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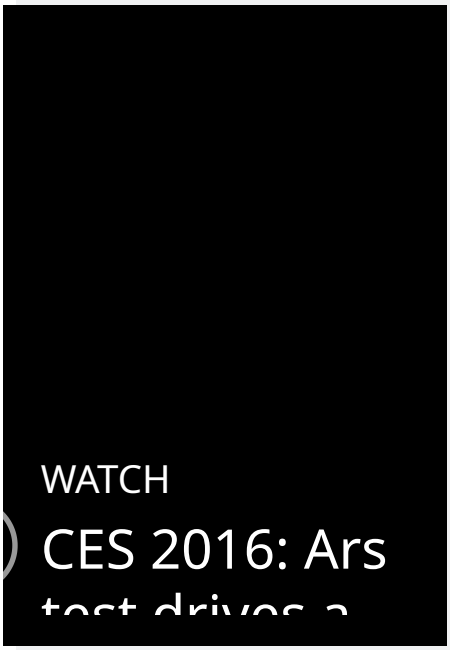


**ondly recall our time driving
noto SRK, the most
gly fun EV we've driven in
leo shot/edited by Jennifer
our experience with it in 2016.**

The Arcimoto FUV slices through a wet Vegas parking lot, kicking up spray from puddles and smiles from passersby. Despite the unusual downpour, I stay bone dry under the electric tricycle's semi-enclosed canopy, twisting the

throttle to zip back and forth with a grin on my face.

While taxis on the road beside me inch through traffic toward the annual CES trade show, the world's first Fun Utility Vehicle is living up to its name. It's nippier than a car, drier than a scooter, and easier to handle than a motorbike.

READING
-wheel EV is still the most fun
e driven all year

From the back seat, Arcimoto founder and CEO Mark Frohnmayer shares his dreams of turning this ultra-efficient (230mpg-equivalent) trike into the world's greenest rideshare vehicle. "Around 80 percent of taxi trips are just one passenger," he says. "In a world where all vehicles are autonomous and you can hit a button and jump in, it doesn't make sense that you'd be jumping into a seven-passenger

5,000lb vehicle all by yourself."

Although the FUV is enjoyably manual for now, Arcimoto is working with two unnamed technology partners to get a self-driving version on the roads later this year, just as soon as it begins mass production of the FUV at a new factory in Eugene, Oregon. "We've got 2,250 pre-orders to fulfill first, then we want to produce 10,000 vehicles in 2019 and beyond," says Frohnmayer.

To help scale up production at its current factory and start work on a second, Arcimoto is about to submit an application for a loan from the Advanced Technology Vehicles Manufacturing (ATVM) program at the US Department of Energy (DOE). This Bush-era project is intended to support the production of fuel-efficient, next-generation vehicles in

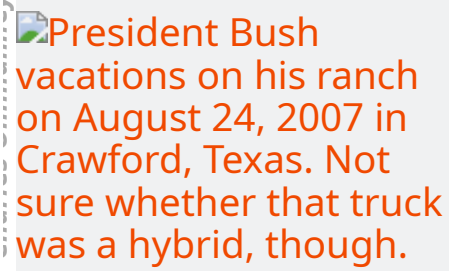
the US with long, low-interest loans. Even in an era of Trumpian cuts and climate skepticism, ATVM retains more than $16 billion in loan authority to distribute—at least until the White House succeeds in killing the program, as it hopes to do this year.

"We are a publicly traded company and have other avenues to capital," Frohnmayer tells me. "But in terms of building out our full financing package, it makes sense to have that support."

He had better not hold his breath. In nearly a decade of operation, the ATVM program has issued just five loans—and none at all since 2011. Some electric vehicle (EV) start-ups are still waiting for a decision on loan applications filed in 2009 and 2010. Despite being credited with saving tens of thousands of blue collar jobs in the American heartland

and launching Tesla to its current heights, the ATVM remains mostly unknown to the public, unloved by politicians, and unable to complete any new loans.

So how did a program that was meant to embody America's high-tech future get so stuck in the past?



President Bush vacations on his ranch on August 24, 2007 in Crawford, Texas. Not sure whether that truck was a hybrid, though.

Enlarge / President Bush vacations on his ranch on August 24, 2007 in Crawford, Texas. Not sure whether that truck was a hybrid, though.

