An all-too-frequent foible of journalists who cover environmental issues is what one might call "glib contrarianism." Journalists write articles that purport to debunk the "politically correct" environmentalist common wisdom. Doing so establishes the journalist's credibility as a "balanced" news provider and also gets good traffic from outraged conservatives and guilt-ridden liberals who question whether they have been doing the right thing all along. This journalism is all too often "glib" because it all too often isn't very well researched.

This Economist blog post on electric vehicles is a classic in the genre. Entitled "Tailpipe Truths" it notes quite correctly that an electric vehicle is only as clean as the electricity source that powers it, and in many parts of the country those sources are coal-fired power plants. It then cites an (extremely informative) Union of Concerned Scientists report that analyzes this issue, and provides advice on whether electric vehicles are necessarily "greener" than gasoline vehicles. (Short answer: They generally are, except in the parts of the country with the highest proportion of electricity powered by coal, and even then, only the most fuel-efficient economy gasoline cars might be a better choice.)

It's at the end where the blog post goes off the rails:

> A second quibble is that no thought seems to have been given to how electric vehicles are actually recharged. The vast majority are expected to have routine duty cycles, being used to commute to work and back during the day, and then recharged overnight with off-peak electricity. What seems to have been ignored in the rush to judgment is the Jekyll and Hyde nature of the grid as it switches from peak to off-peak power.
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> Since deregulation, the energy markets in America have become ruthlessly efficient, with the cheapest power available being shuffled instantaneously around the grid to wherever demand arises. In the process, electrical power has become a commodity, with capacity traded as local need for electricity rises and falls. As the sun sets, renewables like solar and wind power become idle. Meanwhile, generating stations that can be powered down easily, especially those fueled by natural gas, go offline. As a result, the cheap off-peak juice coming out of a plug in clean-energy California can hale from dirty coal-fired plants in Wyoming and elsewhere. Much the same happens in metro areas across the country.
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> So it is hard to say whether, even in California, an electric vehicle is cleaner than

> a modern petrol-powered car. Your correspondent would like to believe it so. But he cannot help thinking that, despite the abundance of cleaner natural gas, cheap and dirty coal will remain the fuel of choice for charging electric vehicles overnight for many a year to come. He welcomes electric cars, whether pure plug-in or hybrid, for the way they can help curtail the country's appetite for foreign oil. But they are not the saviours of the environment as widely believed. And as many motorists have already found to their cost, they are nowhere near as cheap to own as their mpg figures might imply.

It would have been nice if the Economist's blog poster had done some homework before making these kinds of sweeping, glib, contrarian assertions.

First, the UCS report *does* include analysis on a hour-by-hour basis in Appendix A. Table A-3 shows the hour-by-hour average carbon emissions in California (Region 13 on the table) – in none of the hour segments does California's emissions rate ever go over 400 gCO2/kWh, putting it well in the ball park of the lowest emissions rates across the country (and squarely in the range that translates to over 50 MPG) (compare to Table A-1 in Appendix A, and Figure 1.3 and Table 1.4 in the main report for an idea of the general numbers here). (The overall numbers in the hour-by-hour average are all less than the annual numbers for California under the main analysis done by UCS (compare Table A-3 and A-1) because the methodologies of the two analyses are somewhat different. But the difference doesn't appear to matter for the purposes of this discussion.)

But what about electricity imports from out-of-state? Conveniently enough, the California Energy Commission *does* collect that data, available here for 2010. As expected, the in-state numbers for coal in California are tiny (around 1.7%). Imports (primarily from the southwest) raise that number higher, to about 7.7% overall. There is some power from the Southwest for which we don't know the source – if we add all of that in as if it was coal (probably a significant overestimate), then the overall coal mix in California's supply is 14.6%. That still leaves California with a very clean overall source of power, similar to (for example) New England, and again means that electric vehicles end up well over 50 MPG (see Table 1.4 in the main report)

What about combining off-peak numbers with out-of-state sources? One scenario would be to (a) drop all the natural gas out (like the Economist blogger suggests); (b) reduce the hydro (I drop out the small hydro category in the CEC numbers as a way to measure this); and (c) eliminate the solar and wind. This drops total usage by almost half. If you do those numbers, with the assumptions above, the overall mix of California's off-peak power is 38%

coal, 27% nuclear, 21% large hydro, 5% biomass, and 9% geothermal. The closest comparisons I can find in the UCS report to that mix are regions such as RFC East (basically Pennsylvania) and the Northwest regions in Figure 1.3 of the UCS report. Again, this puts California well on the low end of carbon intensity and translates to mileage well over 50 MPG (see Table 1.4 in the main report).

The worst-case scenario I can come up with is to (a) drop all the hydro; (b) keep enough natural gas to maintain the grid at the same production level as in my prior scenario; and (c) still eliminate the solar and wind. Then the percentages are 37% coal, 27% nuclear, 21% natural gas, 5% biomass, and 9% geothermal. Here the closest comparisons are regions such as RFC East and perhaps WECC Southwest (Arizona and New Mexico, more or less). Even in this worst-case scenario, the UCS estimates that MPG would be about 48.

Now these are all back-of-the-envelope calculations. I’d be the first to agree that more analysis may show that these numbers are higher, or lower. But given the assumptions I’ve made in my analysis, I find it hard to believe that in California at least, electric cars end up looking worse than even the best gasoline-powered cars for sale in the United States today.

(There are other problems with the Economist’s blog post, like the assertion that electric cars have “flopped,” and considering the possibility of increased efficiency for gasoline cars, but not increases in renewables for the electric grid. But this post is long enough for now…)