The Regional Distribution of Cap & Trade Auction Funds

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About Andrew Chang & Company, LLC:

Based in Sacramento, California, Andrew Chang & Company provides fiscal, economic, policy and management consulting services to Fortune 1000 companies, government agencies, trade associations and non-profits throughout California and the nation. We work closely with our clients to develop deep understandings of our clients' unique needs and situations. Our team of highly experienced consultants brings together best-in-class research, advanced analytics and unique insights to produce practical solutions and tangible results.

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(Key Findings)

- Cap-and-Trade auctions will conservatively generate approximately $16 billion for state programs through 2020, leveling off at $2.7 - $2.8 billion starting in 2015/16. To date, all current vintage allowances offered at auction have been sold, averaging ten percent over the reserve price

- Approximately $6 billion of forecasted Cap-and-Trade revenues through 2020 are not programmed for specific programs currently

- Future budgets will need to account for 40% of program spending that is not continuously allocated and approximately $1 billion in surplus from 2014/15 and prior budget years

- Cap-and-Trade revenues are primarily being spent in the southern Central Valley, the San Francisco Bay Area and Southern California. Though there are clear guidelines for geographically allocating 25% of the Cap-and-Trade revenues, clear guidelines have not been established to geographically allocate the remaining 75%. This report outlines three potential principles for allocating the remaining funds geographically

    - Depending on the methodology for geographically allocating funds utilized, Los Angeles County appears receives $80 - $128 million less than its fair share

    - Conversely, the southern Central Valley, especially Fresno and Madera Counties, is receiving more than its fair share, depending on the selected methodology. Fresno receives a surplus of $94 - $111 million and Madera receives $104 - $107 million. This is primarily due to short term spending on High Speed Rail. High Speed Rail spending are expected to move over time as sections of the system are completed

    - Southern California, Contra Costa and the Sacramento area generally appear to be underfunded and Bay Area counties, other than Contra Costa, appear to operate at a surplus

The Regional Distribution of Cap & Trade Auction Funds

1. Background

The State of California is approaching its 9th year of implementing Assembly Bill (AB) 32. The landmark initiative was signed into law in 2006 and created a first-in-the-nation Cap-and-Trade program, under which many emitters of greenhouse gases (GHGs) are required to purchase credits through quarterly auctions. The number of credits offered for sale is reduced each year to force emissions reductions using market mechanisms.

In addition to resulting in lower emissions, Cap-and-Trade auctions have generated $2.8 billion to date. The significant revenues generated through the auctions are being allocated to programs for the first time in the 2014-15 budget, including Public and Independent Utilities as well as 20 programs distributed across 12 departments. In dispersing these funds, the programs are guided by Senate Bill (SB) 535 (DeLeon). SB 535 requires that at least 25% of these Cap-and-Trade funds be invested for the benefit of the State's most disadvantaged communities. In addition, at least 10% of those funds must be for projects located within the communities themselves. Further, the Brown Administration has indicated that it views the requirements established by SB 535 as minimum standards and that disadvantaged communities will likely receive more of those funds.

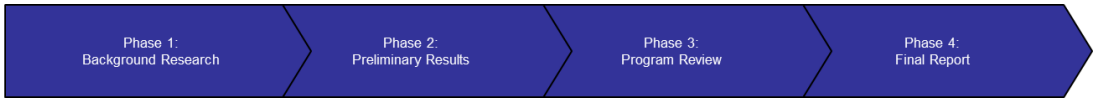
Most state government programs receiving Cap-and-Trade revenue funds are dispersing them through competitive processes. Currently, only a very small portion of the program funds have been distributed and most remain in the early planning or procurement stages. Inasmuch, there is currently significant uncertainty as to which exact communities will receive funds through Cap-and-Trade. In order to inform the decision making process, policymakers have requested preliminary estimates on how current policy favors the geographic distribution of Cap-and-Trade revenues.

Andrew Chang & Company, a Sacramento based economic and management consulting firm, has been retained to assess how current policy favors geographic distribution of Cap-and-Trade funds. While we acknowledge that it is extremely early in the process and significant uncertainty exists, we have undertaken a rigorous process to ensure this report best reflects current policy.

Approach

We completed this engagement through a four phase approach. This approach incorporated standard research and analytic methodologies and focused heavily on engaging programmatic experts at ARB and each of the funded agencies. Figure 1.1 provides an overview of this approach.

Figure 1.1
Approach Overview



	Phase 1: Background Research	Phase 2: Preliminary Results	Phase 3: Program Review	Phase 4: Final Report
Duration:	October 2014	November 2014	December – January 2014	January 2014
Purpose:	Develop thorough understanding of the programs and policies that are impacting the distribution of Cap-and-Trade auction funds	Develop preliminary results to facilitate engagement of program staff	Developing a more thorough understanding of programs and policies and identify opportunities for refinement	Incorporate refinements and update based on program updates
Tasks:	▪ Review statutory documentation ▪ Review ARB documentation ▪ Review program documentation ▪ Review additional literature ▪ Identify data	▪ Preliminary auction revenue estimates ▪ Preliminary spending estimates ▪ Preliminary geographic distribution estimates	▪ Review overall understanding, approach with ARB ▪ Review program-specific understanding, approach with programs ▪ Identify opportunities for refinement	▪ Implement identified revisions ▪ Finalize report

This approach is designed to identify how much funding is likely to be generated, what programs are likely to receive funding and which regions of the state are favored or disfavored by current policy. While uncertainty exists as to auction settlement prices, future budgetary choices and specific spending, this document is intended to provide policy makers with information to support their participation in the process. In designing the report for this purpose, we have: used very conservative future revenue estimates, which are most appropriate for budgeting purposes; chosen to make no assumptions about future budgetary decisions; and focused on the inherent governing dynamics for each program.

Acknowledgements

In developing this report, we have discussed the programs and our methodology with a number of individuals.

- Air Resources Board
  Cynthia Marvin, Division Chief
  Shelby Livingston, Branch Chief
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- High Speed Rail Authority
  Jason Kimbrough, Deputy Director
  Boris Lipkin, Deputy Director
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  Carla Sanchez, Special Assistant to the Secretary, Climate Change
- California Energy Commission
  Marcia Smith, Manager, Local Assistance and Financing

- Strategic Growth Council
  Allison Joe, Deputy Director
- California Department of Fish and Wildlife
  Helen Birss, Branch Chief
- Department of Water Resources
  Joe Yun, Program Manager
  Craig Cross, Project Manager
- Legislative Analyst's Office
  Ross Brown, Principal Fiscal & Policy Analyst

Though we are grateful for their guidance, insight and feedback on the development of this report, their participation does not imply endorsement or concurrence on our methodologies or findings of this report. We would like to thank these individuals for providing substantive comments on the analysis.

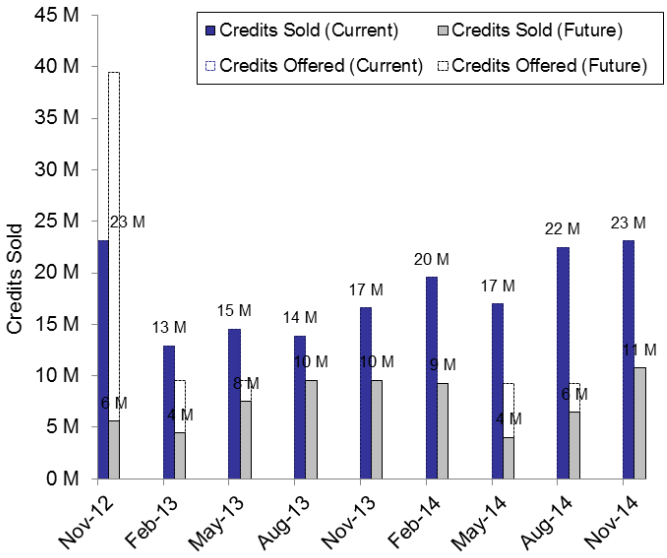
2. Results

In this chapter we provide the results of our analysis. This includes an estimate of the revenue that is likely to be generated through Cap-and-Trade auctions through 2020, an estimate of the programmatic distribution of these funds and an estimate of the geographic distribution for the 2014-15 budget year.

Revenue Estimates

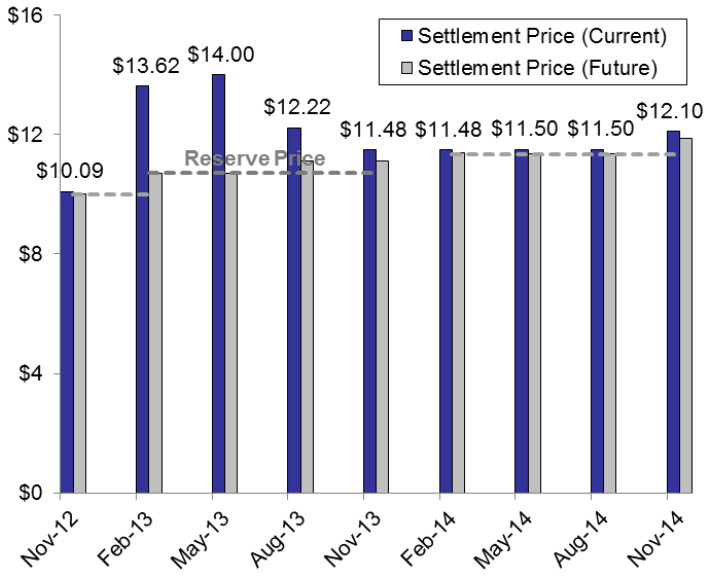
We have developed revenue estimates for AB 32 Cap-and-Trade auctions. These auctions build off of the results of the nine auctions completed to date. Figure 2.1 shows how the great majority of allowances offered for auction have been sold. All current vintage allowances have been sold. A large number of future vintage allowances went unsold in the initial auction but only a small number have gone unsold since. These unsold allowances will be offered again in future auctions.

Figure 2.1
Auction Allowances Sold



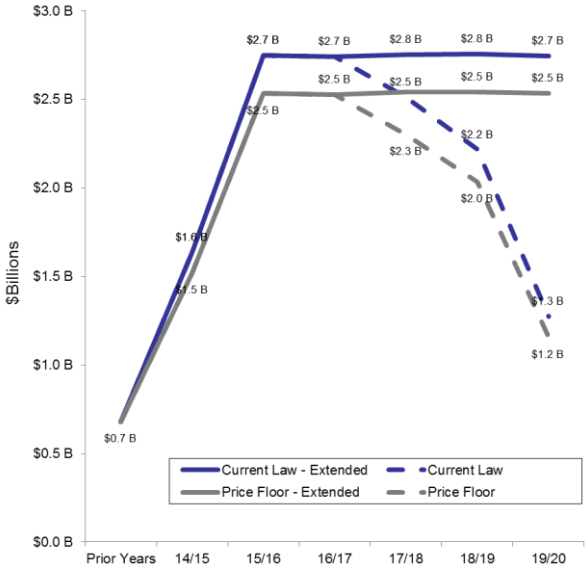
Auction settlement prices have varied from one auction to the next. Current vintage allowances have always sold for more than the reserve price but have varied from $10.09 to $14.00 per ton. Future vintage allowances have remained more stable and have generally remained very close to the reserve price. Figure 2.2 provides settlement prices of each auction to date.

Figure 2.2
Auction Settlement Price



We estimate that the AB 32 auctions will generate $16.0 billion through 2020. This includes approximately $1.1 billion generated through the nine auctions to date, as well as an estimated $15.0 billion over future auctions. Annual revenue is likely to increase significantly through 2015/16, once the cap is fully in effect, and level off moving forward as a tightening cap is largely balanced by increasing allowance prices. Figure 2.3 shows the estimated revenue by budget year. As described in more detail below, this should be considered an extremely conservative estimate. The solid blue line, Current Law – Extended, represents our baseline. This assumes that ARB proceeds as currently planned but that the auction and associated sale of future vintage allowances continues past 2020. The blue dashed line, Current Law, assumes current policy prevails and the auction is not extended, resulting in a significant drop-off in the last few years. The solid gray line, Price Floor – Extended, assumes that allowances are sold at the price floor and the auction is extended past 2020. The dashed gray line, Price Floor, assumes allowances are sold at the price floor but the auction is not extended.

Figure 2.3
State Auction Revenues (by budget year)
Conservative Estimate



Approximately $700 million in state funds was generated in 2012/13 and 2013/14 budget years. We estimate an additional $1.6 billion will be generated in the 2014/15 budget year. This includes $100 million in August, 2014 and $140 million in the November, 2014 auctions as well as an additional $1.4 billion in the remaining two auctions. This significant increase is due to the fact that ARB plans to auction significantly more current vintage allowances in these auctions. We estimate the amount available in future years will increase significantly as the cap broadens to cover more areas and fewer credits are allocated freely.[1]

This should be considered a very conservative estimate. It is possible, and many believe quite likely, that auction settlement prices will grow rapidly as the cap tightens.[2] While this methodology likely underestimates the costs to California businesses, it represents a reasonable basis for budgeting given the substantial potential harms of overestimating revenue.

