Tesla, Inc. (TSLA) — Overweight

The Definitive Guide to Investing in Tesla, 1st Edition (Increasing PT to $1,200)

CONCLUSION

2020 was a breakout year for TSLA, but in our view, the fireworks aren't over. Even after a 10x return over the past 12 months, we don't think investors should be selling this stock. To defend our new price target of $1,200, we are publishing a 100+ page report entitled *The Definitive Guide to Investing in Tesla* (see attached). The report details the updated assumptions underpinning our 20-year DCF model, including estimates for vehicle deliveries by model and region. While it is more exhaustive than anything we have published to date, even our expanded model does not capture all potential revenue streams. Indeed, with Tesla's target industries still embracing outdated business models, it may be decades before this company runs out of new opportunities to pursue.

- **Tesla is now part of the S&P500; investors who use this benchmark should be Overweight TSLA.** Managing a growth portfolio was perhaps easier when TSLA was small enough to ignore. The company had vocal short-sellers, a renegade CEO, and a rickety balance sheet. But now that many of these issues have been addressed (and now that TSLA has been added to the S&P500), the stock can no longer be overlooked. Many investors fret that TSLA will torpedo their performance by influencing the benchmark in unpredictable ways - and we understand their trepidation - but we also believe that downside catalysts, should they materialize, will be met with eager buying.

- **Our new outlook gives TSLA more credit for sustained success.** Our forecast implies 894k vehicle deliveries in 2021, eventually ramping to 9M+ units in 2030. Note that this level of production would rank TSLA among the top-3 auto makers globally. More important still, we anticipate a steady ramp in full self-driving (FSD) software adoption starting in 2030, with 50%+ of all Tesla owners using the FSD package by the end of our forecast period. This should have a big impact on margins, with EBIT margin eventually exceeding 40%. Finally, by the 2030s, we expect Tesla Energy to represent 20%-30% of revenue (vs. ~6% today). Taken together, these changes drive our DCF-based price target up to $1,200 (vs. $515 previously).

- **Tesla is targeting multi-trillion dollar markets; there will always be new levers for growth.** Some may scoff at our generous assumptions re: TSLA's long-term potential, but consider this: our model does not contemplate Tesla's eventual entry into the HVAC or auto insurance markets, both of which represent hundreds of billions in market-wide revenue. Our forecast of peak vehicle production (9M units/year) is also materially below Tesla's own ambitions, based on capacity plans outlined at Battery Day. Plus we could be under-modeling Tesla's solar revenue, as well as "Autobidder" and other opportunities in the Energy segment (these businesses are still nascent).

RISKS TO ACHIEVEMENT OF PT & RECOMMENDATION

Production delays, failure to meet customer expectations, product defects and recalls, supply chain disruptions, slow adoption of electric vehicles.

COMPANY DESCRIPTION

Tesla sells electric vehicles, batteries, solar-powered rooftops, and various other products.

PRICE: US$793.53
TARGET: US$1,200.00
Based on 20-yr DCF, WACC=10.3%

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Changes	Previous	Current
Rating	—	Overweight
Price Tgt	US$515.00	US$1,200.00
FY21E Rev (mil)	US$56,764.7	US$53,102.3
FY22E Rev (mil)	—	US$86,733.1
FY21E EPS	US$5.34	US$4.78
FY22E EPS	—	US$9.68

52-Week High / Low	US$900.40 / US$70.10
Shares Out (mil)	1,124.0
Market Cap. (mil)	US$891,927.7
Avg Daily Vol (000)	43,514
Book Value/Share	US$19.77
Price/Book	4,014%
Net Cash Per Share	US$6.85
Debt to Total Capital	34.0%
Div (ann)	US$0.00
Fiscal Year End	Dec

Price Performance - 1 Year

Source: Bloomberg

YEAR	REVENUE (US$ m)						EARNINGS PER SHARE (US$)					
	Mar	Jun	Sep	Dec	FY	FY RM	Mar	Jun	Sep	Dec	FY	FY P/E
2020A	5,985.0	6,036.0	8,771.0	10,744.0	31,536.0	28.3x	0.23	0.44	0.76	0.80	2.24	NM
2021E	10,772.5	12,728.4	13,833.9	15,767.4	53,102.3	16.8x	0.84	1.10	1.27	1.58	4.78	NM
2022E	17,492.7	20,746.7	22,593.5	25,900.1	86,733.1	10.3x	1.88	2.33	2.52	2.95	9.68	82.0x

Investing in Tesla:

The Definitive Guide, 1st Edition

Establishing our New Price Target of $1,200

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Part 1

Tesla's Products & Go-to-Market Strategy

Products & Go-to-Market Strategy: Automotive Segment

How Does Tesla Generate Revenue in the Automotive Segment?

1

ELECTRIC VEHICLE DIRECT SALES

- Tesla owns/operates its own stores
- Customers buy EVs online or in-store
- ASP includes charging access, software, etc.
- Some of the vehicle sales price gets deferred…
- Deferred rev. example: up-front software fees

2

ELECTRIC VEHICLE LEASES

- Tesla leases vehicles in the U.S., Canada, EU
- Lease terms can last up to 48 months
- TSLA collects payments as leasing revenue
- After 36-48 mo., lessees return or buy the cars
- Reclaimed vehicles are eventually sold by TSLA

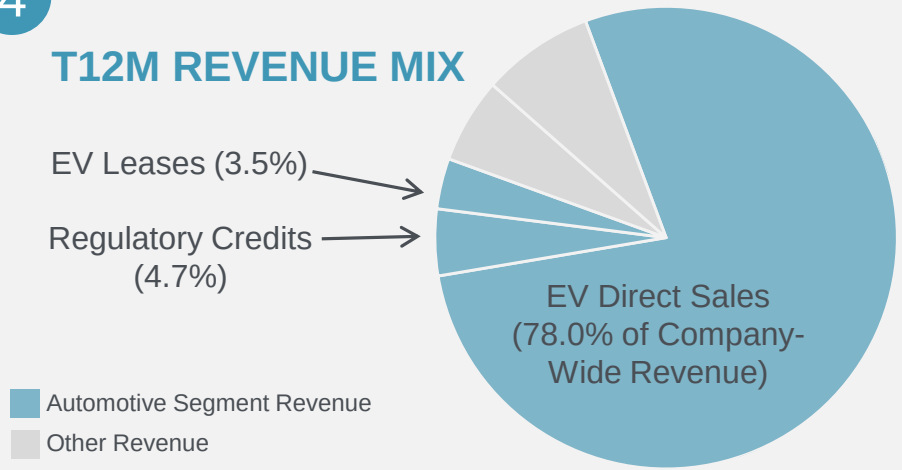
3

REGULATORY CREDIT SALES

- Car makers are required to cut emissions
- …but OEMs often miss their emissions targets
- To gain compliance, OEMs can buy credits
- TSLA has excess credits due to its EV sales
- Credit prices are negotiated on a one-off basis

4

T12M REVENUE MIX



Source: company filings and Piper Sandler research

Automotive Segment Products: Model S and Model X

Model S and Model X are TSLA's flagship vehicles; they target the premium segment

Model S Sedan

- Tesla's premium sedan; introduced in 2012
- 387-520 mile driving range (best among all EVs)
- 0-60mph in <2.0s, top speed 200mph (Plaid)
- 17-in touch-screen, 28ft^3 of storage space
- Pay-per-use access to supercharger network
- Base price: $69,420 (priciest option $158,490)

Model X SUV

- The *Fabergé Egg* of SUVs; introduced late 2015
- 341-371 mile driving range
- 0-60mph in 2.6-4.4 seconds
- 17-in touch-screen, 88ft^3 of storage space
- Pay-per-use access to supercharger network
- Base price: $79,990 (priciest option ~$125,990)

Source: Company website; specifications current as of January 26, 2021

Automotive Segment Products: Model 3 and Model Y

Relative to Model S and Model X, these vehicles are more attainably priced

- The result of Master Plan #1; released late 2017
- 263-353 mile driving range
- 0-60mph in 3.1-5.3 seconds
- 15-in touch-screen, 15ft^3 of storage space
- Pay-per-use access to supercharger network
- Base price: $37,990 (priciest option ~$67,990)

Model 3 Sedan

- Tesla's newest launch; first deliveries March 2020
- 244-326 mile driving range
- 0-60mph in 3.5-5.3 seconds
- 15-in touch-screen, 68ft^3 of storage space
- Pay-per-use access to supercharger network
- Base price: $41,990 (priciest option ~$73,990)

Model Y Crossover

Source: Company website; specifications current as of January 26, 2021

Automotive Segment Products: Roadster and Cybertruck

Roadster and Cybertruck – gutsy designs, amazing specs

Roadster (Coming in 2022)

- Modern incarnation of TSLA's first vehicle
- 200kWh battery will deliver 620 miles of range (!)
- 0-60mph in 1.9 sec; fastest production car ever
- Supercar performance with seating for four
- $50,000 reservation deposit
- Base price: $200,000 (priciest option $250,000)

Cybertruck (Coming in 2021-2022)

- 250-500+ mile range; 0-60mph in <6.5 sec
- Towing capacity: 7,500-14,000+ pounds
- 17" touch-screen; 100ft^3 of lockable storage
- Onboard power, compressed air, seating for six
- Armored glass; nearly impenetrable exoskeleton
- Base price: $39,900 (priciest option ~$80,000)

Source: Company website; specifications current as of January 26, 2021

Automotive Segment Products: Tesla Semi

The physics are legit, but considering battery constraints, can/should TSLA compete here?

- Driving range: 300-500 miles
- Energy consumption: <2 kWh per mile
- Capable of maintaining 60mph up 5% grade
- Price: $150k (300 mile) or $180k (500 mile)
- Very limited volume produced so far
- Other vehicles have been prioritized over Semi
- …this is due to limited battery capacity
- Should Tesla even compete in this segment?

Source: Company website; specifications current as of February 10, 2020

Automotive Segment Products: Unannounced Vehicles

To truly displace gasoline, TSLA will need to introduce more (and cheaper) vehicle models

A $25k car (Coming perhaps in 2023?)

- TSLA committed to a $25k car in Sept. 2020
- Online speculation suggests a possible hatchback
- Any low-end sedan would likely be built in China
- …Tesla's Berlin factory would also make sense
- Sedans are a shrinking segment in the U.S.
- A low-end sedan may also double as a robo-taxi

?????

A van? A small crossover?

- SUVs/crossovers represent the biggest segment
- ~50% of U.S. sales are crossovers and SUVs
- …but Tesla's products (Model Y, X) are too pricey
- A cheap SUV (~$30k) would spark lots of demand
- Delivery vans are also a potentially viable market
- Van sales seem likely to benefit from e-commerce

Source: Tesla Battery Day presentation; Piper Sandler research

Automotive Segment Products: Supercharger Access, Connectivity

Tesla collects fees for Supercharger access and connectivity/infotainment

Superchargers

- Tesla has over 2k supercharger stations globally
- Coverage includes North America, Europe, Asia
- Supercharging is for road trips, not daily usage
- Tesla.com provides a cost estimate of $0.26/kWh
- …this implies $19.50 to "fill" a Model 3 (75kWh)
- Pay-per-use fees: booked in Automotive revenue

Connectivity Packages	Standard Included	Premium $9.99/mo
Navigation	✓	✓
Live Traffic Visualization	-	✓
Satellite-View Maps	-	✓
Video Streaming*	-	✓
Caraoke*	-	✓
Music Streaming*	-	✓
Internet Browser*	-	✓

** Available over Wi-Fi for Standard Connectivity*

Premium Connectivity

- All vehicles come equipped w/ basic connectivity
- Users can buy premium connectivity for $9.99/mo.
- Subscriptions are managed through Tesla account
- Most new vehicles receive a free 30-day trial
- Cars bought before Jul-18 have free lifetime access
- Subscription fees: booked in Automotive revenue

Source: Company website

Automotive Segment Products: Autopilot & Full-Self Driving

Buyers can opt in to access software updates that unlock increasing levels of autonomy

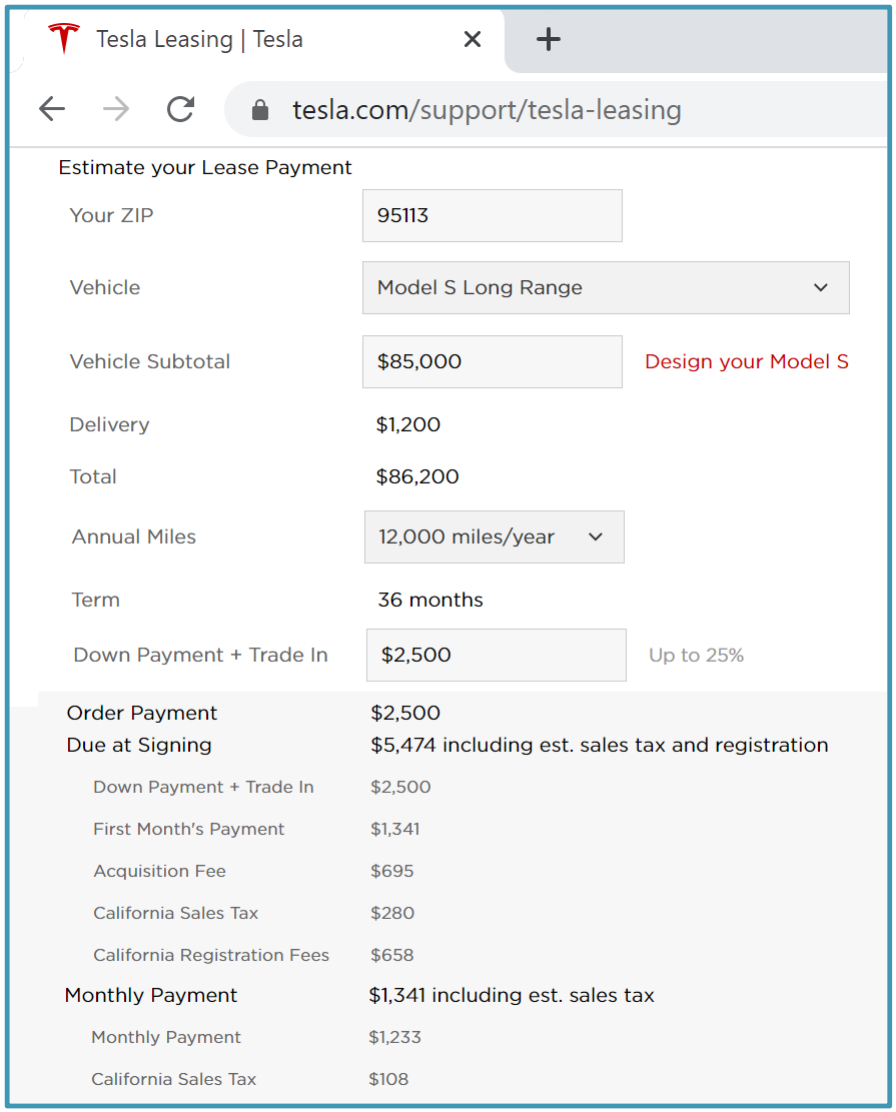
Autopilot & Full Self Driving

- All vehicles come equipped with “future-proof” hardware
- 8 cameras, 1 radar, 12 ultrasonic sensors, custom processors
- As of April 2019, all vehicles also come standard w/ Autopilot
- Autopilot includes adaptive cruise control and “Autosteer”
- Users can enable Full Self Driving (FSD) for an extra $10k
- Despite the name, FSD is not yet capable of full autonomy
- Much of the $10k is initially booked as deferred revenue
- TSLA books revenue when updates are released via software
- Pricing is likely to rise as Tesla demonstrates FSD capability
- Users can buy FSD using over-the-air (OTA) updates
- Cost-free OTA updates can also be used for non-FSD systems
- Other standard (cost-free) features include:
  - Automatic Emergency Braking, Obstacle Aware Acceleration
  - Front and Side Collision Warning system
  - Blind Spot Monitoring, Lane Departure Avoidance

Source: Company website, filings

Automotive Segment Products: Vehicle Leasing

Leasing represents 5%-10% of Tesla's deliveries and 4.1% of company-wide revenue

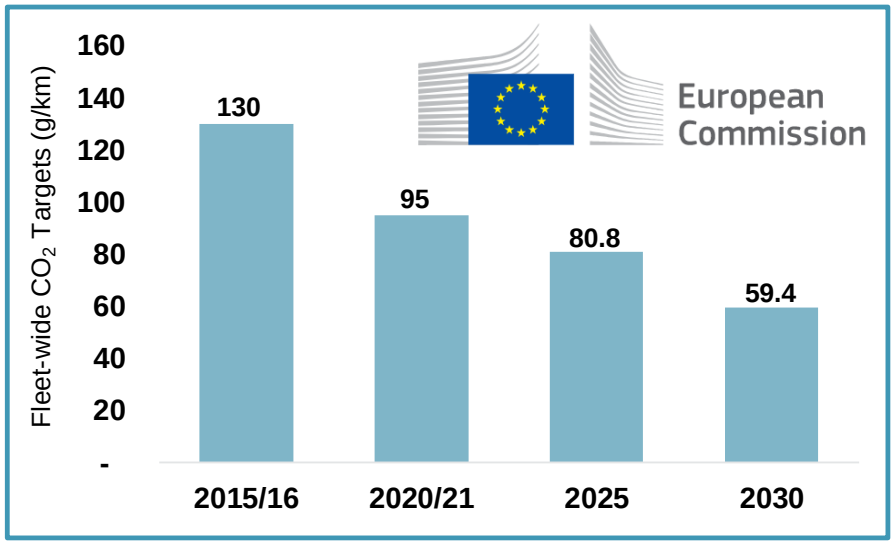


- Consumers can arrange leases at Tesla stores
- At left: a screenshot of Tesla's lease estimator
- Lease terms usually last 36 months
- Tesla carries leased vehicles on its balance sheet
- Three types of lease-related revenue:
  - Down-payments, including customer trade-in
  - Depreciation fees (part of monthly payment)
  - Finance charges (part of monthly payment)
- Off-lease cars are reclaimed and sold by TSLA
- Off-lease car sales are "Service & Other" revenue
- Leasing is often more lucrative than outright sales
- Leasing can drive $000's more in lifetime revenue
- Margins often hinge on strong residual values

Source: Company website

Automotive Segment Products: Regulatory Credits

When auto makers cannot reach emissions-related mandates, they buy credits from Tesla



- Governments are tightening emissions regulations
- California requires auto makers to sell more ZEVs*
- The EU requires auto makers to cut g/km of CO_2
- China is preparing similar mandates
- Tesla is automatically in compliance w/ these rules
- Auto OEMs can pay TSLA to help them hit targets
- Fiat-Chrysler will "pool" its fleet with Tesla in the EU
- …the agreement may net Tesla ~$2B in revenue
- "ZEV credits" can be sold in CA and 9 other states
- In 2016-2019, credit sales were ~$1.4B in revenue
- This revenue is volatile and difficult to forecast
- Pricing is determined in closed-door negotiations
- Revenue has recently been $200M-$400M/quarter

ZEV = "zero emission vehicle"

Source: California Air Resources Board, European Commission, Piper Sandler Research

Products & Go-to-Market Strategy: Energy Generation and Storage

How Does Tesla Generate Revenue in the Energy Generation and Storage Segment?

1

ENERGY STORAGE SYSTEM SALES

- 3 products: Powerwall, Powerpack, Megapack
- All products are sold direct or through partners
- Direct sales examples: website, galleries, etc.
- Larger projects rely on professional sales team
- Utilities or contractors can sell/install too

2

SOLAR SYSTEM SALES

- Traditional solar panels or the new Solar Roof
- Systems are sold through galleries or tesla.com
- Offered as an alternative to grid-based electricity
- Tesla sells to both consumers and businesses
- Installations conducted by Tesla and 3rd parties

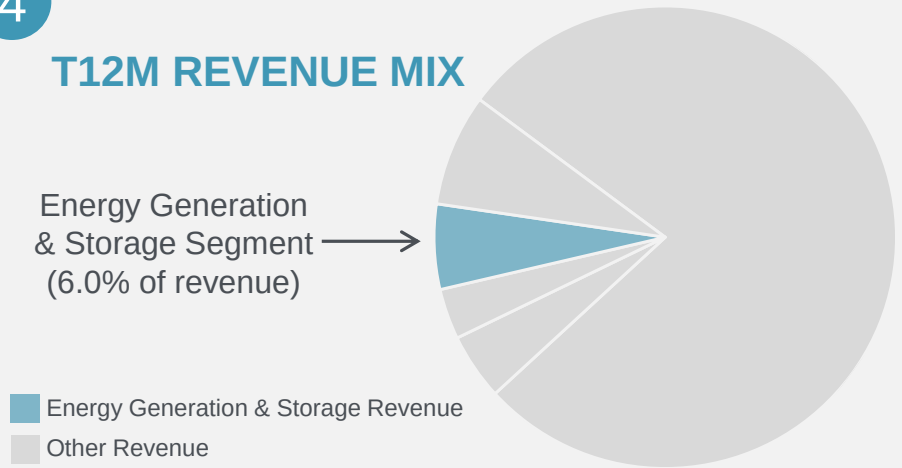
3

LOANS, LEASES, AND PPAs

- Tesla offers several Energy finance products
- Solar loan: 3rd-party loan for new solar systems
- Solar lease: fixed fees to reduce utility bill
- Power purchase agreements: fee per kWh
- Loans for customers combining solar+storage

4

T12M REVENUE MIX



Source: company filings and Piper Sandler research

Energy Generation & Storage Products: Powerwall and Powerpack

Powerwall & Powerpack contain batteries that store large amounts of electricity

Tesla Powerwall

- 13.5kWh Li-ion battery for household use
- Current generation began shipping in late 2016
- Can be mounted on interior/exterior walls or floors
- Scalable: up to 10 Powerwalls per installation
- Targets individual households or small buildings
- Price: $7,000 ($11k+ including hardware & install)

Tesla Powerpack

- Larger than Powerwall; storage up to 232kWh
- Current generation began shipping in 2017
- Scalable to enable greater storage capacity
- Targets commercial consumers, micro-grids, etc.
- Used for shifting consumption to off-peak hours
- Also used for backup power during grid outages

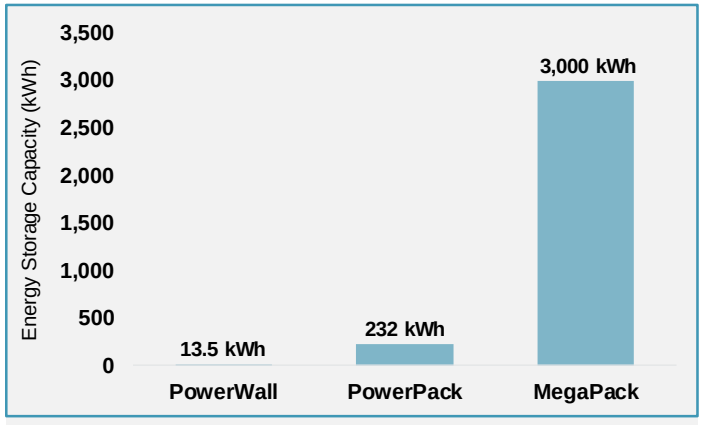
Source: Company website and filings

Energy Generation & Storage Products: Megapack

Since its introduction in 2019, Megapack has offered scalable, utility-grade storage

Tesla Megapack

- Grid-scale storage, scalable to over 1GWh
- …enough to power San Francisco for 6 hours
- Ideal for integrating renewables into power grids
- An alternative to costly gas-fired “peaker plants”
- Can be built 10x faster than comparable solutions
- …also uses 40% less space and 10x fewer parts



Storage Capacity Comparison

- A Megapack is ~13x larger than a Powerpack
- A Powerpack is ~17x larger than a Powerwall
- Pricing varies widely for Powerpack/Megapack
- The 2017 Hornsdale Project (129 MWh) cost $66M
- …this equates to an installed cost of ~$512/kWh
- 1 PowerWall installed cost: probably ~$600/kWh

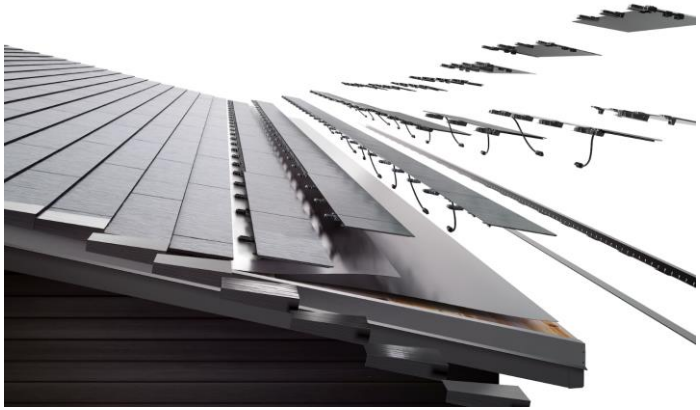
Source: Company website, filings, and Neoen IPO filings; based on specifications in 10-K filed for 2019

Energy Generation & Storage Products: Solar Energy Systems

Tesla sells both traditional solar systems and its proprietary “Solar Roof”

Traditional Solar Energy Retrofits

- Systems include solar panels and other hardware
- Hardware examples: inverters, racks, monitoring
- Most components are purchased from 3rd parties
- Systems are sold+installed by Tesla or partners
- Customers include consumers and businesses
- Panels are installed on existing rooftops



3rd Generation Solar Roof

- Tesla’s integrated solar rooftop, built in New York
- A typical system may cost $30k-$50k
- ~5M new rooftops are installed per year in the U.S.
- …at $33k per solar roof: market size = **$165B/year**
- More economical than a new roof with no solar
- Still in ramp-up phase; not available in all locations

Source: Company website and company filings

Energy Generation & Storage Products: Subscriptions and PPAs

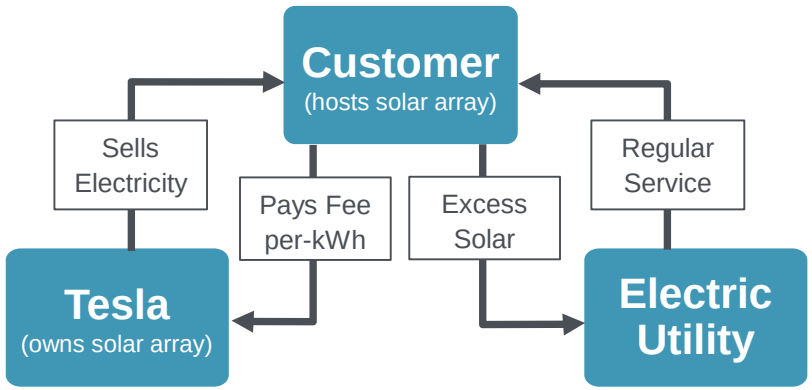
Tesla has de-emphasized these offerings in favor of selling solar power systems directly

Subscription vs. Purchase

	SUBSCRIPTION	LOAN PURCHASE
CASH UPFRONT	None	None
LIFETIME VALUE	Good	Better
SYSTEM OWNERSHIP	No	Yes
POWERWALL	May be purchased separately by cash or loan	Can be added to loan
CANCEL ANYTIME	No cancellation fee	N/A
INVESTMENT TAX CREDIT	Tesla keeps tax credit to provide low subscription price	Yes Apply your tax credit to your loan to maintain monthly payment amount
MAINTENANCE	Tesla owns and maintains the system	10 year comprehensive and 25 year panel performance warranty

Solar Leases (Subscriptions)

- Leases: customers can use solar w/ no initial cost
- Tesla retains ownership of leased systems
- Customers pay a fixed monthly fee
- The fee typically equates to savings vs. utility bills
- Actually not “leases” based on new rev. rec. policy
- Solar energy systems: 13.2% of TSLA’s total assets



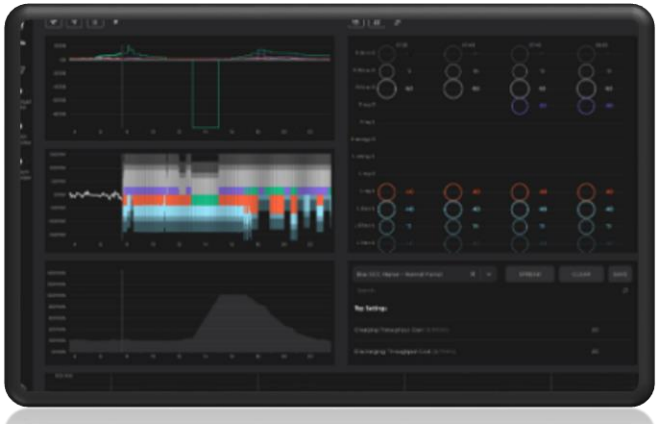
Power Purchase Agreements (PPAs)

- TSLA can also sell power produced by solar panels
- Through a PPA, customers pay a fee per kWh
- Most leases and PPAs: 20-yr renewable terms
- Balance sheet item includes both PPAs and leases
- Leases & PPAs have energy production guarantees
- If production falls short, Tesla compensates 1x/year

Source: Company website, company filings, Piper Sandler research

Energy Generation & Storage Products: Utility Services and HVAC

Tesla's energy expertise could eventually be deployed in lots of creative ways



Utility Services (Autobidder)

- Autobidder is a software platform for utilities
- The system enables grid-scale battery optimization
- Active management helps maximize battery value
- The goal: dispatch power based on price, demand
- Presumably a high margin business
- The system is being trialed in several regions

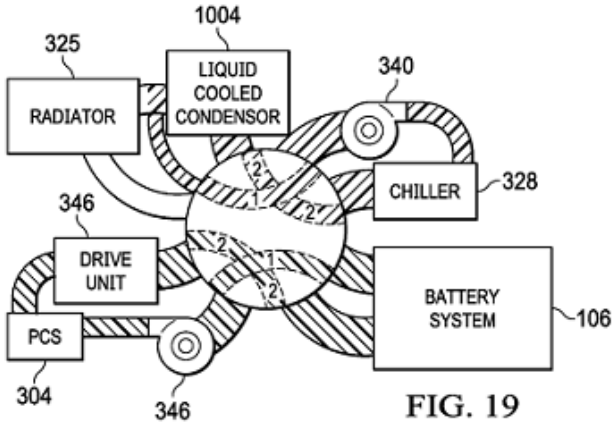


FIG. 19

HVAC Applications (the "Octovalve")

- Tesla's vehicle I.P. can be used in other industries
- …stationary battery storage is but one example
- The HVAC system in Model Y uses the "Octovalve"
- Octovalve is a compact heat exchanger
- …the unit could be used in home heating/cooling
- Global HVAC market size: ~$250B per year

Source: Piper Sandler research; Octovalve image from US patent no. 20190070924A1; Autobidder U.I. image from Tesla.com

Products & Go-to-Market Strategy: Services & Other

How Does Tesla Generate Revenue in the "Services and Other" Segment?

