Starlink satellites into orbit with the primary mission of providing data coverage to large areas of the planet. In 2016, Musk announced an ambitious plan to build 1,000 spacecraft to colonize Mars. In 2022, Japanese entrepreneur Yusaku Maezawa announced the names of the ten passengers selected for the first space tourism trip aboard the Starship,⁹ the largest rocket used to date, although the project was postponed indefinitely in 2024.

All of this was made possible by the birth of the technically complex but economically viable reusable rocket concept. This approach had not been used in the second half of the 20th century in the rockets that carried the space shuttles of the governments of the United States (the ill-fated Challenger and Columbia, among others) and the defunct Soviet Union (the Buran shuttle, which made very few flights). But in a major breakthrough, in 2018, the primary booster of SpaceX's Falcon 9 rocket returned to Earth for the first time, ready to be reused 10 to 20 times according to the company. Since they could now be reused, it made sense to build larger rockets with better technical performance. A new, much more efficient space sector had become a reality.

The space industry had two distinct lines of business. The first included launch systems (e.g., vehicles that go from Earth to outer space), transfer systems (e.g., vehicles that go from one orbit to another), satellite manufacturing, and ground services, along with all the associated operations and represented 20% of the space industry. The second consisted of the services provided by the satellites placed in orbit. The size of the total space industry was €570 billion in 2023, a figure expected to reach €900 billion by 2033.¹ Additionally, the space launch market was valued at nearly €16.5 billion in 2023 and was projected to grow annually at double digits for over 5 years¹⁰. This subsector was further divided based on orbital altitude¹¹ and payload capacity.

The launch business was divided into two segments: small payloads and medium and heavy payloads. The latter were larger than 500 kg, and the segment was dominated by a few companies such as SpaceX, Rocket Lab, Blue Origin, ULA, Arianespace, and Virgin Orbit. SpaceX was the undisputed leader in this category with more than 400 launches between 2006 and 2024, including 61 in 2022, 96 in 2023, and 102 in 2024.¹² Its contracts with the US government (projected sales of \$40 billion by 2035)¹³ made it a competitor on another level, with a market share of 92%. In ten years, the company had built around 100 Falcon rockets, and by 2024 it had put 6,000 Internet satellites into orbit out of a total of 42,000 planned.¹⁴

⁸ Deployed into orbit in 1998 at an altitude of 370 km, the ISS is a space station operated by five national agencies and conceived as a permanent research laboratory under microgravity conditions.

⁹ For more information on SpaceX and the space industry, see the case: Joan Jané and Blanca Guitard, "Starship SpaceX. A Disruption in the Space Value Chain," IESE Business School, ILO-11-E, 2023.

¹⁰ Precedence Research sizes the space launch services market in 16.48 billion in 2023, "Space Launch Services Market".

¹¹ There are four orbit categories based on altitude: Low Earth Orbit, or LEO (up to 2,000 km), for Earth observation and Internet connectivity; Medium Earth Orbit, or MEO (up to 36,000 km), for GPS communications; Geostationary Orbit, or GEO (36,000 km), for television; and High Earth Orbit, or HEO (over 36,000 km).

¹² SpaceXstats

¹³ Joan Jané and Blanca Guitard, "Starship SpaceX."

¹⁴ Joan Jané and Blanca Guitard, "Starship SpaceX."