To develop this estimate, we start with the number of allowances that ARB has stated that it plans to make available for purchase at each auction.[3] We then estimate unique

[1] California Air Resources Board (2013) Estimate of State-Auctioned Allowances by Fiscal Year. Retrieved from: http://www.arb.ca.gov/cc/capandtrade/stateauction.pdf
[2] Legislative Analyst's Office (2012) The 2012–13 Budget: Cap–and–Trade Auction Revenues. Retrieved from: http://www.lao.ca.gov/analysis/2012/resources/cap-and-trade-auction-revenues-021612.aspx
[3] California Air Resources Board (2013) Estimate of State-Auctioned Allowances by Fiscal Year. Retrieved from: http://www.arb.ca.gov/cc/capandtrade/stateauction.pdf

settlement prices for both the current and future vintage allowances. We base this estimate on the auction results to date. We calculate the ratio between reserve and settlement prices for each auction to date to find the average for both current and future vintages. This showed that current vintage allowances have averaged ten percent above the reserve price and future vintage allowances have averaged one percent above the reserve price. We calculate the reserve price using the formula described in policy, which is an increase of five percent plus inflation each year. We use Department of Finance estimates for 2015-2017[4] and assume two percent inflation thereafter.

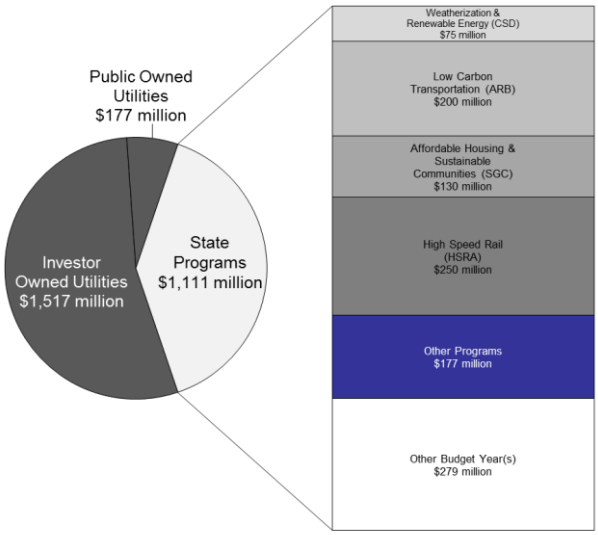
Program Spending Estimates

In Figure 2.4, we detail estimates of program spending to date. The largest share is directed to utilities. AB 32 allocates credits for free to electrical distribution utilities to protect rate payers from sudden increases in the electricity bills (Sections 95870(d), 95890 and 95892). The Public Utilities Commission (PUC) has directed the utilities to return 85% of the revenue generated by these to rate payers. The remaining 15% may be directed towards investments in GHG reductions.

To date, nearly two-thirds of the credits auctioned have been consigned by the state's utilities, primarily the large Investor Owned Utilities (IOU), with the smaller Public Owned Utilities (POU) receiving about 10%. The State of California has generated $1.1 billion to date, mostly from the sales of future vintage credits, which are not consigned.

[4] California Department of Finance (2014) Consumer Price Index (CPI) Forecast. Retrieved from: http://www.dof.ca.gov/html/fs_data/LatestEconData/FS_Forecasts.htm

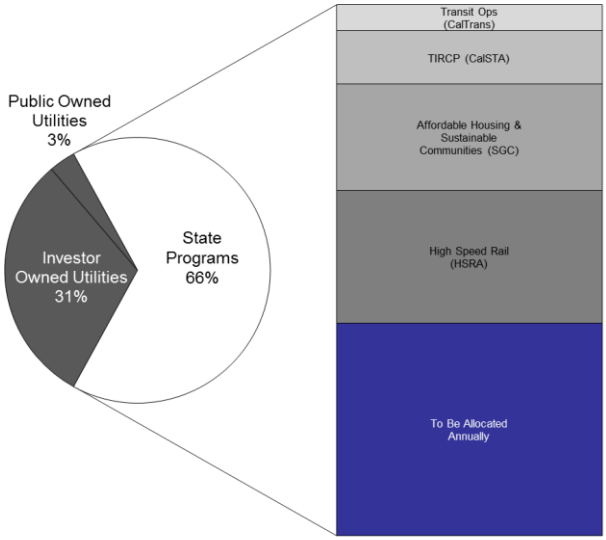
Figure 2.4
Auction Revenues by Recipient, To Date



We estimate utilities will receive an average of 34% of the state auction revenues, while state programs will receive 66%. This portion could change if ARB decided to allocate fewer or more allowances freely.

Among state programs, current law establishes continuous appropriation for four programs: High Speed Rail (25%); Affordable Housing & Sustainable Communities (20%); Transit & Intercity Rail Capital Program (10%); and Low Carbon Transit Operations (five percent), which combine for 60% of the state's share of auction revenues. The remaining 40% is to be allocated annually to programs, which may or may not include programs funded in the 2014-15 budget year. This breakdown is detailed in figure 2.5.

Figure 2.5
Future Allocation of State Funds
(Current Law - Extended)



Unallocated Funds

Our analysis suggests that the AB 32 auctions have collected significant funding that as-yet remains unallocated. The auctions have or will generate $2.3 billion in 2014-15 and prior budget years. This analysis assumes that all credits are sold at the minimum reserve price in the two remaining 2014-15 auctions.

Of the $2.3 billion, the state allocated $70 million towards programs in the 2013-14 budget and loaned an additional $400 million to the General Fund. Additionally, the state allocated $830 million towards program in the 2014-15 and anticipates repayment of $100 million from the prior year's loan.[5] This totals $1.2 billion in spending and outstanding loans. As a result, approximately $1.1 billion appears to remain unallocated to date. While a certain amount of budgetary prudence is in order, given that a large portion of the remaining funds has not yet been realized, the auctions have proven a reliable and stable source of funding to date.

Additionally, the Legislative Analyst's Office (LAO) notes that the Governor's 2014-15 Proposed Budget will likely generate a substantial surplus. The budget calls for $1 billion in spending, however the LAO estimates that the auctions will generate over $2.3 billion in revenue. They write, "Based on our preliminary analysis of different factors (such as the outcomes of prior auctions), it is likely that the state will sell most or all of

[5] California Air Resources Board (2014) Greenhouse Gas Reduction Fund Programs. Retrieved from: http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/summaryproceedsappropriations.pdf

the allowances offered for sale in 2015-16. Therefore, state auction revenue will likely be significantly higher than what is assumed in the budget."[6] As the Legislature considers the 2015-16 Budget, there is likely over $2 billion in additional auction funds that could be programmed.

Geographic Distribution Estimates

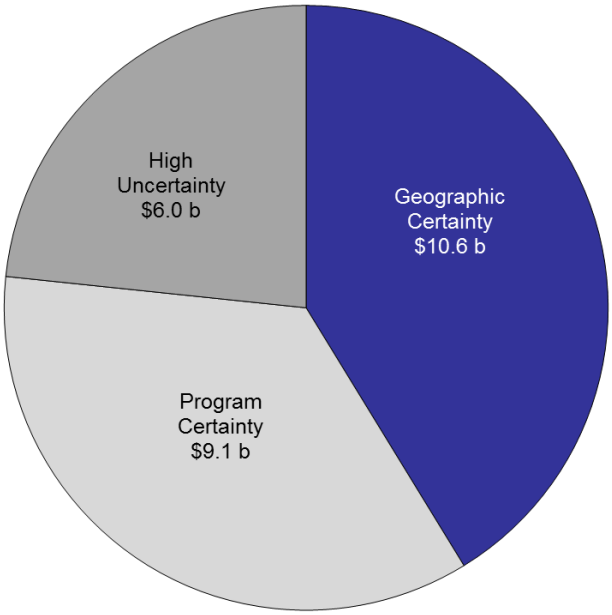
Our estimates show the potential distribution of State of California funds derived from the Cap-and-Trade auctions. The programs receiving funding generally remain in early stages of development, so there is significant uncertainty in these estimates. It should be noted that these estimates should be read to show that policy, as currently written, favors this estimated distribution. As the funding is distributed there will be variation due to:

- The relative quality of applications programs receive;
- Local governments, service providers and/or industries' relative preparation to make use of these funds;
- A relatively small number of planned awards for many programs; and
- Random chance and other unpredictable elements.

Figure 2.6 displays our assessment of the uncertainty of funding distribution. The largest share has geographic certainty. We know with high confidence where these funds are likely to be spent. This group primarily consists of IOU and POU funding, as well as the very small amount of funding that has already been distributed. The second largest group is program certainty. We know which programs these funds are directed to but there remains significant uncertainty as to where, geographically, they will spend the funds. The third group includes future funds that have not yet been allocated to programs. We have not identified any basis for estimating their distribution.

[6] Legislative Analyst's Office (2015) The 2015-16 Budget: Overview of the Governor's Budget. Retrieved from: http://www.lao.ca.gov/reports/2015/budget/overview/budget-overview-2015.pdf

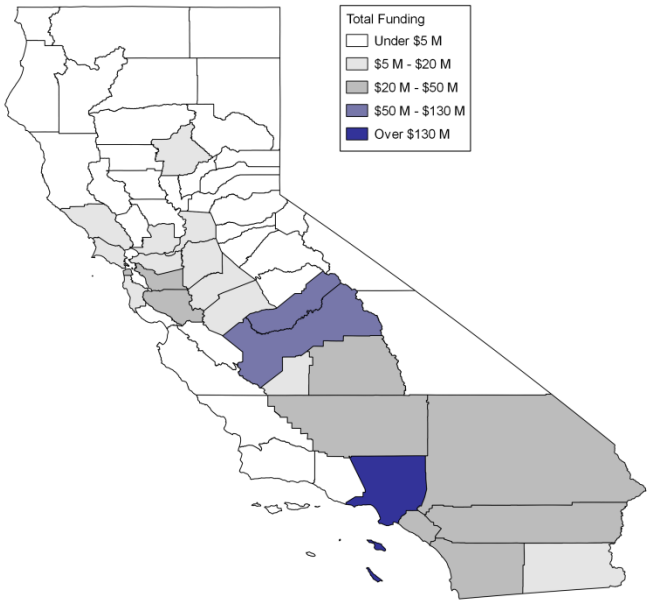
Figure 2.6
Uncertainty of Funding Distribution
(Including future funds)



Because of the high degree of certainty and well established standard for distribution of the IOU and POU funds and the excessive degree of uncertainty for future state programs, our estimates focus on funds allocated in the 2014-15 budget year.

Our estimates indicate that the largest shares of funds are likely to be spent in Southern California, the southern Central Valley and the San Francisco Bay Area. In the next chapter we discuss context in which policy makers could consider this data to assess whether this distribution is fair or otherwise appropriate. Figure 2.7 shows the distribution graphically. For detailed figures, see Appendix 3.

Figure 2.7
Estimate of Funding Distribution



3. Fair Share

In this chapter, we provide context to help policy makers consider the estimates of the distribution of funds. Current law does not provide guidance as to how much money should be spent in the various communities in the state. Generally, the policies are geographically agnostic, focusing primarily on the efficiency of reductions to be achieved as well as SB 535 requirements to direct benefits to disadvantaged communities, “shovel readiness” and other co-benefits that may be achieved.

The extent to which the guidelines designed for each program are appropriate or effective in meeting the goals of AB 32 is beyond the scope of this report. Moreover, this report is not meant to assess any individual program, only to provide context for the geographic distribution of funds around the state.

We developed three models by which “fairness” could be estimated. In all case, we assume that 25% should be distributed based on the disadvantaged population within each community. The three models then take different approaches to estimating a fair distribution of the remaining 75%.

The first model is population based and assumes funds should be distributed evenly per capita. The second is reductions based – focusing on the potential for reductions in each community. The third is payor based – focusing on the amount entities within each community likely paid towards the fund.

In the balance of this chapter, we describe the data used to estimate each model, provide a graphic representation of the fair share distribution of funds generated by each model and a graphic representation of the gap between estimated spending and each county’s fair share. For specific figures in each county, please see Appendix 3.

SB 535

SB 535 was authored by Senator Kevin de Leon and signed into law by Governor Jerry Brown in 2012. SB 535 is based on the idea that “AB 32 requires that public and private investment be directed toward the most disadvantaged communities in California to provide an opportunity for small businesses, schools, affordable housing associations, and other community institutions to participate in and benefit from statewide efforts to reduce GHG emissions,”[7] but that it does not define or create a mechanism for implementing this principle.

[7] De Leon, K. (2012) SB-535 California Global Warming Solutions Act of 2006: Greenhouse Gas Reduction Fund

It is the purpose of SB 535 to provide guidance in the distribution of Cap-and-Trade funds to ensure that environmentally disadvantaged communities receive the benefits a significant share of auction revenue. 25% of funds are required to benefit disadvantaged communities, with a minimum of 10% being spent directly in those communities. To implement this, it directs CalEPA to identify communities that are:

a. "Areas disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure or environmental degradation.
b. "Areas with concentrations of people that are of low income, high unemployment, low levels of homeownership, high rent burden, sensitive populations, or low levels of educational attainment."[8]

To operationalize this, ARB has chosen the CalEnviroScreen tool to identify disadvantaged communities. CalEnviroScreen is a methodology that combines the pollution burden faced by a community with population characteristics that result in increased vulnerability to pollutants.