Sorry, Detroit

The big three US carmakers, Ford, GM and Chrysler, have traditionally had little incentive to build economical vehicles. With gas taxes in the US a fraction of those in most developed countries (about one tenth of those in the UK, for instance), Americans consistently choose large comfortable cars and powerful pickups over smaller, more efficient vehicles.

So when the Bush administration proposed more stringent fuel standards in 2007, Detroit faced a bigger bill than European and Japanese carmakers to bring fleets up to scratch. ATVM was the solution: a corporate welfare package of cheap money to help US-based automakers compete with fuel-sipping imports. The program authorized up

to $25bn in very low-interest loans to build or modernize American car plants, as long as any vehicles they built achieved at least 25-percent higher fuel economy than comparable 2005 models.

ATVM went live in 2009, just as the Great Recession was freezing the banking system. The Big 3, scrambling for cash, saw it as a lifeline. Chrysler requested $8.5 billion in ATVM loans, Ford $11 billion, and GM a whopping $14.4 billion.

"We were never going to be in a position to provide that size of a loan to a single entity," remembers Jonathan Silver, who was named executive director of the DOE's Loan Programs Office (LPO) in November 2009. "One of the ways to de-risk an investment portfolio is to ensure the risk is balanced. It's hard to do that if one investment is over half its value."

ATVM had simply arrived too late for GM and Chrysler, which slid into bankruptcy and restructuring. But Ford held on by the skin of its teeth, securing a $5.9 billion loan late in 2009 to upgrade factories across the midwest to produce hybrid vehicles and new efficiency technologies. Nissan North American got a $1.4 billion loan a few months later.

But the chaos of the recession masked a shift at the DOE. With the arrival of Obama-appointee Silver, ATVM's focus changed overnight. Helping Detroit tweak its gas mileage would now take a back seat to ushering in a green transportation revolution.

Enlarge / Elon Musk unveiled the Model X back in 2015.

Hey Elon

By the end of 2009, Elon Musk's EV startup Tesla had manufactured only a few hundred hand-made Roadster sports cars. To build his next vehicle, the Model S sedan, Musk would need to completely refit an old Toyota-GM plant in California to build battery packs, motors, and other components, quickly and at volume.

"With the credit market completely locked up, there was no place to get support," says James Chen, who worked at Tesla from 2010 to 2016, ending up as vice president for regulatory affairs. "The ATVM loan program was a really good place for us."

"The risk profile at Tesla was certainly different to that at Ford and Nissan," says Silver. "But at the same time, the technology was radically different and

theoretically very important. I was trying to find technologies that could radically transform the nation's infrastructure and that could only get there with some kind of government support, which I took to be the mission of the organization."

In January 2010, just over a year from when it had first applied to ATVM, Tesla received a ten-year loan of $465 million to build the Model S. In April, another EV company, Fisker Automotive, got a $529 million ATVM loan to develop and produce a luxury plug-in hybrid sedan called the Karma at a plant in Delaware.

For Tesla, the loan provided credibility as much as capital. "Having the federal government, which obviously had to do its due diligence, provide that loan was instrumental in helping launch the company," says Chen. "It was a

great validation of what Tesla was doing." Shortly after the loan, Toyota invested $50m in Tesla to work together on an electric SUV. The first Model S rolled off the production line at Tesla's new factory just over two years later. Tesla now has a stock market valuation higher than either Ford or the merged Fiat-Chrysler Automobile.

With Tesla and Fisker netting nearly a billion dollars between them, the EV community woke up to ATVM in a big way. By 2011, more than 75 start-ups, suppliers, and OEMs had applied for a total of around $50 billion. "We saw crazy ideas," says Silver. "We had inflatable cars and underwater cars, stuff that was never going to go anywhere." But there were also dozens of sensible, smart applications from companies that appeared to boast the same mix of entrepreneurship,

practicality, and sustainability as Tesla or Fisker.

Bright Automotive had been founded by an ex-GM executive to develop a plug-in hybrid delivery vehicle. Carbon Motors was building the world's first purpose-built police car. Aptera had already demonstrated an ultra-efficient three-wheeled car built with high-tech composite materials, while Elio Motors' three-wheeler would cost less than $7,500. Local Motors wanted $24m to support a new open source, 3D-printed model of car production.

Aptera filed its ATVM application just a few weeks after Tesla in the fall of 2008. "We were hot on the heels of Tesla and Fisker, with Bright Automotive and a couple of others," remembers Paul Wilbur, Aptera's CEO. "We saw them getting their funding, and that's when we really

started to think it was a viable funding mechanism for us."

