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Ford Motor Company Comments on

Notice of Public Hearing to Consider
Adoption of the 2012 Amendments to the
California Zero Emission Vehicle Regulation

Ford Motor Company (Ford) welcomes the opportunity to comment on California's Proposed 2012 Amendments to the Zero Emission Vehicle (ZEV) Regulation. The Zero Emission Vehicle Regulation is a "technology-forcing" regulation that has been modified on several occasions because the pace of technological development, costs, and realities of the marketplace have not met the expectations of the Air Resources Board (ARB). Ford believes that once again, the proposed ZEV mandate will not align with market demand, especially in the more distant years. The proposal goes beyond commercialization of the technology to mandating consumer choice.

Summary

Ford recommends that the ARB make the following modifications to the proposed amendments:

- Require a full review of the ZEV regulations prior to 2018 model year to evaluate the market, state of technology, and infrastructure development with the goals of 1) ensuring that the regulations are in alignment with projected market demand, and 2) replacing the mandate with performance-based standards.
- Develop an optional program for states that have adopted California's ZEV mandate to gradually introduce ZEV technologies in those states.

- Revise the range-based ZEV and TZEV credit structure to include an attribute-based factor which will encourage ZEV technology on a broader range of vehicles.
- Change the TZEV credit structure for blended operation plug-in hybrids (e.g. replace all electric range with equivalent all electric range) so that this technology is not discouraged before it has even been introduced and we learn how customers will use their vehicles.
- Re-evaluate the BEVx credit treatment because it is overly generous, thus picking a technology "winner". Furthermore, if this technology is treated like a pure-ZEV, then driver inducements to discourage operation on the auxiliary power unit should be required.
- Do not implement retroactive restrictions on previously earned credits (e.g. neighborhood electric vehicles) that were earned in good faith because it discourages manufacturers from taking early action.
- Strike the greenhouse gas over compliance option, which further exacerbates the competitive disadvantage the ZEV mandate places on full line manufacturers. The ARB should be striving to replace the ZEV mandate with performance-based standards for all manufacturers.
- The penalty calculation should be based on the number of vehicles with the highest credit value, rather than number of credits.
- Require good faith estimates alternative fuel vehicle volume estimates as part of the Clean Fuels Outlet, but do not penalize manufacturers for falling short of those estimated volumes because there are too many external factors involved.

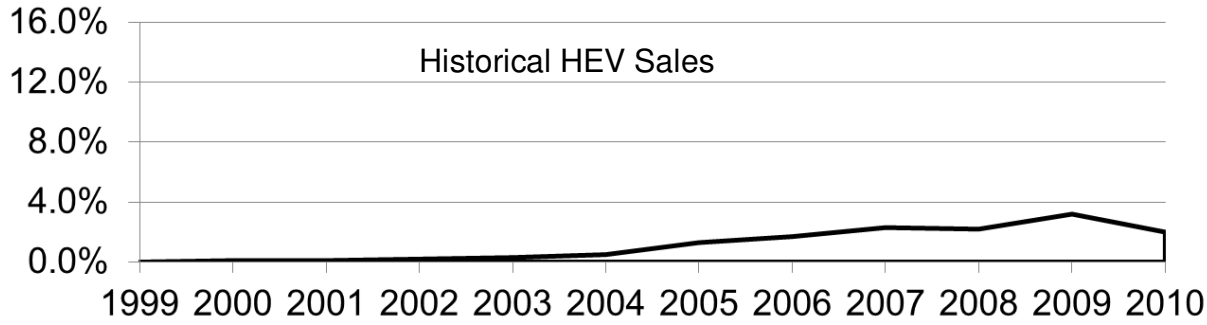
The above recommendations are explained in more detail below.

ZEV Volumes

Since its inception, the goal of the ZEV regulations was to help assure the successful launch of commercial ZEV technologies. Ford believes that the ZEV volumes proposed in the current package of amendments go well beyond launch of commercial ZEV technologies to mandating consumer choice. At some point the ZEV mandate goes beyond its usefulness and market forces need to take over. Once the technology is commercialized and there is a variety of ZEV choices, the market needs to drive the volumes. Governmental policy can assist in driving

the market by adopting complimentary policies to encourage the purchase of the ZEV technology; for example, incentives, infrastructure, education and outreach. Instead, the current proposal amounts to a command-and-control regulation in which government dictates what manufacturers must produce and what consumers must buy.

