

September 16, 2021  
To: CA Air Resources Board  
From: Muriel Strand, P.E.  
Re: California Climate Investments Draft Fourth Investment Plan

I believe there are some very effective investment opportunities that have not yet been included in the Plan's detailed descriptions of investment categories and projects. I also note that substantial existing fossil fuel subsidies (negative carbon fees) continue to counteract carbon offsets and any surcharges. Recently, Sen. Sheldon Whitehouse mentioned an IMF estimate of \$600 billion/year in the US, so the modest proposals for carbon fees that I'm aware of face very strong headwinds in the effort to move the market.

Specifically, I believe that particular practical investments in essential-worker jobs, whose importance has been highlighted in the past year and a half, offer untapped potential for cost-effective environmental justice.

Typically, these jobs don't pay very well, so low-income citizens deserve access to climate-friendly equipment that is very affordable, unlike electric vehicles (EVs) and various other modern electrical appliances. While "high-quality jobs" are generally defined in the Draft Plan as offering middle-class incomes, designing and investing in tools and jobs that are truly practical as well as sustainable offers great potential for improving their economic security and everyone's climate security in a very thrifty way.

Many of these essential jobs are in farming, including field preparation, sowing, weeding, harvesting, washing, packing, and food preservation and storage. Child care, elder care, and home maintenance also qualify, as does urban gardening and farming. Spinning, weaving, sewing, cooking, and laundry are also essential. In short, any job that involves meeting people's basic needs for clean air and water, healthy food, and comfy shelter in energy-thrifty ways deserves attention and investment.

Crucially, all the tasks involved in meeting basic needs can be performed without direct fossil fuel or electric energy, as has been done historically. Investment in tools and equipment that are powered by human muscles offers huge potential to create and increase the economic security of low-income workers, while minimizing greenhouse gas emissions more than is possible with heat pumps and EVs. Fortuitously, manual devices without engines, motors, or electronic controls are categorically cheaper, so investments in them go further.

A prime investment opportunity is replacing the array of noisy nuisances used by the landscapers (no they are not gardeners) that infest our neighborhoods. Leafblowers are the worst, but none are benign. In fact, banning leafblowers would be great way to raise consciousness about the changes we would all be wise to make: <http://motherearthhome.blogspot.com/>. If we cannot even stop using leafblowers, which many people despise, we deserve to be toast.

Similarly, funding the design and manufacture of human-powered tools and equipment offers additional potential for energy-saving investment. An obvious candidate is clothes-washers. Washing clothes by hand is far more exhausting than almost everyone realizes, yet a relatively simple and ergonomic mechanical and human-powered appliance could be designed and manufactured that would make washing clothes far easier than washing by hand.

Other societal processes that merit this kind of attention are the distribution of potable water and the management of wastes, both biological and material. The current pattern of water supply piping to individual houses depends on fossil fuels, whether for metal or plastic piping that inevitably leaks as it ages, or for the pumps that transport water. Similarly, putting poop in the water and then using lots of energy to pump, filter, process, and sanitize the ‘wastewater’ is really very bad engineering. Building and operating composting privies offers essential and long-term jobs, and puts poop where it belongs—in healthy soil.

Currently, big heavy diesel trucks pass by our homes on a weekly basis to pick up and haul away wastes that mostly end up in landfills. Much of this is single-use packaging, yet historically we used very little packaging. Why? Because essential workers were carrying, sorting, and conveying basic items directly to consumers. There’s a direct trade-off between packaging materials vs. human handling.

I note that most of the jobs that are described in the Draft Plan as being “high-quality” jobs are devoted to construction and installation of capital equipment such as PVs, and heat pumps which are powered by electrical energy. But few of these jobs seem to be long-term jobs; thus more attention to operation and maintenance tasks and jobs is I believe very much in order when defining high-quality job descriptions.

Overall, wise investment will shrink our supply chains, in both length and volume. Planners continue to focus on mobility, when it’s access that matters. Think “relocalization.” Sustainable investment will prioritize basic needs, and tasks that can be performed within walking distance of homes. Minimal supply chains offer huge emissions reductions from reduced VMT, reduced refrigeration requirements, reduced manufacturing of junk food, and various other eliminated energy uses.

Originally, federal and state water supply projects for agriculture were linked to a limit of 160 acres per individual landowner; this requirement should be revived and/or reinstated for reasons both ecological and economic, as outlined here: <https://www.gao.gov/assets/b-125045.pdf>. Enforcing this requirement can also be expected to shrink supply chains. As well, minimal supply chains can then be expected to reduce food waste, congruent with efforts to revive and re-weave the natural cycles of carbon, nitrogen, water, and so forth that our fossil fuel addiction continues to disrupt.

Investments to be avoided include any building construction that fails to benefit from passive solar design and natural thermal management of energy flows within the building. As well, manufacture and application of all pesticides and herbicides should end yesterday. CAFOs should be banned, as should any installation of new pavement. Investments in restorative agriculture are more likely to succeed if farmers have truly reliable long-term land security. It’s said that nature abhors a vacuum; deleting foolish products and processes from our economy will create space for new and/or traditional products that are much better.

Analysis of the various investment options should be based primarily on reduction of embedded kwhr and greenhouse gas emissions, not on dollars or monetary profits. Conventional economic indicators such as GDP are of limited use. Real tallies about people’s reliable access to basic real needs such as food, shelter, and clothing offer directly correlated data about income and job quality. Our monetary system is calibrated for the cheap fossil fuels we are addicted to, and great attention and caution is warranted when making these investment choices. For example, the white-elephant high-speed rail project that may or may not ever function should be at the bottom of the list.

My experience in a variety of basic, more-or-less essential jobs is that the people who are actually doing them often have the most relevant and specific awareness of how to design appropriate and low-tech human-power tools that are truly elegant and efficient. This highlights the opportunity to create jobs that are “high-quality” in another way, of resulting in work that is both mental and physical.

Such balanced jobs tend to support health and happiness, as I can personally attest, having had the great good fortune to always be able to support myself comfortably with work that was part-time or intermittent. I would not be at all surprised if such jobs attracted a substantial number of refugees from cube farms. Worker co-operatives offer many opportunities for organizing such enterprises.

More background discussion of these considerations can be found at:

[https://www.researchgate.net/publication/256048802\\_Sustainable\\_Investment\\_Means\\_Energy\\_Independence\\_From\\_Fossil\\_Fuels](https://www.researchgate.net/publication/256048802_Sustainable_Investment_Means_Energy_Independence_From_Fossil_Fuels)

and

[https://www.researchgate.net/publication/333581837\\_Is\\_it\\_true\\_that\\_'Small\\_Is\\_Beautiful'](https://www.researchgate.net/publication/333581837_Is_it_true_that_'Small_Is_Beautiful')

In addition, here are a couple of papers that are tailored to the federal farm bill:

[https://www.researchgate.net/publication/350327927\\_The\\_Farm\\_Bill\\_IS\\_Climate\\_Change\\_Legislation](https://www.researchgate.net/publication/350327927_The_Farm_Bill_IS_Climate_Change_Legislation)

and

[https://www.researchgate.net/publication/352223522\\_The\\_Farm\\_Bill\\_IS\\_Health\\_Care\\_Reform](https://www.researchgate.net/publication/352223522_The_Farm_Bill_IS_Health_Care_Reform)

Thank you for the opportunity to comment.