



PILKINGTON

June 19, 2009

Mary Nichols, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Anthony R. Shaw
*Vice President Technology
Automotive*

Subject: Phasing the Tier 2 Cool Windshield Standard to 2016

Dear Chairperson Nichols:

Thank you for the opportunity to provide comments on the "Proposed Cool Car Standards and Test Procedures."

Pilkington, one of the world's largest automotive glazing manufacturers, fully supports the goal of the Cool Car Standards and the use of auto glass glazing to reduce greenhouse gas emissions.

Pilkington generally supports the goal of the Tier 1 windshield standard in 2012, but respectfully requests that the California Air Resources Board (CARB) consider adjusting the implementation schedule of the Tier 2 windshield standard from 2014 to 2016.

Please see the detailed comments below.

Tier 1 Standard in 2012¹:

- Pilkington generally supports the Tier 1 windshield standard in 2012.
- Tier 1 prevents 50% of solar energy soak, which achieves most of the proposed GHG benefits.

Tier 2 Standard in 2014 is Problematic:

- Tier 2 requires an additional 10 percentage point reduction in the performance of the windshields, limiting total solar transmission to 40%.
- 40% is approximately the theoretical maximum limit for windshield solar transmission.
- GHG emission benefits of going from 50% Tts to 40% Tts are relatively modest.
- Logistical constraints and contracting realities for all models by 2014 are enormous.
- In the current financial markets there is inadequate debt capital to finance the capital costs needed to meet Tier 2 for all vehicle models by 2014.
- Most of the world's major producers cannot currently meet Tier 2.

¹ While it is technically achievable to supply glazing that is compliant with Tier 1, Pilkington acknowledge that the vehicle manufacturers have very clear and specific issues that may prevent the incorporation of IR reflective windshields on current vehicle platforms. These issues relate principally to the compatibility with electronic communication systems and sensors.

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- Specifically, 8 or 9 of the world's 10 major windshield manufacturers do not currently have a proven technology to meet Tier 2.
- Tier 2 in 2014 would potentially inadvertently pick one or two "winners."
- But one or two glazing manufacturers cannot supply all of the models for CA.
- 383 applicable vehicle models for California will be assembled on three continents by 2014.
- 2012-2014 Model Year vehicles are mostly already defined and vehicle glazing supply contracts are awarded to specific suppliers.
- Two additional years are needed for most of the world's glass and glazing manufacturers to:
 - Raise capital for hundreds of millions in necessary immediate global investment,
 - Secure compliant technology,
 - Conduct necessary R&D,
 - Perform required durability testing,
 - Construct sputter coaters and other equipment in each assembly area around the world,
 - Transfer development technology through to production,
 - Establish long-term contracting with vehicle manufacturers, and
 - Work out the necessary logistical planning elements needed for every model.

Benefits of Phasing Tier 2 to 2016:

- Federal Rulemaking to Establish Vehicle GHG Emissions and CAFE propose full implementation of the federal GHG standard in 2016.
- Harmonizing Tier 2 cool CA windshields would be an efficient integration.
- The entire California Cool Car regulation, including all the applicable glass standards, is estimated to achieve 0.7 million metric tons GHG reduction per year statewide by 2020.
- Cool Cars staff report estimates an additional 2.0 to 8.3 million metric tons of reduction if California creates an achievable approach that is emulated nationwide.

Request:

- **Pilkington respectfully requests phasing Tier 2 implementation to 2016.**
- 2016 would allow major manufacturers the ability to develop Tier-2 compliant windshields and/or allow the vehicle manufacturers to develop new sourcing methods.
- This phasing would allow the industry and the consumer to avoid most of the additional transition costs—which would be hundreds of millions in 2014, *if* it is even logistically feasible.
- Tier 1 achieves the majority of the GHG emission reduction benefits.
- Implementing Tier 2 in 2016 will greatly increase the likelihood that the nation harmonizes with California.

Logistical Constraints to Achieving Tier 2 by 2014:

Suppliers:

Major supply limitations, global goods movement challenges, and industry contracting and logistical constraints limit the ability of a majority of the global glass and glazing industry to provide fully compliant Tier 2 windshields for all required models by 2014.