An example of a technology that has been commercialized is hybrid electric vehicles (HEVs). There are a variety of hybrids on the market from several different manufacturers. Hybrid vehicles, competing directly against conventional vehicles (with the benefit of some monetary and non-monetary incentives), now represent 3 – 5% of new car sales. This represents a significant shift in the market for a powertrain technology that was virtually nonexistent a little more than a decade ago. In contrast, the proposed ZEV mandate seeks to impose ZEV sales volumes far surpassing those of hybrids, and well beyond the volumes needed for the launch of commercial ZEV technology. Please see figure 1 which compares the historic hybrid introduction with the proposed ZEV mandate.



Source: http://www.afdc.energy.gov/afdc/data/vehicles.html#market

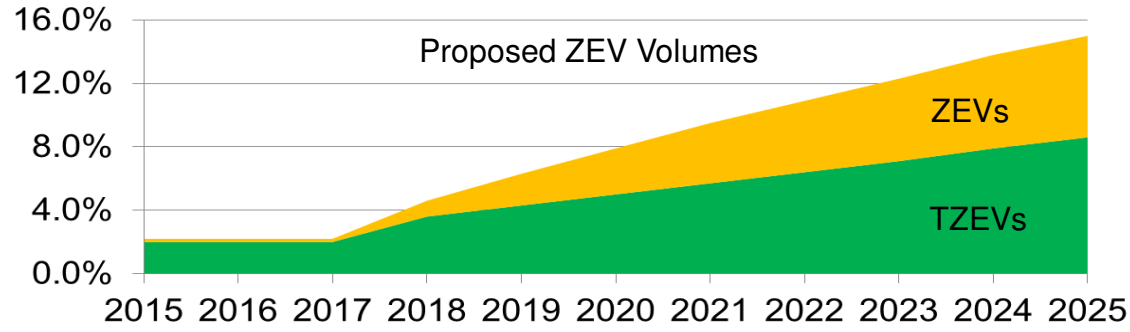


Figure 1 Comparison of Historical HEV Sales to Proposed ZEV Volumes

As seen in Figure 1, the mandated ZEV volumes double in 2018, and the rate of increase in 2018MY and beyond is far steeper than the successful hybrid introduction, and the high volumes being mandated by 2025 are roughly three to five times the hybrid sales rate that is considered commercial today. In addition, hybrids do not require any significant compromises in consumer behavior, whereas ZEVs require consumers to 1) change the way that they fuel their vehicle in consideration of the long recharge times and 2) manage their drives in consideration of the reduced ranges offered by ZEVs. We believe that the proposed ZEV volumes go well beyond what the market will support.

Furthermore, there are a lot of external factors that will affect the market, including the price of fuel, state of the economy, and availability of affordable technologies and materials. Ford believes that the next few years will be crucial for the evaluation on the new ZEV technologies in the market. In light of the above, it is essential that ARB undertake a formal review of the progress relative to the mandate, and anticipated future market conditions, before manufacturers make irreversible resource commitments for the 2018 model year and beyond. The review should target completion by the end of 2014. The review should provide for public participation and comment. If manufacturers are forced to expend vast resources on the production of ZEVs that consumers will not buy, it will only serve to hurt the industry while accomplishing little for the environment.

Once ZEV technology has become commercialized, the ARB should sunset the ZEV mandate and replace it with performance-based standards to achieve the ARB's air quality and greenhouse gas goals. A similar approach was taken in 2009 when the Board recognized that the ZEV mandate had achieved the goal of launching the commercialization of hybrid technology. The Board directed staff to remove the super clean Partial Zero Emissions Vehicles (PZEVs) and Advanced Technology PZEVs (AT PZEVs) (e.g. hybrids) from the ZEV regulations because the emissions and greenhouse gas benefits are appropriately considered in the LEV program, including the greenhouse gas component of that program. The ARB is in the process of doing this with proposed amendments to the Low Emissions Vehicle Program and working with the U.S. Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration (NHTSA) to adopt a second phase to the One National Program for greenhouse gas / fuel economy. We believe these performance-based programs, are a better means to achieve ARB's emissions and greenhouse gas goals because they challenge the ingenuity of our

engineers to figure out the best way to achieve these goals, rather mandating a specific technology, which may or may not be successful.