Pollution burdens include:

- Ozone concentrations
- PM2.5 concentrations
- Diesel PM emissions
- Pesticide use
- Drinking water contaminants
- Toxic releases from facilities
- Traffic density
- Cleanup sites
- Groundwater threats
- Hazardous waste
- Impaired water bodies
- Solid waste sites and facilities

Population characteristics include:

- Children and elderly
- Low birth-weight births
- Asthma emergency department visits
- Educational attainment
- Linguistic isolation

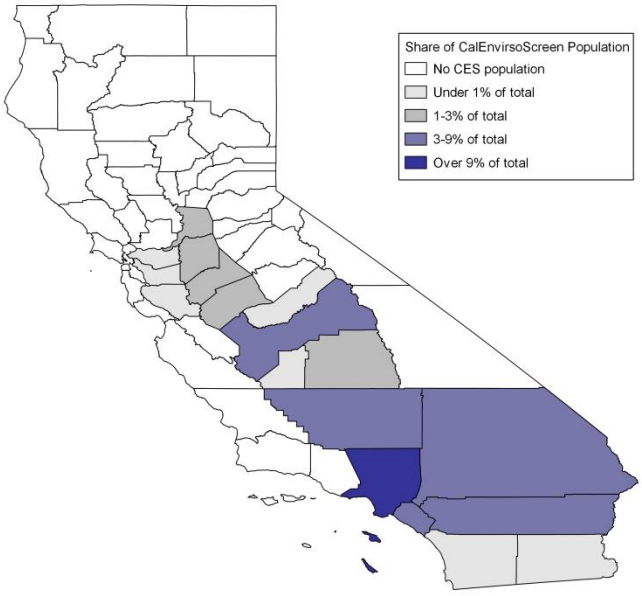
[8] De Leon, K. (2012) SB-535 California Global Warming Solutions Act of 2006: Greenhouse Gas Reduction Fund

- Poverty
- Unemployment

These factors are combined to create a score for each census tract. The 25% of census tracts with the highest scores are considered disadvantaged for purposes of SB 535.

For purpose of our Fair Share estimates, we operationalize this by calculating the share of the overall population living in CalEnviroScore top 25% census tracts in each county. The distribution is shown in figure 3.1.

Figure 3.1
Disadvantage Population Distribution

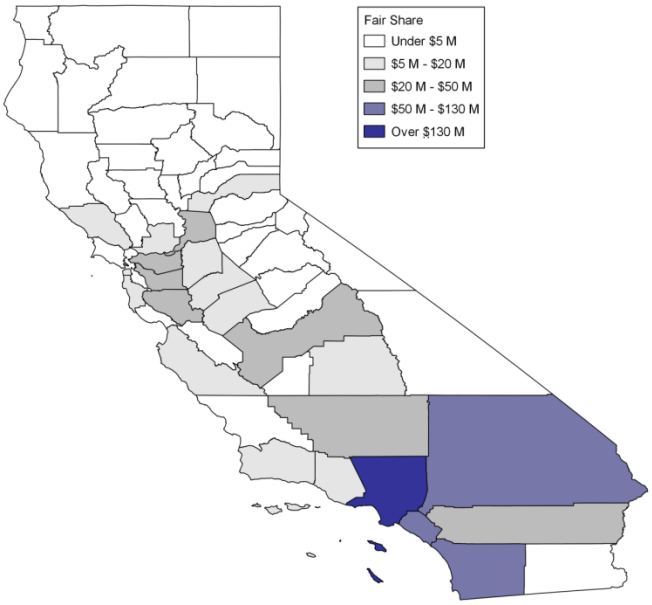


SB 535 requires that 25% of funds be spent to benefit these communities, while only 10% is required to be within the communities themselves. Our analysis is focused on counties. As such, we assume that funds that benefit a given community may be spent in a nearby community but that they will generally be spent within the same county.

Population Based Model

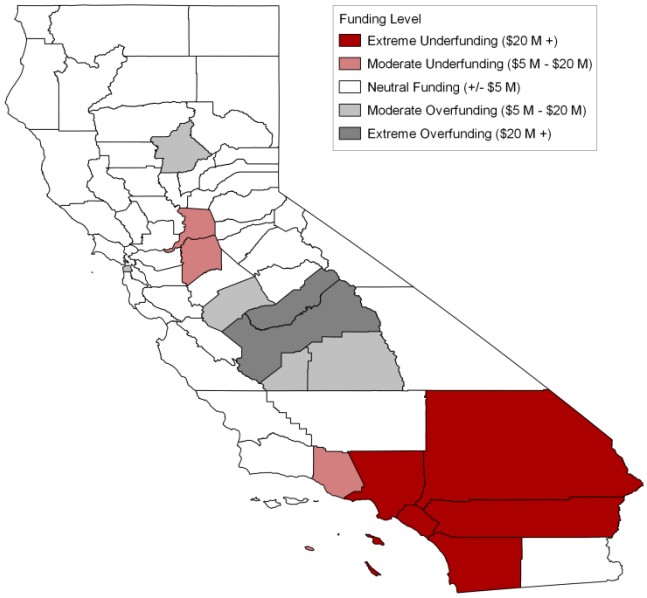
The Population Base Model is based on the concept that the most fair distribution is one that is equal per capita, that each community should receive funding based on how many people reside in it. This approach treats all communities equally but in doing so does not advance any other policy goals.

Figure 3.2
Fair Share Map: Population Based Model



The distribution in this model closely mirrors the population distribution of the state of California. The largest share falls in coastal Southern California. The San Francisco Bay Area also receives a large share. SB 535 causes a somewhat larger share to fall in Los Angeles and inland counties.

Figure 3.3
Spending Gap Map: Population Based Model



There are significant gaps between the population based model and the estimated distribution. While Southern California is expected to receive a large portion of the funding, we estimate it will receive far less than the model would indicate it should. Los Angeles has the largest gap ($95 million) while its neighbors range from $10 million (Ventura) to $29 million (Orange). Sacramento ($17 million) and San Joaquin ($10 million) Counties are also moderately underfunded.

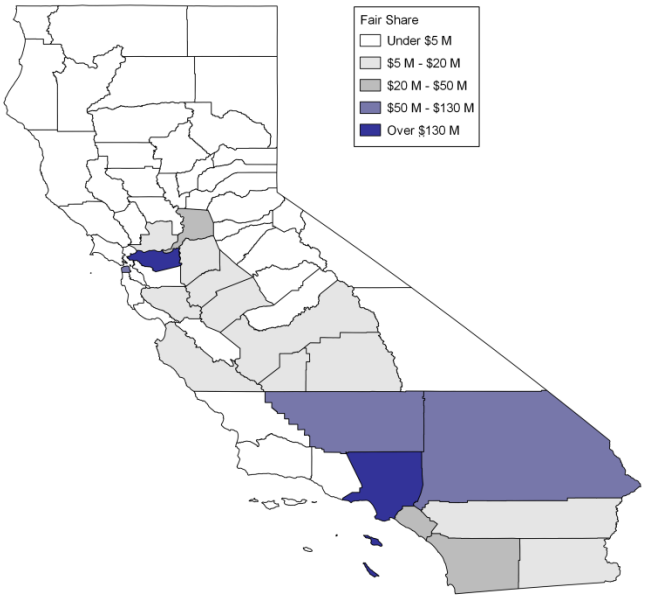
By contrast, we estimate the southern Central Valley will receive a significantly larger share of funding. Fresno and Madera counties are particularly over funded, with a gap of $94 million and $104 million respectively. This is primarily due to short term spending while constructing the initial segment of the High Speed Rail. As the project continues, spending will migrate towards Los Angeles and the Bay Area.

Butte County ($9 million) is also considered overfunded due to the spending on improvements at the Oroville Dam in the small county.

Reductions Based Model

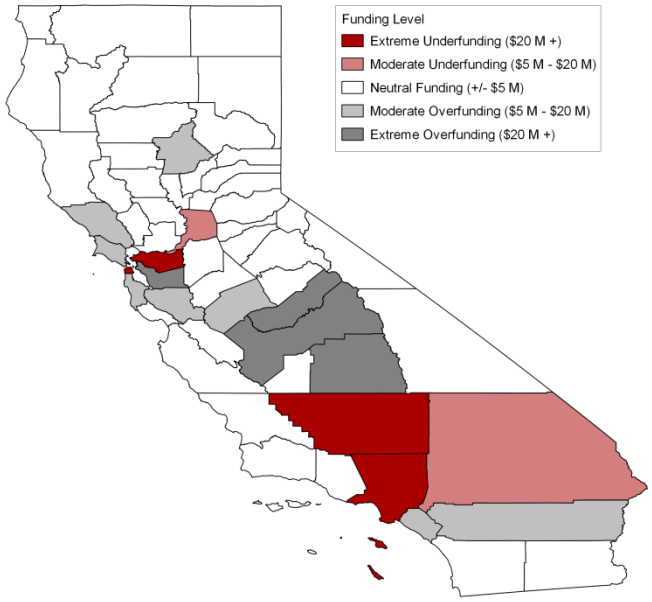
The Reductions Based Model is based on the concept that the most efficient distribution is one that focuses on the potential for reducing emissions. This approach focuses on the policy goal of maximizing GHG reductions. We use ARB's dataset on covered emissions as a proxy for potential reductions. This does not include mobile sources, which we believe is appropriate because they have not been covered by the cap to date.

Figure 3.4
Fair Share Map: Reductions Based Model



The distribution in this model is less widespread than the population based model. Potential reductions are concentrated in a small number of counties, including Los Angeles, Contra Costa, Kern, San Bernardino and San Francisco. Sacramento, Orange and San Diego Counties also have a moderate amount of potential reductions.

Figure 3.5
Spending Gap Map: Reductions Based Model



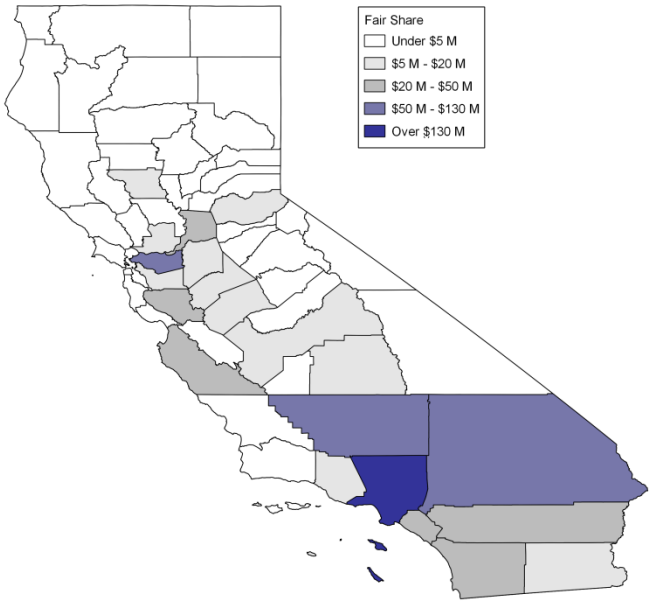
As one would expect, given the more concentrated distribution estimated by this model, larger gaps result. Contra Costa ($131 million), Los Angeles ($128 million), Kern ($44 million) and San Francisco ($28 million) Counties are the most underfunded. These counties have relatively large shares of potential reductions while normal to low shares of estimated funding.

Fresno ($107 million) and Madera ($107 million) are again the most overfunded, with Alameda ($28 million) and Tulare ($23 million) also falling in the top group.

Payor Based Model

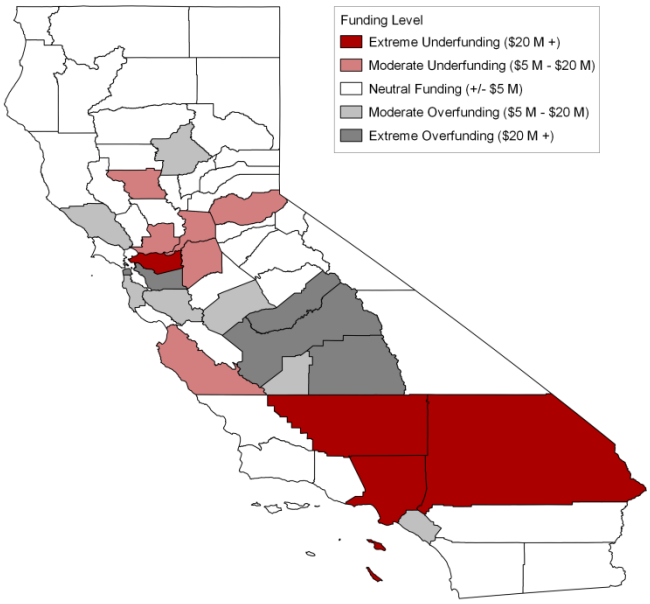
The Payor Based Model is based on the concept that the fairest distribution is one that returns funds to the areas in which they were generated. This approach focuses on the nexus between fee generation and spending. Since ARB has indicated that they will not release data on entities purchasing auction credits, we use data on corporate emissions as a proxy. We consider this most appropriate because transportation emissions have not been under the cap to date and because utility emissions are effectively cost neutral because of the credits that are given to them to protect against rate increases.

