

tive emissions from EVs (e.g., power plant NO_x) and GPVs (tailpipe and associated NO_x emissions) and found them comparable. Stricter controls on power plants were assumed than are currently in place. The results from the AQIRP study showed a relatively small, and ambiguous, impact from NO_x reductions from automobiles. A much stronger response was found from changes in GPV VOC emissions. ROMNET 2.2 results also suggest that peak ozone in the New York City area is also more responsive to VOC reductions. The real impact from using EVs is to reduce VOC emissions.

Smith comments that ozone is a daytime phenomenon, while EVs will be charged at night. Even if true, emissions at night affect ozone levels during the day. It is now understood that ozone and its precursors are transported over many days.

In response to points (2) and (3), our calculations did account for the actual operations of GPVs, including emissions at traffic lights. Our emissions estimates also accounted for the deterioration in gasoline engine performance that results over time in some "super-emitters."

Our estimate of the impact of 500,000 BPVs is based on interpolation of results for a bigger, significant change in ozone. Work by Chang suggests that the models are relatively linear up to a change in VOC emissions of about 30%. We are within that range.

No one should trivialize the small ozone improvements: most of the easy methods to lower ozone are in place, and we are left with piecing together many methods with small individual impacts. However, lead-based BPVs are desirable only if environmental discharges are much smaller.

Graham Spurling notes that industry associations have "rejected" the results of our current study and the previous study, but he offers no data or analysis. If the study is "riddled with false information," Spurling and the Battery Council International owe it to the public to detail the problems in a scientific forum. We would welcome their evidence on the environmental fate of nonrecycled batteries and long-term slag weathering.

Spurling dismisses the health risks from processing lead. One of the biggest public health victories of our time has been reducing human exposure to lead. Without clear evidence of social benefit, we should not require prod-

ucts with new uses of lead.

The current study concludes that 500,000 lead-acid BPVs would increase U.S. lead use by 20%. If lead discharges are not to rise 20%, Spurling has to show what new and more stringent controls will be introduced throughout the lead life cycle.

Since our article was first submitted, California has delayed its zero-emissions vehicle mandate. This will provide more time for better battery technologies to develop and to better assess the tangential environmental impacts. We applaud this action on technological, economic, and environmental grounds.

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When EVs age

Dear Editor: The recent Policy Analysis article on battery-powered vehicles (Sept. 1996, p. 402A) serves as a useful reminder that an apparently environmentally benign program may not in fact be so. The calculations presented in that article appropriately take into account the fact that emissions of real on-road vehicles are larger than their certification emissions.

Another consideration that will affect real-world emissions is the fact that battery-powered vehicles will, toward the end of their battery charge life, become more and more overweight and sluggish. In Los Angeles, with its hills and occasionally free-flowing freeways, there would come a time when a few sluggish electric vehicles would cause enough traffic slowing that the gasoline-powered fleet would have increased on-road emissions caused by the congestion. Thus, a realistic fleet of electric vehicles in realistic service is likely to increase on-road emissions.

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