Recommendation: Reconsider the mandated ZEV volumes; require a formal review of the ZEV regulations prior to 2018 model year to evaluate the market, state of technology, and infrastructure development with the goal of replacing the mandate with performance-based standards.

States Adopting California Standards

Several states have adopted California standards. In total, twelve states have adopted California's Low Emission Vehicle Program, and 10 of those states have also adopted the ZEV Program. These states in total, represent about one third of the U.S. market. The ARB must consider not only the impact of the ZEV program on California, but also the impact of the ZEV program in other states that have adopted California standards.

California is more progressive in preparing the market for ZEVs compared to the other states. California has been developing infrastructure for years and provides vehicle incentives via AB 118 funding. California has established the Fuel Cell Partnership to provide education and outreach, train first responders, and to work collaboratively to ready the market. In addition, the relatively mild climatic conditions prevailing in much of California are far more amenable to the adoption of ZEV technology than the colder, harsher conditions in many other states.

In recognition of the difference between California and the other states, the ARB has adopted the "travel provision" which allows a ZEV placed in California to count toward the obligation in the states that have adopted the ZEV mandate, and vice versa. Because the ZEV technology is just beginning to be introduced, the ARB has proposed to extend the "travel provision" thru the 2017 model year. This extension is important because the technology and market have not developed as fast as anticipated.

However, the Section 177 states would like to have a guarantee of some volume of vehicles in their state, albeit maybe not as many vehicles as California. Therefore, manufacturers have been working with the Section 177 states to adopt an optional program that will gradually introduce ZEV technologies in those states. As a component of this optional program, it is important for the states to be "pooled" together, to avoid a patchwork quilt of regulations in states with varying markets. This is similar to the approach taken for greenhouse

gases in the 2009 – 2011 model years, before the One National Program for greenhouse gases / fuel economy took effect.

Efforts are currently underway to develop an optional program acceptable to all stakeholders. Ford requests that the Staff work with industry and the states that have adopted California standards, prior to finalizing the regulation, to develop an optional program that will gradually introduce ZEV technologies in those states.

Recommendation: Develop an optional program for states that have adopted California's ZEV mandate to gradually introduce ZEV technologies in those states.

Attribute-based Credit Factor

The proposed ZEV regulation includes a linear formula for both ZEV (e.g. battery electric vehicles and fuel cell vehicles) and TZEV (e.g. plug-in hybrid vehicles) credits that is based on range. Ford supports the linear formula versus the step function that is in the regulation today. However, we believe another factor is needed to account for the size of the vehicle.

In 1999, the Board expanded the ZEV program to heavier light-duty trucks. However, the proposed range-based credit structure makes it more difficult to earn credits for these heavier, larger vehicles. Even Staff's model does not predict electrification of these larger vehicles as seen in Table 5.4 in the Initial Statement of Reasons, which only includes incremental technology package prices for subcompact, midsize car / small multi-purpose vehicles (MPV), and large car. Increasing the mandate to include heavier light-duty trucks, without putting the appropriate credit structure in place, has the practical effect of doubling the percentage requirements for full line manufacturers, from approximately 15% of the fleet to 30% of our passenger cars and small MPVs.

Without an attribute-based credit structure, we believe most manufacturers will choose to put the ZEV technology on small sub-compact cars. This could flood this already small market with ZEV technologies. Meanwhile, the technology may not be offered on larger vehicles needed by families, farmers, commercial applications, etc.

During the 2008 ZEV rulemaking (Resolution 08-24), the Board directed Staff to redesign the 2015MY+ ZEV program to look at blended plug-in hybrid credit being based on different parameters, rather than just range. We do not believe the current proposal accomplishes this objective. Although, staff states that "manufacturers with a broad mix of cars and trucks

may pursue multiple technologies" (e.g. FCVs and BEVs), this would put additional strain on resources and costs for full line manufacturers to have to invest in multiple technologies.

Ford believes an attribute-based credit factor is necessary and appropriate to encourage ZEV technology on a broader range of vehicles and to not disadvantage full line manufacturers that produce larger vehicles that provide the utility that consumers need and want. Ford has provided a proposal to staff (see appendix) based on the greenhouse gas footprint attribute. However, we are open to other attribute-based discussions and proposals.