Figure 3.6
Fair Share Map: Payor Based Model



The payor based model is fairly similar to the reductions based model. Estimated auction spending is concentrated in Los Angeles, Kern, Contra Costa and San Bernardino Counties. The most significant difference is San Francisco County, which is estimated as being a relatively small payor but a relatively large potential reducer. This is primarily due to the large amount of PG&E natural gas emissions ARB attributes to San Francisco, which is captured in the potential reductions but not the payor model.

Figure 3.7
Spending Gap Map: Population Based Model



With the exception of San Francisco, gaps are similar to the Reductions Based model. Contra Costa ($97 million), Kern ($92 million), Los Angeles ($80 million) and San Bernardino ($51 million) are again the most underfunded. Fresno ($110 million), Madera ($106 million), Alameda ($24 million) and Tulare ($21 million) are again the most overfunded, this time joined by San Francisco ($22 million).

4. Methodology

In order to estimate the distribution of spending for AB 32 auction funds overall, we developed estimates for each of the programs. There is a significant amount of uncertainty in this process because most of the programs remain in very early stages; some do not yet even have guidelines. We developed a targeted methodology to estimate the distribution for each of the programs.

We wish to draw the reader's attention to two important factors to consider. First, in most cases the methodology could be most accurately described as estimating the potential distribution rather than the actual distribution. The potential distribution will be broader than the actual dispersion of the funding. This is because most programs have been allocated a relatively small amount of money relative to the size of the projects they will fund. Due to these funding levels, they will only be able to fund a small number of the very deserving projects that apply for funding. As a result, the areas that actually receive funding will receive more funds than our estimates suggest while other areas that potentially could have received funding will not receive any under that program. This policy choice is based on the goal of maximizing impact. This is often best achieved by concentrating funding in a smaller number of projects to ensure their effectiveness. This methodology is appropriate for the goal of this report, which is to estimate spending overall rather than for each specific program. There will likely be more uncertainty with each program than with the overall estimate.

The second factor is the timing of this report. The great majority of funding under the State's AB 32 auction funded programs has yet to be spent. Much of it will be distributed through competitive processes. While we can accurately assess the potential for a given community (for example, if a community does not have an existing or restorable wetland, it will not be able to successfully compete for funds related to wetlands restorations) we cannot predict which projects will produce the most competitive applications. In some cases the process and criteria for distribution of funds has been determined. In many cases it has not. Despite the uncertainty, it is critical that this report be produced at this point to facilitate policy makers' participation in the process by helping them understand which communities are favored by current policy.

Below we outline the methodology for each program, the data sources used and the basis for this methodology. The methodologies for each program were developed by first thoroughly reviewing any guidance documents that exist to date. As noted above, the status of these guidance documents vary significantly by program, ranging from finalized to not yet drafted. From this we developed a basic understanding of each program and the data available from which to develop estimates. We then developed a preliminary methodology for each program. We used this as the basis for further

discussion with program staff. These discussions led to wholesale revision, nuanced refinements and/or validation of the original model. The final methodology for each program is detailed below.

Department of Community Services and Development
Low-Income Weatherization Program (LIWP): $75 million
LIWP expands the current program providing weatherization upgrades and solar installations to low income communities with one significant shift. In the existing program, funds are distributed based on low income population, energy costs and regional climate. The AB 32 funded portion of the program will be limited to disadvantaged communities as defined by CalEnviroScreen. There is a requirement that 100% of funds be directed to benefit disadvantaged communities.
There are two key aspects to estimating the distribution of funds: estimating need in each county based on energy costs and weather; and directing funds solely to disadvantaged communities. In order to estimate local need for funds, we take guidance from the program's previous experience. To do this, we calculated the funds per capita each county received in previous years. To combine this with the second component, we then multiplied the previous per capita amount by the each county's disadvantaged population. We then used each county's share of the resulting calculation to estimate the share of total funding each should county should receive.
▪ California Department of Community Services & Development (2012) Statewide Weatherized Homes Breakout ▪ CalEnviroScreen v2.0. 10/14

California Department of Transportation
Low Carbon Transit Operations Program: $25 million
Funds are available to support transit operations to reduce GHG emissions and improve mobility. This includes: ▪ New/expanded bus, rail services or expanded intermodal transit facilities ▪ Service or facility improvements, e.g. equipment, fueling and maintenance Statute stipulates that funds are distributed, in part, based on existing transit and, in part, based on population. The State Controller's Office (SCO) has provided estimates of eligibility for this funding.
We use the distribution calculated by the SCO as the basis for our estimate. In most cases, the SCO assigns funds to a specific agency within a specific county. In these cases, we simply use the distribution provided. In a small number of cases, the SCO assigned funds to a multi-county body. In these cases, we add two additional steps to estimate the distribution of funds within those counties. The first step only applies in a single case – various Bay Area transit agencies that are grouped together. For other cases we begin at step two: 1. We estimate funds will be divided between agencies based on farebox revenues so that larger agencies receive more money and small agencies receive less 2. For agencies that cross county borders, we distribute between counties: a. For rail agencies, we estimate funds will be distributed based on the distribution of tracks within each county b. For other agencies, we estimate funds will be distributed evenly between counties
▪ Expansion, enhancement and improvement of existing rail systems, including new rail cars and locomotives, to increase ridership and service levels and improve reliability ▪ Improved connectivity of existing and future rail systems ▪ Increased integration of rail and transit services, including integrated ticketing ▪ Bus transit investments that increase ridership and reduce GHG emissions

Strategic Growth Council[9]
Affordable Housing and Sustainable Communities (AHSC) Program: $120 million
AHSC is designed to reduce GHG emissions by improving mobility options and increasing infill developments. It will fund two project types: ▪ Transit Oriented Development Project Areas (TOD) ▪ Integrated Connectivity Projects (ICP) Additionally, there is a requirement that 50% of funds be directed to benefit disadvantaged communities.
Based on the requirement that projects must include a qualifying transit line, we assume that funds will be distributed based on the amount of existing transit in each county. We estimate that 50% of funds will be distributed in this manner. Our proxy for existing transit is data on farebox revenue. Based on the disadvantaged requirement, we estimate that 50% of revenues will match the CalEnviroScreen Top 25% distribution.
▪ National Transit Database (2012) RY 2012 Database ▪ CalEnviroScreen v2.0. 10/14

[9] SGC staff expressed reservations about the methodology employed herein. Unfortunately, despite numerous outreach attempts we were unable to discuss their concerns or receive any constructive feedback.

Sustainable Agriculture Land Conservation(SALC) Program: $5 million
SALC is designed to make strategic investments to protect agricultural land. Protecting these areas from development as urban or rural residential development.
Our methodology is based on identifying the amount of agricultural land that is at risk of development. We estimate agricultural land at risk of development by multiplying the portion of each county that is urbanized by its agricultural acreage. This combines the two critical factors of the existence of agricultural land with the presence of residentially developed areas in the county that can threaten it. Although the data used is “Urban”, the data does not reflect the common usage of the term (a dense, central city) but instead includes any area that with residential development, including suburbs and rural towns.
▪ Census (2010) Census Urban and Rural Classification and Urban Area Criteria ▪ Farm Service Agency (2014) FSA Crop Acreage Data Reported to FSA

Air Resources Board
Clean Vehicle Rebate Project (CVRP): $111 million
CVRP is designed to promote the purchase of battery electric, plug-in hybrid electric and fuel cell vehicles. Rebates are available on an ongoing basis for eligible vehicles within California.
This is an ongoing program. We assume the distribution will match the distribution in previous years.
▪ Center for Sustainable Energy (2014) CARB CVRP, Rebate Statistics. Updated 12/15/14
Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP): $10 million
HVIP provides vouchers to help California fleets purchase hybrid and zero-emission trucks and buses. Rebates are available on an ongoing basis for eligible vehicles within California.
This is an ongoing program. We assume the distribution will match the distribution in previous years.
▪ California Air Resources Board (2015) All redeemed vouchers with ARB funding (inception through December 31, 2014) by Manufacturer and County
Pilot and Freight Demonstration Projects: $79 million
ARB has established several pilot projects to support the development of light-duty, heavy-duty and advanced technologies. The programs are currently in workgroup stage. Guidelines have not yet been developed. There is a requirement that 100% of funds be directed to benefit disadvantaged communities.
Based on the disadvantaged requirement, we estimate that 100% of revenues will match the CalEnviroScreen Top 25% distribution.
▪ Office of Environmental Health Hazard Assessment (2014) CalEnviroScreen v2.0. 10/14

California Energy Commission
Energy Efficiency in Public Buildings: $20 million
Loans will be made available to state agencies to improve state owned buildings to generate energy savings that leads to reduced GHG emissions and saves sufficient money to be used to repay the loans. Loans will be made based on a first come application process.
Since funds are directed to state owned buildings our methodology assumes funding will be distributed based on the square footage of state owned buildings. We considered an alternate methodology that incorporated knowledge from specific agencies that indicated where they may apply; however, we decided this may be less reliable as these agencies may not win and it would be impossible to identify all potential applicants.
▪ Department of General Services (2014) Statewide Property Inventory. Received 11/24/14

California State Transportation Agency[10]
Transit and Intercity Rail Capital Program: $25 million
The Transit and Intercity Rail Capital Program is designed to fund capital and operational improvements of existing transit with the goals of reducing emissions, expanding use, enhancing integration and improving safety. This includes: ▪ Expansion, enhancement and improvement of existing rail systems, including new rail cars and locomotives to increase ridership and service levels and improve reliability ▪ Improved connectivity of existing and future rail systems ▪ Increased integration of rail and transit services, including integrated ticketing ▪ Bus transit investments that increase ridership and reduce GHG emissions Additionally, there is a requirement that 25% of funds be directed to benefit disadvantaged communities.
Based on the requirement that funds be used to support and expend existing transit, we assume that funds will be distributed, in part, consistent with the amount of existing transit in each county. Our proxy for existing transit is data on farebox revenue. Based on the disadvantaged requirement, we estimate that 50% of revenues will match the CalEnviroScreen Top 25% distribution.
▪ National Transit Database (2012) RY 2012 Database ▪ CalEnviroScreen v2.0. 10/14

[10] CalTrans staff expressed reservation with this methodology; however staff declined to provide additional detail or suggest alternatives.

California Department of Food and Agriculture
Agricultural Energy and Operational Efficiency: $12 million
Grants to fund dairy digester development at livestock facilities. Livestock manure produces GHG emissions. These gasses can be captured and processed to produce fuel for electrical energy generation and transportation. Funding would be directed to facilities that use the lagoon-based handling methods, which are primarily located in the San Joaquin Valley.
Our methodology assumes funds will be limited to the San Joaquin Valley, based on the advice of ARB and CDFA staff. Within this region, we estimate that it will be distributed relative to each county's share of cattle.
▪ California Department of Food and Agriculture (2012) California Milk Production, by County ▪ Limited to San Joaquin Valley based on advice of ARB & CDFA staff
State Water Efficiency and Enhancement Program (SWEEP): $10 million
SWEEP provides competitive grant funding for financial assistance to agricultural operations to implement water conservation measures that result in increased water efficiency and reduced greenhouse gas emissions.
We assume the funds will be distributed relative to each county's share of agricultural water withdrawals.
▪ United States Geological Survey (2010) Water Use Data for California

Department of Water Resources (DWR)
Water-Energy Grant Program: $19 million
Provides funds to implement water efficiency programs or projects that reduce greenhouse gas emissions and reduce water and energy use. In the competitive process, applications are ranked based on Water Saved, Energy Saved and presence in a disadvantaged community. Conversations with DWR staff indicate that there are far more applicants than available resources. As such, it is likely that all or nearly all of the funds will be awarded to projects in the top tier, which must be in disadvantaged communities.
Based on the likelihood that all funds will be awarded to top tier applicants, we assume funds will be distributed within disadvantaged communities. Within these communities, we estimate distribution by multiplying county disadvantaged population by county per capita water usage.
▪ U.S. Geological Survey (2010) Water Use in the United States ▪ Office of Environmental Health Hazard Assessment (2014) CalEnviroScreen v2.0. 10/14 ▪ DWR staff indicated it is likely most or all funds may be directed to DA communities based on the large number of applicants
Water-Energy Efficiency, Efficient hydro energy turbines: $11 million
More efficient turbines were installed at the Oroville dam.
We assume funds were distributed at the location of the installation.
▪ Information provided by Air Resources Board staff

Department of Fish and Wildlife
Wetlands and Watershed Restoration: $25 million
Funds projects that reduce GHGs and provide co-benefits such as enhancing fish and wildlife habitat, protecting and improving water quality and quantity and helping California adapt to climate change. Applications are based on efficacy of reducing GHG and other co-benefits, verifiability of the reductions and qualifications of the proposer.
Our methodology assumes that these projects will most likely occur in areas where existing projects have been proposed. This does not necessarily mean that the proposed projects in the dataset will be funded but rather that the location of these projects is representative of the potential for such projects. As such, we assume the funds will be distributed relative to each county's share of existing wetland project proposals.
▪ California Wetlands Monitoring Workgroup (CWMW) "Wetland Projects." EcoAtlas

