I am pleased to submit the attached editorial which was published in the San Jose Mercury News in February 2013 proposing the use of some of the AB 32 revenues for an annual series of California **Green Prizes** to incentivize clean technology innovation and job creation in California. The editorial (which contains a list of early supporters and promoters at the end) can also be viewed here:

<http://www.mercurynews.com/opinion/ci_22582291/daniel-yost-use-california-cap-and-trade-funds>

The list of supporters and promoters has grown since this was first published. For example the Clean Tech Open has expressed great support of the idea (and a desire to help administer it) and the California League of Conservation Voters has distributed the attached editorial to all members of the CA Senate and Assembly. In addition I would like to include some additional comments below in responses to questions that I have received about the Green Prize proposal.

**1. Is this a legal use of the AB 32 Revenues? Is there a nexus between clean technology developments and greenhouse gas reduction?**

Yes! [AB 1532](http://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201120120AB1532), expressly allows funds from the Greenhouse Gas Reduction Fund to be used for, among other things, "Funding in research, development, and deployment of innovative technologies, measures, and practices related to programs and projects funded pursuant to this part."  Health & Safety Code Section 39712(c)(7).  In addition the metrics developed for awarding Green Prizes can be expressly tied to greenhouse gas reduction or other relevant metrics that would achieve that aim.

**2. Should we leave technology prizes to the private sector or private “do-gooder types?**

I am all in favor of private donors doing more but in reality both the federal government (with the end of the stimulus money) and the private sector (VCs are focused on the Internet and mobile) are reducing dollars in this area.  This makes state innovation funding more critical than ever. In terms of a private “do-gooder type” I am all in favor of one stepping up, but I don’t see that happening at the moment (education and health seem to be trendier at the moment among the tech multi millionaire set).  One idea on this front might be for the state to use some of its allowance money for a Green Prize with a matching opportunity for some of the prizes to ensure private sector involvement -- although the whole goal of the Green Prize is to have the private sector open its wallets and do the research the state wants.

Historically speaking, if you look at most of the great inventions (the Internet and most every source of energy from coal (subsidized in the 19th century) to nuclear to solar) there has been some form of government support – at least in the early years.

California’s high profile will likely cause greater investment than a “private prize” will.  The state has the advantage of the bully pulpit and can keep something in the news more effectively than if a millionaire or a non-profit was to do this on their own.

Finally, putting aside what the private sector could (and should!) do, the AB 32 money is there and needs to be spent on activities related to climate change.  I genuinely believe that part of the analysis should be – where do you get the biggest bang (climate improvement) for the buck.  In my view, the greatest return on investment comes from a Green Prize that can expire in a few years so that CA either gets (i) its “dream inventions” or (ii) its money is retained to spend on other (climate related) things.

3.       **Will this help Disadvantaged Communities**?

The state can shape the Green Prize to help disadvantaged communities.   CA can identify technology that the state wants to buy or that it thinks meets other state objectives.  Take an example – local air quality clean up technology (i.e. removal of pollutants from ambient air in a specific location).  This is something that the state could set guidelines for what it wants to see with the goal of cleaning up the air in the Central Valley or in disadvantaged communities. California can create a Green Prize covering low cost technology that California would most like to see available for purchase and use within disadvantaged communities based on the needs of disadvantaged communities around the State.

4. **What types of innovations could a Green Prize Support?**

A well designed California Green Prize could provide the inspiration for groundbreaking, scalable, cost-effective advances in: artificial photosynthesis, energy storage, fusion, technology to remove carbon or methane from the atmosphere, reducing climate impacts of specific industries (i.e. aviation and trucking), technologies to remove or replace non-carbon greenhouse gases, environmentally sound desalinization (to mitigate the loss of freshwater in California from a reduced snowpack), tidal energy capture, technologies to bring low cost climate friendly energy to disadvantaged communities or other areas where a break-through is sorely needed to reverse, limit or mitigate climate change.

**5. Will this help with job creation?**

Yes! The Bay Area Council estimates that for every job created in the tech sector that 4.3 jobs are eventually created in the local goods and services economy.  Tesla doesn’t just employ high paid engineers but factory workers and mechanics too.  California could require in its Green Prize rules that some technology development of the product must occur within California to qualify for the Green Prize award.

   **6.      Why support “innovation” rather than something more “tangible” like building retrofits, etc.?**

I do think that if thoughtful metrics are used for what types of innovations will result in the prize then tangible metrics could be relatively straightforward to determine based upon that.  For example (i) carbon sequestration = straightforward to measure GHG reduction; (ii) artificial photosynthesis = compare to alternative sources of energy; (iii) dramatically increased battery storage = probably a little tougher to measure but still a clear benefit and measurements exist to show GHG savings attributable to this.

I don’t believe that all the money should go towards innovation.  But 1-5% does seem like a reasonable (even low) investment -- especially if we get some of it back if the innovations are not created.

