US Air Force Evolved Expendable Launch Vehicle (EELV)

SpaceX Falcon Offers Lower Costs, High Reliability and Commercial Success

If allowed to compete, SpaceX can help DOD **save at least one billion dollars** annually in space launch, while providing a truly independent family of vehicles to help assure access to space.

Background

The Evolved Expendable Launch Vehicle (EELV) is the United States Air Force (USAF)'s program to launch satellites into orbit. The program was designed to assure access to space for the Department of Defense and other United States government payloads and lower costs by at least 25% and with a goal of 50%. DOD now faces a serious set of challenges, including:

- **Continued Cost Escalation.** In one year, the Air Force's EELV budget request increased by more than 30 percent to $1.74 billion in the FY2012 budget request—at a time when most programs are seeing cuts. The prime engine supplier, Pratt & Whitney, recently explained to the press that it will continue to pass significant cost increases to USAF as a result of cancellation of some NASA programs. If this cost growth continues, the EELV budget would consume the entire DOD space budget by the end of the decade.
- **No Competition.** The 2006 merger of Lockheed and Boeing's launch businesses resulted in the creation of the United Launch Alliance (ULA) and left the USAF with a monopoly provider with no incentive to reduce costs, innovate or increase the quality of service. DOD currently relies exclusively on the United Launch Alliance (ULA).
- **$1 Billion "Capability" Subsidy.** Because the government is currently its only customer, DOD and the National Reconnaissance Office (NRO) are forced to pay well over $1 billion a year to ULA simply to "sustain" the EELV capability, which includes subsidizing virtually all of ULA's fixed costs for facilities, support costs, and launch operations.
- **Inability to Cost Share.** Because ULA costs are so high, it charges prices that currently no one but the US Government can afford. ULA has limited ability to leverage the total launch market to reduce its costs.
- **No Assured Access.** EELV initially intended to guarantee assured access to space by having two launch vehicle providers—Boeing with the Delta and Lockheed with the Atlas. The premise that two providers provides assured access breaks down with the Atlas and Delta now since both vehicles rely on the same upper-stage engine and share production facilities. A production failure or disruption at a single location can impact the entire DOD space program.

Why the EELV Program Needs Falcon

In the current fiscal environment, DOD can no longer ignore the benefits of competition to national security space launch or the opportunity for the U.S. government to increase its buying power for the taxpayer through its use. SpaceX offers DOD its Falcon 9 and Falcon Heavy rockets along with:

- **Reliability.** Falcon 9 and Falcon Heavy are designed for maximum reliability (see sidebar).

- **Proven Track Record.** Falcon 9 has over 30 missions under contract with almost a dozen customers scheduled to launch several billion dollars in satellites.
- **Substantial Cost Savings.** The 2012 budget for four Air Force launches is $1.74B, which is an average of $435M per launch. Falcon 9 is offered on the commercial market for $50-60M and Falcon Heavy is offered for $80-$125M. For government missions, NASA has added mission assurance and additional services to the Falcon 9 for less than $20M.
- **Competitive Advantage.** SpaceX offers affordable pricing as it designed its vehicles with current and sustainable technology from the ground up. While ULA relies almost exclusively on the government, SpaceX competes on the commercial and international launch market and wins. As a result, SpaceX can spread its costs over multiple users and reduce its overall cost to the government, whereas DOD and NRO are stuck paying virtually all of ULA's costs.
- **Readiness.** SpaceX can provide launch services to the Pentagon at a fraction of current costs (see below). The sooner DOD supports new entrants with contracts for EELV-class launches, the sooner the government and the taxpayer can reap the benefits of competition—save money while maintaining reliable, innovative, assured access to space.
- **Better Access for the Air Force.** SpaceX is located just miles from the Air Force acquisition office, making for easy contract management and mission assurance teaming. Hardware is built at SpaceX, not thousands of miles from the program office, with fewer subcontractors, allowing for better understanding and quicker responsiveness for the Air Force.
- **All-American.** The SpaceX Falcon 9, Falcon Heavy and Merlin engines are 100% American made. With over 80% of the value of our vehicles manufactured in house, SpaceX is able to better control quality and schedule while keeping overall costs low, without using last century's costly technology.

Falcon: *Designed for Maximum Reliability*

- Multiple engines with ability to lose an engine and still make orbit;
- Two stages, minimizing stage separation events;
- Triple redundant flight computers and avionics;
- Structural safety factors in excess of industry standards;
- Unique hold-on-launch system to ensure launch success.
- Designed from inception to carry astronauts, thereby meeting robust human spaceflight requirements.

Bottom Line

If allowed to compete, SpaceX can help DOD save **at least one billion dollars** annually in space launch, while providing a truly independent family of vehicles to help assure access to space.

	ULA	SpaceX
Capability Sustainment (independent of # of launches)	$1Billion (+ TBD classified portion)	$0
Cost per launch (medium class)	*$180M*	*$75M*
Cost per launch (heavy class)	*$350M*	*$125M**
Total Launch Costs*	$1.7B*	$1B*
Total Cost of Current Program	**$2.7 Billion** + TBD classified portion	**$1B**

Estimated savings with Falcon (assuming 8 EELV launches per year): **~$1.7B - $2.2B per year**

**Cost for 6 Medium and 2 Heavy ULA launches.*
**Cost for 8 Falcon Heavy launches. Reflects commercial pricing for Falcon Heavy.*