Department of Forestry and Fire Protection (CalFire)
Forest Health Restoration and Reforestation: $24 million
Several grant programs are aimed at fire prevention and other aspects of strengthening forests.
Limited data exists. Our initial methodology was to distribute funds based on qualified projects; however CalFire indicated that they were unable to provide the data due to limitations in the procurement process. The alternate methodology we implemented was to assume funds will be distributed based on the distribution of forested areas. We use CalFire's Fire Hazard data as proxy for forested areas.
▪ CalFire (2007) California Fire Hazard Severity Zone Map Update Project
Urban and Community Forestry Program GGRF Grants: $18 million
This category covers five grant programs, which include: urban tree planting; urban forest management; urban biomass utilization; urban reclamation; and other forward thinking projects. There is a requirement that 100% of funds be directed to benefit disadvantaged communities.
Limited directly relevant data exists. Our initial methodology was to distribute funds based on qualified projects; however CalFire indicated that they were unable to provide the data due to limitations in the procurement process. The alternate methodology we implemented was to assume funds will be distributed based on the disadvantaged requirements. We estimate that 100% of revenues will match the CalEnviroScreen Top 25% distribution.
▪ Office of Environmental Health Hazard Assessment (2014) CalEnviroScreen v2.0. 10/14

Department of Resources Recycling and Recovery (CalRecycle)[11]
Organics composting and anaerobic digestion: $15 million
Funding has been distributed.
We assume funds are distributed based on grant funds by county.
▪ Recycled Fiber, Plastic, and Glass Grant Program (FPG1) 2014-15 Grant Cycle Report
Increased recycling materials manufacturing: $5 million
Funding has been distributed.
We assume funds are distributed based on grant funds by county.
▪ Organics Grant Program (ORG1) 2014-15 Grant Cycle Report
Organic and recycling project loans: $5 million
This program provides loans for construction, renovation or expansion of facilities that compost, anaerobically digest and/or use other related digestion or fermentation processes to turn green or food materials into products. Projects must result in GHG emission and landfill reductions to be eligible.
Based on the landfill reductions qualification, we assume funds will be distributed based on landfill tonnage. ARB staff suggested limiting the data to organics tonnage; however we were unable to identify appropriate data.
▪ CalRecycle (2013) IWM Fee Assessment: Landfill Summary Tonnage Report

[11] CalRecycle declined to discuss this report or their program to protect the integrity of their open procurement.

High Speed Rail Authority
High Speed Rail: $250 million
These funds are supporting construction of California's High Speed Rail project. Construction is currently underway. The initial segment is being constructed in Fresno and Madera Counties. Subsequent Phase 1 segments are in the planning stages and run from Los Angeles to San Francisco.
Based on guidance of HSRA staff, we assumed funds will be distributed as followed: $191.4 million for construction, divided evenly between Fresno and Madera Counties $58.6 million for planning and development, divided evenly between counties covered by Phase 1
▪ HSRA staff

5. Conclusion

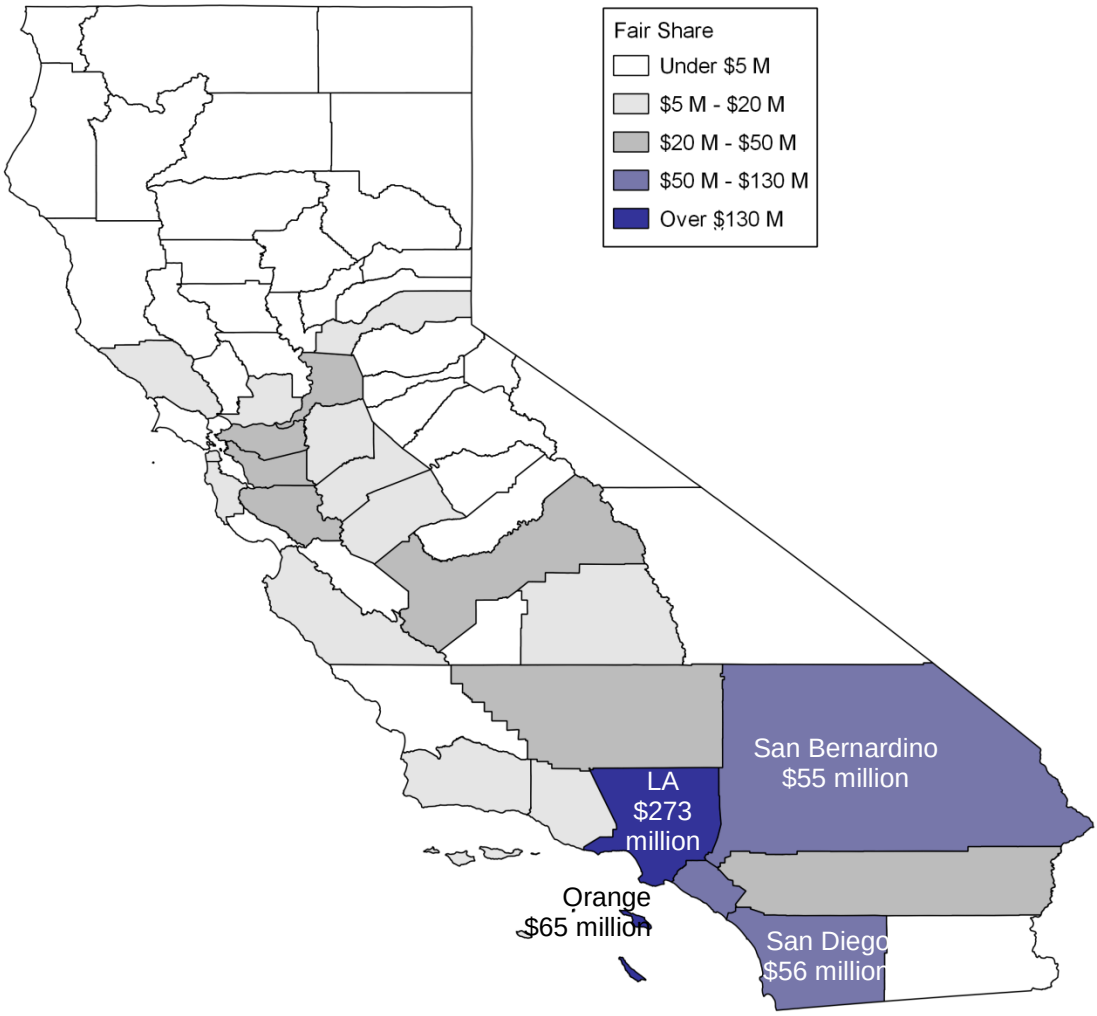
While significant uncertainty exists in every aspect of these estimates, it is likely that AB 32 Cap-and-Trade auctions will generate at least $16 billion for state programs through 2020 and could generate substantially more. While there are a number of reasonable ways to consider how funds might be distributed fairly across the state, it appears that current policy favors the southern Central Valley and several Bay Area counties but disfavors several other counties, including Los Angeles County. As policy makers weigh their options moving forward, these estimates may be helpful in shaping the discussion. In addition, policy makers may wish to consider the implications of a significant surplus in the enacted 2014-15 budget and the proposed 2015-16 budget.

Appendix

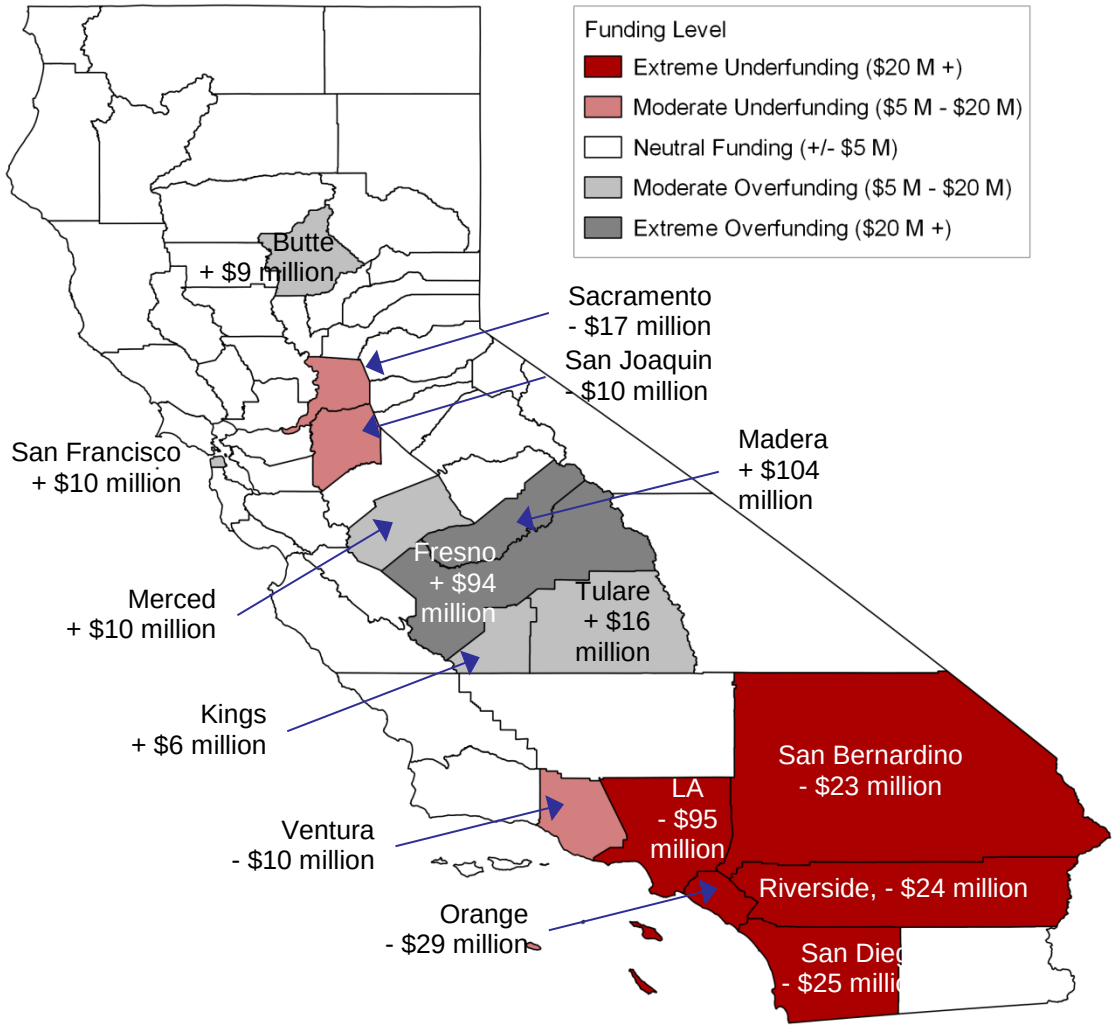
- Appendix 1: Distributions
- Appendix 2: Fair Share Estimates
- Appendix 3: Program Estimates
- Appendix 4: Literature Review – Revenue Estimates
- Appendix 5: CalEnviroScreen