1

AFTER-SALES VEHICLE SERVICE

- Fees for non-warranty vehicle maintenance
- Vehicle warranties are usually ~4 years
- There are 161k 4+ year-old Teslas as of 3Q20
- …by 2H22, this figure should exceed 500k
- Revenue generally increases with fleet size

2

USED VEHICLE SALES

- Tesla books revenue from selling traded-in cars
- Off-lease vehicles are also reclaimed and sold
- Pricing is a key driver of used vehicle revenue
- Used mix should trend toward lower ASPs
- The company sells Tesla- and non-Tesla units

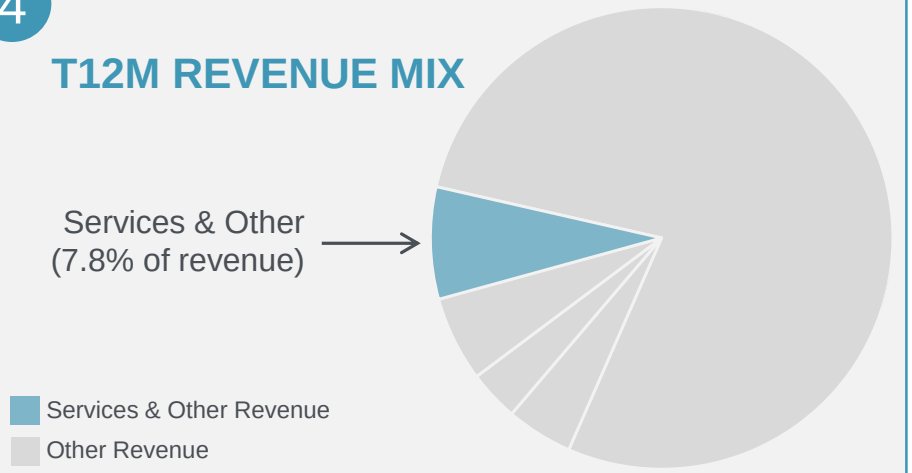
3

MERCHANDISE, INSURANCE, OTHER

- Currently a tertiary driver of revenue
- T-shirts, "short shorts" Tesla Tequila, etc.
- Sales by acquired entities to 3rd parties
- Also includes Insurance revenue
- …this latter category could eventually be big

4

T12M REVENUE MIX

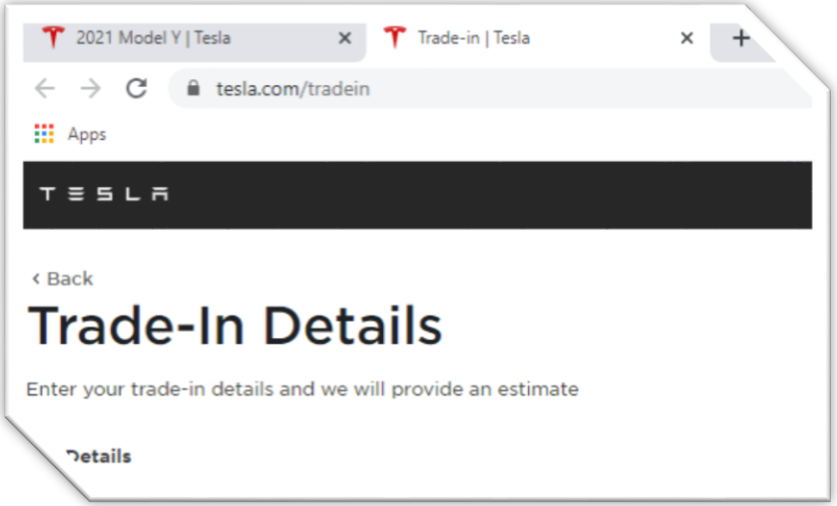


Source: company filings and Piper Sandler research

Services & Other Products: After-market Repairs and Trade-ins

Most “Services & Other” revenue comes from out-of-warranty repairs and used car sales

- Service locations provide out-of-warranty repairs
- Vehicle warranties expire at 4 years or 50k miles
- …so for a given car, revenue inflects after 4 years
- Service can also be conducted via mobile techs
- As of 3Q20, Tesla had 466 service locations
- …and 780 mobile service vehicles



- Tesla accepts used trade-ins (even gasoline cars)
- The company earns revenue by selling these cars
- Offers are fixed (no haggling re: trade-in value)
- Off-lease Teslas are also reclaimed and sold
- We think off-lease Teslas are ~15% of segment rev.
- Trades aren’t a profit driver; goal is to break even

Source: Company website and filings, Piper Sandler research

Services & Other Products: Merchandise and Accessories

A cheeky way to drive brand awareness without devoting opex to advertising

Tesla Tequila
$250
(out of stock)

- Tesla sells merchandise both in-store and online
- Examples of Tesla's products in this category:
  - "Short shorts" that poke fun at short sellers
  - Tesla Tequila… for drinking on the day Tesla files for bankruptcy
  - Vehicle accessories (e.g. floor mats, charging adapters, etc.)
  - Other, more mundane items (e.g. mugs, hoodies, hats, etc.)
- Revenue from these items is likely immaterial…
- …nevertheless, these products have a real impact on the P&L
- Tesla's $0 ad budget is partly due to bold/controversial products

"THEY'VE GONE TO PLAID!!!"

- Space Balls

Source: Company website, filings

Services & Other Products: Tesla Insurance

Maybe a game-changer someday, but currently a nonfactor (only available in California)

- Tesla plans to sell auto insurance, using proprietary data from its network of connected vehicles
- Car insurance is too expensive: at $100+/month, that's 25%+ of the lease cost for a Model 3
- Tesla says pricey auto insurance is due to insurance companies' poor access to real-world data
- We do not explicitly model insurance-related revenue, but the financial impact could be real
- Back-of-the-envelope math:
  - In 2025, we expect Tesla to have an active population of around 15M vehicles
  - If each vehicle were insured by Tesla at $70/month, that equates to ~$12.6B in annual revenue
  - As a percentage of revenue, this would be minor (~5%)
  - …but by reducing the cost to own EVs, cheaper insurance could help Tesla increase vehicle market share

2Q20 Earnings Transcript:

"…on the insurance front, I want to be clear. We're building a great, like, major insurance company. If you're interested in revolutionary insurance, please join Tesla. I would love to have some high energy actuaries, especially. I have great respect for the actuarial profession. You guys are great at math. Please join Tesla; especially if you want to change things and you're annoyed by how slow the industry is. This is the place to be. We want revolutionary actuaries."

-Elon Musk

Source: FactSet; Piper Sandler research

Part 2

Tesla's Sources of Differentiation

Sources of Differentiation: Mission and Branding

Everyone else is a poser.

Mission, culture, and CEO leadership

- Tesla has never waivered from its defining mission
- The "Master Plan" has been on tesla.com since '06
- At other companies, *sustainability* is just a buzzword
- …but Tesla isn't that kind of company
- Consumers can tell: other brands are faking it
- If the industry is changing, it's primarily due to Tesla

Branding and the "coolness" factor

- Tesla's products generate buzz naturally
- …and as a result, the company has no ad budget
- Consumers enjoy Tesla's thumb-in-your-eye attitude
- Other brands seem decidedly boring by comparison
- Elon Musk's old Roadster is literally orbiting the sun
- …what other company can say something like that?

Source: Company website; Piper Sandler research

Sources of Differentiation: Technology and Scale

Tesla offers better technology at a lower cost (due partially to economies of scale)

EV Core Efficiency - Matt Joyce @matty_mogul					
Electric Vehicle (*EPA Estimate)	Starting Price ($USD)	Battery (kWh)	EPA Range (Miles)	Weight (Lbs)	Core Efficiency (kWh/Range/Weight)
Tesla Model X LR	$79,990	100	371	5,421	5.0
Tesla Model S LR	$69,420	100	402	4,883	5.1
Tesla Model Y LR	$49,990	75	326	4,416	5.2
Tesla Model 3 LR	$46,990	75	353	4,032	5.3
Tesla Model 3 SR+	$37,990	50	263	3,554	5.3
Hyundai Ioniq	$33,045	38	170	3,366	6.6
Hyundai Kona	$37,190	64	258	3,715	6.7
Mercedes EQC*	$67,900	80	220	5,346	6.8
Ford Mustang Mach E*	$49,800	99	300	4,727	7.0
Nissan Leaf S Plus	$38,200	62	226	3,882	7.1
Chevy Bolt	$36,620	66	259	3,563	7.2
Volvo Polestar 2*	$59,990	78	233	4,680	7.2
Renault Zoe*	$26,000	52	216	3,311	7.3
Rivian R1S*	$72,000	135	310	5,842	7.5
Rivian R1T*	$69,000	135	300	5,886	7.6
Audi e-tron Sportback	$65,900	95	204	5,843	8.0
Xpeng G3*	$29,102	66	226	3,609	8.1
Jaguar I-Pace	$69,850	90	234	4,702	8.2
Nio ES8*	$67,000	84	185	5,423	8.4
BMW i3	$44,450	42	153	2,972	9.2
Porsche Taycan 4S Perf+	$117,110	93	203	4,953	9.2
Core Efficiency = Battery kWh / (EPA Range/100 Miles) / (Vehicle Weight/1,000 lbs)					

- Peers cannot match Tesla's range or efficiency
- See table at left: the top-ranking EVs are all Teslas
- …this wouldn't be possible without superior tech
- Proprietary I.P. includes the following:
  - Tabless battery cells built using "dry electrode" process
  - "Octovalve" heat pump for maximizing HVAC efficiency
  - In-house software with seamless over-the-air updates
  - Single-piece aluminum casting for vehicle underbody
  - …and there are *MANY* other examples

Technology leadership enables superior EV performance

- Tesla was the first to pursue EVs <u>in earnest</u>
- The supply chain was tiny when Tesla got its start
- …as a result, Tesla *built* the global EV supply chain
- Tesla Gigafactory: the world's biggest building

Mind-boggling scale unlocks lower costs

Source: Matt Joyce - Independent Tesla Analyst (@matty_mogul); Tesla.com; Piper Sandler research

Sources of Differentiation: Vert. Integration & the Musk Ecosystem

Self-reliance through vertical integration, with occasional cross-pollination via SpaceX

- Tesla is more vertically integrated than most OEMs
- Components can't be outsourced if they don't exist
- Also, suppliers don't give Tesla 100% of their focus
- …in these situations, Tesla absorbs core suppliers
- M&A examples: Grohmann, Maxwell, PERBIX, etc.

"We made the machine that made the machine that made the machine." -Elon Musk

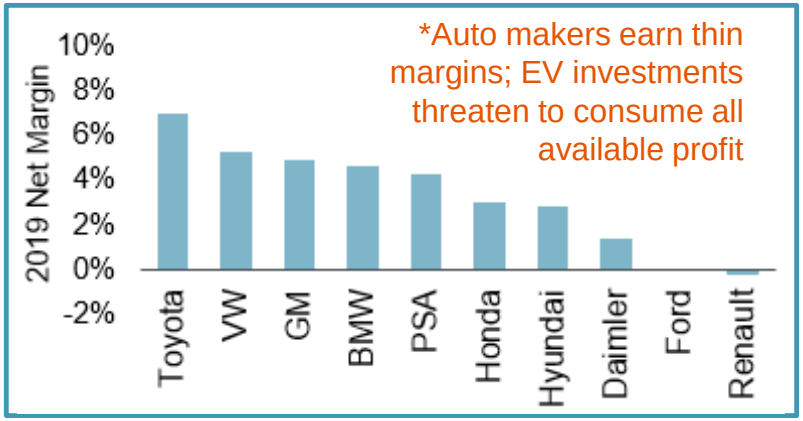
Technology from the "Musk Ecosystem"

- Elon Musk owns several other companies
- …including SpaceX, the Boring Company, OpenAI
- Tesla sometimes borrows tech from these entities
- E.g. Cybertruck uses the same steel as Starship
- Another example: SpaceX thrusters for Roadster??
- Intra-ecosystem acquisitions cannot be ruled out

Source: Company websites; Piper Sandler research

Sources of Differentiation: No ICE Cannibalization and No Dealers

Companies based on the internal combustion engine (ICE) have lots of legacy baggage



- Auto makers usually make single-digit net margins
- …this is too low to support redundant platforms
- EVs will cannibalize more lucrative ICE-based cars
- Ford: EVs require 30% fewer labors hours per unit…
- …this foretells a costly fight with unionized workers

ICE cannibalization: a key worry among legacy automakers (and their employees)

- EVs require fewer repairs (80% fewer moving parts)
- ~50% of dealer profit comes from parts & service
- …given this, existing dealers don't like selling EVs
- ICE brands can't sell EVs if dealers aren't onboard
- This is a non-issue for Tesla (b/c stores are owned)

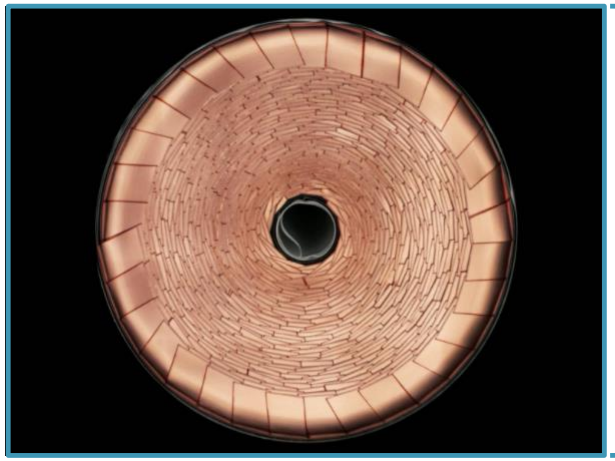
In-house distribution helps Tesla circumvent anti-EV bias among independent dealers

Source: Ford CEO strategic update, Oct 3, 2017, slide 48; Company website; FactSet; Piper Sandler research

Sources of Differentiation: First Principles Reasoning

Tesla's ultimate advantage: a willingness to challenge other peoples' supposed expertise

- In the end, all technology can be copied; this is true of Tesla's technology as well
- *HOWEVER*: it is hard to copy Tesla's company-wide approach to encouraging innovation
- Musk preaches "first principles" reasoning, prompting managers to challenge industry norms
- An example of this in practice (from Elon Musk commentary in 2013):
  - In the early 2010s, experts insisted that EV batteries were too costly ($600+/kWh)
  - …as a result, EVs were deemed uneconomical, and were not pursued by most companies
  - But the commodity price of battery materials (aluminum, lithium, cobalt, etc.) was $80/kWh
  - With this in mind, Tesla began thinking of clever ways to arrange/combine these commodities
  - Much of Tesla's cost leadership stems from that initial willingness to challenge the status quo



What's the bigger competitive advantage?

1) Controlling the I.P. for a new tabless battery cell

2) Understanding how to build a new tabless battery cell

3) <u>Having the ability to conceive new tech in the first place</u>

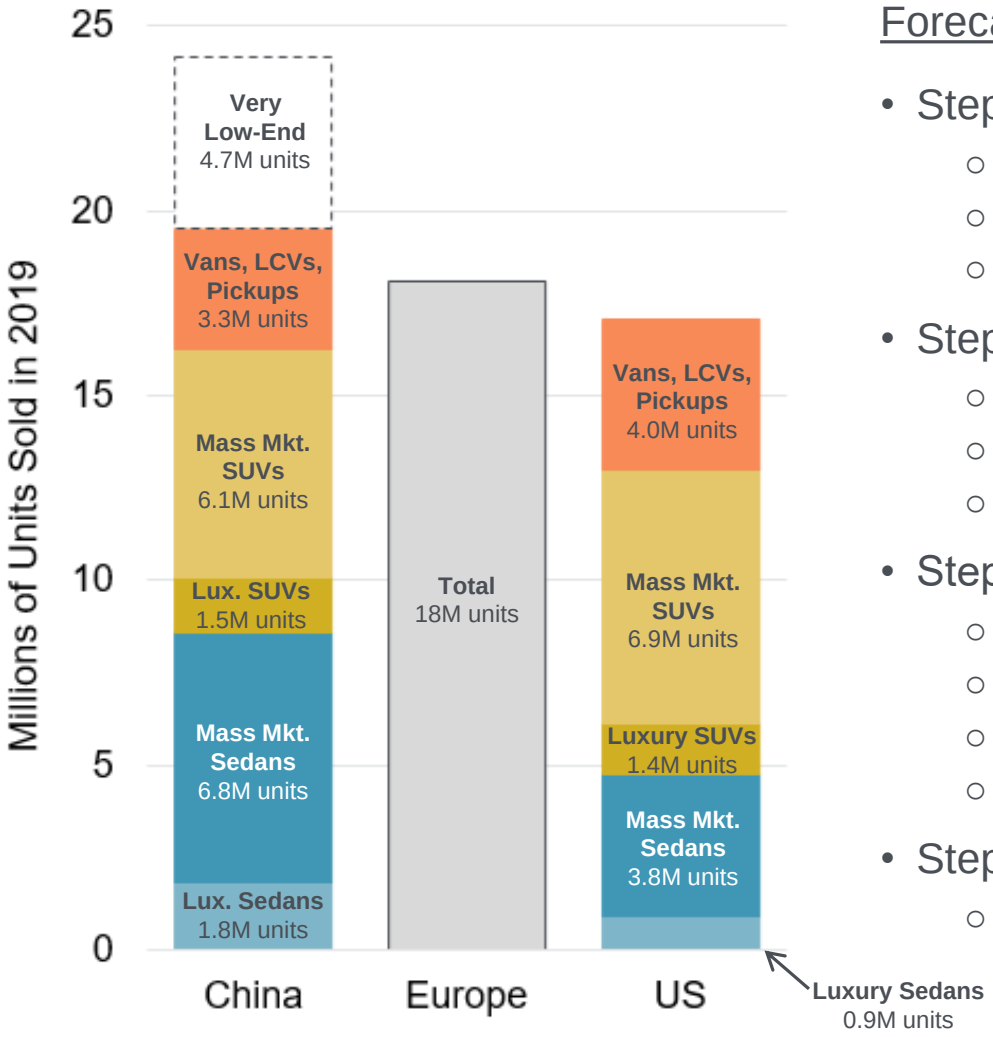
Source: Tesla, Piper Sandler research

Part 3

Forecasting Revenue: Automotive

Summarizing Tesla's Opportunity in the Automotive Market

We forecast deliveries by region and segment; see below for our forecasting process



Forecasting Process for Automotive Revenue:

- Step 1: Predict overall demand by region
  - We use per-capita auto ownership to inform fleet size
  - We estimate scrappage for historical vehicle cohorts
  - We find the # of cars needed to reach target fleet size
- Step 2: Predict segment-level demand
  - Each auto market is divided into 5-6 key segments
  - We use historical data to predict future segmentation
  - We use this approach in China and the U.S.
- Step 3: Predict Tesla's segment-level deliveries
  - We make estimates re: TSLA's segment market share
  - …this yields delivery estimates for each Tesla model
  - We use US+China to inform our EU delivery estimate
  - Assume 10% of deliveries from outside top-3 regions
- Step 4: Calculate global revenue for each model
  - We multiply units x price to find revenue

Source: Wards, Gasgoo, ACEA, Piper Sandler research

Summarizing Tesla's Opportunity in the Automotive Market

Quick glance: see below for our model-by-model expectations re: deliveries and pricing

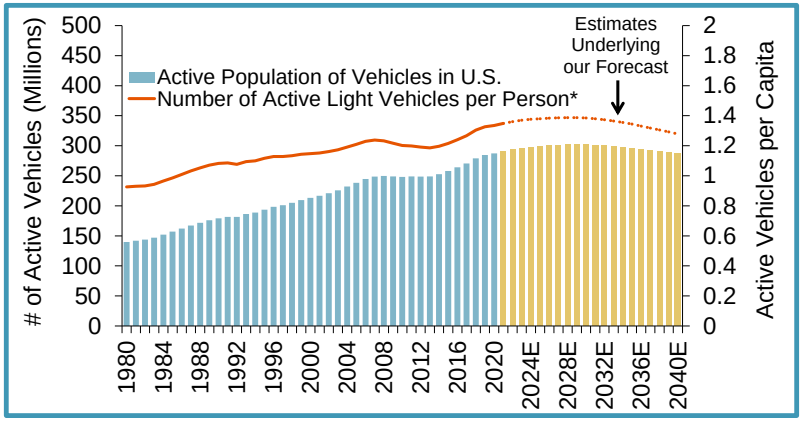
This table is meant as a summary only; for supporting analysis, see pages 36-56

	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Deliveries (millions)																				
Model S	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02
Model 3	0.48	0.60	0.75	0.91	0.94	0.98	1.03	1.07	1.10	1.11	1.11	1.11	1.09	1.06	1.04	1.02	1.00	0.99	0.96	0.94
Model X	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Model Y	0.35	0.73	1.17	1.44	1.51	1.58	1.63	1.67	1.72	1.73	1.74	1.75	1.73	1.69	1.66	1.63	1.61	1.59	1.56	1.53
Roadster	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cybertruck	-	0.07	0.31	0.60	0.79	0.80	0.77	0.76	0.75	0.74	0.74	0.74	0.73	0.72	0.71	0.71	0.70	0.69	0.69	0.68
Tesla Semi	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
Hatchback	-	-	0.15	0.63	1.19	1.72	1.73	1.70	1.70	1.69	1.68	1.70	1.66	1.60	1.58	1.54	1.52	1.50	1.47	1.44
Robo-taxi	-	-	-	-	-	-	0.00	0.01	0.02	0.05	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06
Small Crossover	-	-	-	-	0.24	0.73	1.45	2.30	2.98	3.30	3.30	3.32	3.26	3.17	3.12	3.06	3.02	2.98	2.92	2.87
Van	-	-	-	-	0.05	0.15	0.33	0.42	0.45	0.45	0.45	0.46	0.45	0.44	0.43	0.42	0.42	0.41	0.41	0.41
Mini-Cybertruck	-	-	-	-	-	0.02	0.06	0.11	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Total (millions)	0.88	1.47	2.45	3.66	4.81	6.06	7.10	8.14	8.96	9.31	9.32	9.38	9.23	8.97	8.83	8.67	8.55	8.44	8.28	8.14
*Vehicle Prices**																				
Model S	$ 83k	$ 82k	$ 81k	$ 79k	$ 77k	$ 76k	$ 74k	$ 73k	$ 71k	$ 70k	$ 69k	$ 67k	$ 66k	$ 65k	$ 63k	$ 62k	$ 61k	$ 60k	$ 58k	$ 57k
Model 3	$ 48k	$ 47k	$ 46k	$ 45k	$ 44k	$ 43k	$ 43k	$ 42k	$ 41k	$ 40k	$ 39k	$ 38k	$ 38k	$ 37k	$ 36k	$ 35k	$ 35k	$ 34k	$ 33k	$ 33k
Model X	$ 88k	$ 87k	$ 85k	$ 84k	$ 82k	$ 80k	$ 79k	$ 77k	$ 76k	$ 74k	$ 73k	$ 71k	$ 70k	$ 68k	$ 67k	$ 66k	$ 64k	$ 63k	$ 62k	$ 61k
Model Y	$ 52k	$ 52k	$ 51k	$ 50k	$ 49k	$ 48k	$ 47k	$ 46k	$ 45k	$ 44k	$ 43k	$ 42k	$ 42k	$ 41k	$ 40k	$ 39k	$ 38k	$ 38k	$ 37k	$ 36k
Roadster	$ 250k	$ 250k	$ 250k	$ 250k	$ 250k	$ 250k	$ 250k	$ 250k	$ 250k	$ 250k	$ 250k	$ 250k	$ 250k	$ 250k	$ 250k	$ 250k	$ 250k	$ 250k	$ 250k	$ 250k
Cybertruck	$ 55k	$ 55k	$ 54k	$ 54k	$ 53k	$ 52k	$ 51k	$ 50k	$ 49k	$ 48k	$ 47k	$ 46k	$ 45k	$ 44k	$ 44k	$ 43k	$ 42k	$ 41k	$ 40k	$ 39k
Tesla Semi	$ 180k	$ 180k	$ 180k	$ 180k	$ 180k	$ 180k	$ 180k	$ 180k	$ 180k	$ 180k	$ 180k	$ 180k	$ 180k	$ 180k	$ 180k	$ 180k	$ 180k	$ 180k	$ 180k	$ 180k
Hatchback	$ -	$ 30k	$ 29k	$ 29k	$ 28k	$ 28k	$ 27k	$ 27k	$ 26k	$ 26k	$ 25k	$ 25k	$ 24k	$ 24k	$ 23k	$ 23k	$ 22k	$ 22k	$ 21k	$ 21k
Robo-taxi	$ -	$ -	$ -	$ -	$ -	$ -	$ 45k	$ 45k	$ 45k	$ 45k	$ 45k	$ 45k	$ 45k	$ 45k	$ 45k	$ 45k	$ 45k	$ 45k	$ 45k	$ 45k
Small Crossover	$ -	$ -	$ -	$ -	$ 33k	$ 33k	$ 32k	$ 32k	$ 31k	$ 30k	$ 30k	$ 29k	$ 29k	$ 28k	$ 28k	$ 27k	$ 26k	$ 26k	$ 25k	$ 25k
Van	$ -	$ -	$ -	$ -	$ 42k	$ 42k	$ 41k	$ 41k	$ 40k	$ 39k	$ 38k	$ 38k	$ 37k	$ 36k	$ 35k	$ 35k	$ 34k	$ 33k	$ 33k	$ 32k
Mini-Cybertruck	$ -	$ -	$ -	$ -	$ -	$ 41k	$ 41k	$ 40k	$ 40k	$ 39k	$ 38k	$ 37k	$ 37k	$ 36k	$ 35k	$ 35k	$ 34k	$ 33k	$ 33k	$ 32k
Overall ASP*	$ 52k	$ 52k	$ 50k	$ 47k	$ 44k	$ 41k	$ 39k	$ 38k	$ 37k	$ 36k	$ 35k	$ 34k	$ 34k	$ 33k	$ 32k	$ 32k	$ 31k	$ 31k	$ 30k	$ 29k

Source: Piper Sandler research; *NOTE: pricing here reflects pricing for vehicles only, and hence *EXCLUDES* software

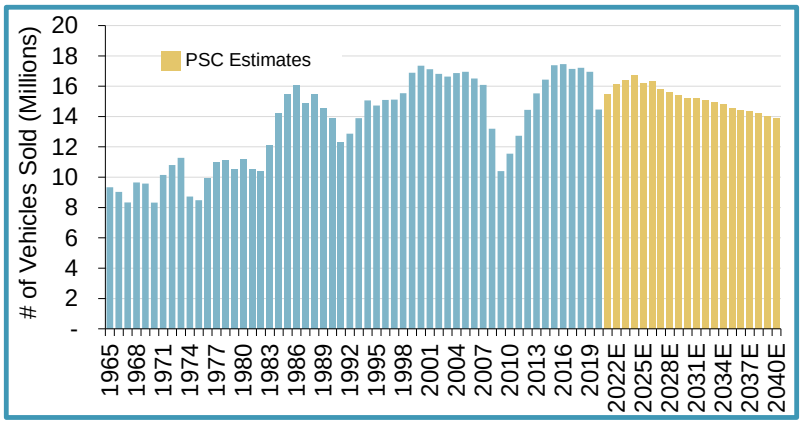
Forecasting Tesla's Vehicle Deliveries in the United States

Step 1: Building a forecast for region-wide vehicle sales in the United States



Fleet Size & Per-capita Ownership (U.S.)

- Our forecast is driven by per-capita auto ownership
- In the US, there are 1.33 active vehicles per person
- …this metric includes only people aged 15-64 years
- We think per-capita car ownership will peak in 2028
- By 2040, we think this metric will have fallen to 1.28
- …this is due to urbanization, automation, sharing



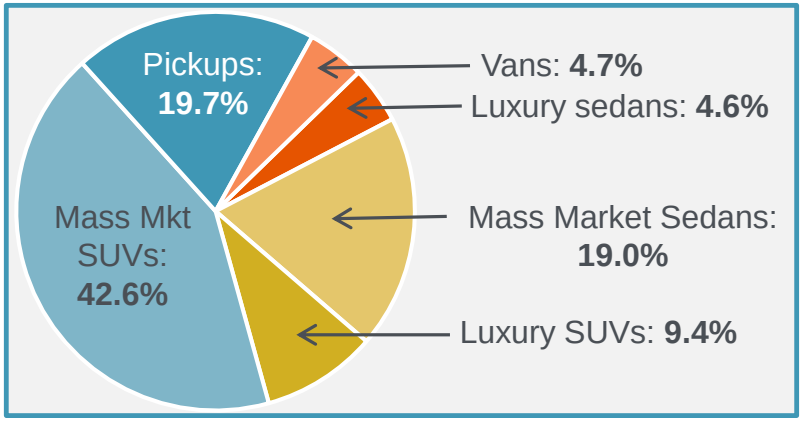
Forecasting Annual Vehicle Sales (U.S.)