Process Needed to Comply with Tier 2:

Eight or nine of the world's ten windshield manufacturers do not have a proven technology that can meet Tier 2. It will take each supplier **4-5 years**, or more, to produce a fully compliant final product—assuming each company can secure financing now, and that their theoretical specs are achievable after lab work, bend testing, manufacturer requirements, contract negotiations, and sun testing.

Specifically, each of the 8-9 companies would need approximately:

1. 3 months lab work on a spot coater
2. 6 months to develop initial equipment and bend shaping and testing of all shapes (to demonstrate coating can withstand the 650 degrees Celsius needed to bend the glass shapes, etc.)
3. 6 months to work with auto manufacturers to ensure consistency with sensors, safety requirements, etc.
4. 6-12 months to acquire any required permitting/approvals and construct coaters, benders, etc.
5. 24+ months weathering tests in Florida, Arizona, etc.
6. 6-12 months for production batches, logistics, shipping, etc.

In order to meet a 2014 standard, the Model Year 2014 would need to be ready by Jan 2013. **If the majority of the windshield industry started today and could secure the necessary debt capital, and if the computer theoreticals are real, and huge costs and contracting constraints were overcome, then the industry would still miss the 2014 Model Year by a year or more.**

Global Market Dynamics:

The market for glazing in North America closely follows where the vehicles are built but differs somewhat from the vehicle sales. Vehicle sales are made up of automotive manufacturing locally, plus imported vehicles from Europe and Asia—a large proportion of these imported vehicles are sold in California.

Figure 1 gives an outline forecast of the proportions of vehicles sold in USA and California.

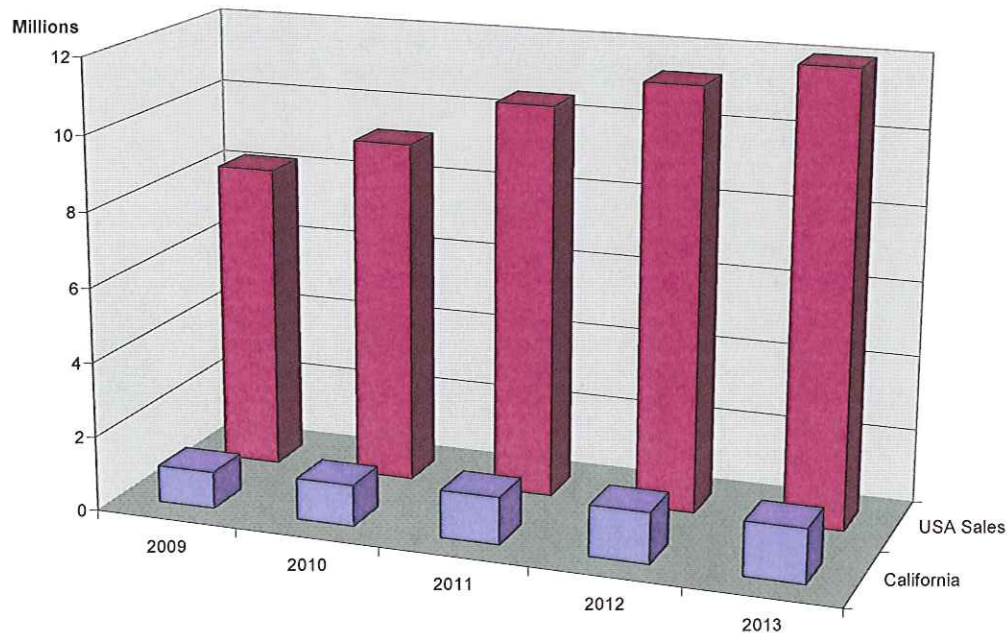


Figure 1 – Vehicle Sales (including imports) for North America and California

For domestic vehicles built and supplied into North America, automotive products are sourced by the vehicle manufacturers in a way that requires that each supplier must have the capability to supply the core volume (about 90%) of the glazing plus the low volume option on the specialist products (about 10% of the volume for California) on each aperture for each vehicle model.

The supply status for 2012 and 2014 MY vehicles is mostly already defined. The majority of the vehicle glazing for these model year programs is already awarded to suppliers.