Appendix 1: Distributions

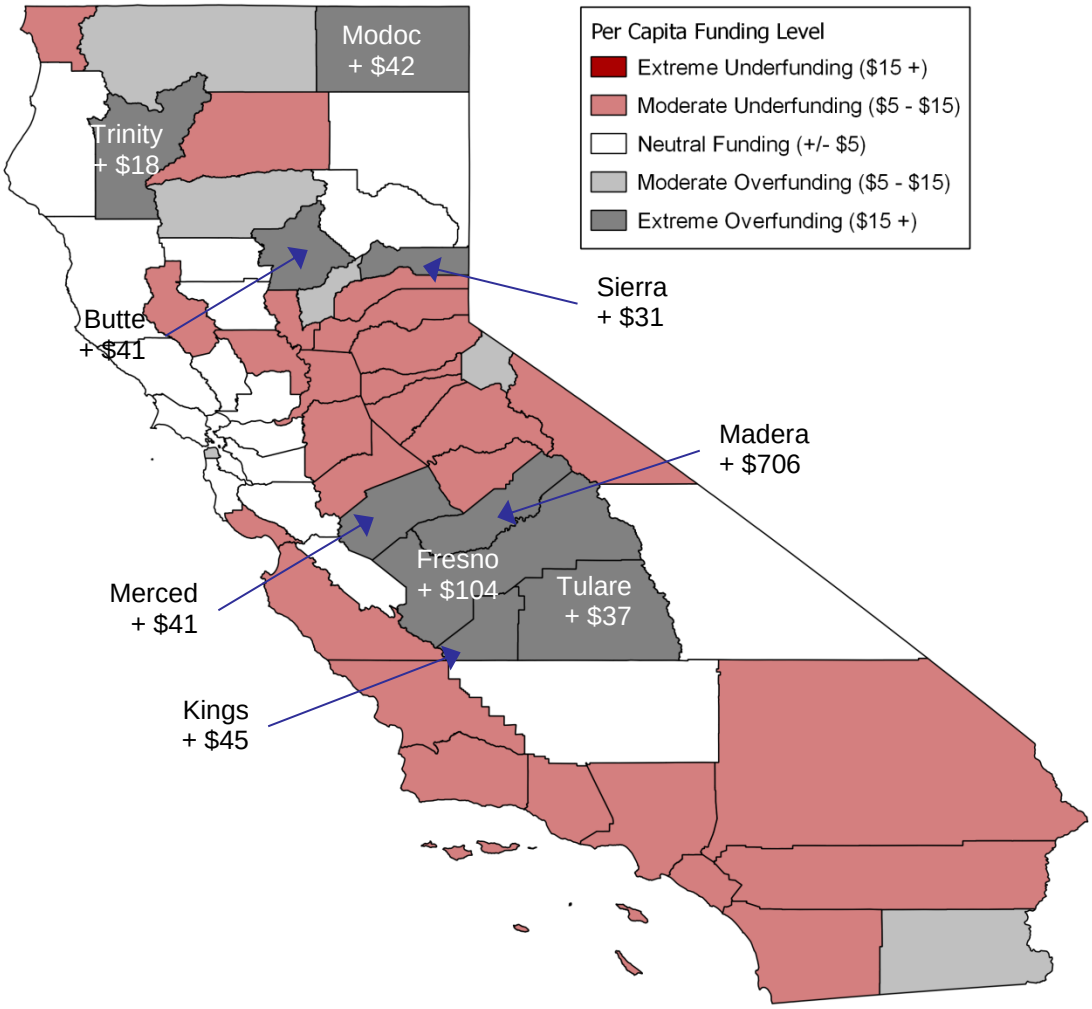
Appendix 1a: Population Based Distribution – Fair Share



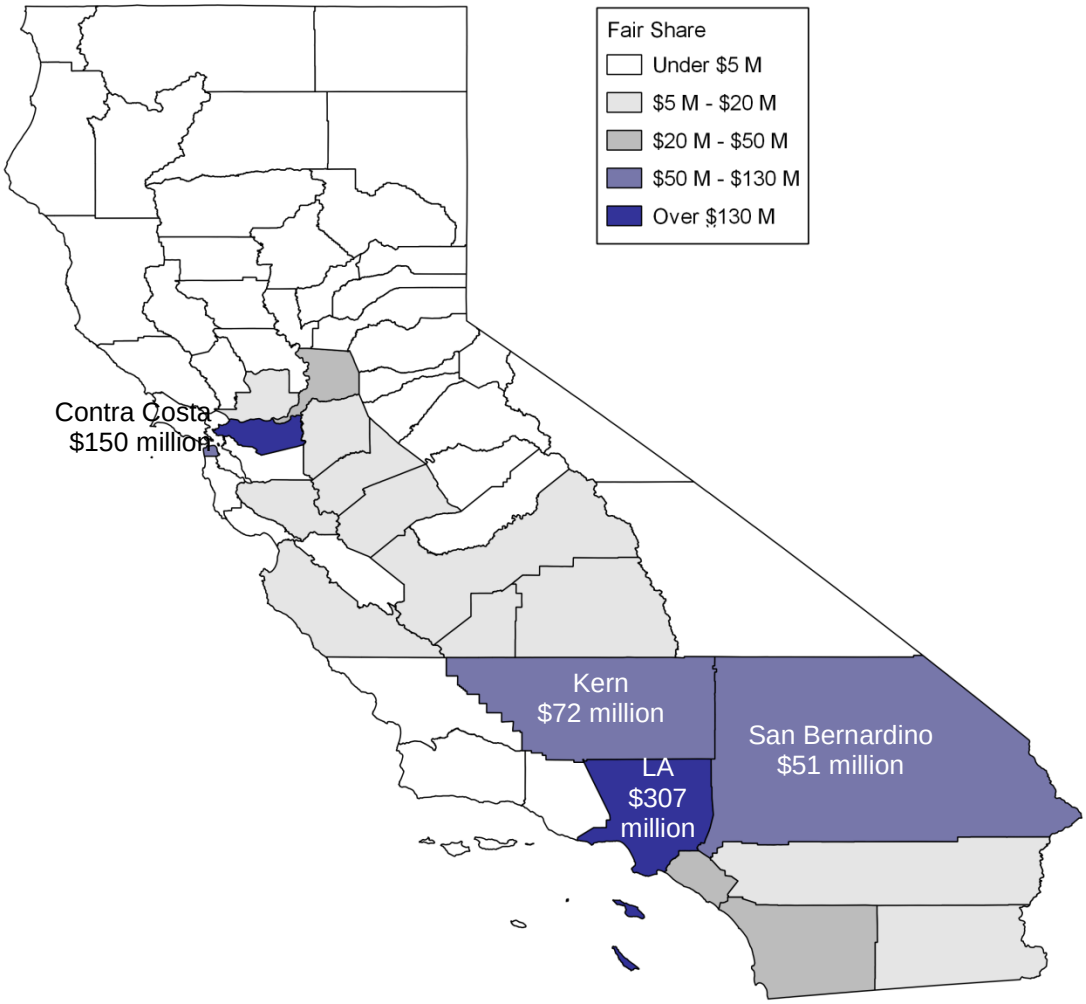
Appendix 1a: Population Based Distribution – Spending Gap



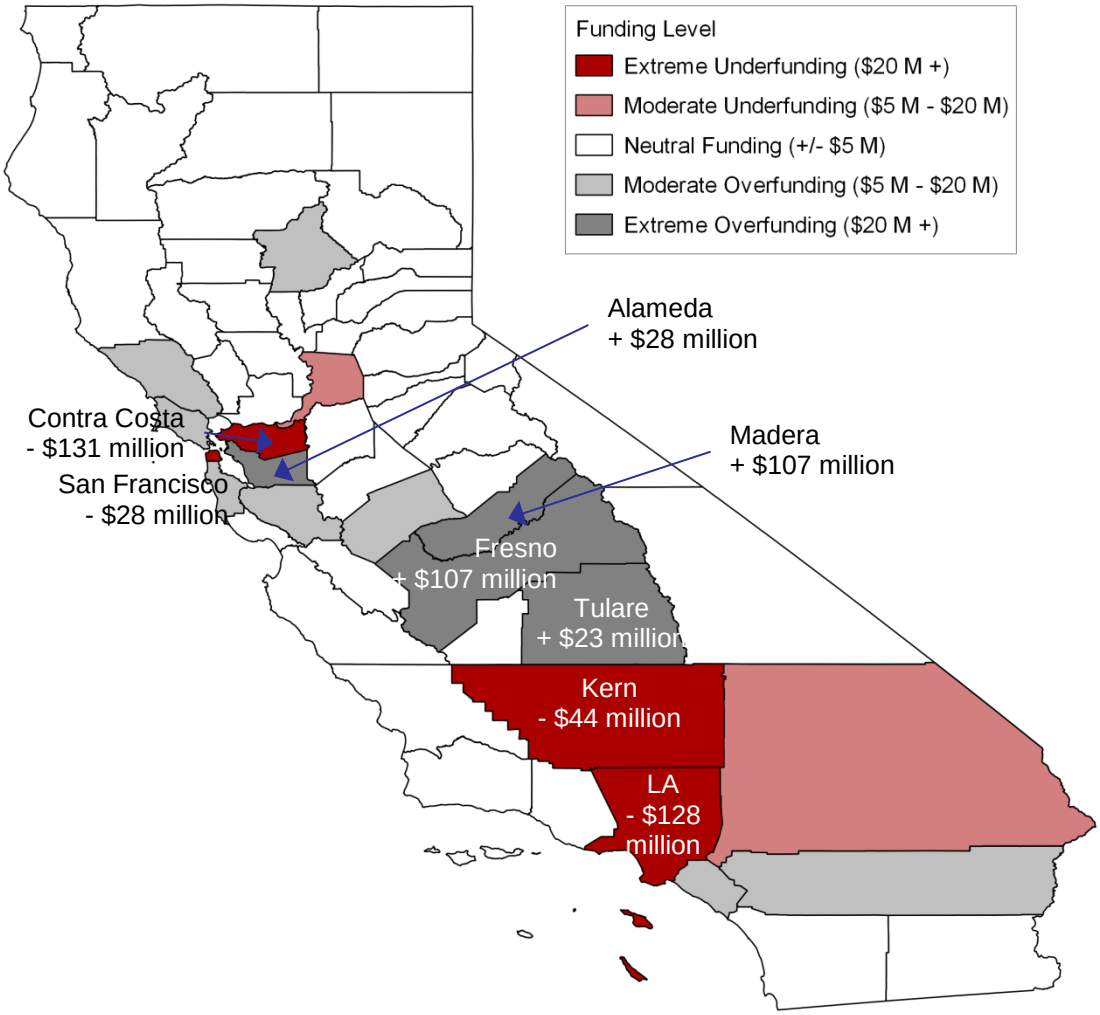
Appendix 1a: Population Based Distribution – Spending Gap per capita



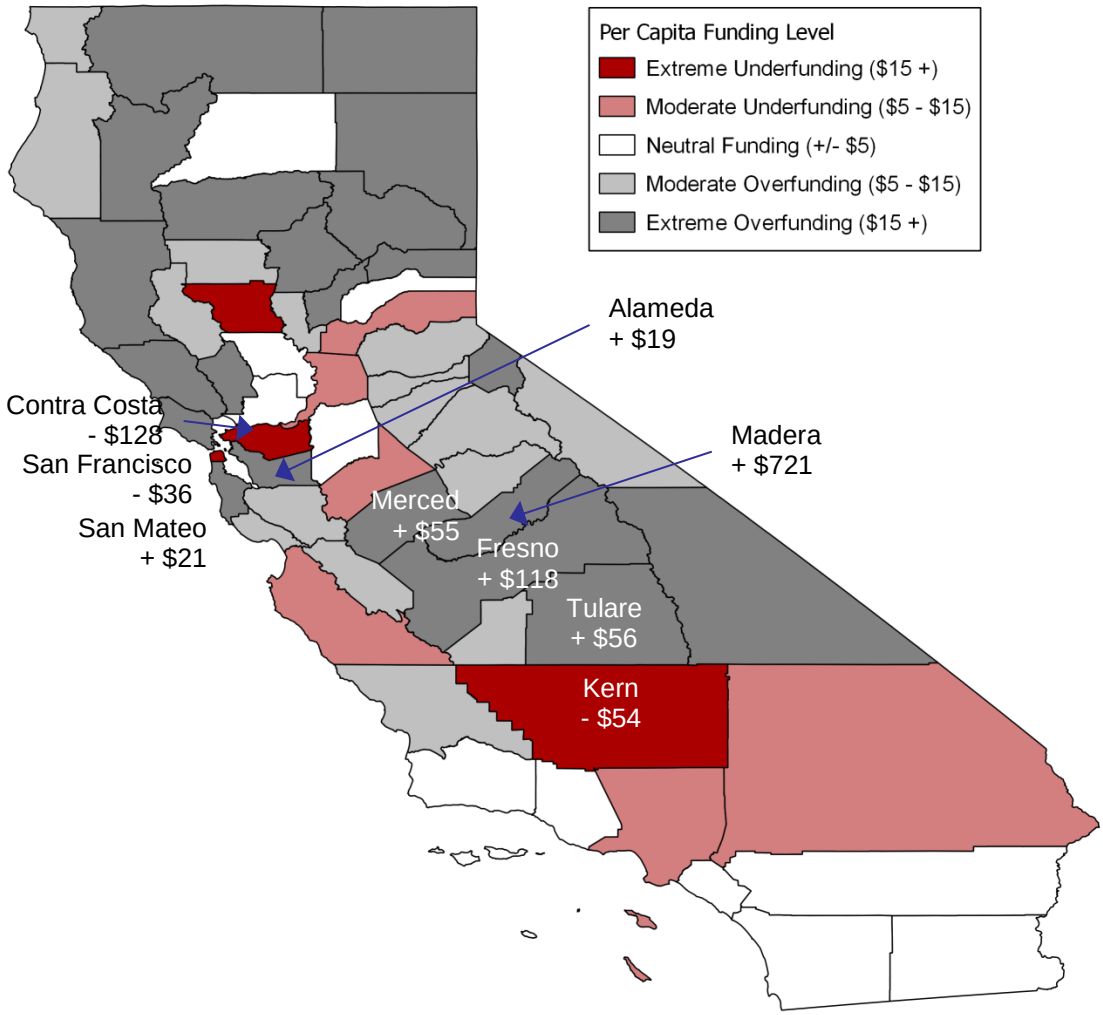
Appendix 1b: Reductions Based Distribution – Fair Share