- The U.S. normally sells 16M-17M light vehicles/year
- Post-COVID, we expect a slow return to 16M+ units
- But in the longer term, we expect sales to decline
- A structural decline could arrive by the late 2020s
- Our forecast contemplates the arrival of robo-taxis
- Without robo-taxis, our forecast would be higher

Source: Wards Auto, Piper Sandler research

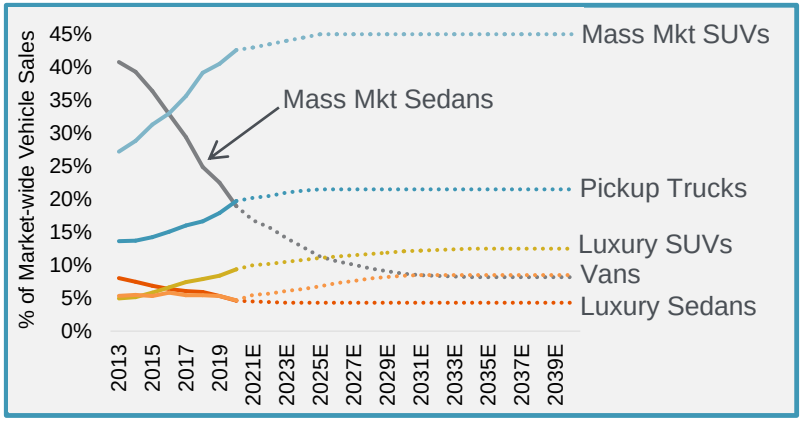
Forecasting Tesla's Vehicle Deliveries in the United States

Building a forecast for region-wide vehicle sales by segment



U.S. Market Segmentation (2020)

- We divide the US market into 6 main segments
- So far, all of Tesla's products are in luxury segments
- …these segments cover only 14% of US auto sales
- There's ample room for launches in new categories
- Cybertruck (2021 or 2022) will be Tesla's first pickup
- Even w/ Cybertruck, 2/3 of the market is off-limits



Forecast: U.S. Auto Market Segmentation

- By 2040, we think luxury will be 16% of auto sales
- We expect sedans to keep losing share to SUVs
- Vans should grow to 8%-9% of sales (e-commerce)
- We think SUVs will remain the largest category
- At present, Tesla's lineup lacks a mass-market SUV
- A crossover priced <$35k would be a game-changer

Source: Wards Auto, Piper Sandler research

Forecasting Tesla's Vehicle Deliveries in the United States

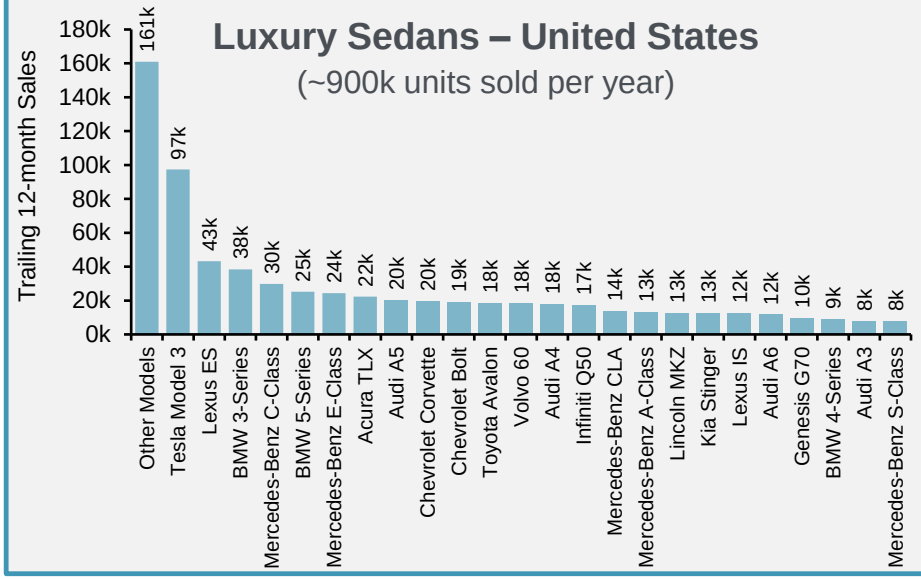
Forecasting Tesla's sales volume by segment – luxury sedans

Projecting Sales: Luxury Sedans in the United States (Millions)

	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Model 3	-	-	-	-	0.00	0.12	0.15	0.10	0.13	0.15	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.14	0.14
Model S	0.02	0.01	0.03	0.03	0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Roadster	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Tesla	0.02	0.01	0.03	0.03	0.03	0.14	0.16	0.11	0.14	0.16	0.18	0.19	0.18	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.16
Other Brands	1.21	1.26	1.22	1.06	0.99	0.88	0.75	0.58	0.56	0.55	0.52	0.53	0.51	0.52	0.50	0.49	0.49	0.48	0.48	0.48	0.47	0.47	0.46	0.46	0.45	0.45	0.44	0.44
All Luxury Sedans	1.23	1.28	1.25	1.09	1.02	1.02	0.91	0.68	0.70	0.71	0.71	0.72	0.70	0.70	0.68	0.67	0.66	0.65	0.66	0.65	0.64	0.64	0.62	0.62	0.62	0.61	0.60	0.60

Projecting Market Share: Luxury Sedans in the United States (Millions)

	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Model 3	-	-	-	-	0.1%	11.3%	16.1%	13.9%	18.0%	21.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%
Model S	1.4%	1.1%	2.0%	2.4%	2.8%	2.5%	1.8%	1.7%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%
Roadster	-	-	-	-	-	-	-	-	-	0.3%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Total Tesla	1.4%	1.1%	2.0%	2.4%	2.9%	13.8%	17.9%	15.6%	19.8%	23.1%	26.2%	26.3%	26.3%	26.3%	26.3%	26.3%	26.3%	26.3%	26.3%	26.3%	26.3%	26.3%	26.3%	26.3%	26.3%	26.3%	26.3%	26.3%
Other Brands	98.6%	98.9%	98.0%	97.6%	97.1%	86.2%	82.1%	84.4%	80.2%	76.9%	73.8%	73.7%	73.7%	73.7%	73.7%	73.7%	73.7%	73.7%	73.7%	73.7%	73.7%	73.7%	73.7%	73.7%	73.7%	73.7%	73.7%	73.7%



- Model 3 is the top luxury sedan in the U.S.
- …sales are 2.25x higher than the #2 model
- Capacity constraints likely limited sales in 2020
- Once capacity loosens, sales may rise further
- We expect Model 3 to win 24% of the segment
- Model S & Roadster are high-ASP "halo" cars
- Unfortunately, this is a shrinking segment

Source: Wards Auto, Piper Sandler research

Forecasting Tesla's Vehicle Deliveries in the United States

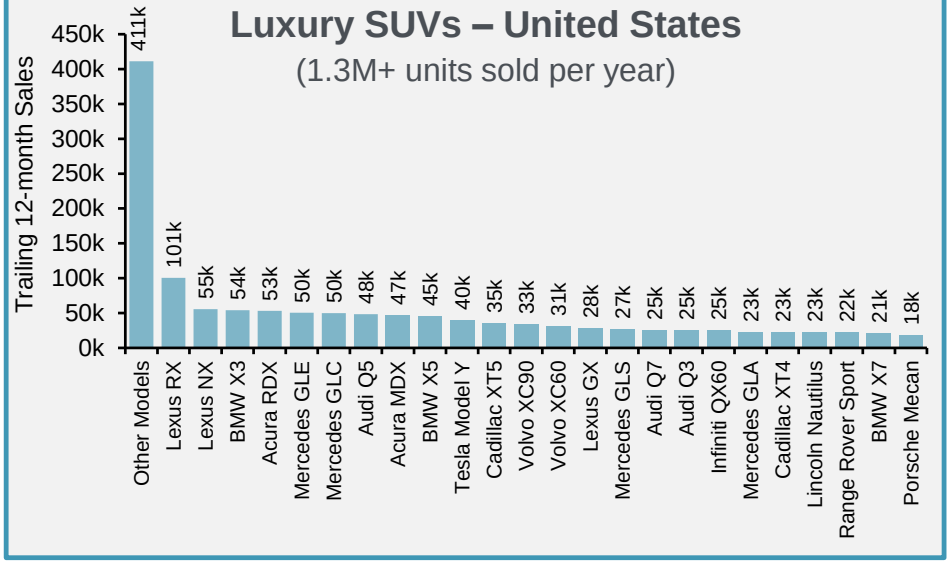
Forecasting Tesla's sales volume by segment – luxury SUVs

Projecting Sales: Luxury SUVs in the United States (Millions)

	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Model Y	-	-	-	-	-	-	-	0.05	0.19	0.30	0.43	0.45	0.45	0.46	0.45	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.45	0.45	0.45	0.44	0.44	0.43
Model X	-	-	0.00	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Total Tesla	-	-	0.00	0.02	0.02	0.02	0.02	0.07	0.20	0.32	0.45	0.47	0.47	0.48	0.48	0.48	0.48	0.48	0.49	0.49	0.49	0.49	0.48	0.47	0.47	0.47	0.46	0.46
Other Brands	0.77	0.85	1.01	1.14	1.19	1.30	1.39	1.27	1.34	1.33	1.27	1.33	1.33	1.36	1.34	1.35	1.35	1.36	1.37	1.37	1.36	1.37	1.34	1.33	1.32	1.31	1.29	1.28
All Luxury SUVs	0.77	0.85	1.01	1.15	1.21	1.32	1.41	1.34	1.55	1.65	1.72	1.80	1.80	1.84	1.82	1.82	1.84	1.84	1.86	1.85	1.85	1.85	1.81	1.80	1.79	1.77	1.76	1.74

Projecting Market Share: Luxury SUVs in the United States

	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Model Y	-	-	-	-	-	-	-	3.8%	12.0%	18.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Model X	-	-	0.0%	1.3%	1.4%	1.6%	1.3%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%
Total Tesla	-	-	0.0%	1.3%	1.4%	1.6%	1.3%	5.0%	13.2%	19.2%	26.2%	26.2%	26.2%	26.2%	26.2%	26.2%	26.2%	26.2%	26.2%	26.2%	26.2%	26.2%	26.2%	26.2%	26.2%	26.2%	26.2%	26.2%
Other Brands	100%	100%	100%	98.7%	98.6%	98.4%	98.7%	95.0%	86.8%	80.8%	73.8%	73.8%	73.8%	73.8%	73.8%	73.8%	73.8%	73.8%	73.8%	73.8%	73.8%	73.8%	73.8%	73.8%	73.8%	73.8%	73.8%	73.8%



- Tesla didn't start selling Model Y until mid-2020
- Still, Model Y ranked #6 in 2020 segment sales
- In 2021, we think Model Y will reach #1
- The Lexus RX is currently #1 (101k units/year)
- …but we think Model Y will eventually top 600k
- Eventually, we expect 25% segment share
- 25% share would be similar to Model 3

Source: Wards Auto, Piper Sandler research

Forecasting Tesla's Vehicle Deliveries in the United States

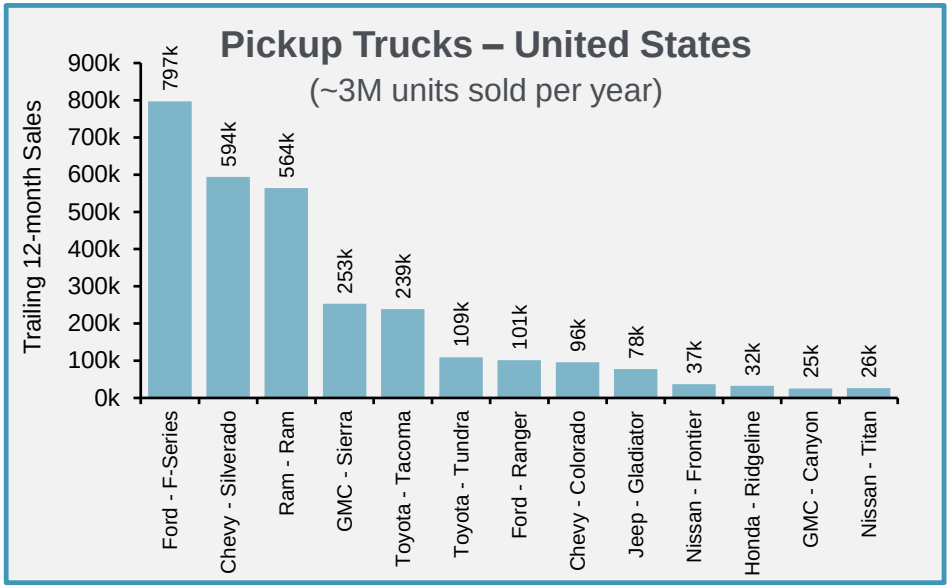
Forecasting Tesla's sales volume by segment – pickup trucks

Projecting Sales: Pickup Trucks in the United States (Millions)

	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Cybertruck	-	-	-	-	-	-	-	-	-	0.07	0.28	0.53	0.70	0.70	0.68	0.67	0.66	0.65	0.66	0.65	0.64	0.64	0.62	0.62	0.62	0.61	0.60	0.60
Mini-Cybertruck	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.05	0.10	0.13	0.13	0.13	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.12
Total Tesla	-	-	-	-	-	-	-	-	-	0.07	0.28	0.53	0.70	0.72	0.73	0.77	0.80	0.78	0.79	0.78	0.77	0.76	0.75	0.74	0.74	0.73	0.72	0.72
Other Brands	2.18	2.33	2.54	2.70	2.83	2.96	3.14	2.95	3.12	3.24	3.17	3.02	2.78	2.79	2.67	2.58	2.52	2.48	2.49	2.46	2.44	2.42	2.37	2.36	2.34	2.32	2.29	2.27
All Pickups	2.18	2.33	2.54	2.70	2.83	2.96	3.14	2.95	3.12	3.31	3.44	3.56	3.48	3.51	3.40	3.35	3.32	3.27	3.28	3.24	3.21	3.18	3.12	3.10	3.08	3.05	3.02	2.99

Projecting Market Share: Pickup Trucks in the United States

	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Cybertruck	-	-	-	-	-	-	-	-	-	2.0%	8.0%	15.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Smaller Truck	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5%	1.5%	3.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Total Tesla	-	-	-	-	-	-	-	-	-	2.0%	8.0%	15.0%	20.0%	20.5%	21.5%	23.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%	24.0%
Other Brands	100%	100%	100%	100%	100%	100%	100%	100%	100.0%	98.0%	92.0%	85.0%	80.0%	79.5%	78.5%	77.0%	76.0%	76.0%	76.0%	76.0%	76.0%	76.0%	76.0%	76.0%	76.0%	76.0%	76.0%	76.0%



- US pickups: TSLA's largest target market so far
- This segment is highly consolidated
- GM leads the segment: 968k units sold in 2020
- Ford's models combined for 898k units in 2020
- Our forecast implies Tesla will be a major player
- We think Tesla's segment share will rise to 24%
- We assume a 2nd truck launch in the late 2020s

Source: Wards Auto, Piper Sandler research

Forecasting Tesla's Vehicle Deliveries in the United States

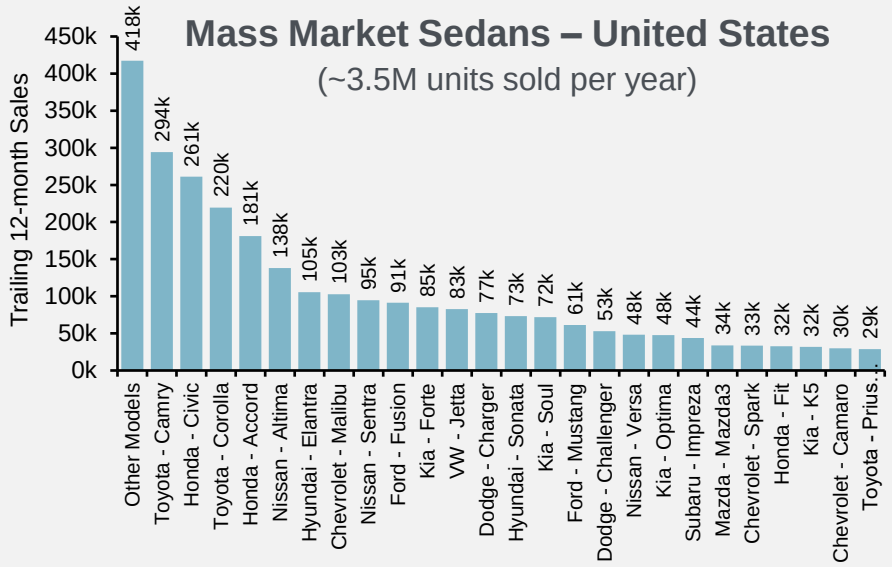
Forecasting Tesla's sales volume by segment – mass-market sedans

Projecting Sales: Mass Market Sedans in the United States (Millions)

	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Hatchback	-	-	-	-	-	-	-	-	-	-	-	0.04	0.15	0.29	0.27	0.25	0.24	0.22	0.22	0.21	0.21	0.21	0.20	0.20	0.20	0.20	0.20	0.19
Robo-taxi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.01	0.01	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Total Tesla	-	-	-	-	-	-	-	-	-	-	-	0.04	0.15	0.29	0.28	0.26	0.25	0.25	0.25	0.25	0.24	0.24	0.23	0.23	0.23	0.23	0.22	0.22
Other Brands	6.36	6.41	6.27	5.78	5.09	4.31	3.82	2.74	2.60	2.53	2.31	2.08	1.68	1.43	1.32	1.22	1.15	1.07	1.04	1.02	0.99	0.98	0.96	0.95	0.94	0.94	0.93	0.92
All Mass Mkt Sedans	6.36	6.41	6.27	5.78	5.09	4.31	3.82	2.74	2.60	2.53	2.31	2.12	1.83	1.73	1.60	1.48	1.40	1.32	1.29	1.26	1.24	1.21	1.19	1.18	1.17	1.16	1.15	1.14

Projecting Market Share: Mass Market Sedans in the United States

	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Hatchback	-	-	-	-	-	-	-	-	-	-	-	2.0%	8.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%
Robo-taxi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3%	0.6%	1.0%	2.0%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Total Tesla	-	-	-	-	-	-	-	-	-	-	-	2.0%	8.0%	17.0%	17.3%	17.6%	18.0%	19.0%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%
Other Brands	100%	100%	100%	100%	100%	100%	100%	100%	100.0%	100.0%	100.0%	98.0%	92.0%	83.0%	82.8%	82.4%	82.0%	81.0%	80.5%	80.5%	80.5%	80.5%	80.5%	80.5%	80.5%	80.5%	80.5%	80.5%



- Tesla currently has no products in this segment
- To achieve its mission, TSLA needs cheap cars
- In September 2020, Musk alluded to a $25k car
- We expect two launches in the coming years
- First: a hatchback in the mid-2020s
- Second: a robo-taxi in the late 2020s
- Our outlook implies sales similar to Honda Civic

Source: Wards Auto, Piper Sandler research

Forecasting Tesla's Vehicle Deliveries in the United States

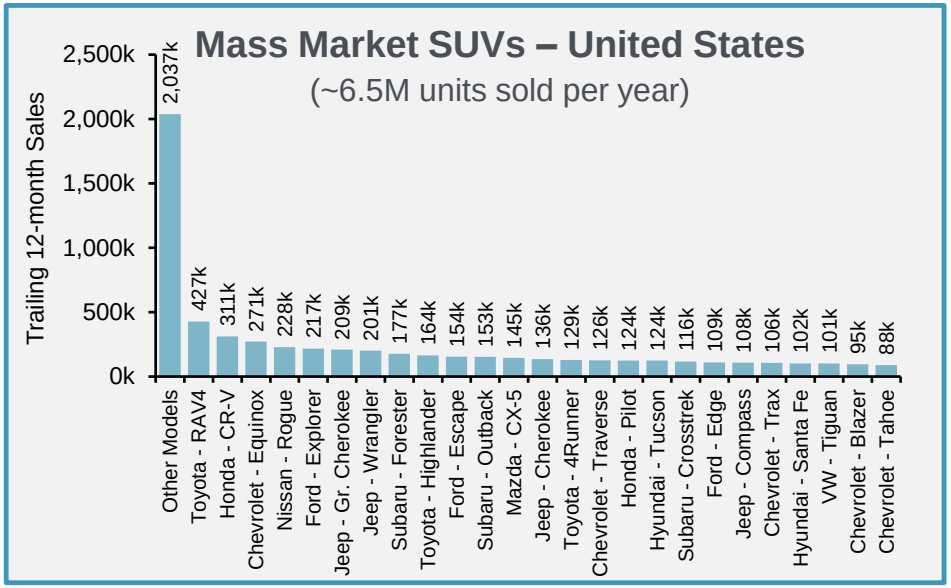
Forecasting Tesla's sales volume by segment – mass-market SUVs

Projecting Sales: Mass Market SUVs in the United States (Millions)

	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Small Crossover	-	-	-	-	-	-	-	-	-	-	-	-	0.15	0.37	0.71	0.88	0.87	0.86	0.86	0.85	0.84	0.83	0.82	0.81	0.81	0.80	0.79	0.78
Other (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Tesla	-	-	-	-	-	-	-	-	-	-	-	-	0.15	0.37	0.71	0.88	0.87	0.86	0.86	0.85	0.84	0.83	0.82	0.81	0.81	0.80	0.79	0.78
Other Brands	4.23	4.74	5.45	5.80	6.15	6.77	6.87	6.16	6.65	7.02	7.22	7.43	7.14	6.97	6.41	6.14	6.07	5.99	6.00	5.93	5.87	5.83	5.72	5.68	5.64	5.59	5.53	5.48
All Mass Mkt SUVs	4.23	4.74	5.45	5.80	6.15	6.77	6.87	6.16	6.65	7.02	7.22	7.43	7.28	7.34	7.12	7.02	6.94	6.84	6.86	6.77	6.71	6.66	6.53	6.50	6.45	6.39	6.32	6.26

Projecting Market Share: Mass Market SUVs in the United States

	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Small Crossover	-	-	-	-	-	-	-	-	-	-	-	-	2.0%	5.0%	10.0%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%
Other (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Tesla	-	-	-	-	-	-	-	-	-	-	-	-	2.0%	5.0%	10.0%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%
Other Brands	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	98.0%	95.0%	90.0%	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%	87.5%



- This is the largest segment in the U.S. market
- Tesla hasn't teased a mass-market SUV (yet)
- Presumably, a product will be forthcoming
- Model Y is too expensive for this segment
- Best-selling models include the RAV4, CR-V
- These models sell 300k-400k units annually
- We think a Tesla model could sell 2x more units

Source: Wards Auto, Piper Sandler research

Forecasting Tesla's Vehicle Deliveries in the United States

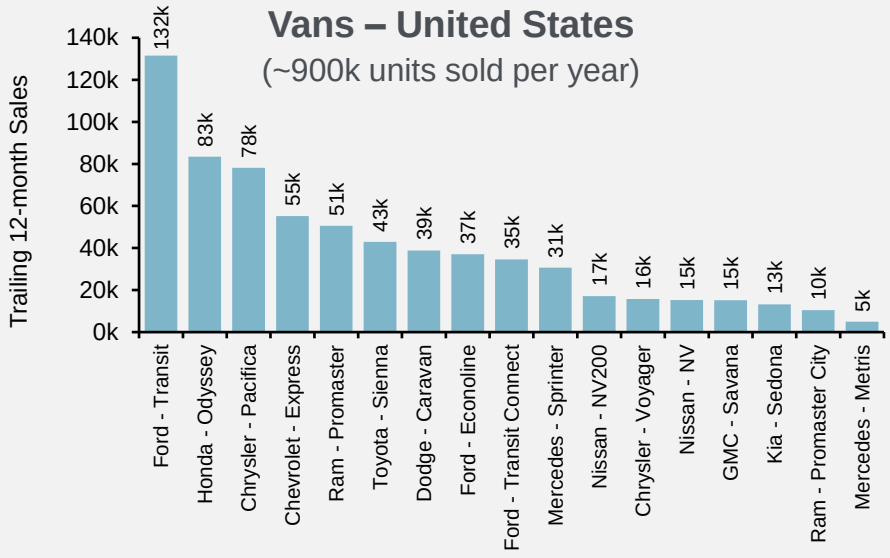
Forecasting Tesla's sales volume by segment – vans

Projecting Sales: Vans in the United States (Millions)

	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Tesla Van	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.06	0.12	0.15	0.15	0.15	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14
Other (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Tesla	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.06	0.12	0.15	0.15	0.15	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14
Other Brands	0.83	0.90	0.93	1.02	0.93	0.94	0.90	0.67	0.85	0.92	1.00	1.07	1.08	1.13	1.08	1.10	1.11	1.12	1.14	1.13	1.12	1.11	1.09	1.08	1.07	1.06	1.05	1.04
All Vans	0.83	0.90	0.93	1.02	0.93	0.94	0.90	0.67	0.85	0.92	1.00	1.07	1.10	1.19	1.20	1.25	1.26	1.28	1.29	1.28	1.27	1.26	1.23	1.23	1.22	1.21	1.19	1.18

Projecting Market Share: Vans in the United States

	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Tesla Van	-	-	-	-	-	-	-	-	-	-	-	-	2.0%	5.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
Other (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Tesla	-	-	-	-	-	-	-	-	-	-	-	-	2.0%	5.0%	10.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
Other Brands	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	98.0%	95.0%	90.0%	88.0%	88.0%	88.0%	88.0%	88.0%	88.0%	88.0%	88.0%	88.0%	88.0%	88.0%	88.0%	88.0%

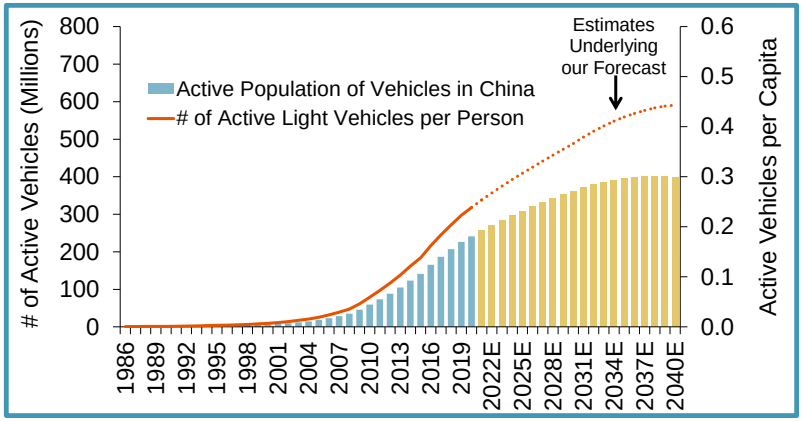


- Musk says Tesla will eventually make a van
- …but other launches are more pressing
- This segment should grow due to e-commerce
- Tesla could also use vans for mobile service
- In the U.S., Ford sells >100k Transit vans/year
- Minivans combine for another 300k-400k units
- A cargo van could maybe double as a minivan

Source: Wards Auto, Piper Sandler research

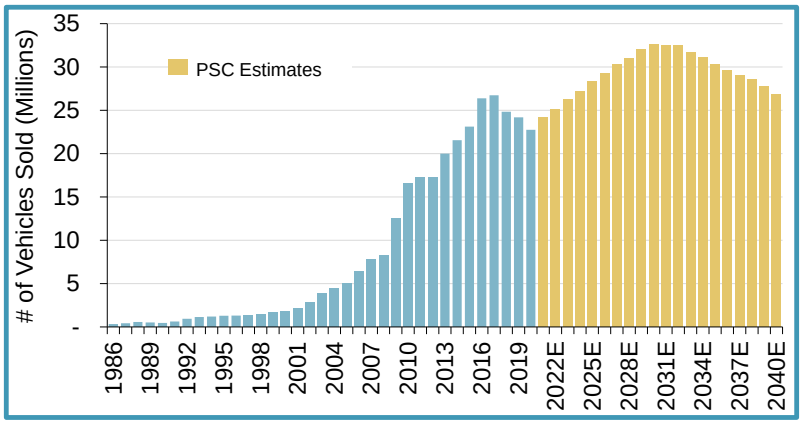
Forecasting Tesla's Vehicle Deliveries in China

Step 1: Building a forecast for region-wide vehicle sales in China



Fleet Size & Per-capita Auto Ownership

- Our forecast is driven by per-capita auto ownership
- In China, there are 0.24 active vehicles per person
- …this metric includes only people aged 15-64 years
- China's car fleet is almost as large as the U.S. fleet
- …but per-capita ownership is only 1/5 as high
- We think this metric will max out around 0.45/person



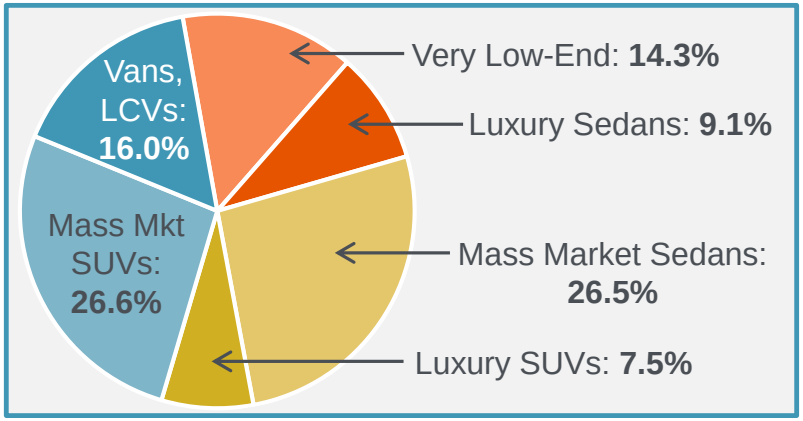
Forecasting Annual Vehicle Sales

- We think China's car market can grow for 10+ years
- …this is due to low per-capita auto ownership
- But by the 2030s, robo-taxis should limit growth
- High population density is also a limiting factor
- Even so, China should sell 30M+ units by 2027
- …this would be ~2x more than the U.S. market

Source: Gasgoo, Piper Sandler research

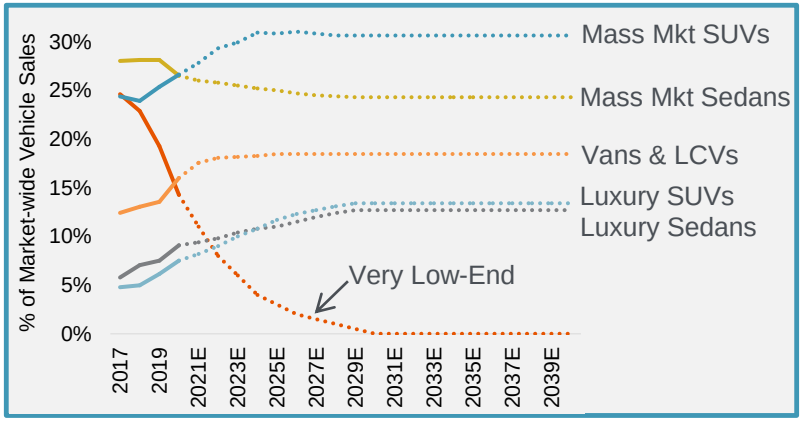
Forecasting Tesla's Vehicle Deliveries in China

Building a forecast for region-wide vehicle sales by segment



China Market Segmentation (2020)

- China's market differs from the U.S. in many ways…
- "Very Low-End" models (<$11k) are a big segment
- Pickup trucks matter in the U.S. – but not in China
- Sedans fare better in China than they do in the U.S.
- China's luxury segment is bigger than the U.S.
- Light commercial vehicles (LCVs) are a hodgepodge



Forecast: China Auto Market Segmentation

- Tesla benefits from China's penchant for luxury
- By 2040, we think luxury will be ¼ of overall sales
- China may eventually sell 7M-8M luxury units/year
- For reference: the U.S. sells <2.5M units/year
- There's huge potential in the mass market segment
- …but new products (and lower ASPs) are needed

Source: Gasgoo, Piper Sandler research

Forecasting Tesla's Vehicle Deliveries in China

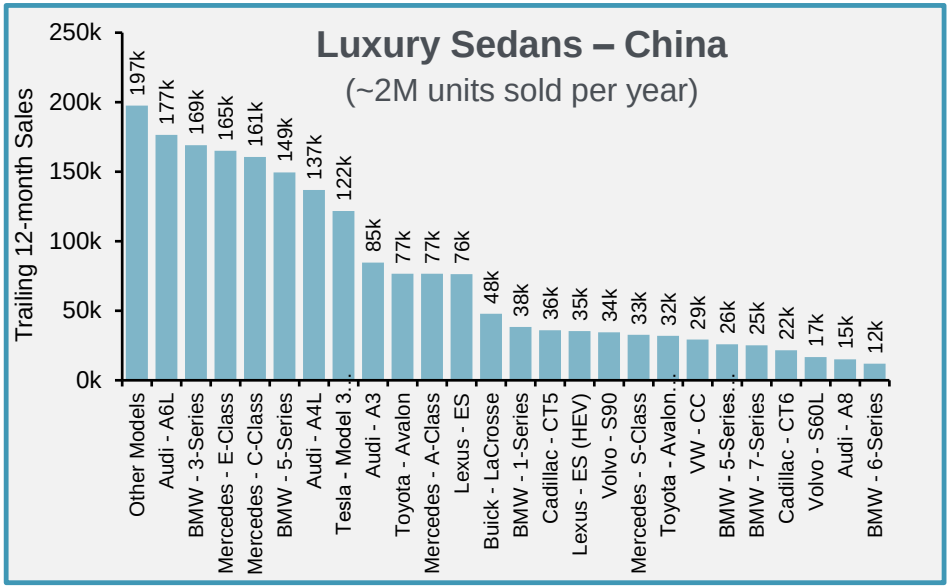
Forecasting Tesla's sales volume by segment – luxury sedans

Projecting Sales: Luxury Sedans in China (Millions)