Recommendation: Revise range-based ZEV and TZEV credit structure to include an attribute-based factor which will encourage ZEV technology on a broader range of vehicles.

Plug-in Hybrids Credit Structure

Ford believes blended operation hybrids provide the best solution to optimize electric operation with good fuel economy, thus providing a value product for the consumer. However, the proposed credit structure does not provide as much credit for this technology compared to a series hybrid, which may discourage its use. The problem with a design-based regulation, like the ZEV mandate, is that the credit structure is used to pick technology "winners and losers" rather than letting the market decide. We believe blended operation hybrids have the potential to increase zero emission vehicle miles travelled at a far lower societal cost. This technology should not be discouraged with an uneven credit structure.

The next few years, with the introduction of several electrified vehicles, will provide a wealth of data on how the market will react to this technology and how the technology will be used. We should take this opportunity to evaluate the number of vehicle miles traveled that are electrified by the various ZEV technologies. This data could be considered during the next ZEV program review.

Until data is available, the ARB should not discourage the introduction of blended operation plug-ins by the proposed credit structure. The proposal changes the minimum range from "equivalent all electric range", recognizing the blended hybrid approach, to "all electric range". Although some blended operation hybrids may be able to drive the Urban Dynamometer Driving Scheduled (UDDS) in all electric mode, this will be more difficult for larger plug-in hybrids. Ford recommends that the minimum range be based on equivalent all electric range

(EAER), in conjunction with changing the zero emission vehicle miles traveled TZEV allowance from charge depletion range (Rcda) to EAER.

Recommendation: Change the TZEV credit structure for blended operation plug-in hybrids (e.g. replace all electric range with equivalent all electric range) so that this technology is not discouraged before it has even been introduced and we learn how customers will use their vehicles.

BEVx

A new ZEV category, BEVx, is being proposed as a vehicle powered predominantly by a zero emission energy storage device and also equipped with a backup auxiliary power unit (APU), which does not operate until the energy storage device is fully depleted. This is a very expensive vehicle that is an over-designed plug-in hybrid. However, the proposal essentially treats these vehicles as a pure-ZEV, with the same credit structure, allowing these vehicles to satisfy up to half of the pure-ZEV requirement and allowing the credit from these vehicles placed in California to "travel" to other states. As stated previously, the problem with a design-based regulation is that it can be used to pick technology "winners and losers", as is being done by the generous credit treatment of this new category of vehicle. This is another reason why the ZEV regulation should be replaced by performance-based regulations.

The BEVx provision will likely be used by luxury vehicle manufacturers, whose customers can afford this very expensive technology. Because this technology can be used to offset 50% of the pure-ZEV requirement, a manufacturer may avoid producing any pure-ZEVs by using this technology in conjunction with the greenhouse gas over-compliance option that may also be used for up to 50% of the pure-ZEV requirement. The ZEV regulations should not provide some non-full-line manufacturers with an escape hatch from the production of pure ZEVs, particularly when the absence of an attribute-based approach gives full-line manufacturers such an enormous ZEV task.

The BEVx technology was described as a battery electric vehicle with a "limp home" mode, to be used in case of emergency to address consumer range anxiety. However, there is nothing in the proposal that limits the operation of the APU. An 80-plus mile APU range allows this vehicle to be used like other plug-in hybrids with just the added inconvenience of more frequent fuel refills. It would not stop a user from taking this vehicle on a long distance weekend

trip, which is not a "limp-home" emergency situation. If the ARB moves forward with this technology definition, we believe that the APU should have driver inducements that discourage operation in this mode; for example, limited power, number of restarts.

Recommendation: Re-evaluate the BEVx credit treatment because it is overly generous, thus picking a technology "winner". Furthermore, if this technology is treated like a pure-ZEV, then driver inducements to discourage operation on the auxiliary power unit should be required.