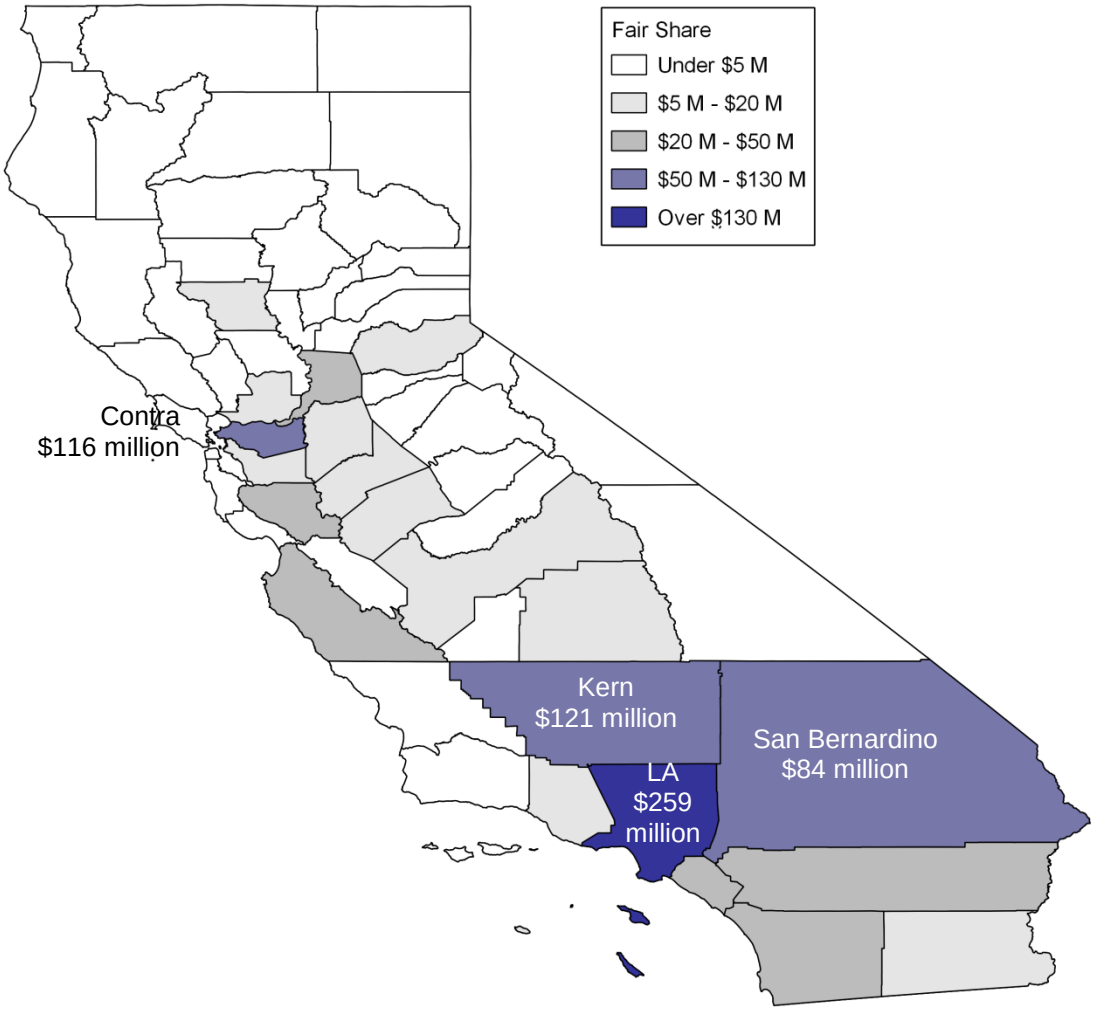
Appendix 1b: Reductions Based Distribution – Spending Gap



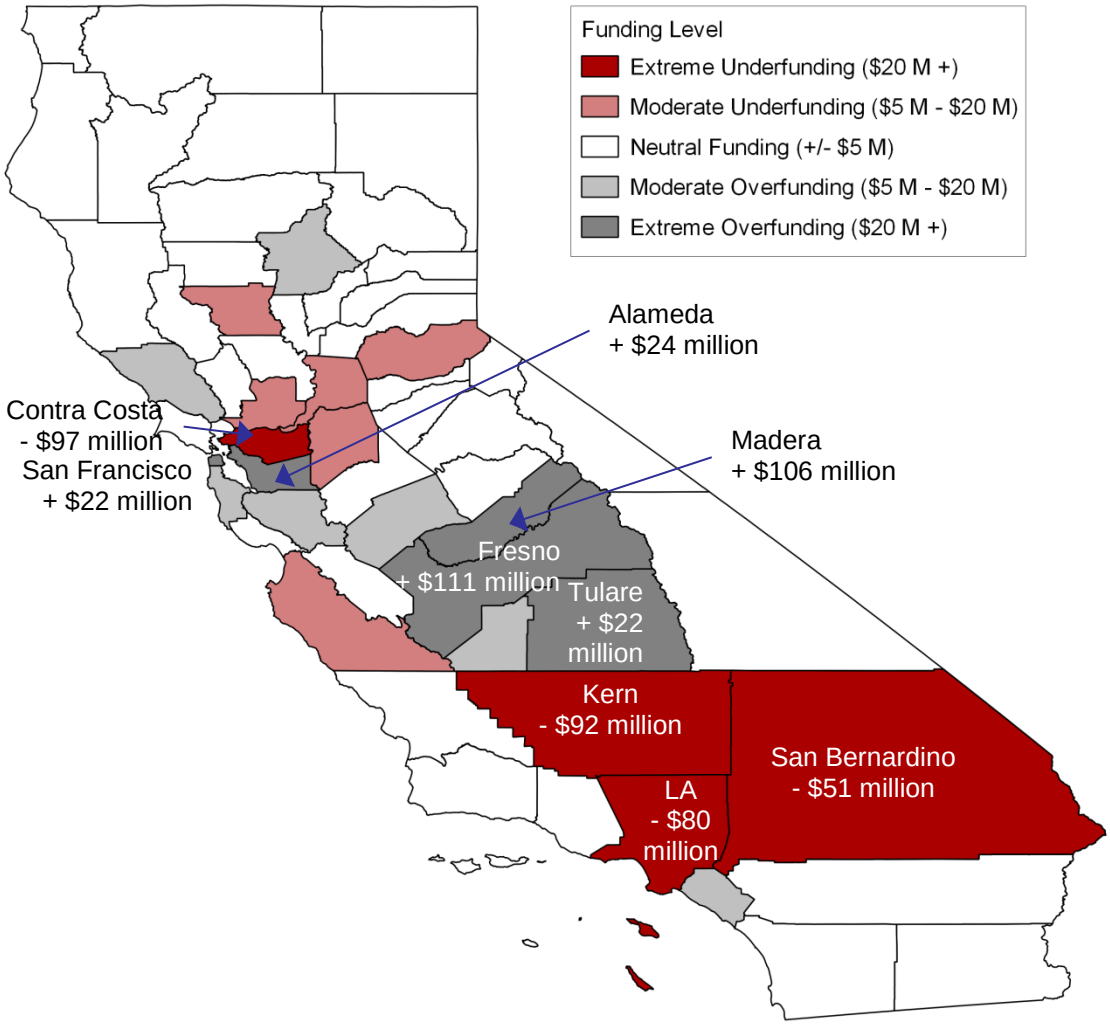
Appendix 1b: Reductions Based Distribution – Spending Gap per capita



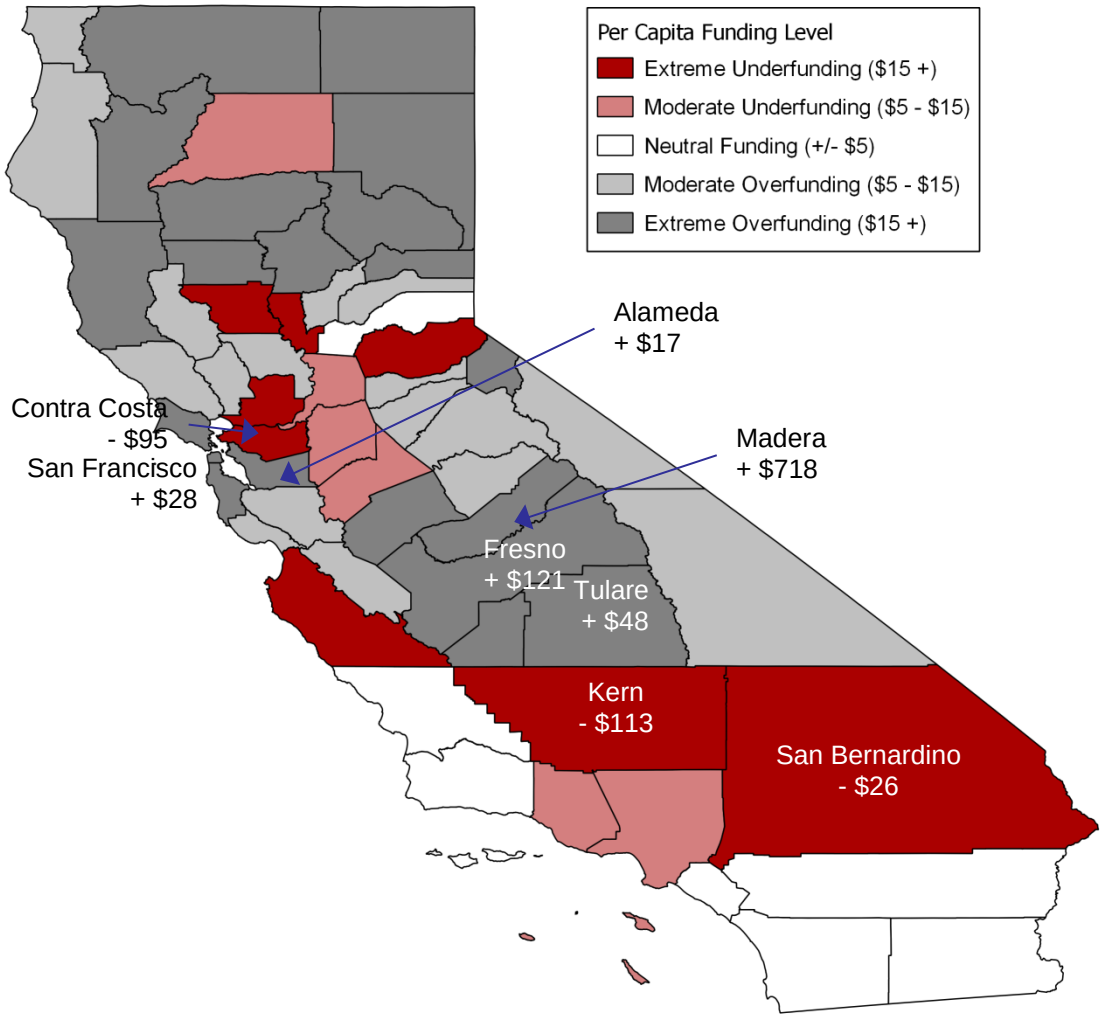
Appendix 1c: Payor Based Distribution – Fair Share



Appendix 1c: Payor Based Distribution – Spending Gap



Appendix 1c: Payor Based Distribution – Spending Gap per capita



Appendix 2: Fair Share Estimates

County	Payor Share	Reductions Share	Population Share
Alameda	$8.4 M	$5 M	$29.1 M
Alpine	**	**	**
Amador	**	**	$0.7 M
Butte	$0.5 M	$0.3 M	$4.2 M
Calaveras	**	**	$0.8 M
Colusa	$6.6 M	$3 M	$0.4 M
Contra Costa	$115.8 M	$149.6 M	$21 M
Del Norte	**	**	$0.5 M
El Dorado	$7.9 M	$0.3 M	$3.2 M
Fresno	$14.5 M	$17.4 M	$30.6 M
Glenn	**	$0.1 M	$0.5 M
Humboldt	$1.1 M	$0.4 M	$2.4 M
Imperial	$5.9 M	$6.4 M	$4.6 M
Inyo	$0.1 M	**	$0.3 M
Kern	$120.6 M	$72.3 M	$24.3 M
Kings	$3.8 M	$9.6 M	$4.1 M
Lake	**	**	$1.1 M
Lassen	**	**	$0.6 M
Los Angeles	$258.5 M	$306.5 M	$273.3 M
Madera	$3 M	$2.5 M	$4.7 M
Marin	$0.7 M	**	$4.4 M
Mariposa	**	**	$0.3 M
Mendocino	$0.1 M	**	$1.6 M
Merced	$6.2 M	$5.4 M	$8.8 M
Modoc	$0.2 M	$0.1 M	$0.2 M
Mono	**	**	$0.2 M
Monterey	$20.7 M	$8.7 M	$8 M
Napa	$0.3 M	**	$2.4 M
Nevada	**	$0.1 M	$1.7 M