	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Model 3	-	0.00	0.03	0.14	0.20	0.27	0.36	0.50	0.53	0.57	0.62	0.65	0.69	0.70	0.70	0.70	0.68	0.67	0.65	0.64	0.63	0.62	0.60	0.58
Model S	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roadster	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Tesla	0.01	0.01	0.03	0.14	0.21	0.27	0.36	0.50	0.53	0.58	0.62	0.66	0.70	0.71	0.71	0.71	0.69	0.68	0.66	0.64	0.63	0.62	0.60	0.58
Other Brands	1.54	1.75	1.78	1.89	2.07	2.19	2.38	2.43	2.58	2.79	3.01	3.19	3.37	3.42	3.42	3.41	3.33	3.27	3.19	3.11	3.06	3.01	2.92	2.82
All Luxury Sedans	1.54	1.75	1.82	2.03	2.27	2.46	2.74	2.93	3.12	3.37	3.63	3.85	4.07	4.13	4.13	4.12	4.02	3.95	3.85	3.76	3.69	3.63	3.52	3.41

Projecting Market Share: Luxury Sedans in China

	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Model 3	-	0.0%	1.8%	6.9%	9.0%	11.0%	13.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%
Model S	0.4%	0.3%	0.1%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Roadster	-	-	-	-	-	-	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Tesla	0.4%	0.3%	1.9%	7.0%	9.1%	11.1%	13.1%	17.1%	17.1%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%	17.2%
Other Brands	99.6%	99.7%	98.1%	93.0%	90.9%	88.9%	86.9%	82.9%	82.9%	82.8%	82.8%	82.8%	82.8%	82.8%	82.8%	82.8%	82.8%	82.8%	82.8%	82.8%	82.8%	82.8%	82.8%	82.8%



- China is the world's #1 luxury sedan market
- BMW, Benz, Audi ("BBA") brands are dominant
- …these brands combine for 60%+ luxury share
- Top-selling BBA sedans sell 140k-180k units/yr
- Model 3 should soon overtake these models
- We think TSLA can win 17%+ segment share
- Higher capacity is key to unlocking more sales

Source: Gasgoo, Piper Sandler research

Forecasting Tesla's Vehicle Deliveries in China

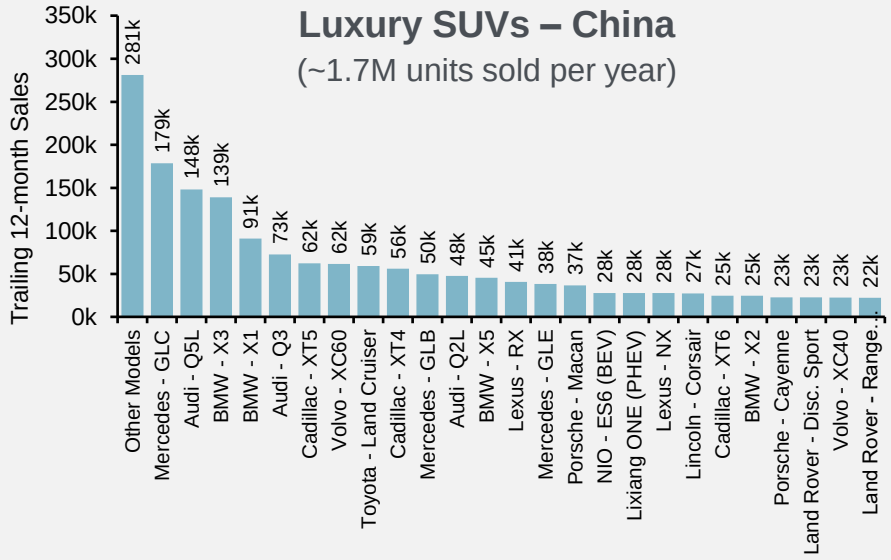
Forecasting Tesla's sales volume by segment – luxury SUVs

Projecting Sales: Luxury SUVs in China (Millions)

	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Model Y	-	-	-	-	0.10	0.23	0.34	0.50	0.56	0.61	0.65	0.69	0.73	0.74	0.74	0.74	0.72	0.71	0.69	0.67	0.66	0.65	0.63	0.61
Model X	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01
Total Tesla	0.01	0.01	0.01	0.01	0.11	0.23	0.35	0.51	0.58	0.63	0.67	0.71	0.75	0.76	0.76	0.76	0.74	0.72	0.71	0.69	0.68	0.67	0.65	0.63
Other Brands	1.27	1.23	1.48	1.68	1.88	2.03	2.28	2.42	2.74	2.98	3.18	3.36	3.55	3.60	3.60	3.59	3.50	3.45	3.36	3.28	3.22	3.17	3.07	2.97
All Luxury SUVs	1.28	1.24	1.49	1.68	1.98	2.26	2.63	2.93	3.32	3.60	3.84	4.07	4.29	4.36	4.36	4.35	4.24	4.17	4.06	3.97	3.90	3.83	3.72	3.60

Projecting Market Share: Luxury SUVs in China

	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Model Y	-	-	-	-	5.0%	10.0%	13.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%	17.0%
Model X	0.7%	0.9%	0.6%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Total Tesla	0.7%	0.9%	0.6%	0.4%	5.4%	10.4%	13.4%	17.4%	17.4%	17.4%	17.4%	17.4%	17.4%	17.4%	17.4%	17.4%	17.4%	17.4%	17.4%	17.4%	17.4%	17.4%	17.4%	17.4%
Other Brands	99%	99%	99%	99.6%	94.6%	89.6%	86.6%	82.6%	82.6%	82.6%	82.6%	82.6%	82.6%	82.6%	82.6%	82.6%	82.6%	82.6%	82.6%	82.6%	82.6%	82.6%	82.6%	82.6%



- Made-in-China Model Y is now available
- …this model should enable rapid share gains
- We think TSLA can win 17%+ segment share
- Our share estimates are lower in China vs. U.S.
- …this is to account for competition, local peers
- "BBA" brands aren't as dominant in SUVs
- This presents an opening for TSLA, NIO, etc.

Source: Gasgoo, Piper Sandler research

Forecasting Tesla's Vehicle Deliveries in China

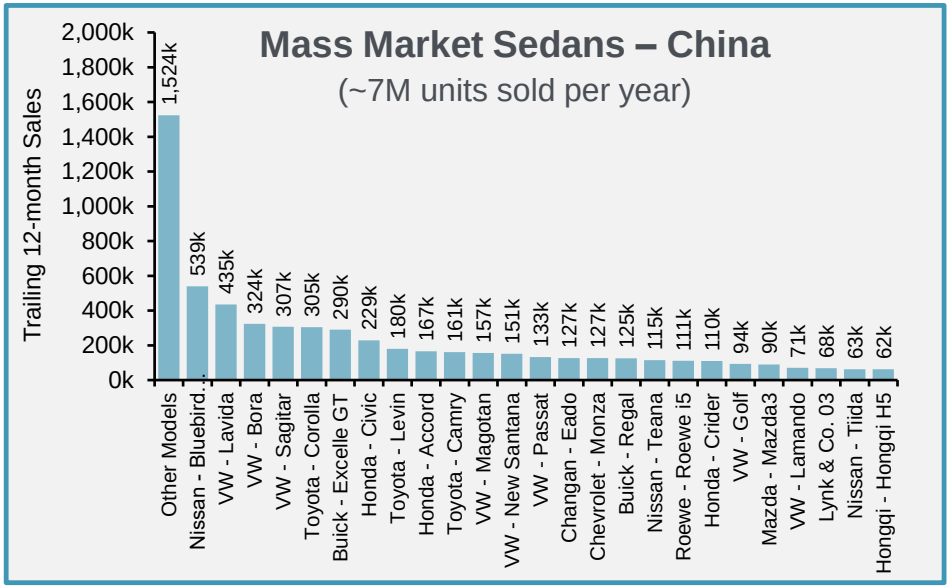
Forecasting Tesla's sales volume by segment – mass market sedans

Projecting Sales: Mass Market Sedans in China (Millions)

	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Hatchback	-	-	-	-	-	-	0.10	0.34	0.57	0.72	0.74	0.76	0.78	0.79	0.79	0.79	0.77	0.76	0.74	0.72	0.71	0.70	0.67	0.65
Robo-taxi	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Total Tesla	-	-	-	-	-	-	0.10	0.34	0.57	0.72	0.74	0.76	0.78	0.81	0.81	0.80	0.78	0.77	0.75	0.73	0.72	0.71	0.69	0.67
Other Brands	7.50	6.99	6.80	6.10	6.29	6.49	6.61	6.50	6.52	6.51	6.67	6.82	7.00	7.10	7.10	7.08	6.90	6.79	6.61	6.46	6.34	6.24	6.05	5.86
All Mass Mkt Sedans	7.50	6.99	6.80	6.10	6.29	6.49	6.71	6.84	7.09	7.23	7.42	7.57	7.78	7.91	7.91	7.89	7.69	7.56	7.36	7.19	7.06	6.95	6.74	6.52

Projecting Market Share: Mass Market Sedans in China

	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Hatchback	-	-	-	-	-	-	1.5%	5.0%	8.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Robo-taxi	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Total Tesla	-	-	-	-	-	-	1.5%	5.0%	8.0%	10.0%	10.0%	10.0%	10.0%	10.2%	10.2%	10.2%	10.2%	10.2%	10.2%	10.2%	10.2%	10.2%	10.2%	10.2%
Other Brands	100%	100%	100%	100%	100%	100%	99%	95%	92.0%	90.0%	90.0%	90.0%	90.0%	89.8%	89.8%	89.8%	89.8%	89.8%	89.8%	89.8%	89.8%	89.8%	89.8%	89.8%



- This is a truly massive market segment
- VW dominates, with 8 of the top 25 models
- …this one brand (VW) could sell ~2M units/yr
- In this context, 700k-800k units seems doable
- Obviously, Tesla would need an offering first
- China is an obvious target for TSLA's $25k car
- We expect deliveries to start in 2023 (a guess)

Source: Gasgoo, Piper Sandler research

Forecasting Tesla's Vehicle Deliveries in China

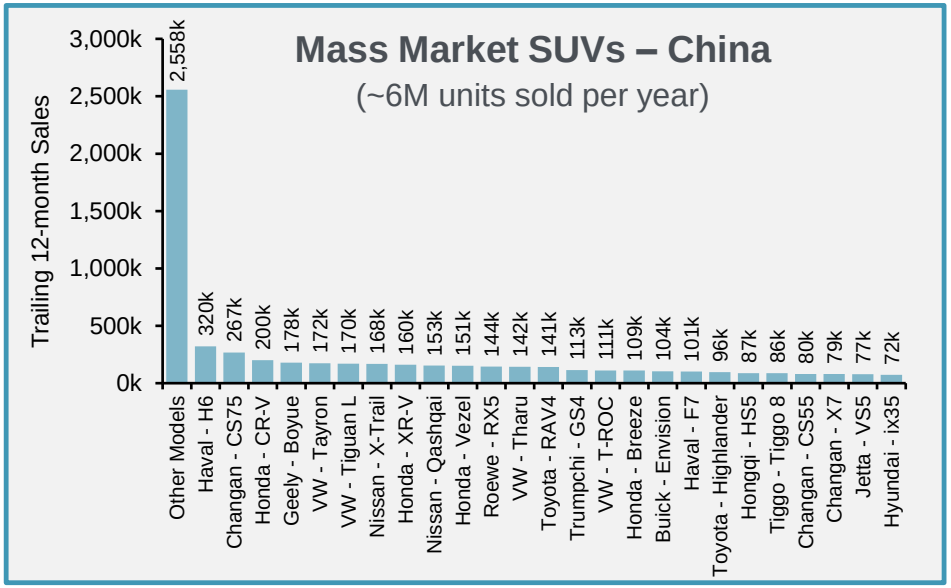
Forecasting Tesla's sales volume by segment – mass market SUVs

Projecting Sales: Mass Market SUVs in China (Millions)

	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Small Crossover	-	-	-	-	-	-	-	-	0.04	0.18	0.37	0.76	1.18	1.40	1.40	1.39	1.36	1.33	1.30	1.27	1.25	1.23	1.19	1.15
Other (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Tesla	-	-	-	-	-	-	-	-	0.04	0.18	0.37	0.76	1.18	1.40	1.40	1.39	1.36	1.33	1.30	1.27	1.25	1.23	1.19	1.15
Other Brands	6.52	5.94	6.14	6.16	6.73	7.38	7.88	8.40	8.70	8.90	8.96	8.75	8.63	8.57	8.57	8.55	8.34	8.20	7.98	7.80	7.66	7.54	7.31	7.07
All Mass Mkt SUVs	6.52	5.94	6.14	6.16	6.73	7.38	7.88	8.40	8.74	9.09	9.33	9.51	9.81	9.97	9.97	9.94	9.69	9.53	9.28	9.07	8.91	8.77	8.50	8.22

Projecting Market Share: Mass Market SUVs in China

	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Small Crossover	-	-	-	-	-	-	-	-	0.5%	2.0%	4.0%	8.0%	12.0%	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%
Other (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Tesla	-	-	-	-	-	-	-	-	0.5%	2.0%	4.0%	8.0%	12.0%	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%
Other Brands	100%	100%	100%	100%	100%	100%	100%	100%	99.5%	98.0%	96.0%	92.0%	88.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%



- A large, fragmented market (like in the U.S.)
- Local SUV brands have made inroads
- Examples: Great Wall/Haval, Chang'an, Geely
- There's enough demand to support 1M units/yr
- …but Tesla would need a cheap SUV/crossover
- We expect a product launch by the mid-2020s
- Long-term estimate: mid-teens segment share

Source: Gasgoo, Piper Sandler research

Forecasting Tesla's Vehicle Deliveries in China

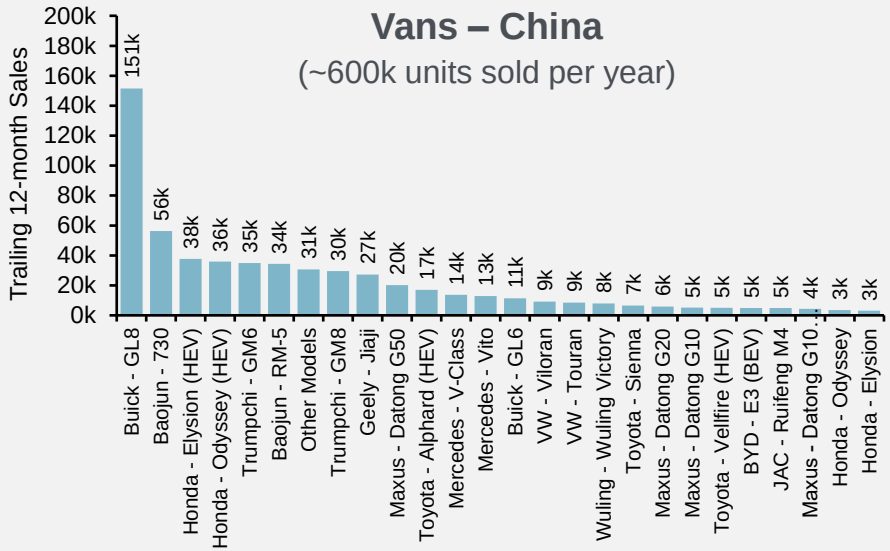
Forecasting Tesla's sales volume by segment – vans

Projecting Sales: Vans in China (Millions)

	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Tesla Van	-	-	-	-	-	-	-	-	-	0.01	0.04	0.06	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.07
Other (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Tesla	-	-	-	-	-	-	-	-	-	0.01	0.04	0.06	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.07
Other Brands	0.67	0.61	0.62	0.60	0.62	0.65	0.68	0.70	0.73	0.74	0.74	0.73	0.74	0.75	0.75	0.75	0.73	0.72	0.70	0.68	0.67	0.66	0.64	0.62
All Vans	0.67	0.61	0.62	0.60	0.62	0.65	0.68	0.70	0.73	0.75	0.78	0.80	0.82	0.84	0.84	0.83	0.81	0.80	0.78	0.76	0.75	0.73	0.71	0.69

Projecting Market Share: Vans in China

	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Tesla Van	-	-	-	-	-	-	-	-	-	1.0%	5.0%	8.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Other (?)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Tesla	-	-	-	-	-	-	-	-	-	1.0%	5.0%	8.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Other Brands	100%	100%	100%	100%	100%	100%	100%	100%	100.0%	99.0%	95.0%	92.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%



- China's van market targets corporate entities
- Vans are used for picking up guests, etc.
- The Buick GL8 is the segment standard
- This is a small segment; probably not a focus
- We do expect Tesla to launch a van…
- …but the overall volume impact will be low
- We model 10% segment share by the late '20s

Source: Gasgoo, Piper Sandler research

Forecasting Tesla's Vehicle Deliveries in China

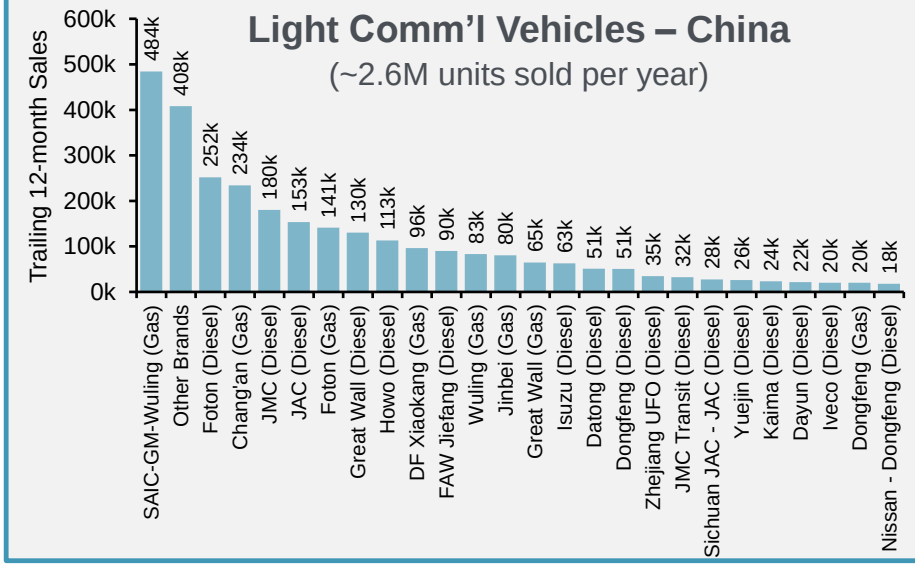
Forecasting Tesla's sales volume by segment – light commercial vehicles (LCVs)

Projecting Sales: Light Commercial Vehicles in China (Millions)

	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Cybertruck	-	-	-	-	-	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mini-Cybertruck	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Tesla	-	-	-	-	-	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Other Brands	2.65	2.63	2.66	2.92	3.63	3.90	4.11	4.26	4.50	4.65	4.80	4.93	5.08	5.16	5.16	5.15	5.02	4.94	4.81	4.70	4.61	4.54	4.40	4.26
All Light CVs	2.65	2.63	2.66	2.92	3.63	3.90	4.11	4.26	4.51	4.66	4.81	4.94	5.09	5.17	5.17	5.16	5.03	4.95	4.82	4.71	4.62	4.55	4.41	4.27

Projecting Market Share: Light Commercial Vehicles in China

	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Cybertruck	-	-	-	-	-	-	-	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Smaller Truck	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Tesla	-	-	-	-	-	-	-	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Other Brands	100%	100%	100%	100%	100%	100%	100%	100%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%

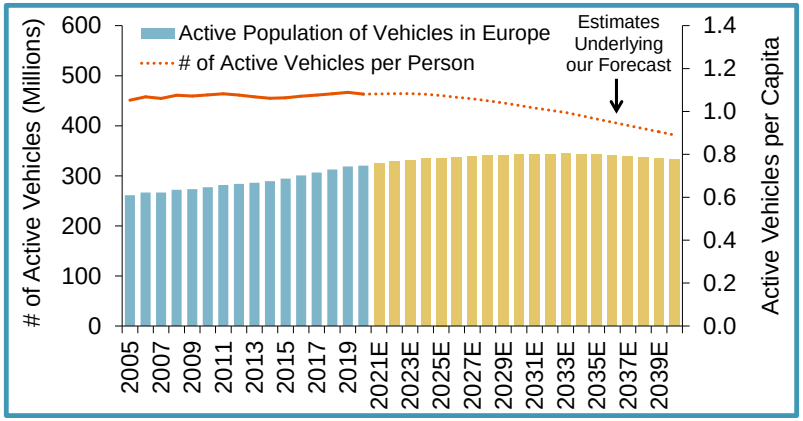


- China's LCV market is large, but price sensitive
- Low-end local brands dominate the segment
- Pickup trucks get lumped into this category too
- Many LCVs are light trucks or van-like vehicles
- Except Isuzu and Ford, foreign brands are rare
- We do not anticipate Tesla targeting this market
- …but the volume opportunity is sizable

Source: Gasgoo, Piper Sandler research

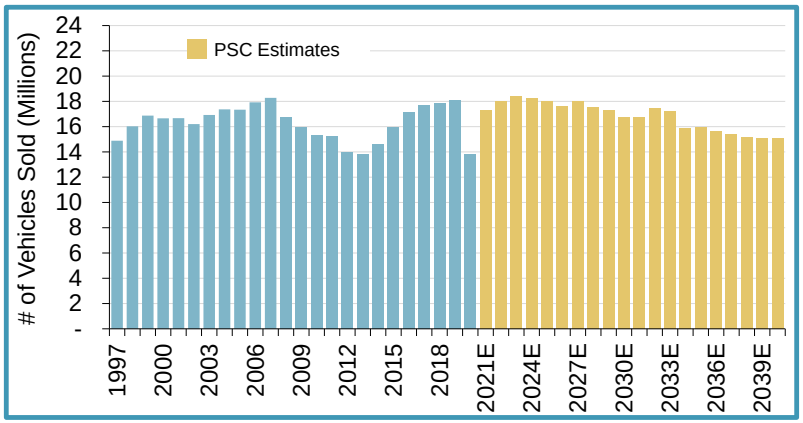
Forecasting Tesla's Vehicle Deliveries in Europe

Building a forecast for region-wide vehicle sales in Europe



Fleet Size & Per-capita Auto Ownership

- Our forecast is driven by per-capita auto ownership
- In Europe, there are 1.09 cars per person
- …this metric includes only working age people
- This compares to 1.33 (in the U.S.) and 0.24 (China)
- As in the US, we expect car ownership to drift lower
- Eventually we think this metric will be <0.9/person



Forecasting Annual Vehicle Sales

- Europe sells about as many cars as the U.S.
- As in the U.S., we don't expect much growth
- Over time, annual sales should move to <15M/year
- Robo-taxi development is a big unknown
- EU regulators could hinder robo-taxi deployment
- Local brands usually outperform US or Asian brands

Source: ACEA, Piper Sandler research

Forecasting Tesla's Vehicle Deliveries in Europe

We use a less granular approach to forecast Tesla's European deliveries

- Unlike in the US and China, our European forecast is not based on a segment-level projection
- Instead, we set TSLA's region-wide market share at a level similar to China (11%+ by the 2030s)
- For reference, our forecast implies Tesla's market share in the U.S. will max out around 18%

Projecting Tesla's Region-wide Deliveries in Europe (Millions)

	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Model S	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Model 3	0.11	0.12	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.13	0.12	0.12
Model X	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Model Y	0.03	0.13	0.28	0.34	0.35	0.35	0.36	0.36	0.36	0.36	0.36	0.38	0.37	0.35	0.35	0.34	0.34	0.33	0.33	0.33
Roadster	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cybertruck	-	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hatchback	-	-	0.04	0.18	0.36	0.53	0.54	0.53	0.52	0.50	0.50	0.52	0.52	0.48	0.48	0.47	0.46	0.46	0.45	0.45
Robo-taxi	-	-	-	-	-	-	-	-	0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Small Crossover	-	-	-	-	0.03	0.11	0.22	0.43	0.63	0.72	0.72	0.75	0.74	0.68	0.69	0.67	0.66	0.65	0.65	0.65
Van	-	-	-	-	0.02	0.06	0.14	0.17	0.17	0.17	0.17	0.18	0.18	0.16	0.16	0.16	0.16	0.15	0.15	0.15
Mini-Cybertruck	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Tesla	0.15	0.27	0.48	0.70	0.93	1.22	1.44	1.65	1.85	1.92	1.92	2.01	1.99	1.84	1.85	1.81	1.78	1.76	1.75	1.75
Other Brands	17.12	17.71	17.91	17.55	17.06	16.41	16.59	15.86	15.41	14.85	14.79	15.42	15.21	14.05	14.14	13.79	13.57	13.42	13.34	13.33
All Light Vehicles	17.27	17.98	18.39	18.25	18.00	17.63	18.03	17.51	17.26	16.77	16.70	17.43	17.20	15.89	15.99	15.59	15.35	15.18	15.09	15.07

Projecting Tesla's Region-wide Market Share in Europe

	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Total Tesla	0.9%	1.5%	2.6%	3.8%	5.2%	6.9%	8.0%	9.4%	10.7%	11.4%	11.5%	11.5%	11.6%	11.6%	11.6%	11.6%	11.6%	11.6%	11.6%	11.6%
Other Brands	99.1%	98.5%	97.4%	96.2%	94.8%	93.1%	92.0%	90.6%	89.3%	88.6%	88.5%	88.5%	88.4%	88.4%	88.4%	88.4%	88.4%	88.4%	88.4%	88.4%

Source: Piper Sandler research

Tesla's Overall Deliveries by Model & Region – *Existing Models*

See below for the output of our delivery forecast

- Tesla has 4 existing models; here we summarize our delivery estimates for each model, by region
- Model S and Model X established Tesla's brand, but financially, they are growing less relevant
- While still relatively high-priced, Model 3 and Model Y have enabled higher volume

Tesla's Unit Deliveries by Region and Model (Millions of Units)

	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Model S - U.S.	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Model S - China	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Model S - Europe	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Model S - Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MODEL S TOTAL	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.02**	**0.02**
Model 3 - U.S.	0.13	0.15	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.14	0.14
Model 3 - China	0.20	0.27	0.36	0.50	0.53	0.57	0.62	0.65	0.69	0.70	0.70	0.70	0.68	0.67	0.65	0.64	0.63	0.62	0.60	0.58
Model 3 - Europe	0.11	0.12	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.13	0.12	0.12
Model 3 - Other	0.05	0.06	0.08	0.09	0.09	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.09
MODEL 3 TOTAL	**0.49**	**0.60**	**0.75**	**0.91**	**0.94**	**0.98**	**1.03**	**1.07**	**1.10**	**1.11**	**1.11**	**1.11**	**1.09**	**1.06**	**1.04**	**1.02**	**1.00**	**0.99**	**0.96**	**0.94**
Model X - U.S.	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Model X - China	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01
Model X - Europe	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Model X - Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
MODEL X TOTAL	**0.04**	**0.04**	**0.04**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**
Model Y - U.S.	0.19	0.30	0.43	0.45	0.45	0.46	0.45	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.45	0.45	0.45	0.44	0.44	0.43
Model Y - China	0.10	0.23	0.34	0.50	0.56	0.61	0.65	0.69	0.73	0.74	0.74	0.74	0.72	0.71	0.69	0.67	0.66	0.65	0.63	0.61
Model Y - Europe	0.03	0.13	0.28	0.34	0.35	0.35	0.36	0.36	0.36	0.36	0.36	0.38	0.37	0.35	0.35	0.34	0.34	0.33	0.33	0.33
Model Y - Other	0.03	0.07	0.12	0.14	0.15	0.16	0.16	0.17	0.17	0.17	0.17	0.18	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.15
MODEL Y TOTAL	**0.35**	**0.73**	**1.17**	**1.44**	**1.51**	**1.58**	**1.63**	**1.67**	**1.72**	**1.73**	**1.74**	**1.75**	**1.73**	**1.69**	**1.66**	**1.63**	**1.61**	**1.59**	**1.56**	**1.53**

Source: Piper Sandler research

Tesla's Overall Deliveries by Model & Region – *Emerging Models*

See below for the output of our delivery forecast

- Tesla has committed to launching four additional models in the coming years
- …of these, Cybertruck is the highest-visibility and most relevant in terms of near-term P&L impact
- The "Hatchback" listed below is a placeholder to reflect a $25k car (announced at Battery Day)

Tesla's Unit Deliveries by Region and Model (Millions of Units)

	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Roadster - U.S.	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roadster - China	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roadster - Europe	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Roadster - Other	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROADSTER TOTAL	**-**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
Cybertruck - U.S.	-	0.07	0.28	0.53	0.70	0.70	0.68	0.67	0.66	0.65	0.66	0.65	0.64	0.64	0.62	0.62	0.62	0.61	0.60	0.60
Cybertruck - China	-	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cybertruck - Europe	-	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cybertruck - Other	-	0.01	0.03	0.06	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
CYBERTRUCK TOTAL	**-**	**0.07**	**0.31**	**0.60**	**0.79**	**0.80**	**0.77**	**0.76**	**0.75**	**0.74**	**0.74**	**0.74**	**0.73**	**0.72**	**0.71**	**0.71**	**0.70**	**0.69**	**0.69**	**0.68**
Tesla Semi - U.S.	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
Tesla Semi - China	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tesla Semi - Europe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tesla Semi - Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TESLA SEMI TOTAL	**-**	**-**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Hatchback - U.S.	-	-	-	0.04	0.15	0.29	0.27	0.25	0.24	0.22	0.22	0.21	0.21	0.21	0.20	0.20	0.20	0.20	0.20	0.19
Hatchback - China	-	-	0.10	0.34	0.57	0.72	0.74	0.76	0.78	0.79	0.79	0.79	0.77	0.76	0.74	0.72	0.71	0.70	0.67	0.65
Hatchback - Europe	-	-	0.04	0.18	0.36	0.53	0.54	0.53	0.52	0.50	0.50	0.52	0.52	0.48	0.48	0.47	0.46	0.46	0.45	0.45
Hatchback - Other	-	-	0.02	0.06	0.12	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.15	0.15	0.15	0.15	0.14
HATCHBACK TOTAL	**-**	**-**	**0.15**	**0.63**	**1.19**	**1.72**	**1.73**	**1.70**	**1.70**	**1.69**	**1.68**	**1.70**	**1.66**	**1.60**	**1.58**	**1.54**	**1.52**	**1.50**	**1.47**	**1.44**

Source: Piper Sandler research

Tesla's Overall Deliveries by Model & Region – *Undisclosed Models*

See below for the output of our delivery forecast

- None of the following models have been announced; we don't expect deliveries until the late '20s
- A small, affordable SUV/crossover would probably be Tesla's most consequential model
- …without a product in this segment, Tesla would be ignoring the world's largest auto segment