Previously Earned Credits

The proposal is placing additional restrictions on previously earned credits, which discourages manufacturers from taking early action. This is not the first time the ARB has provided credits under one set of rules, to later change the rules after the manufacturer has made investments and placed vehicles in good faith. The ARB previously retroactively limited the use of neighborhood electric vehicle (NEV) credits to up to 50% of the TZEV category. This was a severe degradation on the use of these credits that when earned had unlimited ability to meet the pure-ZEV category. Although we did not agree with this change, we have come to accept it. However, now the ARB is proposing further retroactive limitations of NEV credits to 25% of the TZEV category. The further limitation will not accelerate the introduction of ZEV technology, but it does create mistrust in the whole rulemaking process and further penalizes a subset of manufacturers. We agree with the limitation of 25% on converted PZEVs and AT-PZEVs, because this is a new provision in the regulation. However, we do not support retroactively changing the rule for NEV credits, again.

Recommendation: Do not implement retroactive restrictions on previously earned credits (e.g. neighborhood electric vehicles) that were earned in good faith because it discourages manufacturers from taking early action.

Greenhouse Gas Over-Compliance

Ford does not support the greenhouse gas over-compliance option. The ZEV mandate is a very costly regulation, and this cost should be shared by all manufacturers to avoid creating a competitive advantage for certain manufacturers. The goal of the ZEV mandate should be to commercialize the technology so that the mandate can be replaced by a performance-based standard for all manufacturers. Instead, the greenhouse gas over-compliance option allows some

manufacturers to replace the design-based ZEV mandate with a performance-based greenhouse gas requirement, thus avoiding substantial costs and market uncertainties.

The greenhouse gas over-compliance is more difficult to use for full line manufacturers because of the challenges of adding fuel economy improving technology to trucks that require significant load-carrying and towing capabilities. The ZEV mandate is already more difficult for full line manufacturers. This provision further exacerbates the competitive disadvantage imposed by the regulations on full line manufacturers.

Recommendation: The ARB should be strike the greenhouse gas over-compliance option and strive to replace the ZEV mandate with performance-based standards for all manufacturers.

Changes to Penalty Equation

As noted in the Staff Report, Section 43211 of the California Health and Safety Code provides that vehicles failing to comply with California's emissions standards are subject to a $5,000 civil penalty. The Staff Report indicates that it is unclear how this provision should be applied to non-compliance with the ZEV mandate, given the fact that different vehicles earn different amounts of credits. Staff proposes to clarify the penalty provisions of Section 1962.1 to provide that the penalty for non-compliance with the ZEV mandate is $5,000 per "whole credit not produced." We do not think this proposed clarification aligns with the statute, since a "credit" does not necessarily equate to a "vehicle"--some types of vehicles are worth more than a "whole credit." If a manufacturer falls out of compliance with the ZEV mandate, attempting to guess how that manufacturer "would have complied" with the mandate is pure speculation. We think ARB is obligated give the manufacturer the benefit of the doubt by calculating the per-vehicle penalty based on the lowest number of vehicles the manufacturer could have produced in order to come into compliance. In other words, the penalty calculation would be based on the number of vehicles with the highest credit values that it would take to eliminate the shortfall. We note that it is Ford's policy is to comply with all applicable regulations, and we will strive to comply with the ZEV mandate regardless of the nature of the penalty provision.

Recommendation: The penalty calculation should be based on the number of vehicles with the highest credit value, rather than number of credits.

Clean Fuel Outlet Penalty Provision

Ford supports the goals of the clean fuels outlet ("CFO") because it is important for the infrastructure and the vehicles to be introduced concurrently. However, the proposal to impose penalties on automobile manufacturers for projections that turn out to be inaccurate is inappropriate, counterproductive, and not authorized by statute, and it should be eliminated.

Under the proposed CFO regulations, automobile manufacturers would be required to submit, by March 1 of each year, clean fuel vehicle projections for three model years into the future, including clean fuel vehicle placement numbers by air basin. The proposal also includes a new penalty provision, Section 2315(d). The CFO ISOR explains the penalty provision as follows:

> The proposed amendments add a penalty (section 2315(d)) that could be assessed on automakers. The penalty would apply to automakers that knowingly provide false information in their vehicle projections submitted pursuant to the test procedure reporting requirements discussed earlier in this section. In addition, each automaker that fails to deliver for sale or lease at least 80 percent of their projected number of vehicles by the end of the calendar year for which the projections are being made would be fined $35,000 according to Health and Safety Code section 42402.5. The reason for adding this provision is to address concerns raised by refiner/importers that stations may be underutilized if automakers do not actually deliver the approximate number of vehicles they projected.