In March 2011, one of these scrappy start-ups, Vehicle Production Group, even secured a modest $50m loan to produce a wheelchair-accessible vehicle powered by natural gas. But this would prove to be the last loan that ATVM ever completed.

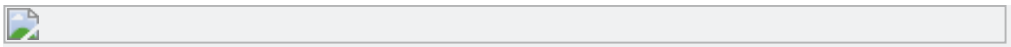
In May 2011, the DOE froze Fisker's credit line after it missed key performance milestones. Fisker's battery supplier then recalled power packs and went bankrupt, while Hurricane Sandy destroyed more than 300 Fisker Karmas at a port in New Jersey in 2012. The company filed for bankruptcy itself the next year, leaving the ATVM program with a net loss of $139 million.

Silver says, "The Fisker loan was done before I got there, where the Tesla loan was

completed after we put some professionals in place. [But] from the very beginning, Henrik Fisker was developing a car, and Elon Musk was developing a car company. And those are two very different things."

The spectacular implosion of Fisker was compounded by the failure of Solyndra, a manufacturer of innovative photovoltaic solar panels that received a $535 million DOE loan guarantee in 2009 under a sister DOE program. However, Solyndra was unable to turn a profit and filed for Chapter 11 bankruptcy in September 2011.

Listing image by Lucid



"Completely closed down"

Republicans cried foul, accusing the DOE of poor management and making loans on the basis of politics rather than finance. (Vice President Joe Biden had championed Fisker building a factory in his home state, while Solyndra investors had close links to the Obama White House, which reportedly exerted pressure on the DOE to push the loan through.)

At the same time, Aptera was ready to close its ATVM loan for $150 million. It had taken the start-up three years to do what Tesla and Fisker had managed in one, but it finally had a 250-page application agreed and signed, with milestones in place. All that was left was for the White House's Office of Management and

Budget to give the final go-ahead.

"At that point, the program got completely closed down," says Wilbur, "I believe for political reasons because we were about to go into an election year. The top people, who were clearly influenced by the White House, didn't want it to be a black mark on anyone's re-election campaign."

Aptera was not the only company to suffer from ATVM's abrupt about-face. In February 2012, Bright Automotive closed its doors after the DOE attached increasingly onerous terms to its conditional loan offer. "The ineffectiveness of the DOE to execute its program harms commercial enterprise, as it not only interfered with the capital markets; it placed American companies at the whim of approval by a group of bureaucrats," complained executives.

Just a few days later, the DOE denied the $450 million loan request of Carbon Motors, prompting its CEO to say, "We are outraged by the actions of the DOE, and it is clear that this was a political decision in a highly charged, election year environment." All three companies ceased operations soon afterward.

(Insider DNC Crook) Jonathan Silver has a different memory of the loans that did not make it to completion: "Anybody who gets turned down always thinks it's somebody else's fault." But he admits that the program had become politically toxic. "The failure of Solyndra put a freeze on everybody," he tells me. "It made it very hard to move additional loans forward. It made applicants nervous about being in the program. It was unhealthy from every perspective, and it was

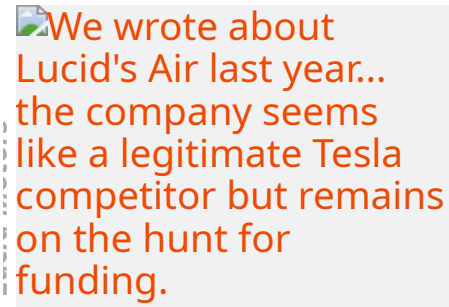
entirely due to the politicization of the program in Congress."

If anything, attacks on ATVM increased following Obama's re-election. There were multiple legislative attempts to end the program, rescind its authority, and claw back its billions to spend elsewhere. It didn't help that the small Vehicle Production Group was unable to make loan repayments in early 2013 and was acquired for pennies on the dollar, saddling ATVM with another $42 million loss.

ATVM's woes were even rubbing off on its biggest success. "As we went around and told the Tesla story, there would be talk about how Tesla was only surviving on subsidies, that Tesla could only do this or that because the government was propping them up," says James Chen.

Musk decided to pay back Tesla's ATVM loan five years early, in March 2013. "We could take that and use it as a shield against people who said we were only surviving because of government subsidies," says Chen.