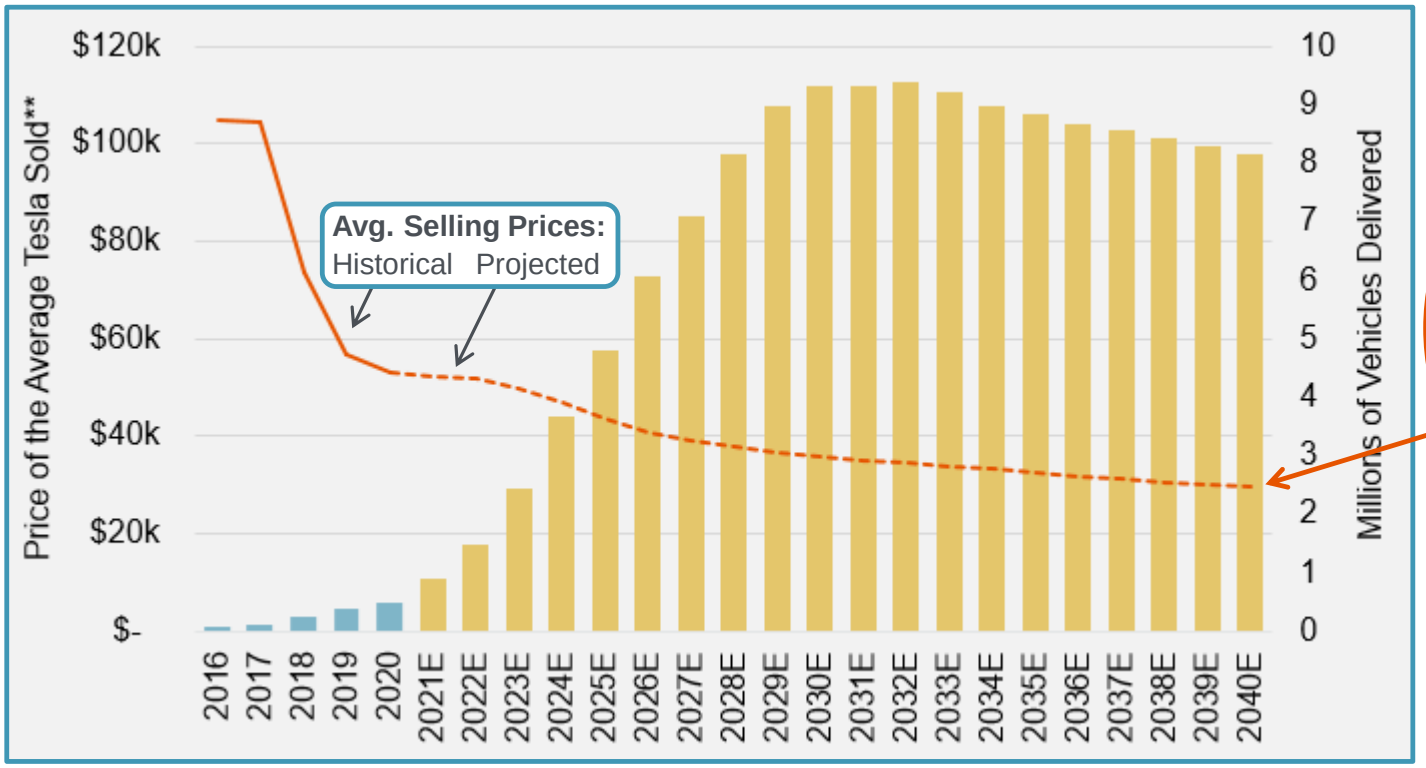
Tesla's Unit Deliveries by Region and Model (Millions of Units)

	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Robo-taxi - U.S.	-	-	-	-	-	-	0.00	0.01	0.01	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Robo-taxi - China	-	-	-	-	-	-	-	-	-	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Robo-taxi - Europe	-	-	-	-	-	-	-	-	0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Robo-taxi - Other	-	-	-	-	-	-	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
ROBO-TAXI TOTAL	**-**	**-**	**-**	**-**	**-**	**-**	**0.00**	**0.01**	**0.02**	**0.05**	**0.06**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.06**	**0.06**	**0.06**
Small Crossover - U.S.	-	-	-	-	0.15	0.37	0.71	0.88	0.87	0.86	0.86	0.85	0.84	0.83	0.82	0.81	0.81	0.80	0.79	0.78
Small Crossover - China	-	-	-	-	0.04	0.18	0.37	0.76	1.18	1.40	1.40	1.39	1.36	1.33	1.30	1.27	1.25	1.23	1.19	1.15
Small Crossover - Europe	-	-	-	-	0.03	0.11	0.22	0.43	0.63	0.72	0.72	0.75	0.74	0.68	0.69	0.67	0.66	0.65	0.65	0.65
Small Crossover - Other	-	-	-	-	0.02	0.07	0.15	0.23	0.30	0.33	0.33	0.33	0.33	0.32	0.31	0.31	0.30	0.30	0.29	0.29
SM. CROSSOVER TOTAL	**-**	**-**	**-**	**-**	**0.24**	**0.73**	**1.45**	**2.30**	**2.98**	**3.30**	**3.30**	**3.32**	**3.26**	**3.17**	**3.12**	**3.06**	**3.02**	**2.98**	**2.92**	**2.87**
Tesla Van - U.S.	-	-	-	-	0.02	0.06	0.12	0.15	0.15	0.15	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14
Tesla Van - China	-	-	-	-	-	0.01	0.04	0.06	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.07
Tesla Van - Europe	-	-	-	-	0.02	0.06	0.14	0.17	0.17	0.17	0.17	0.18	0.18	0.16	0.16	0.16	0.16	0.15	0.15	0.15
Tesla Van - Other	-	-	-	-	0.01	0.01	0.03	0.04	0.04	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04
TESLA VAN TOTAL	**-**	**-**	**-**	**-**	**0.05**	**0.15**	**0.33**	**0.42**	**0.45**	**0.45**	**0.45**	**0.46**	**0.45**	**0.44**	**0.43**	**0.42**	**0.42**	**0.41**	**0.41**	**0.41**
Mini-Cybertruck - U.S.	-	-	-	-	-	0.02	0.05	0.10	0.13	0.13	0.13	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.12
Mini-Cybertruck - China	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mini-Cybertruck - Europe	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mini-Cybertruck - Other	-	-	-	-	-	0.00	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
MINI-CYBERTRUCK TOTAL	**-**	**-**	**-**	**-**	**-**	**0.02**	**0.06**	**0.11**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.14**	**0.14**	**0.14**	**0.14**	**0.14**	**0.14**	**0.14**

Source: Piper Sandler research

Visualizing Tesla's Overall Deliveries and Pricing

Price cuts and new, lower-priced models should fuel a steady increase in deliveries



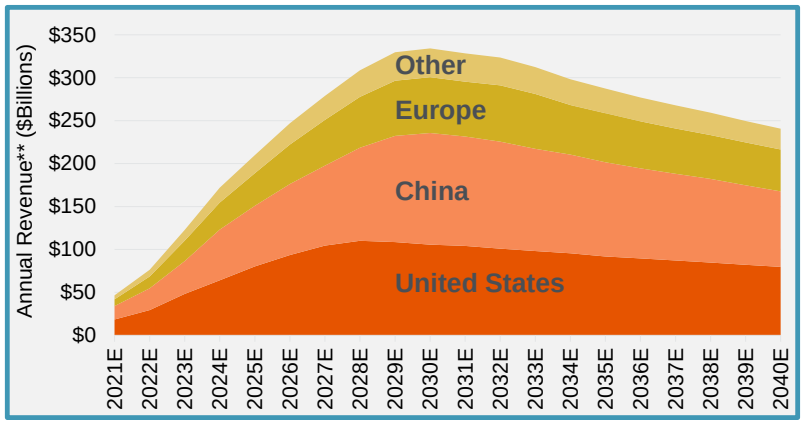
By the mid-2030s, the *average* Tesla (w/out FSD software) should be approaching $30k. Some models may be priced much lower than this.

- The deliveries depicted here are based on our model-by-model forecast (pages 36-56)
- Notably, we expect steadily declining prices throughout the forecast period
- This reflects a mix shift toward new (cheaper) products, as well as price cuts on existing models
- Investors shouldn't fret when Tesla cuts price; lower ASPs support the company's mission

Source: Piper Sandler research and Tesla filings; **NOTE: the prices reflected here *EXCLUDE* the estimated impact of FSD software

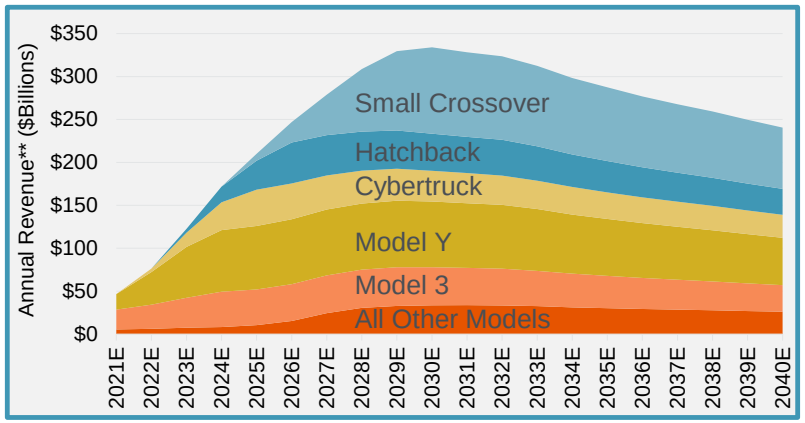
Tying it All Together: Units x Price = Automotive Revenue**

**These charts depict revenue *from selling vehicles only* (excl. software, credits, leasing)



Tesla's Automotive Revenue by Region**

- We expect China to become Tesla's #1 market
- Unlike most peers, Tesla books 100% of China profit
- Share is high in the US, but China is a bigger market
- U.S. brands lag in Europe; Tesla may change that
- We estimate 10% of deliveries in "Other" regions
- After 2030: no new launches, steadily lower prices



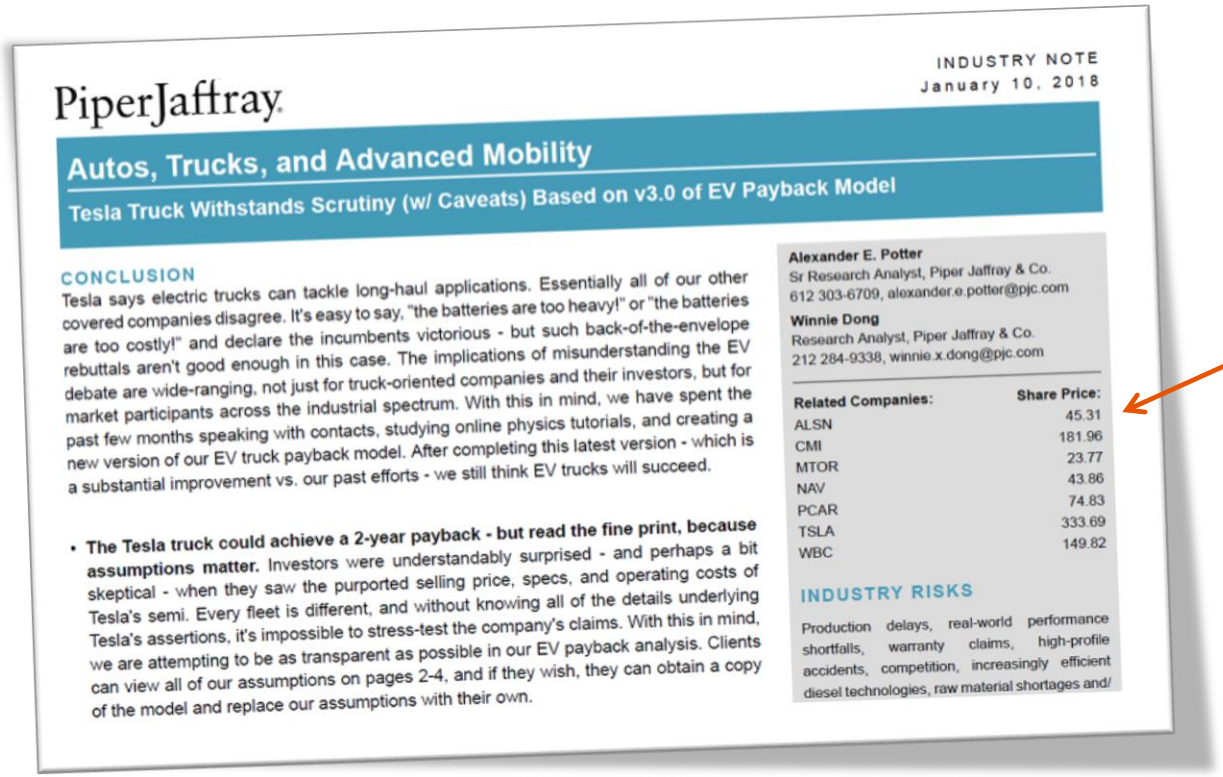
Tesla's Automotive Revenue by Model**

- This chart shows the importance of new models
- To change the world, Tesla needs mass market cars
- A cheap hatchback and SUV would go a long way
- …but existing models have lots of room to grow
- Model 3, Model Y, Cybertruck have a 5-year runway
- In the long run, Model S and Model X barely register

Source: Piper Sandler research; **NOTE: technically speaking, these "Automotive Revenue" figures also embed revenue from charging and infotainment software, but these are minor contributors

A Note Regarding Tesla Semi

We aren't EV truck skeptics – but we are modeling very little contribution from Tesla Semi



PiperJaffray

INDUSTRY NOTE
January 10, 2018

Autos, Trucks, and Advanced Mobility

Tesla Truck Withstands Scrutiny (w/ Caveats) Based on v3.0 of EV Payback Model

CONCLUSION

Tesla says electric trucks can tackle long-haul applications. Essentially all of our other covered companies disagree. It's easy to say, "the batteries are too heavy!" or "the batteries are too costly!" and declare the incumbents victorious - but such back-of-the-envelope rebuttals aren't good enough in this case. The implications of misunderstanding the EV debate are wide-ranging, not just for truck-oriented companies and their investors, but for market participants across the industrial spectrum. With this in mind, we have spent the past few months speaking with contacts, studying online physics tutorials, and creating a new version of our EV truck payback model. After completing this latest version - which is a substantial improvement vs. our past efforts - we still think EV trucks will succeed.

- **The Tesla truck could achieve a 2-year payback - but read the fine print, because assumptions matter.** Investors were understandably surprised - and perhaps a bit skeptical - when they saw the purported selling price, specs, and operating costs of Tesla's semi. Every fleet is different, and without knowing all of the details underlying Tesla's assertions, it's impossible to stress-test the company's claims. With this in mind, we are attempting to be as transparent as possible in our EV payback analysis. Clients can view all of our assumptions on pages 2-4, and if they wish, they can obtain a copy of the model and replace our assumptions with their own.

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Related Companies:	Share Price:
ALSN	45.31
CMI	181.96
MTOR	23.77
NAV	43.86
PCAR	74.83
TSLA	333.69
WBC	149.82

INDUSTRY RISKS

Production delays, real-world performance shortfalls, warranty claims, high-profile accidents, competition, increasingly efficient diesel technologies, raw material shortages and/

Nothing has changed since we published this analysis; we still think EV trucks are capable of achieving sub 2-year paybacks. *But is Tesla committed*? Success in this segment would represent upside vs. our forecast.

- Since Tesla unveiled the Semi in 2017, we have only grown more bullish re: electric trucks
- We think electric vehicles can address almost all duty cycles, including many types of heavy trucks
- …however, Tesla hasn't been prioritizing this segment (partially due to battery constraints)
- Launch delays are only part of the story… fleets will require 24/7 service and "Megachargers"

Source: Piper Sandler research

Comments on Other Sources of Automotive Revenue

In addition to vehicle sales & FSD software, there are 4 other types of Automotive revenue

1

REVENUE FROM VEHICLE LEASING

- Leasing is usually ~4% of segment revenue
- We have a forecasting method for lease revenue
- Our model predicts revenue with +/- 5% accuracy
- The model is based on historical lease activity
- Clients can view the model upon request

2

REVENUE FROM REGULATORY CREDITS

- In 2020, Tesla booked $1.6B in credit revenue
- …this is pure margin business
- Revenue is volatile and difficult to predict
- Our estimates: $1.1B per year in 2021-2022
- By the mid-2020s, we expect revenue of $0

3

REVENUE FROM INFOTAINMENT

- Premium infotainment option: $9.99/month
- We do not model explicitly (embedded in ASP)
- Current vehicle population: ~1.4M units
- At 50% opt-in rate: 1.4M*50%*$9.99*12 = $84M
- This would be 0.3% of 2020 Automotive revenue

4

REVENUE FROM SUPERCHARGING

- Supercharger access is a pay-as-you-go service
- We do not model explicitly (embedded in ASP)
- Current vehicle population: ~1.4M units
- At $20/charge, 15x/year: 1.4M*$20*15 = $420M
- This would be 1.5% of 2020 Automotive revenue

Source: Piper Sandler research

Part 4

Forecasting Revenue: Self-Driving Software

Full Self-Driving (FSD) Software: a Key Aspect of The TSLA Thesis

Our forecast relies heavily on a contribution from high-margin software

!

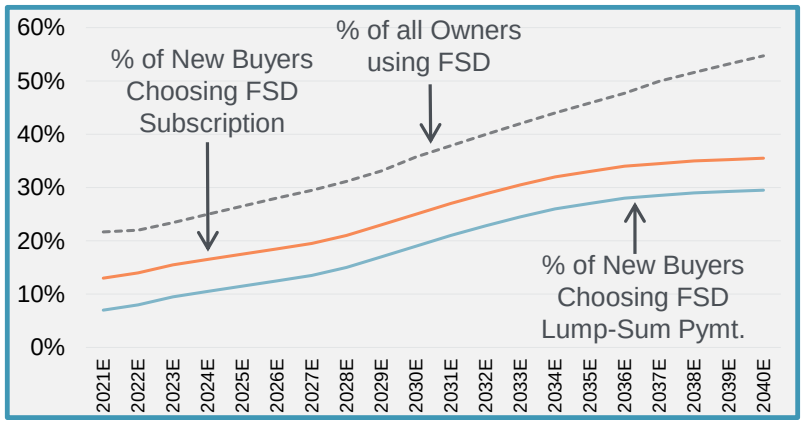
By the mid-2030s, we expect Tesla's revenue from FSD software to have exceeded Tesla's revenue from selling vehicles; the impact on profit is even greater

- It would be difficult (probably impossible) to articulate a "Buy" thesis without Tesla's FSD software
- Customers can buy FSD up-front for $10k; subscriptions will also be available soon (pricing TBD)
- The hardware is "future proof", so owners can opt-in for FSD even if they don't buy up-front
- We assume 85% gross margin, with opt-in rates eventually rising to >50% (despite $39k pricing)

Source: Tesla.com, Piper Sandler research

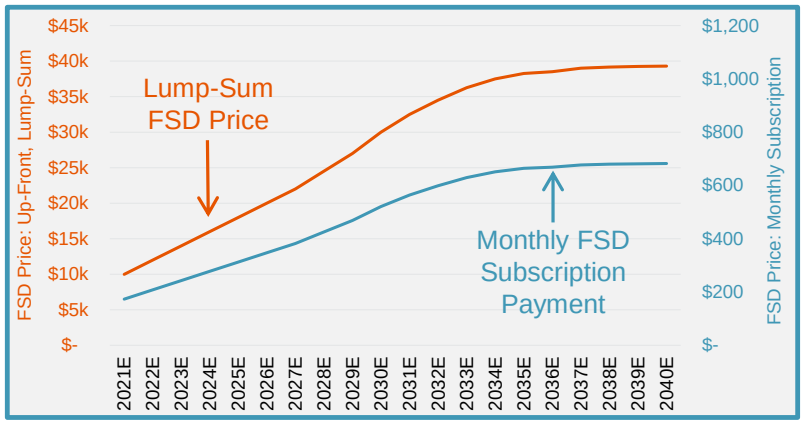
Forecasting Revenue from Full Self-Driving (FSD) Software

FSD is buried in Automotive revenue; disclosure is limited, and forecasting takes effort



Forecasting FSD Take Rates

- Building an FSD forecast necessitates guesswork
- "Take rates" are the first key input to our model
- Take rate = the % of buyers who opt in for FSD
- In late 2019, the FSD take-rate was in the mid-20s
- But take-rates have fallen since then (due to China)
- Another input: % owners buying FSD post-purchase



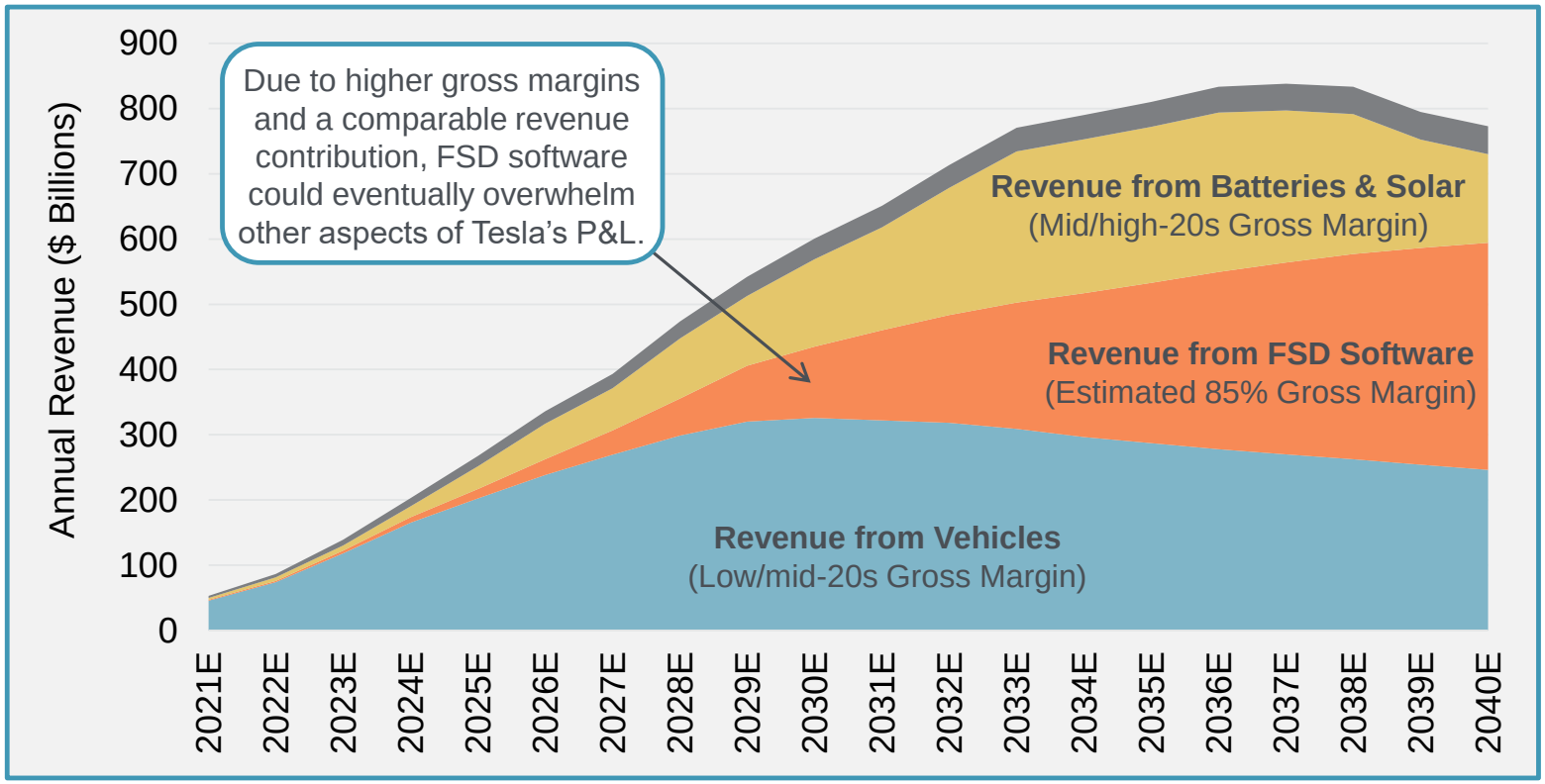
Forecasting FSD Pricing

- Pricing is obviously another key revenue driver
- We think the lump-sum price will rise to nearly $40k
- We assume a 6yr duration for monthly subscriptions
- Lifetime subscription revenue: 125% x lump-sum rev
- Like take-rates, we expect price to inflect in 2030
- There's room for debate re: take rates & pricing

Source: Piper Sandler research

Forecasting Revenue from Full Self-Driving (FSD) Software

If our thesis plays out, Tesla will eventually transform into a software company



- In addition to take-rates and pricing, our FSD forecast requires many other inputs
- Examples include fleet size, vehicle survival (scrappage) rates, and changes in deferred revenue
- We have included an exhaustive list of inputs and other assumptions on pages 84-101
- Given the importance of this topic to the thesis, we hope TSLA increases FSD-related disclosure

Source: Piper Sandler research

Full Self-Driving Software – Key Forecast Inputs

Our updated estimates are based on the model inputs illustrated below

% of New Buyers Buying FSD Up-Front Using Lump Sum Payments

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
7.0%	8.0%	9.5%	10.5%	11.5%	12.5%	13.5%	15.0%	17.0%	19.0%	21.0%	22.8%	24.5%	26.0%	27.0%	28.0%	28.5%	29.0%	29.3%	29.5%

% of Eligible Owners Buying FSD as a Post-Purchase Upgrade (Lump Sum)

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.5%	1.5%	1.5%	1.5%	1.5%

Price to Buy FSD in a Lump Sum Payment

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
$ 10k	$ 11k	$ 13k	$ 15k	$ 17k	$ 20k	$ 22k	$ 25k	$ 27k	$ 30k	$ 33k	$ 35k	$ 36k	$ 38k	$ 38k	$ 39k	$ 39k	$ 39k	$ 39k	$ 39k

% of New Buyers Buying FSD Up-Front Using Subscriptions

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
13.0%	14.0%	15.5%	16.5%	17.5%	18.5%	19.5%	21.0%	23.0%	25.0%	27.0%	28.8%	30.5%	32.0%	33.0%	34.0%	34.5%	35.0%	35.3%	35.5%

% of Eligible Owners Buying FSD as a Post-Purchase Upgrade (Subscriptions)

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.5%	1.5%	1.5%	1.5%	1.5%

Monthly Cost of an FSD Subscription

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
$ 174	$ 195	$ 226	$ 260	$ 295	$ 339	$ 386	$ 429	$ 476	$ 521	$ 564	$ 599	$ 629	$ 651	$ 664	$ 668	$ 677	$ 680	$ 681	$ 682

% of FSD Functionality that Has Been "Unlocked"

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
77%	81%	83%	85%	87%	89%	91%	94%	98%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Vehicle Survival Rate Assumptions

Yr5	Yr6	Yr7	Yr8	Yr9	Yr10	Yr11	Yr12	Yr13	Yr14	Yr15	Yr16	Yr17	Yr18	Yr19	Yr20	Yr21	Yr22	Yr23	Yr24
97.0%	95.0%	92.0%	89.0%	84.0%	79.0%	73.0%	65.0%	57.0%	47.0%	37.0%	27.0%	19.0%	13.0%	9.0%	6.0%	4.5%	3.0%	2.0%	1.0%

Total % of Tesla Owners Utilizing FSD

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
22%	22%	23%	25%	27%	28%	29%	31%	33%	36%	37.8%	39.9%	42.0%	44.0%	45.9%	47.7%	49.9%	51.6%	53.2%	54.7%

Total % of Tesla Owners NOT Utilizing FSD

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
78%	78%	77%	75%	73%	72%	71%	69%	67%	64%	62%	60%	58%	56%	54%	52%	50%	48%	47%	45%

In the table pictured here, cells with blue font represent the most important inputs in our FSD model

Source: Piper Sandler research

Full Self-Driving Software – Key Forecast Outputs

***see appendix for detailed data tables that support our FSD revenue forecast*

# of New Deliveries with FSD Installed Up-front - Paid for in Lump Sum (Millions)

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
0.063	0.118	0.233	0.385	0.553	0.758	0.959	1.221	1.524	1.769	1.958	2.138	2.261	2.334	2.383	2.427	2.436	2.448	2.424	2.403

# of New Deliveries with FSD Installed Up-front - Paid for with Subscriptions (Millions)

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
0.116	0.206	0.380	0.605	0.842	1.121	1.385	1.709	2.062	2.328	2.518	2.701	2.815	2.872	2.913	2.947	2.949	2.954	2.921	2.891

Revenue from Up-front FSD Lump Sum Payments ($ Millions)

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
482	1,072	2,515	4,906	8,184	13,150	19,410	28,345	40,917	52,537	63,643	73,775	81,960	87,506	91,165	93,446	95,019	95,839	95,131	94,423

Deferred Revenue Recognized from Up-front FSD Lump Sum Payments ($ Millions)

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
420	95	74	135	250	438	734	1,740	3,527	1,299	1,830	-	-	-	-	-	-	-	-	-

Revenue from Post-Purchase FSD Lump Sum Upgrades ($ Millions)

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
28	52	99	171	253	363	482	605	1,444	1,548	1,576	1,566	1,505	1,414	1,351	1,902	1,850	1,785	1,732	1,680

Deferred Revenue Recognized from Post-Purchase FSD Lump Sum Upgrades ($ Millions)

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
15	4	3	6	10	15	24	51	94	38	54	-	-	-	-	-	-	-	-	-

Revenue from Up-front FSD Subscriptions ($ Millions)

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
186	587	1,455	3,093	5,752	9,920	15,944	24,659	37,100	51,638	68,814	87,620	107,967	129,094	150,463	171,579	192,179	211,894	230,201	246,929

Deferred Revenue Recognized from Up-front FSD Subscriptions ($ Millions)

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
-	10	15	36	74	135	227	531	1,052	381	522	-	-	-	-	-	-	-	-	-

Revenue from Post-Purchase FSD Subscriptions ($ Millions)

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
6	17	38	74	128	205	309	442	1,214	1,524	1,846	2,144	2,420	2,666	2,884	4,604	4,795	4,985	5,128	5,223

Deferred Revenue Recognized from Post-Purchase FSD Subscriptions ($ Millions)

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
-	0	0	1	2	3	5	10	10	13	15	-	-	-	-	-	-	-	-	-

TOTAL REVENUE FROM FSD ($ Millions)

2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
1,138	1,836	4,199	8,420	14,652	24,229	37,133	56,384	85,358	108,978	138,299	165,105	193,853	220,679	245,863	271,531	293,844	314,502	332,191	348,256

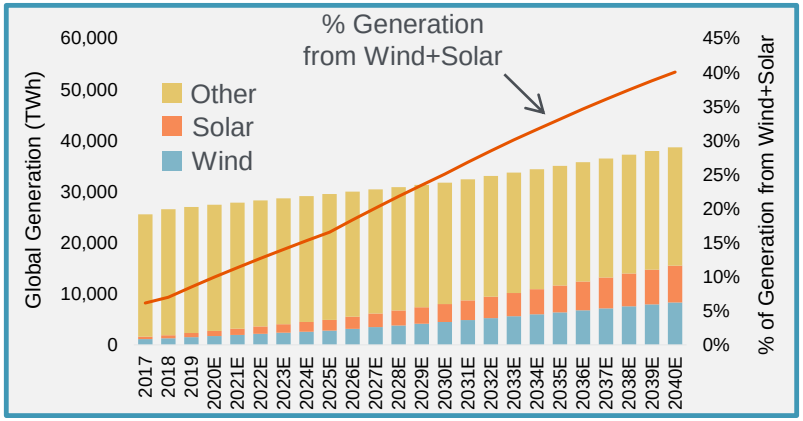
Source: Piper Sandler research

Part 5

Forecasting Revenue: Energy Gen. & Storage

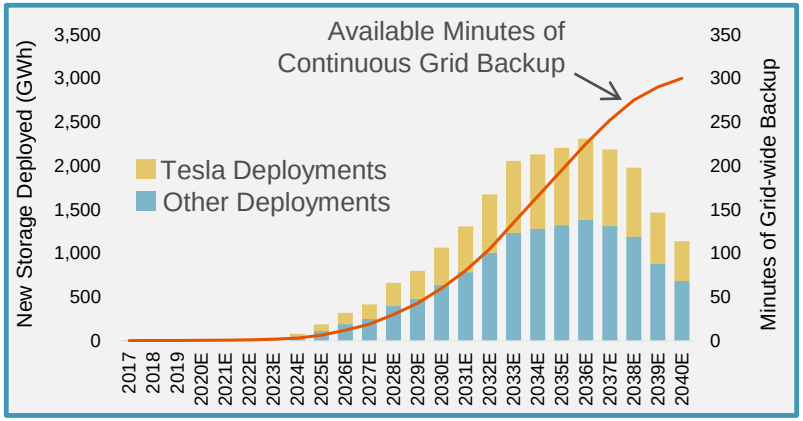
Energy Generation and Storage – Forecasting Methodology