Vehicle manufacturers concentrate on eliminating dual suppliers for each identical vehicle. Vehicle manufacturers need to be able to source from many suppliers, and ultimately award each vehicle model windshield contract to one of the individual suppliers. This approach enables consistency of product quality, the flexibility to meet changing volume requirements, more cost competitive sourcing, stability for the supply base, minimizes supplier management by the OEMs, and enables faster evolution of products.

There is no realistic possibility that any one or two glazing manufacturers can supply the entire breadth of California volume and Model Year diversity. It is absolutely necessary that the majority of the supply market has the capability to offer tier 1 and tier 2 specification glazing.

Breadth of Windshield Numbers for California:

Our best estimate based on the market data that we have available indicates the number of new and replacement windshield models required to meet Tier 2 in California by 2014

will be approximately 383. More than half of these vehicles will be assembled outside North America:

North America	176 models
Europe	104 models
Asia	103 models

Cross continent windshield supply chains are unrealistic for vehicle manufacturers. Long supply chains bring about inflexibility, risks for supply, high costs and significant carbon footprints from transport.

Glazing is generally sourced from suppliers located in the same geographic area as the vehicle final assembly plant. For example, less than 10% of all windshields used in North American assembly plants are produced outside of North America, this is particularly indicative given North America's generally high cost of goods manufactured. Of the companies claiming the ability to meet Tier 2 performance, none have a manufacturing base in Asia and only one has a base in Europe.

The total volume of vehicles built in each continent, where a portion of those vehicles is available for sale in California, is shown in Figure 2 below.

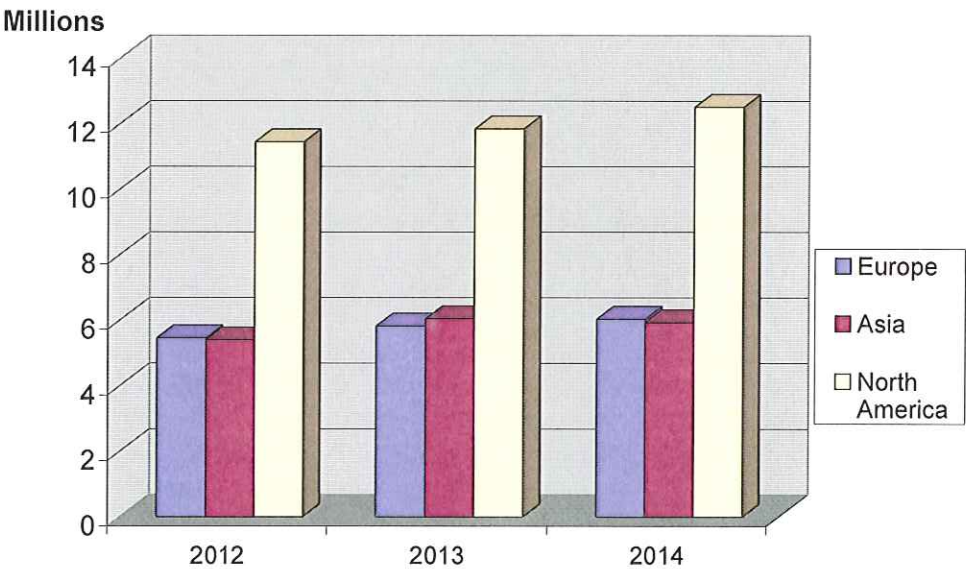


Figure 2 – Volume of vehicles built, by region for those vehicles that are sold into California

To have the capability to supply the entire California sales requirement, a glazing supplier would need the capability to supply 22 Million windshields across the globe.