**7. Do existing programs of grants like EPIC address this issue?**

EPIC is a good program and provides for limited GHG reduction R&D.  It should continue to be supported.  Nothing here is intended to take away from that, however EPIC is not very much money in the scheme of things. The Green Prize is a longer term investment in big GHG-reducing technologies.  The state could formulate the prize in any one of a number different ways and, in fact, there should be many prizes over time. California is a leader on climate policy for the US, and must also be a technology leader, demonstrating that more substantial technology development is possible.

A prize for big GHG-reducing technologies will motivate entrepreneurship and redirect companies into new business areas much faster that EPIC R&D and at a very low cost to the state. Funding a Prize from AB 32 revenue helps to solve the "R&D Financing Gaps" that has been raised in a number of other comments submitted online through the ARB website.

Based on my experience working with entrepreneurs: there are many that have little interest in applying for a grant; however if you set up a competition with a prize – that will get their juices flowing.  I don’t know if this is human nature or a reflection of the types of people that are attracted to high growth technology companies but it is certainly something I have observed.

**8. It’s a good idea but there are allot of good ideas out there. Why should California support this idea?**

a) Current technology is not adequate to solve our climate crisis so increased spending on clean technology innovation is needed to produce game changing technologies;

 b) the prize should be awarded to only large GHG-reduction technologies that would create “game changers” like the creation of the aviation industry (Lindenbergh’s prize) or commercial spaceflight (the Ansari X Prize), since the rest of the AB 32 funds will go towards more incremental GHG reductions;

c) a Green Prize will use only a small fraction of the proceeds (and leverages private funds) and, therefore, will not take away from other CA priorities; and

d) A Green Prize can be targeted to help with job creation and assistance to disadvantaged communities.

The "cap" part of cap-and-trade is what is going to drive down GHG to 1990 levels by 2020.  Industry will spend money on credits, and when those become more expensive, then on GHG reducing actions.  What will be needed are new technologies to reduce GHG in big ways.  The private sector is not going to make those R&D investments without an incentive.   As noted in the attached editorial, the technologies do not currently exit to meet the State’s 2050 goals. A Green Prize will create that incentive!



**Daniel Yost: Use California cap-and-trade funds for Green Prize to reward climate-change innovation**

*Special to the Mercury News*

February 13, 2013

California has a unique opportunity to use competition to combat climate change and generate jobs and innovation. By leveraging a very modest share of revenue from California's new cap-and-trade program to award an annual Green Prize, California can motivate and inspire innovators to leverage their intellectual and financial capital to solve our climate change crisis.

There is a pool of money available for reducing or mitigating climate change generated from the sale of pollution "allowances" under AB 32, California's cap-and-trade program that went into effect last fall. According to Gov. Jerry Brown's recent proposed budget and an analysis by the Legislative Analyst's Office, the pool will be in the hundreds of millions of dollars this fiscal year and multiple billions over coming years. From that pool, California should set aside one or more buckets of $10 million a year for an annual Green Prize for innovators who are first to achieve some specific groundbreaking technology that meets thoughtfully established, published criteria.

Prizes designed to facilitate technological breakthroughs have a proven track record. The Orteig Prize inspired Charles Lindbergh in 1927 to be the first to fly nonstop from New York to Paris. The $10 million Ansari X Prize was awarded to Paul Allen's team in 2004 for the creation of a privately financed spacecraft, and the contest generated more than $100 million in private investment in spacecraft innovation. Both prizes launched new industries.

California could run this Green Prize through the Air Resources Board or partner with outside experts such as California-based Cleantech Open or the X Prize Foundation, each of which has worked with other government agencies (including the U.S. Department of Energy and NASA) to manage similar competitions. A panel of experts can recommend high-impact breakthrough technologies currently in their infancy and identify criteria to justify the award of a Green Prize, including milestones related to demonstration of an effective prototype or readiness for widespread adoption.

To accelerate innovation and ensure the money is spent as intended, if the prize criteria are not met within three years of the announcement of a particular Green Prize, it should expire, and the prize money should be applied to a new Green Prize or repurposed for more conventional climate change mitigation efforts. The prize expiration creates a no-lose opportunity for California. Either a high-impact innovation is created, or the money is returned to the climate change revenue pot.

Private investment in clean technology has dropped, just as the impacts of climate change are becoming more apparent. Deployment of existing technology is not enough for California to reach its legally mandated goal of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050, according to a 2011 report by the California Council on Science and Technology. Achieving that aim will require "intensive and sustained investment in new technologies," the study concluded. A Green Prize where a desired innovation is created or the prize money is recycled by the state creates a win-win opportunity for California.

State Sen. Jerry Hill, D-San Mateo, has said that the Green Prize "would create an investment in our future." Assemblyman Rich Gordon, D-Menlo Park, has stated that the idea "captures California's spirit." Assemblyman Kevin Mullin, D-San Mateo, finds it a "great way to incentivize action to solve the complex problem of climate change." Assemblyman Paul Fong, D-Cupertino, called this a "great idea." San Francisco Board of Supervisors President David Chiu, Joint Venture Silicon Valley and Environmental Entrepreneurs have all endorsed this idea. Let the contest begin!

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