In this segment, our forecast is driven by the global penetration of renewable energy



Long-term Forecast: Electricity Demand

- For both generation (solar) and storage (batteries)…
- …demand is a function of renewables penetration
- More intermittent generation requires more storage
- As a basis for our model, we use EIA forecasts (left)
- Solar rev = (global installations)*(mkt share)*($/watt)
- Projecting storage revenue is more involved (below)



Global Energy Storage Forecast

- Storage capacity is measured in watt-hours…
- …but it can also be expressed in units of *time*
- Namely: how long can a grid rely solely on batteries?
- A grid with 80% solar+wind needs 12hrs of storage
- We use this rule to forecast global storage demand
- We expect TSLA to achieve #1 market share (40%)

Source: Piper Sandler research; EIA, Bloomberg New Energy Finance

Energy Generation and Storage – Forecast Summary

As with FSD, the following model involves informed guessing (disclosure is limited)

	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E	2038E	2039E	2040E
Global Electricity Generation																				
Wind (TWh)	1,918	2,135	2,353	2,570	2,788	3,121	3,454	3,787	4,120	4,453	4,834	5,216	5,598	5,979	6,361	6,748	7,134	7,521	7,908	8,295
Solar PV (TWh)	1,237	1,452	1,667	1,882	2,098	2,381	2,664	2,947	3,230	3,513	3,859	4,206	4,553	4,900	5,246	5,639	6,031	6,423	6,816	7,208
All Other (TWh)	24,686	24,679	24,671	24,663	24,655	24,485	24,315	24,145	23,975	23,805	23,731	23,656	23,582	23,508	23,434	23,383	23,332	23,282	23,231	23,180
Global Electricity Generation (TWh)	27,841	28,266	28,691	29,116	29,541	29,986	30,432	30,878	31,324	31,770	32,424	33,079	33,733	34,387	35,041	35,769	36,498	37,226	37,955	38,683
Solar+Wind as % of Total Generation	11.3%	12.7%	14.0%	15.3%	16.5%	18.3%	20.1%	21.8%	23.5%	25.1%	26.8%	28.5%	30.1%	31.6%	33.1%	34.6%	36.1%	37.5%	38.8%	40.1%
Cumulative Storage Capacity																				
Global Storage Capacity (GWh)	42	65	98	177	365	685	1,100	1,762	2,563	3,627	4,935	6,608	8,664	10,795	13,000	15,312	17,499	19,477	20,941	22,079
Global Storage Capacity (Mins of Backup)	0.80	1.20	1.80	3.20	6.50	12.00	19.00	30.00	43.00	60.00	80.00	105.00	135.00	165.00	195.00	225.00	252.00	275.00	290.00	300.00
New Storage Deployments																				
New Storage Deployments - Global (GWh)	11	22	34	79	188	319	415	662	800	1,064	1,308	1,673	2,056	2,131	2,205	2,312	2,187	1,978	1,464	1,138
New Storage Deployments - Tesla (GWh)	4.0	8.4	13.2	31.2	74.8	128	166	265	320	426	523	669	822	852	882	925	875	791	586	455
New Storage Deployments - Tesla - % Share	36.0%	38.0%	39.0%	39.5%	39.8%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
New Storage Deployments - Tesla - % YoY	30.8%	113%	56.2%	137%	140%	70.6%	30.1%	59.4%	20.8%	33.0%	23.0%	27.9%	22.9%	3.6%	3.5%	4.8%	-5.4%	-9.5%	-26.0%	-22.3%
Cumulative Global Solar Capacity (MW)																				
Global Solar Capacity (GW)	1,056	1,243	1,441	1,643	1,848	2,118	2,393	2,673	2,959	3,251	3,572	3,906	4,243	4,597	4,956	5,327	5,698	6,068	6,439	6,810
Solar Generation (Hrs/Day @ Max GW)	3.21	3.20	3.17	3.14	3.11	3.08	3.05	3.02	2.99	2.96	2.96	2.95	2.94	2.92	2.90	2.90	2.90	2.90	2.90	2.90
New Solar Deployments																				
New Solar Deployments - Global (GW)	186	187	198	201	205	270	275	281	286	292	321	334	336	354	359	371	371	371	371	371
New Solar Deployments - Tesla (GW)	0.32	0.47	0.79	1.21	1.64	2.70	3.30	3.93	4.58	5.25	6.42	7.35	8.07	9.13	9.79	10.56	10.93	11.30	11.58	11.86
New Solar Deployments - Tesla - % Share	0.2%	0.3%	0.4%	0.6%	0.8%	1.0%	1.2%	1.4%	1.6%	1.8%	2.0%	2.2%	2.4%	2.6%	2.7%	2.9%	3.0%	3.1%	3.1%	3.2%
New Solar Deployments - Tesla - % YoY	54.5%	48.0%	68.7%	52.9%	35.9%	64.2%	22.4%	19.0%	16.6%	14.8%	22.2%	14.5%	9.8%	13.0%	7.3%	7.9%	3.5%	3.4%	2.5%	2.4%
Tesla's Estimated Pricing																				
Revenue per Unit - Storage - $/kWh	$ 335	$ 325	$ 315	$ 300	$ 285	$ 265	$ 245	$ 225	$ 215	$ 205	$ 195	$ 190	$ 185	$ 180	$ 175	$ 170	$ 170	$ 170	$ 170	$ 170
Revenue per Unit - Solar - $/Watt	$ 1.68	$ 1.67	$ 1.66	$ 1.66	$ 1.65	$ 1.65	$ 1.65	$ 1.65	$ 1.65	$ 1.65	$ 1.65	$ 1.65	$ 1.65	$ 1.65	$ 1.65	$ 1.65	$ 1.65	$ 1.65	$ 1.65	$ 1.65
Tesla Energy Revenue ($billions)																				
Revenue - Storage Sales (est.)	1.3	2.7	4.1	9.4	21.3	33.8	40.7	59.6	68.8	87.3	102.1	127.1	152.1	153.4	154.4	157.2	148.7	134.5	99.6	77.4
Revenue - Solar Sales (est.)	0.5	0.8	1.3	2.0	2.7	4.5	5.5	6.5	7.6	8.7	10.6	12.1	13.3	15.1	16.2	17.5	18.1	18.7	19.1	19.6
Revenue - Energy Gen & Storage - Sales	1.9	3.5	5.5	11.4	24.0	38.3	46.2	66.1	76.4	95.9	112.7	139.3	165.5	168.5	170.6	174.7	166.8	153.2	118.7	97.0
Revenue - Energy Gen & Storage - Leasing	0.9	1.8	2.8	5.8	12.3	19.5	23.5	33.7	39.0	48.9	57.5	71.0	84.4	85.9	87.0	89.1	85.1	78.1	60.5	49.5

Source: Piper Sandler research; IEA

Charging a Tesla Using Solar Power: Our Experience So Far

Single-family home in Minneapolis; site includes a 5.8 kW solar array (no Powerwalls yet)

Source: Piper Sandler research

Charging a Tesla Using Solar Power: Our Experience So Far

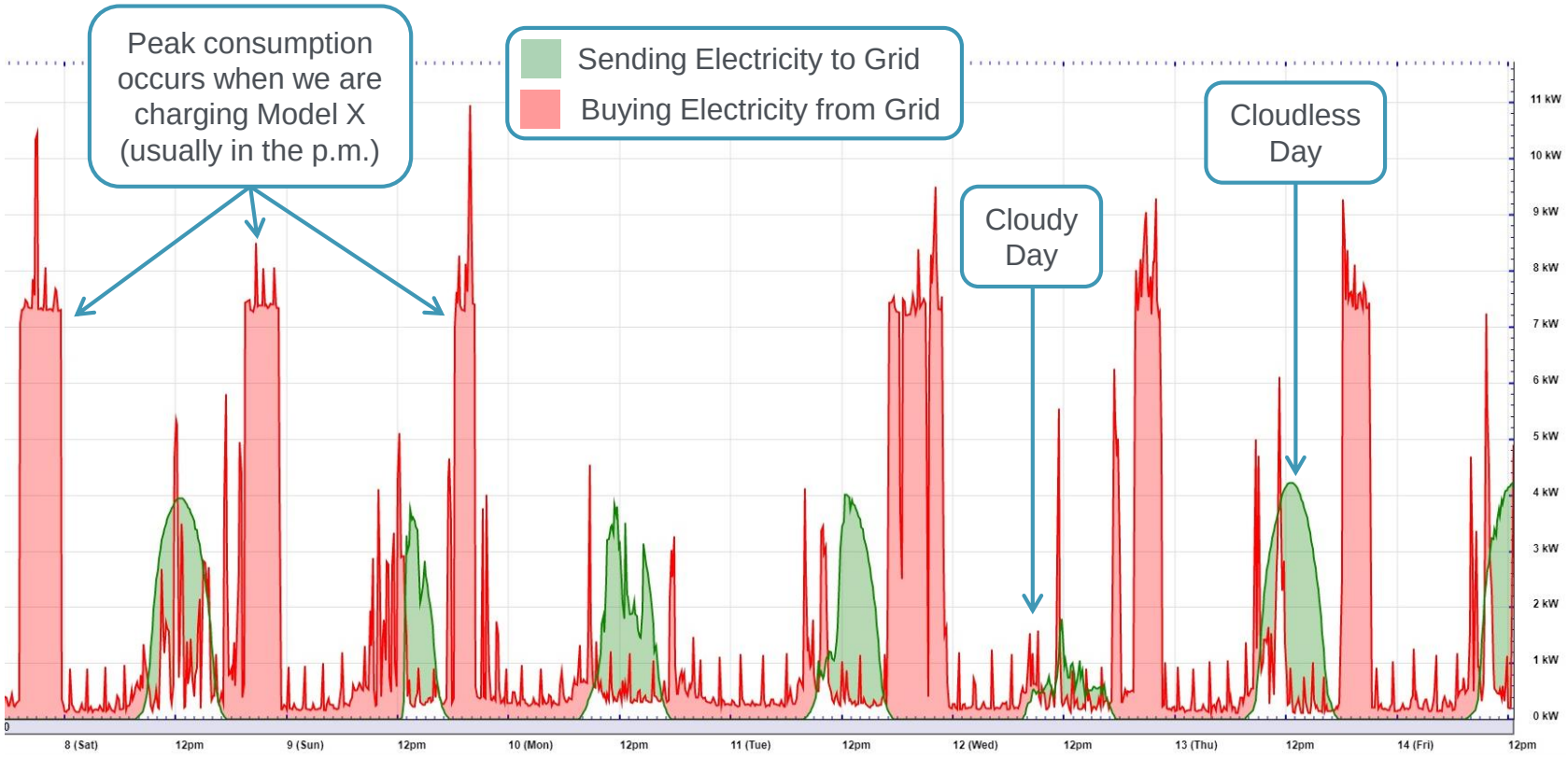
System includes sixteen 360-watt LG modules; installation completed by local contractor

Source: Piper Sandler research

Charging a Tesla Using Solar Power: Our Experience So Far

We began monitoring energy production & consumption starting one year ago (1/24/2020)

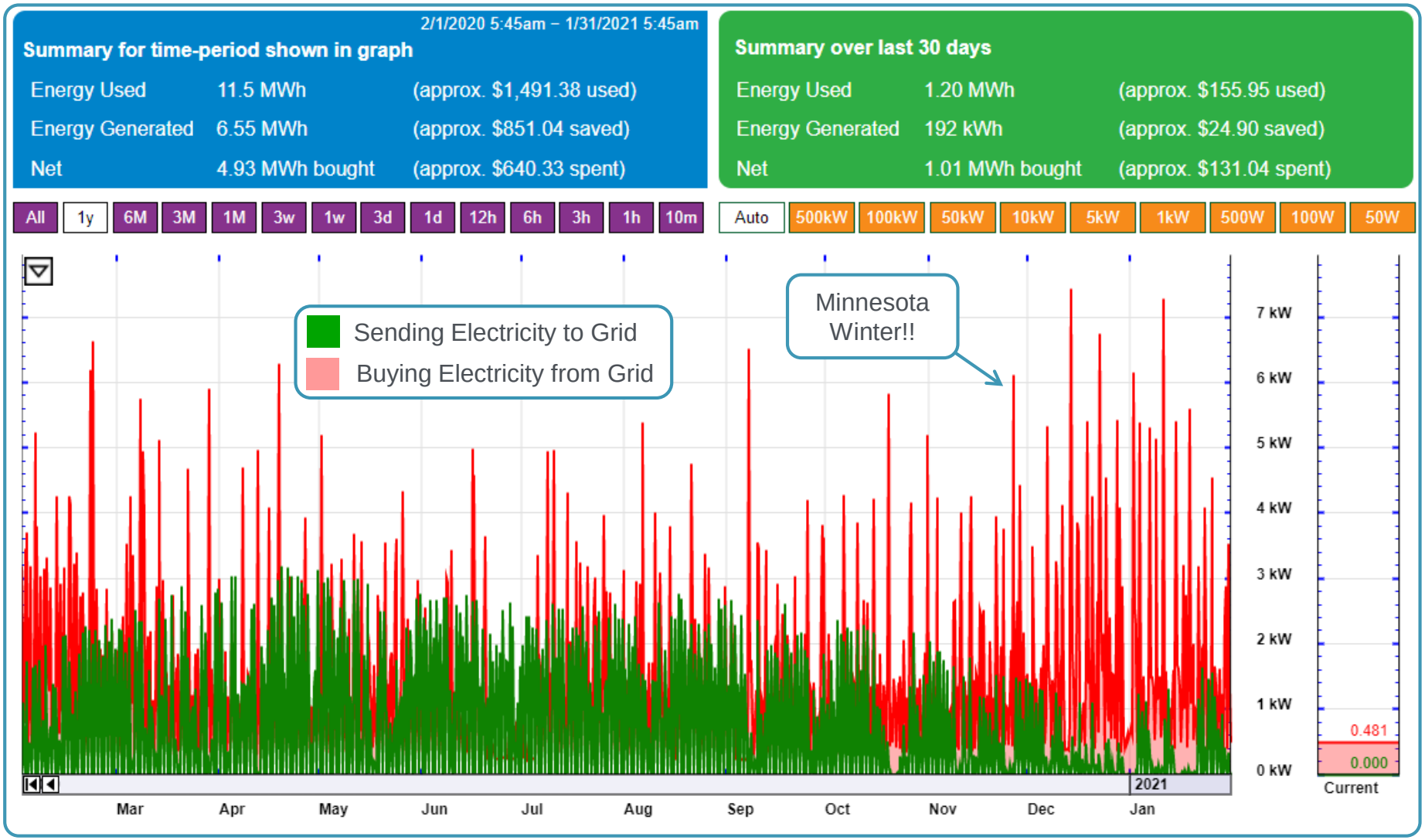
- Over the past year, the solar array has generated 6.6 MWh of electricity (57% of household usage)
- …this seems respectable, given the additional demands of an electric SUV
- Installation cost: ($24,194 labor & materials) – ($7,258 tax credit) – ($1,498 city rebate) = **$15,438**



Source: Piper Sandler research

Charging a Tesla Using Solar Power: Our Experience So Far

Here's a 1-year summary of solar performance for a single-family home with a Model X



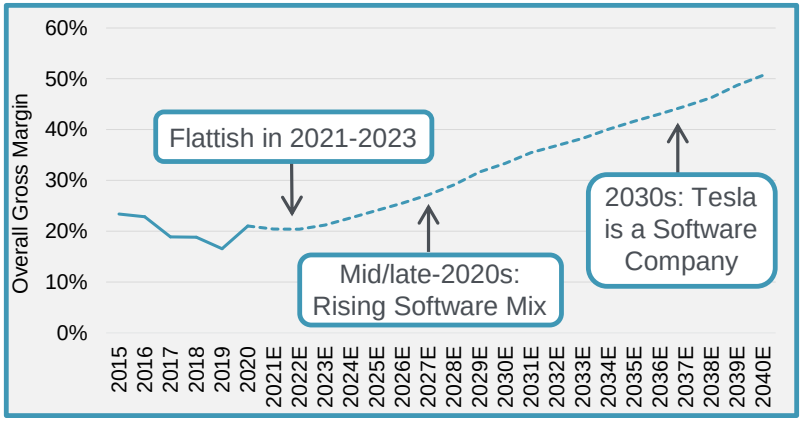
Source: Piper Sandler research

Part 6

Other Drivers of our DCF Model

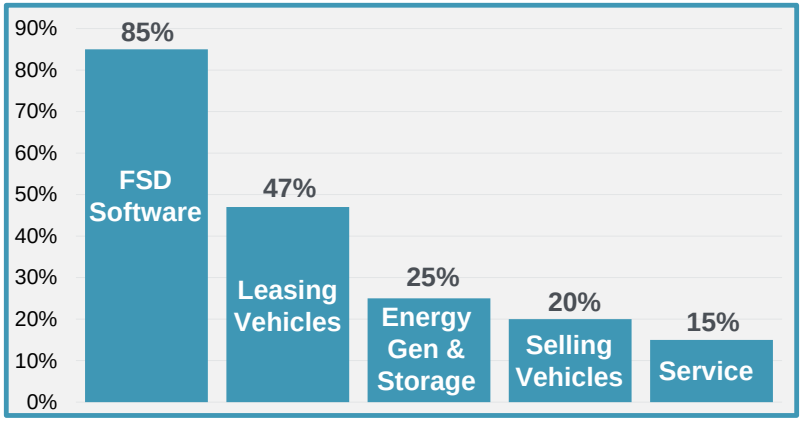
Other DCF Drivers – Gross Margin

Eventually, we think FSD software will drive a step-function change in gross margin



Company-wide Gross Margin Forecast

- This chart shows all-in gross margin (incl. credits)
- We don't expect much near-term improvement
- …because new launches often drive choppy margins
- Warranty expense is worth watching in the near-term
- Warranty has been a respectable ~2.5% of auto rev.
- Software mix is (by far) the biggest long-term driver



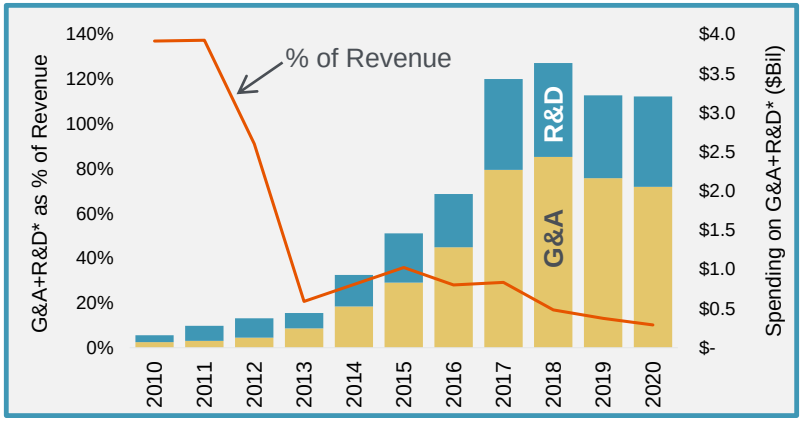
Steady-state Gross Margin Assumptions

- Due to 85% margin, FSD mix has a sizable impact
- Our forecast implies improvement in Energy, Service
- …but run-rate margins not doable until late-2020s
- Recent margin has been *negative* in these segments
- TSLA's medium-term target: breakeven in Service
- Energy margin upside if software deployed at scale?

Source: Tesla and Piper Sandler research

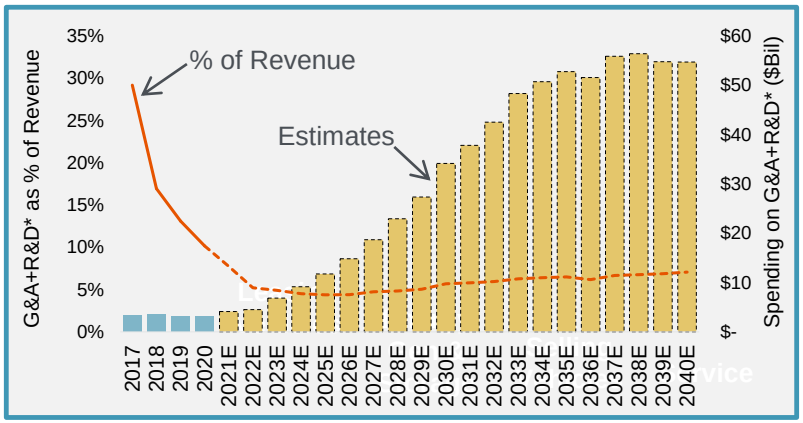
Other DCF Drivers – SG&A and R&D

These figures reflect absolute spending on opex *EXCLUDING* stock-based compensation



Visualizing Tesla's Recent Opex Discipline

- Op. margin may rise in '21-'24 despite flat gr. margin
- Tesla has exhibited impressive spending discipline
- Revenue rose +168% between 2017 and 2020…
- …but over this time, opex spending *FELL* by -6.5%
- We expect continued leverage in the coming years
- Operating margin could be low/mid-teens by 2022



Our Long-term Expectations for Opex

- At first blush, our leverage forecast seems generous
- …but in absolute terms, we expect opex to balloon
- Overseas growth could feasibly drive more spending
- Management provides relatively little opex guidance
- TSLA says opex will rise, but more slowly than sales
- Our forecast aligns with this qualitative guidance

Source: Tesla and Piper Sandler research; *NOTE: these figures *exclude* stock-based compensation

Other DCF Drivers – Stock-based Compensation (SBC)*

In compensating its employees (and its CEO), Tesla leans heavily on stock-based awards

ELON MUSK'S COMPENSATION

- Elon Musk receives no salary, but collects compensation through a performance-based options plan
- These are the components of Musk's compensation package (approved by shareholders on March 21, 2018):
  - 20,264,042 options which grant Musk the opportunity to buy TSLA shares at $350.02 apiece
  - …in split-adjusted terms, this equates to 101.3M options with exercise price of ~$70
  - To be eligible, Musk must remain employed as CEO or both Executive Chairman and Chief Product Officer
  - Shares vest in 12 tranches. Each $50B increase in Tesla's market cap unlocks 1/12th of Musk's options
  - *However*, the options will only vest if Tesla pairs a market cap milestone with one of 16 financial milestones
  - For instance, in 2Q20, TSLA exceeded the $100B market cap milestone *and* the $20B revenue milestone
  - …as a result of this pairing, Musk unlocked his first tranche of options. See below for additional detail.

Tranche #	1	2	3	4	5	6	7	8	9	10	11	12
Market Cap ($B)	100	150	200	250	300	350	400	450	500	550	600	650
Annualized Revenue ($B)	20	35	55	75	100	125	150	175				
Annualized EBITDA ($B)	1.5	3	4.5	6	8	10	12	14				

=Options associated w/ this milestone are likely to have vested by the end of 2021 (in our view)

Source: company filings and Piper Sandler research; *NOTE: for the purpose of our DCF-based price target, we treat SBC as a cash expense

Other DCF Drivers – Stock-based Compensation (SBC)*

In compensating its employees (and its CEO), Tesla leans heavily on stock-based awards

ELON MUSK'S COMPENSATION (…CONTINUED)

- The key issue for investors: how to forecast stock-based comp in the context of Musk's options package?
- To answer this question, investors must track Tesla's revenue, EBITDA, and market capitalization
- The following considerations are also relevant:
  - In aggregate, TSLA will incur ~$2.28B in stock-based compensation expense due to Musk's option plan
  - As of 3Q20, ~$1.04B of plan-related expenses had been booked, leaving $1.24B in unrecognized expense
  - Since the total plan-related expense is known, the main question is the *timing* of the expenses
  - Expense recognition begins for a given tranche when achievement of a financial milestone seems probable
  - …note that expenses are recognized regardless of how much additional market cap is required for vesting
  - Also, merely achieving a market cap threshold for the first time does not constitute a vesting event
  - For Musk's options to vest, TSLA must sustain its market cap based on trailing 6-mo. and 30-day averages
  - Likewise, financial milestones are expressed in annualized terms, and performance must be sustained
  - Musk's options will not vest unless financial milestones have been met for four consecutive fiscal quarters

Source: company filings and Piper Sandler research; *NOTE: for the purpose of our DCF-based price target, we treat SBC as a cash expense

Other DCF Drivers – Stock-based Compensation (SBC)*

In compensating its employees (and its CEO), Tesla leans heavily on stock-based awards

= Milestone likely to be achieved = Milestone achieved, option unvested = Milestone achieved, option vested

CEO STOCK-BASED COMP FROM ACHIEVING REVENUE MILESTONES	2018				2019				2020				2021				2022			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4E	Q1E	Q2E	Q3E	Q4E	Q1E	Q2E	Q3E	Q4E
$20B Revenue Milestone - Recognized Expense	2.2	18.6	18.7	18.8	18.4	18.5	18.7	19.1	16.5	22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
$35B Revenue Milestone - Recognized Expense								72.0	16.5	22.0	20.0	20.0	29.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
$55B Revenue Milestone - Recognized Expense												60.0	20.0	20.0	20.0	20.0	30.0	0.0	0.0	0.0
$75B Revenue Milestone - Recognized Expense																40.0	20.0	20.0	80.0	0.0
$100B Revenue Milestone - Recognized Expense																				
$125B Revenue Milestone - Recognized Expense																				
$150B Revenue Milestone - Recognized Expense																				
$175B Revenue Milestone - Recognized Expense																				
Expense from Achieving Revenue Milestones	2.2	18.6	18.7	18.8	18.4	18.5	18.7	91.1	33.0	44.0	20.0	80.0	49.5	20.0	20.0	60.0	50.0	20.0	80.0	0.0

CEO STOCK-BASED COMP FROM ACHIEVING EBITDA MILESTONES	2018				2019				2020				2021				2022			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4E	Q1E	Q2E	Q3E	Q4E	Q1E	Q2E	Q3E	Q4E
$1.5B EBITDA Milestone - Recognized Expense	2.2	18.6	18.7	18.8	18.4	18.5	18.7	19.1	16.5	22.0	95.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
$3.0B EBITDA Milestone - Recognized Expense	2.2	18.6	18.7	18.8	18.4	18.5	18.7	19.1	16.5	22.0	118.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
$4.5B EBITDA Milestone - Recognized Expense										79.0	28.0	122.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
$6.0B EBITDA Milestone - Recognized Expense											77.0	60.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
$8.0B EBITDA Milestone - Recognized Expense													70.0	20.0	20.0	20.0	30.0	0.0	0.0	0.0
$10.0B EBITDA Milestone - Recognized Expense														70.0	20.0	20.0	20.0	20.0	10.0	0.0
$12.0B EBITDA Milestone - Recognized Expense																70.0	20.0	20.0	20.0	30.0
$14.0B EBITDA Milestone - Recognized Expense																		70.0	20.0	20.0
Expense from Achieving EBITDA Milestones	4.5	37.1	37.3	37.7	36.7	37.1	37.3	38.2	33.0	123.0	318.0	182.0	110.0	90.0	40.0	110.0	70.0	110.0	50.0	50.0

Quarterly Expense, CEO 2018 Plan ($mil)	**6.7**	**55.7**	**56.0**	**56.5**	**55.1**	**55.6**	**56.0**	**129.3**	**66.0**	**167.0**	**338.0**	**262.0**	**159.5**	**110.0**	**60.0**	**170.0**	**120.0**	**130.0**	**130.0**	**50.0**

Cumulative Expense - CEO 2018 Plan ($mil)	7	62	118	175	230	286	342	471	537	704	1,042	1,304	1,463	1,573	1,633	1,803	1,923	2,053	2,183	2,233
Remaining Expense - CEO 2018 Plan ($mil)	2,276	2,221	2,164	2,108	2,053	1,987	1,941	1,817	1,751	1,582	1,241	979	820	710	650	480	360	230	100	50

Source: company filings and Piper Sandler research; *NOTE: for the purpose of our DCF-based price target, we treat SBC as a cash expense

Other DCF Drivers – Stock-based Compensation (SBC)*

In compensating its employees (and its CEO), Tesla leans heavily on stock-based awards

OUR EXPECTATIONS FOR TESLA'S OVERALL SPENDING ON STOCK-BASED COMP

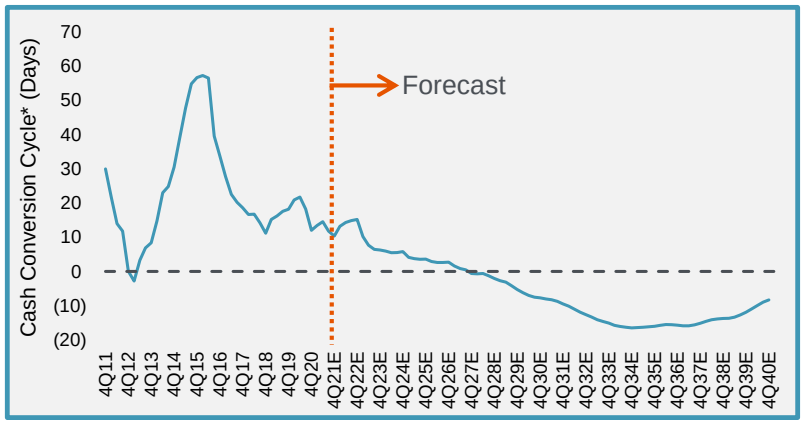
- Tesla also spends about 3% of revenue (in GAAP terms) on SBC for other employees
- …even with this, Musk's stock-based comp (2020) was comparable to SBC for all other employees *combined*
- Note that Musk cannot exercise vested options for five years, so most of his wealth remains "on paper"
- See below for our company-wide expectations for stock-based compensation expenses
- Note: our long-term forecast assumes no leverage here; we assume SBC = 2.5% of revenue into perpetuity

	2018				2019				2020				2021				2022			
	1QA	2QA	3QA	4QA	1QA	2QA	3QA	4QA	1QA	2QA	3QA	4QE	1QE	2QE	3QE	4QE	1QE	2QE	3QE	4QE
Stock-based Comp - COGS	18	22	30	39	27	35	29	37	33	52	62	62	62	75	83	94	105	128	142	165
Stock-based Comp - R&D	61	66	66	68	72	71	72	70	65	73	76	124	119	142	157	171	190	224	247	283
Stock-based Comp - SG&A - Elon 2012 plan	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stock-based Comp - SG&A - Elon 2018 plan	7	56	56	57	55	56	56	129	66	167	338	262	160	110	60	170	120	130	130	50
Stock-based Comp - SG&A - Other	56	50	53	41	52	47	42	45	47	55	67	88	84	99	111	121	134	161	180	206
Stock-based Comp - SG&A - Total	62	106	109	98	107	103	98	174	113	222	405	350	243	209	171	291	254	291	310	256
Stock-based Comp - Restructuring	-	4	-	-	2	1	-	0	-	-	-	-	-	-	-	-	-	-	-	-
Stock-based Comp - Total	142	197	205	205	208	210	199	281	211	347	543	536	424	427	410	556	549	643	698	704
Stock-based Comp % of Rev - COGS	0.5%	0.5%	0.4%	0.5%	0.6%	0.5%	0.5%	0.5%	0.6%	0.9%	0.7%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
Stock-based Comp % of Rev - R&D	1.8%	1.6%	1.0%	0.9%	1.6%	1.1%	1.1%	0.9%	1.1%	1.2%	0.9%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Stock-based Comp % of Rev - SG&A	1.6%	1.3%	0.8%	0.6%	1.1%	0.7%	0.7%	0.6%	0.8%	0.9%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%