But there was another big incentive for Musk to pay back early. As part of the original loan in 2010, Tesla had issued a warrant to the DOE to purchase over 3 million Tesla shares at $7.54 each. Those shares would have started to vest in December 2018. With Tesla stock currently hovering above $350, those shares would now be worth more than a billion dollars. By paying off the loan ahead of time, the warrant expired, and Tesla could sell those shares to other investors at the market rate.



Enlarge / We wrote about Lucid's Air last year... the company seems like a legitimate Tesla competitor but remains on the hunt for funding.

Loan life today

The years since then have been quiet for ATVM. Many existing applications were quietly refused or withdrawn. In 2014, the program was revamped to allow companies producing components like engines or tires to apply, even as the Government Accountability Office (GAO) recommended rescinding ATVM unless it could demonstrate demand for new loans. "Most... manufacturers we had spoken to indicated that the costs of participating outweigh the benefits... and that problems with other DOE programs have tarnished the ATVM loan program," it reported.

The GAO repeated its suggestion in March 2017, noting that the DOE was sitting on 11 substantially complete

applications, together requesting about $5.4 billion in loans. Six additional companies had submitted new applications that were still under review.

To get an idea of what is going on inside the ATVM, I filed a series of Freedom of Information Act requests with the Loan Program Office at the DOE. By all accounts, staff there seem busy.

READING
Air could be Tesla's most val—as long as it gets funding

Lucid Motors is a Silicon Valley EV start-up funded by Chinese and US investors. It has developed yet another luxury all-electric sedan, called the Air, which it hopes to build at a $700,000 factory in Casa Grande, Arizona. Work on the assembly plant has yet to begin.

Lucid's ATVM request, for an unknown sum, to help build its Arizona factory, has been substantially complete

since January 2016. Emails through 2016 and 2017 show Lucid executives responding to a long list of questions from LPO staff. Over multiple messages, meetings, and visits, the DOE drilled down to detailed engineering data for the Air's battery pack, powertrain, interior and exterior design, and safety features.

Toward the end of 2016, as the loan inched along, the DOE requested details for all of Lucid's suppliers, their qualifications, and contracts. The LPO wanted to see schedules and budgets for prototyping, construction, supply logistics, infrastructure, management and staffing, as well as market analysis, details of Lucid's proposed sales and servicing plans, and warranties. The first half of 2017 saw Lucid revealing its capitalization and ownership structure and tweaking a financial model for the

business should a loan be granted.

In April 2017, the ATVM office sent an email to Brian Barron, Lucid's director of manufacturing, saying, "It would also help us to understand what, if you didn't receive the conditional commitment or funding by a certain date, would happen, keeping in mind there are likely many factors that you and/or we cannot control."

Barron's response was not recorded, but Lucid's factory plans are currently on hold while it seeks funding or a possible buyout. Lucid did not respond to requests for an interview.

If Lucid's progress toward an ATVM loan seems endless, it pales in comparison with Elio Motors. Elio initially applied for a $260m ATVM loan to mass produce its low-cost three-wheeler at the end of 2009. In early

2010, its founder and CEO, Paul Elio, told a public meeting in Michigan that the company was "one month into [an] ATVM loan process which takes approximately six months." He told local officials that he was confident that Elio would receive the ATVM money.

Eight years later, Elio is still waiting to hear whether its loan, now for approximately $185m, is ready to move into its due diligence phase. In an SEC filing last August, Elio finally admitted, "There can be no assurances that we will be successful in obtaining an ATVM loan."

Incredibly, perhaps, the ATVM team continues to woo new applicants. In December, the LPO announced another substantially complete application, from Workhorse, a company about to head into production with the world's first EV pickup

truck. The W-15 has an all-electric range of 80 miles, as well as an internal combustion "range extender" engine that frees it from having to find an electrical outlet in the middle of a field or forest. The W-15 will be built in Ohio and already has more than 6,000 pre-orders from fleet customers.

"We're talking meat and potato customers, not finicky Fisker high-end buyers," says Steve Burns, Workhorse's CEO. "I'm ready to say that the W-15 can do anything a Ford F-150 can do, and that's the best-selling vehicle in America."