ISOR at pp. 32-33. The provision described above should be dropped from the final rule for both policy reasons and legal reasons.

First, a manufacturer's clean fuel vehicle projections are necessarily good-faith estimates. There are a lot of uncertainties associated with such estimates, many of which are out of a manufacturer's control. For example, projections are likely to be based on best-guess assumptions regarding economic conditions, gasoline prices, competitive actions, and market acceptance of an alternative fuel technology. It is always possible that such assumptions may turn out to be wrong, even when they are developed carefully using the best available information. The exercise of developing projections is even more uncertain in the case of alternative fuel vehicles for which a mature market has not yet been established. In light of this, it is wholly inappropriate to attempt to penalize a good-faith projection that turns out to be incorrect. Moreover, manufacturers that have already invested in an alternative fuel technology

are motivated to recover those costs by selling as many alternative fuel units as possible. If the projected volume turns out to be infeasible due to external factors, manufacturers will already be saddled with unrecovered costs that may be quite substantial; a requirement to pay a penalty on top of that cost is wholly unreasonable. The penalty provision would have the unintended consequence of incentivizing manufacturers to reduce their projected volumes in order to avoid a potential penalty. This would have the effect of retarding the development of the infrastructure, which reduces the pace of acceptance of the alternative fuel vehicles, creating a vicious circle. So, as a policy matter, ARB should drop the penalty provision on the grounds that it is bad policy. Manufacturers who are doing their part by delivering alternative fuel vehicles to the marketplace should not be further penalized if their good faith volume estimates turn out to be incorrect.

Second, apart from the policy considerations, the proposed regulatory provision is not authorized by the statutes cited by ARB and is therefore contrary to law.

- The ISOR explanation cites H&S Code § 42402.5 as statutory authority for the penalty, but we assume this is a typographical error. That section provides for administrative civil penalties limited to $500. We assume that the asserted statutory basis for this provision is §42402.4, which is the section cited in the proposed regulatory language.
- Looking at § 42402.4, it applies to the "falsification" of documents done "knowingly and with intent to deceive." The term "falsification" applies only to a misrepresentation of *facts*, not an errant projection about the future. Furthermore, the statutory phrase "knowingly and with intent to deceive" makes the submitter's state of mind a necessary element of the violation. ARB may not, by regulation, simply "deem" that the failure or inability of a manufacturer to deliver the projected number of vehicles equates to a "falsified" projection done "knowingly and with intent to deceive." At a minimum, in order to collect a penalty under § 42402.4, ARB would have to demonstrate that a manufacturer inflated its projection to a level that the manufacturer *knew* it would not be able to meet, with the intent of deceiving the government. It is hard to fathom why any manufacturer would ever have a motive to do this. In any case, ARB may not simply read the "intent" element out of the statute

and impose penalties based on whether or not a manufacturer meets some arbitrary percentage of its good-faith projection.

In light of the above, Section 2315(d) should be stricken from the proposed CFO regulations. Beyond that, if the purpose of the CFO is to require infrastructure development for zero emissions fuels, we believe the reporting requirements should be changed to only include vehicles using those fuels. It takes time and resources to gather the data for flexible-fuel vehicles, compressed natural gas, and other alternative fueled vehicles. If there is no longer a requirement in the CFO to supply the infrastructure for these vehicles, the requirement to gather data for such vehicles should also be dropped.

Recommendation: Require manufacturers to provide good faith volume projections for alternative fuel vehicles covered by the CFO, but strike the provision purporting to penalize manufacturers for falling short of their projected volumes.

Conclusion

Ford shares the ARB's goal for a sustainable zero emission vehicle transportation system. To be successful, the zero emission transportation system must be economically sustainable with market supply of ZEV technology meeting the customer demand at a price that customer values while supporting a viable industry and supply base. We urge ARB to move forward cautiously to avoid pushing specific technologies into the market before they are commercially viable, leading to market rejection which would further delay achievement of the ARB's goals. We remain concerned about the aggressive ZEV volume requirements in this proposal, which go beyond market commercialization toward governmental command-and-control over what manufacturers must sell and what consumers must buy. We believe a formal review should be conducted in advance of the 2018 model year to evaluate the technology development, market acceptance of the various ZEV technologies, customer usage, and infrastructure development.