Source: company filings and Piper Sandler research; *NOTE: for the purpose of our DCF-based price target, we treat SBC as a cash expense

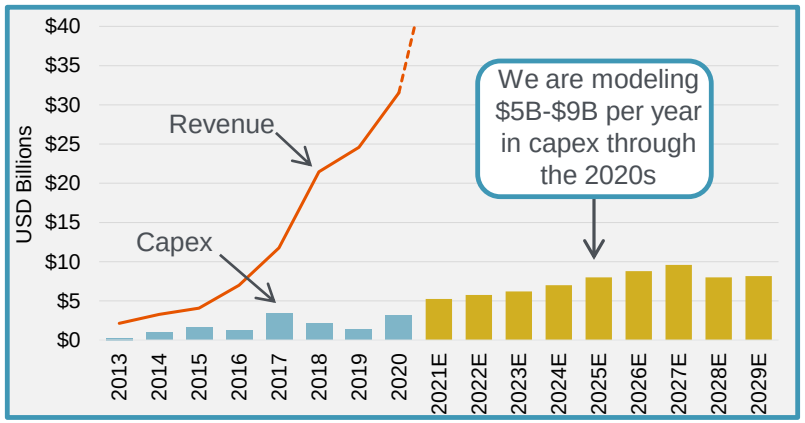
Other DCF Drivers – Working Capital & Capex

See below for our assumptions re: Tesla's capital spending



Tesla's Cash Conversion Cycle (CCC)[1]

- In the Auto business, Tesla should have CCC[1] < 0
- …because incoming cash outpaces supplier invoices
- Inventory turns have also been improving recently
- As software mix rises, capital intensity should fall
- Non-automotive receivables negatively impact CCC[1]
- …but non-auto A/R should fall as a % of total



Tesla's Impressive Capex Leverage

- Capex is difficult to forecast, and guidance is spotty
- Revenue has grown swiftly despite flattish capex
- Such impressive results probably can't last forever
- Battery Day implies $10B/yr for battery capex alone[2]
- …but we think Tesla will temper the Battery Day plan
- Also, Tesla has a history of surprisingly low capex

[1]Cash Conversion Cycle = [Days Sales Outstanding] + [Days Inventory Outstanding] – [Days Payable Outstanding]
[2]See Tesla Daily Podcast here for details; video courtesy Rob Maurer: https://youtu.be/N2pAkEjUUrg
Source: company filings; Tesla Daily Podcast; Piper Sandler research

Discounted Cash Flow and Price Target Justification

This page illustrates the output of our DCF model, along w/ our new price target of $1,200

- Our new (higher) price target is mostly due to the inclusion of new vehicle models in our long-term forecast
- The higher PT is also due to a more detailed FSD modeling effort – particularly regarding mix and margins
- These changes are partially offset by a higher WACC (10.3%, up from 9.4%) to reflect higher treasury yields

Fundamentals (All Figures in Billions of USD)

Fiscal Year:	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Forecast Year #	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Revenue	53.1	86.7	139.4	203.0	267.6	336.0	393.4	473.6	542.0	600.7	651.1	713.5	770.7	790.3	810.2	833.6	838.0	833.3	794.8	773.0
Operating Expenses	47.9	75.6	119.2	170.0	219.9	271.4	312.6	367.6	407.9	445.8	470.3	506.6	538.6	539.2	540.9	541.8	535.7	519.8	477.4	450.5
Operating Margin (Unadj.)	*9.8%*	*12.8%*	*14.4%*	*16.3%*	*17.8%*	*19.2%*	*20.5%*	*22.4%*	*24.7%*	*25.8%*	*27.8%*	*29.0%*	*30.1%*	*31.8%*	*33.2%*	*35.0%*	*36.1%*	*37.6%*	*39.9%*	*41.7%*
Operating Income - Unadjusted	5.2	11.1	20.1	33.0	47.7	64.6	80.8	106.0	134.0	154.9	180.8	206.9	232.2	251.1	269.3	291.8	302.4	313.5	317.4	322.5
Add: Equity Income	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Income - Incl. Equity Income	5.2	11.1	20.1	33.0	47.7	64.6	80.8	106.0	134.0	154.9	180.8	206.9	232.2	251.1	269.3	291.8	302.4	313.5	317.4	322.5
Tax Rate	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*
Less: Unlevered Taxes	(1.0)	(2.2)	(4.0)	(6.6)	(9.5)	(12.9)	(16.2)	(21.2)	(26.8)	(31.0)	(36.2)	(41.4)	(46.4)	(50.2)	(53.9)	(58.4)	(60.5)	(62.7)	(63.5)	(64.5)
Add Back: D&A	2.9	3.4	3.9	4.4	5.0	5.7	6.3	6.9	7.1	7.1	6.8	6.5	6.3	6.2	6.1	6.0	6.0	6.0	6.0	6.0
Add Back: Change in Working Capital	(1.2)	(2.8)	(3.5)	(0.5)	1.7	3.1	(2.7)	0.5	2.6	(0.8)	3.1	2.0	2.3	(1.5)	(2.8)	(0.2)	(4.6)	(2.2)	(5.6)	(3.9)
Add Back: Other Sources & Uses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Capex	(5.3)	(5.8)	(6.2)	(7.0)	(8.0)	(8.8)	(9.6)	(8.0)	(8.2)	(5.5)	(5.5)	(5.6)	(5.6)	(5.7)	(5.7)	(5.8)	(5.8)	(5.9)	(6.0)	(6.0)
Unlevered Free Cash Flow →	0.7	3.8	10.3	23.3	36.9	51.7	58.7	84.2	108.8	124.7	149.1	168.5	188.7	199.9	213.0	233.5	237.4	248.7	248.3	254.1
Present Value of Unlevered FCF →	0.7	3.4	8.5	17.4	24.9	31.7	32.6	42.5	49.8	51.7	56.1	57.5	58.4	56.1	54.2	53.9	49.7	47.2	42.8	39.7

Valuation *(Figures in Billions of USD)*

Sum of PV of 20-year Unlevered FCF	778.9
Add: PV of Residual Value	562.5
Discounted Value of All Unlevered FCF	1,341
Add: Cash	19.4
Subtract: Debt	(11.7)
Subtract: Unfunded Pension	-
Total Net Value of Equity	1,349
Divide by: # of Diluted Shares (bil)	1.124

WACC Assumptions

Tax Rate	20%
Risk Free Rate	1.04%
Equity Premium	4.5%
Beta	2.07
Cost of Equity	10.4%
Cost of Debt	4.0%
Terminal CF Growth	3.0%
WACC	10.3%

Capital Structure

Debt	12
Unfunded Pension	-
Cash (bil)	19.4
Share Price ($)	828
Diluted Shares (bil)	1.12
Market Cap ($bil)	931
Debt % of Capital	1%
Equity % of Capital	99%

TARGET PRICE PER SHARE	**$ 1,200**

Source: Piper Sandler research estimates

Part 7

Appendix

Full Self-Driving Software – Detailed Data Tables

These figures underpin our FSD revenue model; clients can view the model upon request

Total # of Vehicles that Are Capable of FSD Functionality (Millions, By Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	0.101	0.100	0.098	0.095	0.092	0.087	0.082	0.075	0.067	0.059	0.049	0.038	0.028	0.020	0.013	0.009	0.006	0.005	0.003	0.002
2018	0.243	0.240	0.238	0.233	0.226	0.218	0.206	0.194	0.179	0.159	0.140	0.115	0.091	0.066	0.047	0.032	0.022	0.015	0.011	0.007
2019	0.367	0.364	0.360	0.357	0.349	0.338	0.327	0.309	0.290	0.268	0.239	0.210	0.173	0.136	0.099	0.070	0.048	0.033	0.022	0.017
2020	0.499	0.498	0.494	0.489	0.484	0.474	0.459	0.444	0.419	0.394	0.364	0.325	0.285	0.235	0.185	0.135	0.095	0.065	0.045	0.030
2021	0.894	0.893	0.892	0.885	0.876	0.867	0.850	0.823	0.796	0.751	0.706	0.653	0.581	0.510	0.420	0.331	0.241	0.170	0.116	0.080
2022		1.470	1.468	1.466	1.455	1.441	1.426	1.396	1.352	1.308	1.235	1.161	1.073	0.955	0.838	0.691	0.544	0.397	0.279	0.191
2023			2.453	2.451	2.446	2.429	2.404	2.380	2.331	2.257	2.183	2.061	1.938	1.791	1.595	1.398	1.153	0.908	0.662	0.466
2024				3.664	3.661	3.653	3.628	3.591	3.555	3.481	3.371	3.261	3.078	2.895	2.675	2.382	2.089	1.722	1.356	0.989
2025					4.812	4.807	4.797	4.764	4.716	4.668	4.571	4.427	4.283	4.042	3.801	3.513	3.128	2.743	2.262	1.780
2026						6.061	6.055	6.043	6.001	5.940	5.880	5.758	5.577	5.395	5.092	4.789	4.425	3.940	3.455	2.849
2027							7.101	7.094	7.080	7.030	6.959	6.888	6.746	6.533	6.320	5.965	5.610	5.184	4.616	4.048
2028								8.139	8.131	8.114	8.057	7.976	7.895	7.732	7.488	7.244	6.837	6.430	5.941	5.290
2029									8.964	8.955	8.937	8.874	8.784	8.695	8.515	8.246	7.978	7.529	7.081	6.543
2030										9.310	9.301	9.282	9.217	9.124	9.031	8.845	8.565	8.286	7.821	7.355
2031											9.325	9.316	9.297	9.232	9.138	9.045	8.859	8.579	8.299	7.833
2032												9.379	9.370	9.351	9.285	9.191	9.098	8.910	8.629	8.347
2033													9.228	9.219	9.201	9.136	9.044	8.952	8.767	8.490
2034														8.975	8.966	8.948	8.885	8.796	8.706	8.526
2035															8.827	8.819	8.801	8.739	8.651	8.563
2036																8.668	8.660	8.642	8.582	8.495
2037																	8.549	8.540	8.523	8.463
2038																		8.441	8.433	8.416
2039																			8.286	8.278
2040																				8.144
TOTAL	2.10	3.57	6.00	9.64	14.40	20.38	27.34	35.25	43.88	52.70	61.32	69.72	77.64	84.90	91.54	97.46	102.63	107.02	110.55	113.20

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

These figures underpin our FSD revenue model; clients can view the model upon request

# of Vehicles Equipped w/ FSD Up-Front, in a Lump Sum (Millions, By Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	0.025	0.025	0.025	0.024	0.023	0.022	0.020	0.019	0.017	0.015	0.012	0.010	0.007	0.005	0.003	0.002	0.002	0.001	0.001	0.001
2018	0.061	0.060	0.059	0.058	0.056	0.055	0.052	0.048	0.045	0.040	0.035	0.029	0.023	0.017	0.012	0.008	0.006	0.004	0.003	0.002
2019	0.092	0.091	0.090	0.089	0.087	0.085	0.082	0.077	0.073	0.067	0.060	0.052	0.043	0.034	0.025	0.017	0.012	0.008	0.006	0.004
2020	0.090	0.090	0.089	0.088	0.087	0.085	0.083	0.080	0.075	0.071	0.066	0.058	0.051	0.042	0.033	0.024	0.017	0.012	0.008	0.005
2021	0.063	0.063	0.062	0.062	0.061	0.061	0.059	0.058	0.056	0.053	0.049	0.046	0.041	0.036	0.029	0.023	0.017	0.012	0.008	0.006
2022		0.118	0.117	0.117	0.116	0.115	0.114	0.112	0.108	0.105	0.099	0.093	0.086	0.076	0.067	0.055	0.044	0.032	0.022	0.015
2023			0.233	0.233	0.232	0.231	0.228	0.226	0.221	0.214	0.207	0.196	0.184	0.170	0.151	0.133	0.110	0.086	0.063	0.044
2024				0.385	0.384	0.384	0.381	0.377	0.373	0.366	0.354	0.342	0.323	0.304	0.281	0.250	0.219	0.181	0.142	0.104
2025					0.553	0.553	0.552	0.548	0.542	0.537	0.526	0.509	0.493	0.465	0.437	0.404	0.360	0.315	0.260	0.205
2026						0.758	0.757	0.755	0.750	0.743	0.735	0.720	0.697	0.674	0.636	0.599	0.553	0.492	0.432	0.356
2027							0.959	0.958	0.956	0.949	0.939	0.930	0.911	0.882	0.853	0.805	0.757	0.700	0.623	0.546
2028								1.221	1.220	1.217	1.209	1.196	1.184	1.160	1.123	1.087	1.025	0.964	0.891	0.794
2029									1.524	1.522	1.519	1.509	1.493	1.478	1.448	1.402	1.356	1.280	1.204	1.112
2030										1.769	1.767	1.764	1.751	1.734	1.716	1.680	1.627	1.574	1.486	1.397
2031											1.958	1.956	1.952	1.939	1.919	1.899	1.860	1.802	1.743	1.645
2032												2.138	2.136	2.132	2.117	2.096	2.074	2.031	1.967	1.903
2033													2.261	2.259	2.254	2.238	2.216	2.193	2.148	2.080
2034														2.334	2.331	2.327	2.310	2.287	2.263	2.217
2035															2.383	2.381	2.376	2.360	2.336	2.312
2036																2.427	2.425	2.420	2.403	2.379
2037																	2.436	2.434	2.429	2.412
2038																		2.448	2.446	2.441
2039																			2.424	2.421
2040																				2.403
TOTAL	0.33	0.45	0.68	1.06	1.60	2.35	3.29	4.48	5.96	7.67	9.54	11.55	13.64	15.74	17.82	19.86	21.80	23.64	25.31	26.80

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

These figures underpin our FSD revenue model; clients can view the model upon request

# of Vehicles Equipped w/ FSD Up-Front, as a Subscription (Millions, By Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2021	0.116	0.116	0.116	0.115	0.114	0.113	0.110	0.107	0.103	0.098	0.092	0.085	0.076	0.066	0.055	0.043	0.031	0.022	0.015	0.010
2022		0.206	0.206	0.205	0.204	0.202	0.200	0.196	0.189	0.183	0.173	0.163	0.150	0.134	0.117	0.097	0.076	0.056	0.039	0.027
2023			0.380	0.380	0.379	0.376	0.373	0.369	0.361	0.350	0.338	0.319	0.300	0.278	0.247	0.217	0.179	0.141	0.103	0.072
2024				0.605	0.604	0.603	0.599	0.593	0.586	0.574	0.556	0.538	0.508	0.478	0.441	0.393	0.345	0.284	0.224	0.163
2025					0.842	0.841	0.840	0.834	0.825	0.817	0.800	0.775	0.749	0.707	0.665	0.615	0.547	0.480	0.396	0.312
2026						1.121	1.120	1.118	1.110	1.099	1.088	1.065	1.032	0.998	0.942	0.886	0.819	0.729	0.639	0.527
2027							1.385	1.383	1.381	1.371	1.357	1.343	1.315	1.274	1.232	1.163	1.094	1.011	0.900	0.789
2028								1.709	1.707	1.704	1.692	1.675	1.658	1.624	1.572	1.521	1.436	1.350	1.248	1.111
2029									2.062	2.060	2.055	2.041	2.020	2.000	1.959	1.897	1.835	1.732	1.629	1.505
2030										2.328	2.325	2.321	2.304	2.281	2.258	2.211	2.141	2.072	1.955	1.839
2031											2.518	2.515	2.510	2.493	2.467	2.442	2.392	2.316	2.241	2.115
2032												2.701	2.698	2.693	2.674	2.647	2.620	2.566	2.485	2.404
2033													2.815	2.812	2.806	2.787	2.758	2.730	2.674	2.590
2034														2.872	2.869	2.863	2.843	2.815	2.786	2.728
2035															2.913	2.910	2.904	2.884	2.855	2.826
2036																2.947	2.944	2.938	2.918	2.888
2037																	2.949	2.946	2.940	2.920
2038																		2.954	2.952	2.946
2039																			2.921	2.918
2040																				2.891
TOTAL	0.12	0.32	0.70	1.30	2.14	3.26	4.63	6.31	8.33	10.58	12.99	15.54	18.14	20.71	23.22	25.64	27.91	30.03	31.92	33.58

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

These figures underpin our FSD revenue model; clients can view the model upon request

# of Vehicles that Have NOT Been Equipped w/ FSD, and are Eligible for an Upgrade (Millions, By Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	0.075	0.074	0.073	0.070	0.068	0.064	0.061	0.056	0.050	0.043	0.036	0.028	0.020	0.014	0.010	0.007	0.004	0.003	0.002	0.001
2018	0.180	0.178	0.177	0.173	0.167	0.162	0.153	0.144	0.133	0.117	0.103	0.084	0.066	0.048	0.034	0.023	0.016	0.011	0.008	0.005
2019	0.272	0.270	0.268	0.265	0.259	0.251	0.243	0.229	0.216	0.197	0.175	0.154	0.127	0.099	0.072	0.051	0.034	0.024	0.016	0.012
2020	0.405	0.404	0.401	0.397	0.393	0.385	0.373	0.361	0.340	0.317	0.293	0.260	0.228	0.188	0.148	0.108	0.075	0.051	0.035	0.024
2021	0.715	0.708	0.706	0.701	0.694	0.687	0.673	0.651	0.630	0.588	0.553	0.511	0.455	0.399	0.328	0.258	0.185	0.130	0.089	0.062
2022		1.147	1.134	1.132	1.124	1.112	1.101	1.078	1.044	1.000	0.943	0.887	0.819	0.729	0.639	0.526	0.408	0.297	0.209	0.143
2023			1.840	1.820	1.816	1.803	1.785	1.767	1.730	1.658	1.604	1.513	1.423	1.315	1.170	1.025	0.834	0.656	0.477	0.335
2024				2.675	2.646	2.641	2.622	2.595	2.569	2.490	2.411	2.333	2.200	2.069	1.911	1.701	1.474	1.213	0.953	0.694
2025					3.416	3.379	3.372	3.349	3.315	3.248	3.181	3.080	2.979	2.810	2.643	2.441	2.147	1.883	1.549	1.218
2026						4.182	4.136	4.129	4.099	4.017	3.977	3.894	3.770	3.647	3.440	3.235	2.956	2.630	2.305	1.897
2027							4.758	4.705	4.696	4.616	4.570	4.524	4.429	4.288	4.149	3.913	3.641	3.364	2.992	2.622
2028								5.209	5.152	5.090	5.055	5.004	4.953	4.849	4.695	4.542	4.239	3.988	3.683	3.275
2029									5.378	5.265	5.257	5.219	5.166	5.113	5.007	4.848	4.641	4.378	4.117	3.803
2030										5.214	5.104	5.096	5.060	5.008	4.957	4.854	4.651	4.501	4.244	3.991
2031											4.849	4.747	4.739	4.706	4.658	4.610	4.468	4.327	4.186	3.948
2032												4.539	4.444	4.437	4.405	4.361	4.272	4.184	4.051	3.919
2033													4.153	4.066	4.059	4.030	3.949	3.910	3.828	3.706
2034														3.770	3.690	3.684	3.621	3.585	3.549	3.475
2035															3.531	3.457	3.417	3.393	3.359	3.324
2036																3.294	3.192	3.188	3.165	3.133
2037																	3.163	3.065	3.062	3.040
2038																		3.039	2.945	2.941
2039																			2.942	2.850
2040																				2.851
TOTAL	1.65	2.78	4.60	7.23	10.58	14.67	19.28	24.27	29.35	33.86	38.11	41.87	45.03	47.56	49.55	50.97	51.39	51.82	51.77	51.27

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

These figures underpin our FSD revenue model; clients can view the model upon request

# of Vehicles Adding FSD as a Post-Purchase Upgrade, Using a Lump Sum Payment (Millions, By Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2018	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2019	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000
2020	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.002	0.002	0.001	0.002	0.001	0.001	0.001	0.000
2021	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.006	0.006	0.006	0.005	0.005	0.004	0.003	0.004	0.003	0.002	0.001	0.001
2022		0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.010	0.010	0.009	0.009	0.008	0.007	0.006	0.008	0.006	0.004	0.003	0.002
2023			0.009	0.009	0.009	0.009	0.009	0.009	0.017	0.017	0.016	0.015	0.014	0.013	0.012	0.015	0.013	0.010	0.007	0.005
2024				0.013	0.013	0.013	0.013	0.013	0.026	0.025	0.024	0.023	0.022	0.021	0.019	0.026	0.022	0.018	0.014	0.010
2025					0.017	0.017	0.017	0.017	0.033	0.032	0.032	0.031	0.030	0.028	0.026	0.037	0.032	0.028	0.023	0.018
2026						0.021	0.021	0.021	0.041	0.040	0.040	0.039	0.038	0.036	0.034	0.049	0.044	0.039	0.035	0.028
2027							0.024	0.024	0.047	0.046	0.046	0.045	0.044	0.043	0.041	0.059	0.055	0.050	0.045	0.039
2028								0.026	0.052	0.051	0.051	0.050	0.050	0.048	0.047	0.068	0.064	0.060	0.055	0.049
2029									0.054	0.053	0.053	0.052	0.052	0.051	0.050	0.073	0.070	0.066	0.062	0.057
2030										0.052	0.051	0.051	0.051	0.050	0.050	0.073	0.070	0.068	0.064	0.060
2031											0.048	0.047	0.047	0.047	0.047	0.069	0.067	0.065	0.063	0.059
2032												0.045	0.044	0.044	0.044	0.065	0.064	0.063	0.061	0.059
2033													0.042	0.041	0.041	0.060	0.059	0.059	0.057	0.056
2034														0.038	0.037	0.055	0.054	0.054	0.053	0.052
2035															0.035	0.052	0.051	0.051	0.050	0.050
2036																0.049	0.048	0.048	0.047	0.047
2037																	0.047	0.046	0.046	0.046
2038																		0.046	0.044	0.044
2039																			0.044	0.043
2040																				0.043
TOTAL	0.01	0.01	0.02	0.04	0.05	0.07	0.10	0.12	0.29	0.34	0.38	0.42	0.45	0.48	0.50	0.76	0.77	0.78	0.78	0.77

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

These figures underpin our FSD revenue model; clients can view the model upon request

# of Vehicles Adding FSD as a Post-Purchase Upgrade, Using a Subscription (Millions, By Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2018	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2019	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000
2020	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.002	0.002	0.001	0.002	0.001	0.001	0.001	0.000
2021	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.006	0.006	0.006	0.005	0.005	0.004	0.003	0.004	0.003	0.002	0.001	0.001
2022		0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.010	0.010	0.009	0.009	0.008	0.007	0.006	0.008	0.006	0.004	0.003	0.002
2023			0.009	0.009	0.009	0.009	0.009	0.009	0.017	0.017	0.016	0.015	0.014	0.013	0.012	0.015	0.013	0.010	0.007	0.005
2024				0.013	0.013	0.013	0.013	0.013	0.026	0.025	0.024	0.023	0.022	0.021	0.019	0.026	0.022	0.018	0.014	0.010
2025					0.017	0.017	0.017	0.017	0.033	0.032	0.032	0.031	0.030	0.028	0.026	0.037	0.032	0.028	0.023	0.018
2026						0.021	0.021	0.021	0.041	0.040	0.040	0.039	0.038	0.036	0.034	0.049	0.044	0.039	0.035	0.028
2027							0.024	0.024	0.047	0.046	0.046	0.045	0.044	0.043	0.041	0.059	0.055	0.050	0.045	0.039
2028								0.026	0.052	0.051	0.051	0.050	0.050	0.048	0.047	0.068	0.064	0.060	0.055	0.049
2029									0.054	0.053	0.053	0.052	0.052	0.051	0.050	0.073	0.070	0.066	0.062	0.057
2030										0.052	0.051	0.051	0.051	0.050	0.050	0.073	0.070	0.068	0.064	0.060
2031											0.048	0.047	0.047	0.047	0.047	0.069	0.067	0.065	0.063	0.059
2032												0.045	0.044	0.044	0.044	0.065	0.064	0.063	0.061	0.059
2033													0.042	0.041	0.041	0.060	0.059	0.059	0.057	0.056
2034														0.038	0.037	0.055	0.054	0.054	0.053	0.052
2035															0.035	0.052	0.051	0.051	0.050	0.050
2036																0.049	0.048	0.048	0.047	0.047
2037																	0.047	0.046	0.046	0.046
2038																		0.046	0.044	0.044
2039																			0.044	0.043
2040																				0.043
TOTAL	0.01	0.01	0.02	0.04	0.05	0.07	0.10	0.12	0.29	0.34	0.38	0.42	0.45	0.48	0.50	0.76	0.77	0.78	0.78	0.77

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

These figures underpin our FSD revenue model; clients can view the model upon request

Cumulative Revenue from Up-Front Lump Sum Payments ($Millions, by Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	99	104	107	110	112	115	117	121	126	128	129	129	129	129	129	129	129	129	129	129
2018	236	248	254	261	267	273	279	288	300	303	307	307	307	307	307	307	307	307	307	307
2019	460	484	496	508	520	532	544	562	586	591	597	597	597	597	597	597	597	597	597	597
2020	554	582	597	611	625	640	654	676	705	712	719	719	719	719	719	719	719	719	719	719
2021	482	507	520	532	545	557	570	588	613	620	626	626	626	626	626	626	626	626	626	626
2022		1,072	1,098	1,125	1,151	1,177	1,204	1,244	1,296	1,310	1,323	1,323	1,323	1,323	1,323	1,323	1,323	1,323	1,323	1,323
2023			2,515	2,575	2,636	2,696	2,757	2,848	2,969	2,999	3,030	3,030	3,030	3,030	3,030	3,030	3,030	3,030	3,030	3,030
2024				4,906	5,021	5,137	5,252	5,425	5,656	5,714	5,771	5,771	5,771	5,771	5,771	5,771	5,771	5,771	5,771	5,771
2025					8,184	8,373	8,561	8,843	9,219	9,313	9,407	9,407	9,407	9,407	9,407	9,407	9,407	9,407	9,407	9,407
2026						13,150	13,445	13,888	14,479	14,627	14,775	14,775	14,775	14,775	14,775	14,775	14,775	14,775	14,775	14,775
2027							19,410	20,050	20,903	21,116	21,330	21,330	21,330	21,330	21,330	21,330	21,330	21,330	21,330	21,330
2028								28,345	29,551	29,853	30,154	30,154	30,154	30,154	30,154	30,154	30,154	30,154	30,154	30,154
2029									40,917	41,335	41,752	41,752	41,752	41,752	41,752	41,752	41,752	41,752	41,752	41,752
2030										52,537	53,068	53,068	53,068	53,068	53,068	53,068	53,068	53,068	53,068	53,068
2031											63,643	63,643	63,643	63,643	63,643	63,643	63,643	63,643	63,643	63,643
2032												73,775	73,775	73,775	73,775	73,775	73,775	73,775	73,775	73,775
2033													81,960	81,960	81,960	81,960	81,960	81,960	81,960	81,960
2034														87,506	87,506	87,506	87,506	87,506	87,506	87,506
2035															91,165	91,165	91,165	91,165	91,165	91,165
2036																93,446	93,446	93,446	93,446	93,446
2037																	95,019	95,019	95,019	95,019
2038																		95,839	95,839	95,839
2039																			95,131	95,131
2040																				94,423
TOTAL	1,831	2,998	5,586	10,627	19,061	32,649	52,793	82,878	127,322	181,159	246,631	320,406	402,366	489,873	581,038	674,484	769,503	865,341	960,473	1,054,896

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

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Deferred Revenue on Balance Sheet Due to Up-Front Lump Sum Payments ($Millions, by Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	30	25	22	19	17	14	12	8	3	1	-	-	-	-	-	-	-	-	-	-
2018	71	58	52	46	40	34	28	18	6	3	-	-	-	-	-	-	-	-	-	-
2019	137	114	102	90	78	66	54	36	12	6	-	-	-	-	-	-	-	-	-	-
2020	165	137	122	108	93	79	65	43	14	7	-	-	-	-	-	-	-	-	-	-
2021	144	119	106	94	81	69	56	38	13	6	-	-	-	-	-	-	-	-	-	-
2022		251	225	198	172	146	119	79	26	13	-	-	-	-	-	-	-	-	-	-
2023			515	454	394	333	273	182	61	30	-	-	-	-	-	-	-	-	-	-
2024				866	750	635	519	346	115	58	-	-	-	-	-	-	-	-	-	-
2025					1,223	1,035	847	564	188	94	-	-	-	-	-	-	-	-	-	-
2026						1,625	1,330	886	295	148	-	-	-	-	-	-	-	-	-	-
2027							1,920	1,280	427	213	-	-	-	-	-	-	-	-	-	-
2028								1,809	603	302	-	-	-	-	-	-	-	-	-	-
2029									835	418	-	-	-	-	-	-	-	-	-	-
2030										531	-	-	-	-	-	-	-	-	-	-
2031											-	-	-	-	-	-	-	-	-	-
2032												-	-	-	-	-	-	-	-	-
2033													-	-	-	-	-	-	-	-
2034														-	-	-	-	-	-	-
2035															-	-	-	-	-	-
2036																-	-	-	-	-
2037																	-	-	-	-
2038																		-	-	-
2039																			-	-
2040																				-
TOTAL	547	703	1,144	1,875	2,848	4,035	5,221	5,290	2,598	1,830	0	0	0	0	0	0	0	0	0	0

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

These figures underpin our FSD revenue model; clients can view the model upon request

Deferred Revenue Recognized from Up-Front Lump Sum Payments (by Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	31	5	3	3	3	3	3	4	5	1	1	-	-	-	-	-	-	-	-	-
2018	74	12	6	6	6	6	6	9	12	3	3	-	-	-	-	-	-	-	-	-
2019	143	24	12	12	12	12	12	18	24	6	6	-	-	-	-	-	-	-	-	-
2020	173	29	14	14	14	14	14	22	29	7	7	-	-	-	-	-	-	-	-	-
2021	-	25	13	13	13	13	13	19	25	6	6	-	-	-	-	-	-	-	-	-
2022		-	26	26	26	26	26	40	53	13	13	-	-	-	-	-	-	-	-	-
2023			-	61	61	61	61	91	121	30	30	-	-	-	-	-	-	-	-	-
2024				-	115	115	115	173	231	58	58	-	-	-	-	-	-	-	-	-
2025					-	188	188	282	376	94	94	-	-	-	-	-	-	-	-	-
2026						-	295	443	591	148	148	-	-	-	-	-	-	-	-	-
2027							-	640	853	213	213	-	-	-	-	-	-	-	-	-
2028								-	1,206	302	302	-	-	-	-	-	-	-	-	-
2029									-	418	418	-	-	-	-	-	-	-	-	-
2030										-	531	-	-	-	-	-	-	-	-	-
2031											-	-	-	-	-	-	-	-	-	-
2032												-	-	-	-	-	-	-	-	-
2033													-	-	-	-	-	-	-	-
2034														-	-	-	-	-	-	-
2035															-	-	-	-	-	-
2036																-	-	-	-	-
2037																	-	-	-	-
2038																		-	-	-
2039																			-	-
2040																				-
TOTAL	420	95	74	135	250	438	734	1,740	3,527	1,299	1,830	0	0	0	0	0	0	0	0	0