While Burns hopes that the W-15's blue-collar credentials and red state manufacturing jobs will strike a chord with the current administration, he is not relying on the $250 million loan. "Given the previous failures, the main thing they want to see is that you're not dependent on it," he

says. "It would be nice to have and would let us retool our factory with more robots, helping our margin and throughput, but it's not essential. I don't lose any sleep over ATVM."

Emails show that the LPO has also been talking with Nio, another Chinese-Silicon Valley hybrid planning a high-end EV, as well as Zoox, a stealthy start-up building an autonomous taxi. Bert Kaufman, Zoox's head of corporate and regulatory affairs, confirmed that the LPO had been "hustling for business" in 2016 but that the company had not yet submitted a loan application.

At around that time, yet another EV start-up based in California and funded by Chinese investors did ask for ATVM funds. In April 2016, Faraday Future filed an application, complete with a five-year business plan, balance sheet, quarterly financials,

and cost breakdowns—probably to help build an ambitious $1billion dollar assembly plant in Nevada for, you guessed it, a luxury EV sedan. Those plans have since been shelved, although Faraday Future itself seems to be limping on.

At one point in early 2017, Faraday's then-head of corporate finance Steve Howard wrote to the ATVM team to ask, "[We] would be interested to hear how the DOE and the Loan Programs Office will be moving forward under the leadership of a new Energy Secretary and new [president]." An officer at the LPO swiftly replied, "The program remains business as usual under the new administration."

If ATVM's business is failing to complete loans, that might be true, but the ascension of Donald Trump signals a testing time

for the program. Trump has zeroed out the program in his last two presidential budgets, and Republicans also continue to gun for the program.

At a House Committee on Science, Space, and Technology hearing ab out the DOE loan guarantee program in February 2017, Chairman Lamar Smith said, "President Obama's political allies... were often fast-tracked, with little consideration for project merit or benefits to the taxpayer. The results were predictable. High profile defaults occurred, like ... $139 million lost from a direct loan to Fisker Automotive. These costs will increase if another loan defaults or if the Department issues new loan guarantees to projects with any financial risk."

But its losses are only one side of the ATVM story. James Chen told me that Tesla's loan

was paid back early with $25 million in interest, and SEC filings suggest that Ford alone will have paid over $700 million in interest by the time its loan finishes in 2022. Ford has probably already paid more than $550 million—about three times as much as ATVM lost on Fisker and VPG combined.

"This was a remarkably successful, remarkably focused financing effort, probably one of the most successful in the history of the federal government," says Jonathan Silver. "Show me another lending organization, working on never-before-built technologies, never before built at scale, done as quickly as these were done, with that kind of risk and loss profile. It doesn't exist."

"All the EVs you see running around today are the result of the ATVM loan to Tesla," says Steve Burns. "If it

hadn't been for that loan, Tesla probably wouldn't still be here. The people at the DOE should feel good about that."

James Chen agrees: "When you've got Russia, China, and other countries around the world putting their thumb on the scale of technology, the least we can do in the public sector is support promising American technology."

After I leave Arcimoto's FUV in its Vegas parking lot, I stroll over to the main CES conference for a chat with Henrik Fisker, founder of Fisker Automotive, the failed EV start-up that gave ATVM a $139 million kick in the teeth. Fisker is here promoting a new company, Fisker Inc, and a new electric luxury sedan, the EMotion. Like the Karma before it, the EMotion will eventually use an innovative battery technology, this time a solid-state pack

that promises longer range and improved safety—if the start-up can succeed in producing it at scale.

I start to ask Fisker whether he will be seeking ATVM funds to bring the EMotion to market, but he cuts me off immediately. "No! It's not something that I ever want to do again," he says with exasperation. "It's difficult to work with government officials when you're in such a risky business as a start-up car company. But at the end of the day, whatever you think about Fisker, we got several thousand cars on the road and educated 500 engineers who are now deployed all over the US in American companies. Now we're back with lessons learned, hopefully to create jobs, and full steam ahead... with private money."

The Department of Energy’s 2019 budget document, released

this month, calls for cancelling ATVM's remaining loan authority, clawing back its billions, and winding down the office. But that is only the final coup de grace on a program that has been effectively dead for years. After supercharging the world's most valuable EV company, making money for the nation, and fostering a generation of engineers, ATVM's dream of supporting the domestic production of energy-efficient vehicles is almost over.

The average fuel economy of new vehicles sold in the US in December was 25.0 mpg, down 0.2 mpg from November and 0.5mpg lower than its peak in August 2014.