The proportion of the vehicles built outlined in Figure 3 that is ultimately sold into California can be seen in Figure 3

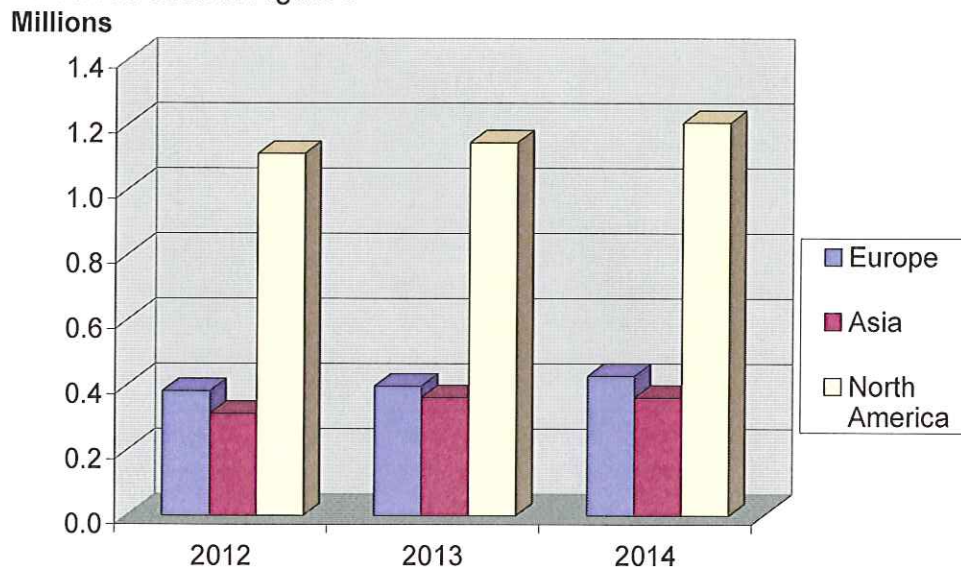


Figure 3 – Volume of vehicles built, by region for those vehicles that are sold into California

Additional Costs of Tier 2 Compliance by 2014 :

- A glazing process line and associated equipment costs approximately \$30-50 million.
- Multiple Tier 2 lines would need to be constructed on each continent with overlapping timing with Tier 1 coaters under the proposed two years phasing to Tier 2.
- Each coater must be paired with an existing or constructed glass manufacturing plant, which cost hundreds of millions each.
- Adequate debt capital is not currently available to ramp up to meet Tier 2 by 2014.
- A significant amount of the volume of windshields for 2012 and 2014 is already sourced and cannot be resourced without substantial costs to the ailing auto industry.
- Each windshield model has dedicated tooling, usually pallets for delivery, development resources, testing requirements, ramp-up requirements, and a proportion of depreciation of the manufacturing equipment.
- In broad terms, the dedicated tooling requirement for each windshield model, which is specifically dedicated for each specific vehicle model, would cost approximately \$1.3M.
- If we assume that the vehicle manufacturers intend to keep supplying the California market with the existing broad range of vehicles in 2014 and we assumed all of the financing, R&D, construction, durability testing, production, etc. could somehow be overcome, then the additional tooling and pallet cost burden alone, spread across 383 different windshield models, would burden the industry and ultimately California consumers with $(383 \times \$1.3M =)$ **about \$500 million additional costs**, from a dual supply approach needed for a two year transition from phase 1 or a California only car—if we assumed Tier 2 is

logistically feasible by 2014 for all models. This only represents the cost to supply, the costs that the vehicle manufacturers incur to incorporate this technology and modify existing vehicle architecture would be in addition.

Conclusion:

Phasing Tier 2 from 2014 to 2016 will allow each major manufacturer the ability to develop Tier 2 compliant windshields or allow the vehicle manufacturers to develop new sourcing methods to meet Tier 2 requirements.

Implementation of the Tier 1 standard already will achieve the majority of the GHG emission reduction benefits from California's Cool Car standard.

This phasing would allow the industry and the consumer to avoid most of the additional transition costs.

Phasing the Tier 2 standard for successful implementation in 2016 will greatly increase the likelihood that the nation will harmonize with California.

The Cool Cars staff report estimates that national implementation of California's standards would achieve 3 to possibly more than 10 times the GHG emission benefits.

Please consider adjusting the implementation schedule of the Tier 2 windshield standard from 2014 to 2016.

Sincerely,



Anthony R. Shaw
Vice President – Technology
Pilkington Automotive Worldwide
NSG Group

cc: CARB Board Members
Tom Cackette
Dr. Marijke Bekken
Andy Richards