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

These figures underpin our FSD revenue model; clients can view the model upon request

Cumulative Revenue Recognized from Post-Purchase Lump Sum FSD Upgrades (by Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2018	7	7	8	8	8	8	8	9	9	9	9	9	9	9	9	9	9	9	9	9
2019	14	15	15	15	16	16	16	17	18	18	18	18	18	18	18	18	18	18	18	18
2020	25	27	27	28	28	29	30	31	32	32	33	33	33	33	33	33	33	33	33	33
2021	28	29	30	30	31	32	33	34	35	35	36	36	36	36	36	36	36	36	36	36
2022		52	54	55	56	57	59	61	63	64	64	64	64	64	64	64	64	64	64	64
2023			99	102	104	106	109	112	117	118	120	120	120	120	120	120	120	120	120	120
2024				171	175	179	183	189	197	199	201	201	201	201	201	201	201	201	201	201
2025					253	258	264	273	285	287	290	290	290	290	290	290	290	290	290	290
2026						363	371	383	400	404	408	408	408	408	408	408	408	408	408	408
2027							482	498	519	524	529	529	529	529	529	529	529	529	529	529
2028								605	630	637	643	643	643	643	643	643	643	643	643	643
2029									1,444	1,459	1,474	1,474	1,474	1,474	1,474	1,474	1,474	1,474	1,474	1,474
2030										1,548	1,564	1,564	1,564	1,564	1,564	1,564	1,564	1,564	1,564	1,564
2031											1,576	1,576	1,576	1,576	1,576	1,576	1,576	1,576	1,576	1,576
2032												1,566	1,566	1,566	1,566	1,566	1,566	1,566	1,566	1,566
2033													1,505	1,505	1,505	1,505	1,505	1,505	1,505	1,505
2034														1,414	1,414	1,414	1,414	1,414	1,414	1,414
2035															1,351	1,351	1,351	1,351	1,351	1,351
2036																1,902	1,902	1,902	1,902	1,902
2037																	1,850	1,850	1,850	1,850
2038																		1,785	1,785	1,785
2039																			1,732	1,732
2040																				1,680
TOTAL	77	133	235	412	674	1,052	1,558	2,214	3,752	5,339	6,969	8,535	10,040	11,454	12,804	14,707	16,557	18,342	20,073	21,754

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

These figures underpin our FSD revenue model; clients can view the model upon request

Deferred Revenue on Balance Sheet Due to Post-Purchase Lump Sum Payments ($Millions, by Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	1	1	1	1	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-
2018	2	2	2	1	1	1	1	1	0	0	-	-	-	-	-	-	-	-	-	-
2019	4	3	3	3	2	2	2	1	0	0	-	-	-	-	-	-	-	-	-	-
2020	8	6	6	5	4	4	3	2	1	0	-	-	-	-	-	-	-	-	-	-
2021	8	7	6	5	5	4	3	2	1	0	-	-	-	-	-	-	-	-	-	-
2022		12	11	10	8	7	6	4	1	1	-	-	-	-	-	-	-	-	-	-
2023			20	18	16	13	11	7	2	1	-	-	-	-	-	-	-	-	-	-
2024				30	26	22	18	12	4	2	-	-	-	-	-	-	-	-	-	-
2025					38	32	26	17	6	3	-	-	-	-	-	-	-	-	-	-
2026						45	37	24	8	4	-	-	-	-	-	-	-	-	-	-
2027							48	32	11	5	-	-	-	-	-	-	-	-	-	-
2028								39	13	6	-	-	-	-	-	-	-	-	-	-
2029									29	15	-	-	-	-	-	-	-	-	-	-
2030										16	-	-	-	-	-	-	-	-	-	-
2031											-	-	-	-	-	-	-	-	-	-
2032												-	-	-	-	-	-	-	-	-
2033													-	-	-	-	-	-	-	-
2034														-	-	-	-	-	-	-
2035															-	-	-	-	-	-
2036																-	-	-	-	-
2037																	-	-	-	-
2038																		-	-	-
2039																			-	-
2040																				-
TOTAL	23	31	48	73	101	130	154	141	77	54	0	0	0	0	0	0	0	0	0	0

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

These figures underpin our FSD revenue model; clients can view the model upon request

Deferred Revenue Recognized from Post-Purchase Lump Sum FSD Upgrades (by Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	1	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-
2018	2	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-
2019	4	1	0	0	0	0	0	1	1	0	0	-	-	-	-	-	-	-	-	-
2020	8	1	1	1	1	1	1	1	1	0	0	-	-	-	-	-	-	-	-	-
2021	-	1	1	1	1	1	1	1	1	0	0	-	-	-	-	-	-	-	-	-
2022		-	1	1	1	1	1	2	3	1	1	-	-	-	-	-	-	-	-	-
2023			-	2	2	2	2	4	5	1	1	-	-	-	-	-	-	-	-	-
2024				-	4	4	4	6	8	2	2	-	-	-	-	-	-	-	-	-
2025					-	6	6	9	12	3	3	-	-	-	-	-	-	-	-	-
2026						-	8	12	16	4	4	-	-	-	-	-	-	-	-	-
2027							-	16	21	5	5	-	-	-	-	-	-	-	-	-
2028								-	26	6	6	-	-	-	-	-	-	-	-	-
2029									-	15	15	-	-	-	-	-	-	-	-	-
2030										-	16	-	-	-	-	-	-	-	-	-
2031											-	-	-	-	-	-	-	-	-	-
2032												-	-	-	-	-	-	-	-	-
2033													-	-	-	-	-	-	-	-
2034														-	-	-	-	-	-	-
2035															-	-	-	-	-	-
2036																-	-	-	-	-
2037																	-	-	-	-
2038																		-	-	-
2039																			-	-
2040																				-
TOTAL	15	4	3	6	10	15	24	51	94	38	54	0	0	0	0	0	0	0	0	0

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

These figures underpin our FSD revenue model; clients can view the model upon request

Revenue Recognized from Up-Front FSD Subscriptions ($Millions, by Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2021	186	196	200	204	206	209	209	209	211	201	191	177	157	138	114	90	65	46	31	22
2022		391	400	409	415	421	426	431	435	425	405	381	352	314	275	227	178	130	92	63
2023			855	874	893	907	918	939	959	938	917	865	814	752	669	587	484	381	278	196
2024				1,606	1,642	1,677	1,702	1,741	1,796	1,777	1,738	1,682	1,587	1,493	1,379	1,228	1,077	888	699	510
2025					2,595	2,652	2,706	2,775	2,864	2,864	2,833	2,744	2,654	2,505	2,356	2,177	1,939	1,700	1,402	1,103
2026						4,054	4,141	4,269	4,420	4,420	4,419	4,328	4,191	4,054	3,827	3,599	3,326	2,961	2,597	2,141
2027							5,841	6,028	6,271	6,291	6,290	6,226	6,098	5,905	5,713	5,392	5,071	4,686	4,172	3,659
2028								8,267	8,611	8,681	8,707	8,619	8,531	8,355	8,091	7,828	7,388	6,948	6,420	5,717
2029									11,533	11,639	11,733	11,651	11,533	11,415	11,180	10,827	10,474	9,885	9,297	8,591
2030										14,402	14,533	14,503	14,402	14,256	14,111	13,820	13,383	12,947	12,220	11,492
2031											17,047	17,030	16,996	16,877	16,706	16,536	16,195	15,683	15,172	14,320
2032												19,414	19,395	19,356	19,220	19,026	18,832	18,444	17,861	17,279
2033													21,257	21,235	21,193	21,044	20,832	20,619	20,194	19,556
2034														22,438	22,415	22,370	22,213	21,989	21,764	21,316
2035															23,213	23,190	23,144	22,981	22,749	22,517
2036																23,640	23,616	23,569	23,403	23,167
2037																	23,963	23,939	23,891	23,723
2038																		24,097	24,073	24,025
2039																			23,884	23,861
2040																				23,672
TOTAL	186	587	1,455	3,093	5,752	9,920	15,944	24,659	37,100	51,638	68,814	87,620	107,967	129,094	150,463	171,579	192,179	211,894	230,201	246,929

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

These figures underpin our FSD revenue model; clients can view the model upon request

Deferred Revenue on Balance Sheet Due to Up-Front FSD Subscriptions ($Millions, by Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2021	56	46	41	36	31	26	21	13	4	2	-	-	-	-	-	-	-	-	-	-
2022		92	82	72	62	52	42	27	9	4	-	-	-	-	-	-	-	-	-	-
2023			175	154	133	112	91	60	20	9	-	-	-	-	-	-	-	-	-	-
2024				283	245	207	168	111	37	18	-	-	-	-	-	-	-	-	-	-
2025					388	328	268	177	58	29	-	-	-	-	-	-	-	-	-	-
2026						501	410	273	90	45	-	-	-	-	-	-	-	-	-	-
2027							578	385	128	64	-	-	-	-	-	-	-	-	-	-
2028								528	176	88	-	-	-	-	-	-	-	-	-	-
2029									235	118	-	-	-	-	-	-	-	-	-	-
2030										145	-	-	-	-	-	-	-	-	-	-
2031											-	-	-	-	-	-	-	-	-	-
2032												-	-	-	-	-	-	-	-	-
2033													-	-	-	-	-	-	-	-
2034														-	-	-	-	-	-	-
2035															-	-	-	-	-	-
2036																-	-	-	-	-
2037																	-	-	-	-
2038																		-	-	-
2039																			-	-
2040																				-
TOTAL	56	138	298	546	860	1,226	1,577	1,574	757	522	0	0	0	0	0	0	0	0	0	0

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

These figures underpin our FSD revenue model; clients can view the model upon request

Deferred Revenue Recognized from Up-Front FSD Subscriptions ($Millions, by Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2021	-	10	5	5	5	5	5	7	9	2	2	-	-	-	-	-	-	-	-	-
2022		-	10	10	10	10	10	15	19	5	4	-	-	-	-	-	-	-	-	-
2023			-	21	21	21	21	31	40	10	9	-	-	-	-	-	-	-	-	-
2024				-	38	38	39	57	74	19	18	-	-	-	-	-	-	-	-	-
2025					-	60	60	90	119	30	29	-	-	-	-	-	-	-	-	-
2026						-	92	137	182	46	45	-	-	-	-	-	-	-	-	-
2027							-	193	257	64	64	-	-	-	-	-	-	-	-	-
2028								-	352	88	88	-	-	-	-	-	-	-	-	-
2029									-	118	118	-	-	-	-	-	-	-	-	-
2030										-	145	-	-	-	-	-	-	-	-	-
2031											-	-	-	-	-	-	-	-	-	-
2032												-	-	-	-	-	-	-	-	-
2033													-	-	-	-	-	-	-	-
2034														-	-	-	-	-	-	-
2035															-	-	-	-	-	-
2036																-	-	-	-	-
2037																	-	-	-	-
2038																		-	-	-
2039																			-	-
2040																				-
TOTAL	0	10	15	36	74	135	227	531	1,052	381	522	0	0	0	0	0	0	0	0	0

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

These figures underpin our FSD revenue model; clients can view the model upon request

Revenue Recognized from Post-Purchase FSD Subsrciptions ($Millions, by Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2021	6	6	6	6	6	6	6	6	13	12	12	11	9	8	7	8	6	4	3	2
2022		11	11	11	11	12	12	12	24	23	22	21	19	17	15	18	14	10	7	5
2023			21	21	21	22	22	22	46	44	43	41	39	36	32	42	34	27	19	14
2024				36	36	37	37	38	79	77	75	73	69	65	60	80	69	57	45	33
2025					53	53	54	56	115	114	113	109	106	100	94	130	114	100	82	65
2026						76	76	79	163	162	162	158	153	148	140	197	180	160	140	116
2027							100	103	213	212	212	210	205	199	192	272	253	234	208	182
2028								126	260	259	260	257	255	250	242	351	327	308	284	253
2029									301	298	300	298	295	292	286	415	397	375	353	326
2030										323	319	318	316	313	310	455	436	422	398	374
2031											328	321	321	319	315	468	454	439	425	401
2032												326	319	319	317	470	461	451	437	422
2033													314	307	307	457	447	443	434	420
2034														294	288	432	424	420	416	407
2035															281	413	408	406	401	397
2036																396	384	384	381	377
2037																	385	374	373	370
2038																		372	360	360
2039																			361	350
2040																				350
TOTAL	6	17	38	74	128	205	309	442	1,214	1,524	1,846	2,144	2,420	2,666	2,884	4,604	4,795	4,985	5,128	5,223

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

These figures underpin our FSD revenue model; clients can view the model upon request

Deferred Revenue on Balance Sheet Due to Post-Purchase FSD Subscriptions ($ Millions, by Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2021	2	1	1	1	1	1	1	0	0	0	-	-	-	-	-	-	-	-	-	-
2022		3	2	2	2	1	1	1	0	0	-	-	-	-	-	-	-	-	-	-
2023			4	4	3	3	2	1	1	0	-	-	-	-	-	-	-	-	-	-
2024				6	5	5	4	2	2	1	-	-	-	-	-	-	-	-	-	-
2025					8	7	5	4	2	1	-	-	-	-	-	-	-	-	-	-
2026						9	8	5	3	2	-	-	-	-	-	-	-	-	-	-
2027							10	7	4	2	-	-	-	-	-	-	-	-	-	-
2028								8	5	3	-	-	-	-	-	-	-	-	-	-
2029									6	3	-	-	-	-	-	-	-	-	-	-
2030										3	-	-	-	-	-	-	-	-	-	-
2031											-	-	-	-	-	-	-	-	-	-
2032												-	-	-	-	-	-	-	-	-
2033													-	-	-	-	-	-	-	-
2034														-	-	-	-	-	-	-
2035															-	-	-	-	-	-
2036																-	-	-	-	-
2037																	-	-	-	-
2038																		-	-	-
2039																			-	-
2040																				-
TOTAL	2	4	8	13	19	25	31	28	25	15	0	0	0	0	0	0	0	0	0	0

Source: Piper Sandler research estimates

Full Self-Driving Software – Detailed Data Tables

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Deferred Revenue Recognized from Post-Purchase FSD Subscriptions ($Millions, by Yearly Cohort)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2021	-	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-
2022		-	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-
2023			-	1	0	1	1	1	0	0	0	-	-	-	-	-	-	-	-	-
2024				-	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-
2025					-	1	1	2	1	1	1	-	-	-	-	-	-	-	-	-
2026						-	2	3	2	2	2	-	-	-	-	-	-	-	-	-
2027							-	3	2	2	2	-	-	-	-	-	-	-	-	-
2028								-	3	3	3	-	-	-	-	-	-	-	-	-
2029									-	3	3	-	-	-	-	-	-	-	-	-
2030										-	3	-	-	-	-	-	-	-	-	-
2031											-	-	-	-	-	-	-	-	-	-
2032												-	-	-	-	-	-	-	-	-
2033													-	-	-	-	-	-	-	-
2034														-	-	-	-	-	-	-
2035															-	-	-	-	-	-
2036																-	-	-	-	-
2037																	-	-	-	-
2038																		-	-	-
2039																			-	-
2040																				-
TOTAL	0	0	0	1	2	3	5	10	10	13	15	0	0	0	0	0	0	0	0	0

Source: Piper Sandler research estimates

Tesla Motors, Inc.

Income Statement

(millions, except per share amounts)

Current disclosure information for this company can be found at:

http://www.pipersandler.com/researchdisclosures

Date: 1/31/2021

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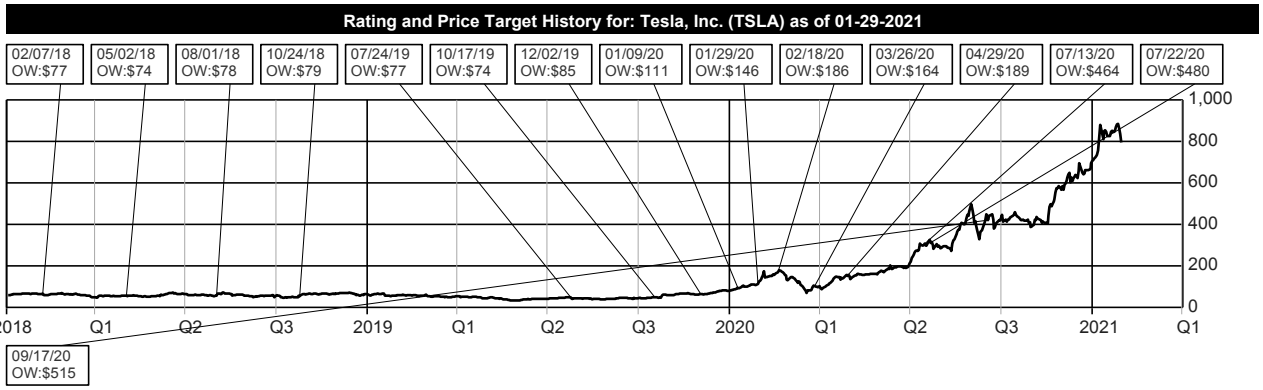
	FY2019				FY2020				FY2021E									
	1QA	2QA	3QA	4QA	1QA	2QA	3QA	4QA	1Q	2Q	3Q	4Q	2017	2018	2019	2020	2021E	2022E
Revenue																		
Automotive - Revenue from Selling Vehicles	-	-	-	-	-	-	-	-	8,538.1	10,245.8	11,099.6	12,807.2	-	-	-	-	-	-
Automotive - Revenue from Selling Software	-	-	-	-	-	-	-	-	227.5	273.0	295.8	341.3	-	-	-	-	-	-
Automotive w/out Resale Value Guarantee	3,683.4	4,918.3	4,821.0	5,789.3	4,367.0	4,423.0	6,788.0	8,502.0	8,765.6	10,518.8	11,395.3	13,148.4	8,354.6	15,810.0	19,212.0	24,080.0	43,828.1	71,730.6
Automotive with Resale Value Guarantee	(390.6)	138.5	177.0	221.1	172.0	60.0	161.0	131.0	130.0	156.0	169.0	195.0	-	1,403.0	146.0	524.0	650.1	1,064.4
Automotive Regulatory Credits	216.0	111.2	134.0	132.8	354.0	428.0	397.0	401.0	275.0	275.0	275.0	275.0	180.1	419.0	594.0	1,580.0	1,100.0	1,100.0
Automotive Leasing	215.1	208.4	221.0	224.5	239.0	268.0	265.0	280.0	290.0	330.6	360.5	403.9	1,106.5	883.0	869.0	1,052.0	1,384.9	2,135.2
Total Automotive Revenue	3,723.9	5,376.4	5,353.0	6,367.8	5,132.0	5,179.0	7,611.0	9,314.0	9,460.6	11,280.4	12,199.8	14,022.4	9,641.3	18,515.0	20,821.0	27,236.0	46,963.2	76,030.1
Energy Generation and Storage - Sales	212.1	225.8	241.0	321.1	173.0	225.0	439.0	564.0	427.0	428.7	507.8	492.9	1,116.3	1,056.0	1,000.0	1,401.0	1,856.5	3,519.0
Energy Generation and Storage - Leasing	112.6	142.4	161.0	115.0	120.0	145.0	140.0	188.0	217.8	218.6	259.0	251.4	-	499.0	531.0	593.0	946.8	1,724.3
Services and other	492.9	605.1	548.0	580.0	560.0	487.0	581.0	678.0	667.2	800.6	867.3	1,000.8	1,001.2	1,391.0	2,226.0	2,306.0	3,335.9	5,459.6
Net sales (GAAP)	**4,541.5**	**6,349.7**	**6,303.0**	**7,383.9**	**5,985.0**	**6,036.0**	**8,771.0**	**10,744.0**	**10,772.5**	**12,728.4**	**13,833.9**	**15,767.4**	**11,758.8**	**21,461.0**	**24,578.0**	**31,536.0**	**53,102.3**	**86,733.1**
Cost of Sales - from Selling Vehicles	-	-	-	-	-	-	-	-	7,021.2	8,425.4	9,071.2	10,466.8	-	-	-	-	-	-
Cost of Sales - from Selling Software	-	-	-	-	-	-	-	-	34.1	41.0	44.4	51.2	-	-	-	-	-	-
Cost of sales - Automotive	2,856.2	4,253.8	4,014.0	4,815.0	3,699.0	3,714.0	5,361.0	6,922.0	7,055.3	8,466.4	9,115.6	10,518.0	6,724.5	13,685.6	15,939.0	19,696.0	35,155.3	57,397.0
Cost of sales - Automotive leasing	117.1	106.3	117.0	119.0	122.0	148.0	145.0	148.0	153.7	175.2	191.0	214.1	708.2	488.4	459.4	563.0	734.0	1,131.6
Cost of sales - Automotive	2,973.3	4,360.1	4,131.0	4,934.0	3,821.0	3,862.0	5,506.0	7,070.0	7,209.0	8,641.6	9,306.6	10,732.0	7,432.7	14,174.0	16,398.4	20,259.0	35,889.3	58,528.7
Cost of sales - Energy generation and storage	316.9	325.5	314.0	385.0	282.0	349.0	558.0	787.0	619.0	615.0	720.8	684.8	874.5	1,364.9	1,341.4	1,976.0	2,639.5	4,633.5
Cost of sales - Services and other	685.5	743.0	667.0	674.0	648.0	558.0	644.0	821.0	767.2	904.7	962.7	1,090.8	1,229.0	1,880.4	2,769.6	2,671.0	3,725.5	5,865.8
Gross profit (GAAP)	565.7	921.0	1,191.0	1,390.9	1,234.0	1,267.0	2,063.0	2,066.0	2,177.3	2,567.1	2,843.8	3,259.8	2,222.5	4,041.8	4,068.6	6,630.0	10,848.0	17,705.1
Stock-based compensation expense	16.6	34.6	29.0	47.8	33.0	52.0	62.0	61.8	62.3	75.4	82.6	94.2	43.8	80.3	128.0	208.8	314.5	539.9
Gross profit (Non-GAAP)	582.3	955.7	1,220.0	1,438.7	1,267.0	1,319.0	2,125.0	2,127.8	2,239.6	2,642.4	2,926.4	3,354.0	2,266.3	4,122.0	4,196.6	6,838.8	11,162.5	18,245.0
R&D - Stock based comp	72.5	71.5	72.0	69.0	65.0	73.0	76.0	123.7	118.7	141.9	156.7	171.4	217.6	261.1	285.0	337.7	588.7	942.3
R&D - Others	267.7	252.4	262.0	276.0	259.0	206.0	290.0	398.3	366.3	381.9	401.2	410.0	1,160.5	1,199.3	1,058.1	1,153.3	1,559.3	1,570.3
SG&A - Stock based comp	114.1	102.9	98.0	167.0	113.0	222.0	405.0	350.3	243.4	209.2	170.7	290.8	205.3	398.3	482.0	1,090.3	914.1	1,111.7
SG&A - Others	589.9	544.3	498.0	532.0	514.0	439.0	483.0	618.7	592.5	636.4	650.2	678.0	2,271.2	2,436.2	2,164.2	2,054.7	2,557.1	2,951.4
Operating Income (loss)	(478.4)	(50.1)	261.0	346.9	283.0	327.0	809.0	575.0	856.5	1,197.7	1,465.0	1,709.7	(1,632.1)	(253.1)	79.4	1,994.0	5,228.8	11,129.4
Interest income	8.8	10.4	15.0	10.0	10.0	8.0	6.0	6.0	6.0	6.0	6.0	6.0	19.7	24.5	44.1	30.0	24.0	24.0
Interest expense	(157.5)	(172.0)	(185.0)	(170.0)	(169.0)	(170.0)	(163.0)	(246.0)	(159.2)	(146.7)	(146.7)	(146.7)	(471.3)	(663.1)	(684.4)	(748.0)	(599.4)	(587.0)
Other (loss) gain	(17.7)	(158.1)	85.0	(13.0)	(54.0)	(15.0)	(97.0)	44.0	-	-	-	-	(125.4)	(113.4)	(103.8)	(122.0)	-	-
Pretax income (loss)	(644.8)	(369.8)	176.0	173.9	70.0	150.0	555.0	379.0	703.3	1,056.9	1,324.3	1,568.9	(2,209.0)	(1,005.0)	(664.7)	1,154.0	4,653.4	10,566.4
Taxes	22.9	19.4	26.0	42.0	2.0	21.0	186.0	83.0	140.7	211.4	264.9	313.8	31.5	57.8	110.3	292.0	930.7	2,113.3
GAAP net income (loss)	(667.6)	(389.3)	150.0	131.9	68.0	129.0	369.0	296.0	562.6	845.5	1,059.4	1,255.1	(2,240.6)	(1,062.9)	(775.0)	862.0	3,722.7	8,453.1
Attributable to non-controlling interests	34.5	19.1	7.0	27.0	52.0	25.0	69.0	26.0	43.0	40.8	44.7	38.6	(279.2)	(86.5)	87.6	172.0	167.0	165.7
GAAP net income (loss) to common stockholders	(702.1)	(408.3)	143.0	104.9	16.0	104.0	300.0	270.0	519.6	804.8	1,014.8	1,216.5	(1,961.4)	(976.4)	(862.6)	690.0	3,555.7	8,287.4
Add: Others	-	-	-	-	-	-	-	-	-	-	-	-	57.7	-	-	-	-	-
Add: Non-cash stock based compensation	208.4	209.9	199.0	281.0	211.0	347.0	543.0	633.0	424.4	426.5	410.0	556.4	466.8	749.0	898.2	1,734.0	1,817.3	2,593.9
Non-GAAP net income	**(493.8)**	**(198.5)**	**342.0**	**385.9**	**227.0**	**451.0**	**843.0**	**903.0**	**944.0**	**1,231.3**	**1,424.7**	**1,772.9**	**(1,436.9)**	**(227.3)**	**35.6**	**2,424.0**	**5,373.0**	**10,881.3**
Reported EPS (diluted)	(0.85)	(0.46)	0.16	0.11	0.02	0.10	0.27	0.24	0.46	0.72	0.90	1.08	(2.37)	(5.73)	(0.96)	0.64	3.16	7.37
Non-GAAP diluted EPS	**(0.62)**	**(0.22)**	**0.37**	**0.41**	**0.23**	**0.44**	**0.76**	**0.80**	**0.84**	**1.10**	**1.27**	**1.58**	**(1.72)**	**(1.33)**	**0.04**	**2.24**	**4.78**	**9.68**
Weighted average number of shares- diluted	864.9	883.3	920.0	935.0	995.0	1,035.0	1,105.0	1,124.0	1,124.0	1,124.0	1,124.0	1,124.0	828.7	170.5	900.8	1,083.0	1,124.0	1,124.0
EBITDA	145.4	561.1	1,068.9	1,164.9	941.0	1,201.0	1,770.0	1,844.0	1,919.8	2,299.1	2,578.0	3,005.3	682.2	2,367.1	2,940.2	5,756.0	9,802.2	16,978.8
Revenue Growth	33.2%	58.7%	-7.6%	2.2%	31.8%	-4.9%	39.2%	45.5%	80.0%	110.9%	57.7%	46.8%	68.0%	82.5%	14.5%	28.3%	68.4%	63.3%
Margins & Ratios:																		
Automotive GPM - Vehicles Only	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	19.0%	19.0%	19.5%	19.5%	N/A	N/A	N/A	N/A	N/A	N/A
Automotive GPM - Software	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	85.0%	85.0%	85.0%	85.0%	N/A	N/A	N/A	N/A	N/A	N/A
Automotive GPM (excl. credits & leasing)	13.3%	15.9%	19.7%	19.9%	18.5%	17.2%	22.9%	19.8%	20.7%	20.7%	21.2%	21.2%	19.5%	20.5%	17.7%	19.9%	21.0%	21.2%
Automotive GPM (excl. credits)	15.2%	17.2%	20.8%	20.9%	20.0%	18.7%	23.7%	20.7%	21.5%	21.5%	22.0%	21.9%	21.4%	21.7%	18.9%	21.0%	21.7%	21.9%
Automotive GPM (leasing only)	45.6%	49.0%	47.1%	47.0%	49.0%	44.8%	45.3%	47.1%	47.0%	47.0%	47.0%	47.0%	36.0%	44.7%	47.1%	46.5%	47.0%	47.0%
Automotive GPM - TOTAL	20.2%	18.9%	22.8%	22.5%	25.5%	25.4%	27.7%	24.1%	23.8%	23.4%	23.7%	23.5%	22.9%	23.4%	21.2%	25.6%	23.6%	23.0%
Energy generation and storage GPM	2.4%	11.6%	21.9%	11.7%	3.8%	5.7%	3.6%	-4.7%	4.0%	5.0%	6.0%	8.0%	21.7%	12.2%	12.4%	0.9%	5.8%	11.6%
Service and other GPM	-39.1%	-22.8%	-21.7%	-16.2%	-15.7%	-14.6%	-10.8%	-21.1%	-15.0%	-13.0%	-11.0%	-9.0%	-22.8%	-35.2%	-24.4%	-15.8%	-11.7%	-7.4%
Overall GPM	12.5%	14.5%	18.9%	18.8%	20.6%	21.0%	23.5%	19.2%	20.2%	20.2%	20.6%	20.7%	18.9%	18.8%	16.6%	21.0%	20.4%	20.4%
R&D (excl. stock based comp)	5.9%	4.0%	4.2%	3.7%	4.3%	3.4%	3.3%	3.7%	3.4%	3.0%	2.9%	2.6%	9.9%	5.6%	4.3%	3.7%	2.9%	1.8%
SG&A (excl. stock based comp)	13.0%	8.6%	7.9%	7.2%	8.6%	7.3%	5.5%	5.8%	5.5%	5.0%	4.7%	4.3%	19.3%	11.4%	8.8%	6.5%	4.8%	3.4%
Operating Margin	-10.5%	-0.8%	4.1%	4.7%	4.7%	5.4%	9.2%	5.4%	8.0%	9.4%	10.6%	10.8%	-13.9%	-1.2%	0.3%	6.3%	9.8%	12.8%
EBITDA Margin	3.2%	8.8%	17.0%	15.8%	15.7%	19.9%	20.2%	17.2%	17.8%	18.1%	18.6%	19.1%	5.8%	11.0%	12.0%	18.3%	18.5%	19.6%
Tax rate	-3.5%	-5.3%	14.8%	24.2%	2.9%	14.0%	33.5%	21.9%	20.0%	20.0%	20.0%	20.0%	-1.4%	-5.8%	-16.6%	25.3%	20.0%	20.0%

IMPORTANT RESEARCH DISCLOSURES



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T: Transferring Coverage
D: Discontinuing Coverage
S: Suspending Coverage
OW: Overweight
N: Neutral
UW: Underweight
NA: Not Available
UR: Under Review

Distribution of Ratings/IB Services
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			IB Serv./Past 12 Mos.	
Rating	**Count**	**Percent**	**Count**	**Percent**
BUY [OW]	**575**	**62.30**	**202**	**35.13**
HOLD [N]	**338**	**36.62**	**54**	**15.98**
SELL [UW]	**10**	**1.08**	**0**	**0.00**

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