County	Payor Share	Reductions Share	Population Share
Orange	$22.2 M	$28.7 M	$64.7 M
Placer	$1.7 M	$4.9 M	$6 M
Plumas	**	**	$0.4 M
Riverside	$23.8 M	$18.4 M	$49.6 M
Sacramento	$20.2 M	$25.9 M	$29.3 M
San Benito	**	**	$1 M
San Bernardino	$84.2 M	$50.8 M	$55.4 M
San Diego	$30.3 M	$32.1 M	$56.3 M
San Francisco	$2.4 M	$52.7 M	$14.2 M
San Joaquin	$14.8 M	$8.7 M	$18.8 M
San Luis Obispo	$2 M	$0.9 M	$4.7 M
San Mateo	$1.7 M	$1.1 M	$12.8 M
Santa Barbara	$3.4 M	$1.6 M	$7.6 M
Santa Clara	$23.8 M	$14.3 M	$33.3 M
Santa Cruz	$0.4 M	$0.2 M	$4.7 M
Shasta	$3.3 M	$1.5 M	$3.1 M
Sierra	**	**	**
Siskiyou	**	**	$0.8 M
Solano	$16.9 M	$8.1 M	$7.5 M
Sonoma	$0.9 M	**	$8.4 M
Stanislaus	$13.9 M	$13.2 M	$14.6 M
Sutter	$3.4 M	**	$1.7 M
Tehama	$0.6 M	$0.2 M	$1.2 M
Trinity	**	**	$0.2 M
Tulare	$9.2 M	$7.2 M	$14 M
Tuolumne	**	**	$1 M
Ventura	$9.3 M	$3.9 M	$15.1 M
Yolo	$1.2 M	$3 M	$3.9 M
Yuba	$1.4 M	$0.8 M	$1.5 M

*** Indicates less than $100,000*

Appendix 3: Program Estimates, part 1

County	HSRA	CVRP	HVIP	ARB Pilots	SGC 1	SGC 2	CSD	CalFire1	CalFire2	CalSTA
Alameda	**	$9.3 M	**	$1 M	$9.1 M	**	**	**	**	$1.9 M
Alpine	**	**	**	**	**	**	**	**	**	**
Amador	**	**	**	**	**	**	**	**	**	**
Butte	**	**	**	**	**	**	**	**	**	**
Calaveras	**	**	**	**	**	**	**	**	**	**
Colusa	**	**	**	**	**	**	**	**	**	**
Contra Costa	**	$4.3 M	**	$1 M	$5.8 M	**	$1.4 M	**	**	$1.2 M
Del Norte	**	**	**	**	**	**	**	**	**	**
El Dorado	**	**	**	**	**	**	**	**	**	**
Fresno	$101.6 M	**	**	$5.3 M	$4.4 M	**	**	$1.2 M	**	**
Glenn	**	**	**	**	**	**	**	**	**	**
Humboldt	**	**	**	**	**	**	**	**	$1.5 M	**
Imperial	**	**	**	**	**	**	$2.9 M	**	**	**
Inyo	**	**	**	**	**	**	**	**	**	**
Kern	$5.9 M	**	**	$3.6 M	$2.9 M	**	$7.3 M	**	**	**
Kings	$5.9 M	**	**	**	**	**	**	**	**	**
Lake	**	**	**	**	**	**	**	**	**	**
Lassen	**	**	**	**	**	**	**	**	**	**
Los Angeles	$5.9 M	$28.4 M	$2.5 M	$36.6 M	$45.8 M	**	$22.4 M	$8.3 M	**	$9.5 M
Madera	$101.6 M	**	**	**	**	**	$3.7 M	**	**	**
Marin	**	$1.9 M	**	**	$1.1 M	**	**	**	**	**
Mariposa	**	**	**	**	**	**	**	**	**	**
Mendocino	**	**	**	**	**	**	**	**	$1.7 M	**
Merced	$5.9 M	**	**	$1.6 M	$1.3 M	**	$4.4 M	**	**	**
Modoc	**	**	**	**	**	**	**	**	**	**
Mono	**	**	**	**	**	**	**	**	**	**
Monterey	**	**	**	**	**	**	**	**	$1.1 M	**
Napa	**	**	**	**	**	**	**	**	**	**
Nevada	**	**	**	**	**	**	**	**	**	**
Orange	**	$12.4 M	$1 M	$4.4 M	$6 M	**	$3.1 M	$1 M	**	$1.3 M
Placer	**	**	**	**	**	**	**	**	**	**
Plumas	**	**	**	**	**	**	**	**	**	**
Riverside	**	$2.5 M	**	$4.4 M	$4.1 M	**	$5.2 M	$1 M	$1.2 M	**
Sacramento	**	$2.3 M	**	$1.7 M	$2.4 M	**	$1.1 M	**	**	**
San Benito	**	**	**	**	**	**	**	**	**	**
S. Bernardino	**	$1.9 M	**	$7.3 M	$6.4 M	**	$7.9 M	$1.7 M	**	$1.3 M
San Diego	**	$10 M	**	**	$5.2 M	**	**	**	$1 M	$1.1 M
S. Francisco	$5.9 M	$2.6 M	**	**	$9.7 M	**	**	**	**	$2 M
San Joaquin	**	**	**	$2.5 M	$2.1 M	**	**	**	**	**
SL Obispo	**	**	**	**	**	**	**	**	$1.3 M	**
San Mateo	$5.9 M	$4.8 M	**	**	$2.7 M	**	**	**	**	**
S. Barbara	**	**	**	**	**	**	**	**	**	**
Santa Clara	$5.9 M	$17.6 M	**	**	$2.9 M	**	**	**	**	**
Santa Cruz	**	$1.1 M	**	**	**	**	**	**	**	**
Shasta	**	**	**	**	**	**	**	**	$1.3 M	**
Sierra	**	**	**	**	**	**	**	**	**	**
Siskiyou	**	**	**	**	**	**	**	**	$1.2 M	**
Solano	**	**	**	**	**	**	**	**	**	**
Sonoma	**	$1.8 M	**	**	**	**	**	**	**	**
Stanislaus	**	**	**	$2 M	$1.7 M	**	**	**	**	**
Sutter	**	**	**	**	**	**	**	**	**	**
Tehama	**	**	**	**	**	**	**	**	**	**
Trinity	**	**	**	**	**	**	**	**	**	**
Tulare	$5.9 M	**	**	$2.3 M	$1.8 M	**	$10.2 M	**	**	**
Tuolumne	**	**	**	**	**	**	**	**	**	**
Ventura	**	$2.2 M	**	**	**	**	**	**	**	**
Yolo	**	**	**	**	**	**	**	**	**	**
Yuba	**	**	**	**	**	**	$1.4 M	**	**	**

*** Indicates less than $100,000*

Appendix 3: Program Estimates, part 2

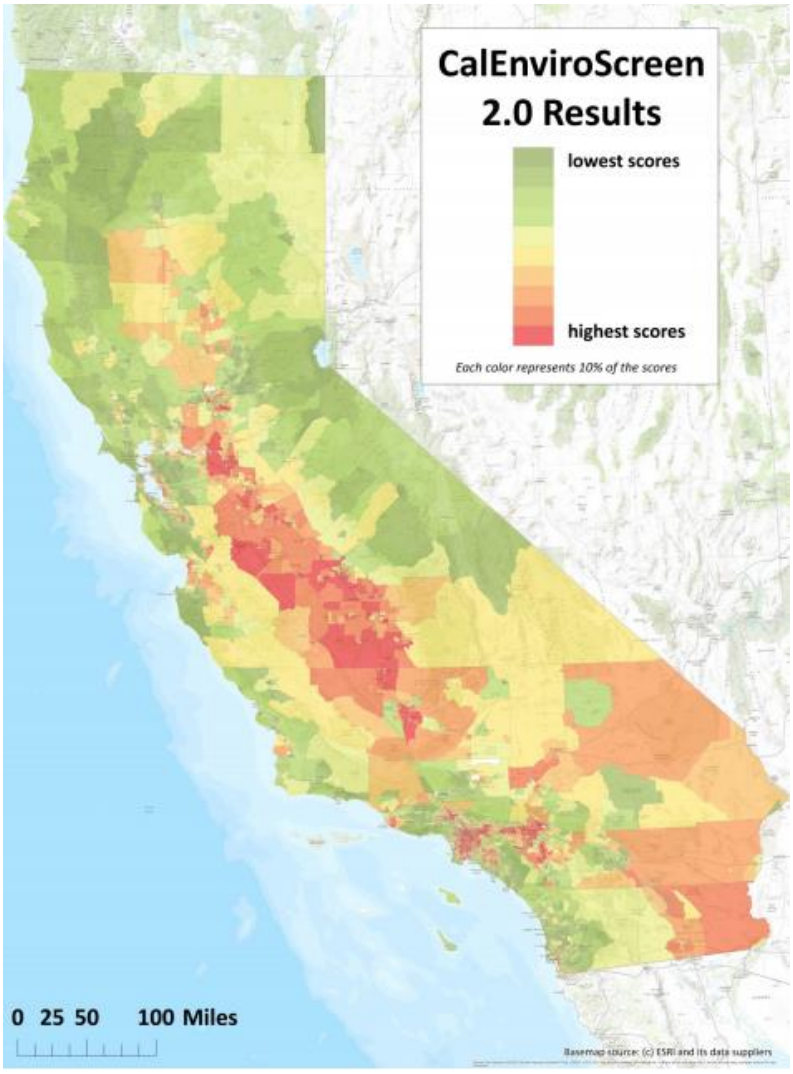
County	CalTrans	DFW	CalRec 1	CalRec 2	CEC	CDFA 1	CDFA 2	DWR 1	DWR 2	Total
Alameda	$2.2 M	$1.1 M	$3 M	**	$1.1 M	**	**	**	**	$32 M
Alpine	**	**	**	**	**	**	**	**	**	**
Amador	**	**	**	**	**	**	**	**	**	**
Butte	**	**	**	**	**	**	**	**	$11 M	$13.2 M
Calaveras	**	**	**	**	**	**	**	**	**	**
Colusa	**	**	**	**	**	**	**	**	**	**
Contra Costa	$1.4 M	$2.1 M	**	**	**	**	**	**	**	$18 M
Del Norte	**	**	**	**	**	**	**	**	**	**
El Dorado	**	**	**	**	**	**	**	**	**	$2 M
Fresno	**	**	$3 M	**	**	**	$1.1 M	$3.2 M	**	$125.2 M
Glenn	**	**	**	**	**	**	**	**	**	**
Humboldt	**	**	**	**	**	**	**	**	**	$2 M
Imperial	**	**	**	**	**	**	**	**	**	$5.9 M
Inyo	**	**	**	**	**	**	**	**	**	**
Kern	**	**	**	**	**	$1.2 M	**	$1.8 M	**	$28.4 M
Kings	**	**	**	**	**	$1.3 M	**	**	**	$10.6 M
Lake	**	**	**	**	**	**	**	**	**	**
Lassen	**	**	**	**	**	**	**	**	**	**
Los Angeles	$7.1 M	**	$4 M	**	$3.9 M	**	**	$2.3 M	**	$178.8 M
Madera	**	**	**	**	**	**	**	**	**	$109.1 M
Marin	**	$1.6 M	**	**	**	**	**	**	**	$5.5 M
Mariposa	**	**	**	**	**	**	**	**	**	**
Mendocino	**	**	**	**	**	**	**	**	**	$1.9 M
Merced	**	**	**	**	**	$2.4 M	**	$1.8 M	**	$19.2 M
Modoc	**	**	**	**	**	**	**	**	**	**
Mono	**	**	**	**	**	**	**	**	**	**
Monterey	**	**	**	**	**	**	**	**	**	$3.9 M
Napa	**	$1.2 M	**	**	**	**	**	**	**	$2.2 M
Nevada	**	**	**	**	**	**	**	**	**	**
Orange	$1.3 M	**	$2.9 M	**	**	**	**	**	**	$35.6 M
Placer	**	**	**	**	**	**	**	**	**	$1.7 M
Plumas	**	**	**	**	**	**	**	**	**	**
Riverside	**	**	$3 M	**	**	**	**	**	**	$25.6 M
Sacramento	**	**	**	**	$2.2 M	**	**	**	**	$12 M
San Benito	**	**	**	**	**	**	**	**	**	**
S. Bernardino	**	**	$2.6 M	**	**	**	**	**	**	$33 M
San Diego	$1.6 M	$7 M	**	**	$1.6 M	**	**	**	**	$30.8 M
S. Francisco	$2.2 M	**	**	**	**	**	**	**	**	$23.4 M
San Joaquin	**	**	**	**	**	**	**	$1.3 M	**	$9 M
SL Obispo	**	**	**	**	**	**	**	**	**	$2.9 M
San Mateo	$1.1 M	**	**	**	**	**	**	**	**	$15.9 M
S. Barbara	**	**	**	**	**	**	**	**	**	$3 M
Santa Clara	$1.4 M	$1.6 M	**	**	**	**	**	**	**	$33.4 M
Santa Cruz	**	**	**	**	**	**	**	**	**	$2.4 M
Shasta	**	**	**	**	**	**	**	**	**	$1.8 M
Sierra	**	**	**	**	**	**	**	**	**	**
Siskiyou	**	**	**	**	**	**	**	**	**	$1.4 M
Solano	**	$4.4 M	**	**	**	**	**	**	**	$6.9 M
Sonoma	**	$3.7 M	**	**	**	**	**	**	**	$7.1 M
Stanislaus	**	**	**	**	**	$1.6 M	**	$1.3 M	**	$10 M
Sutter	**	**	**	**	**	**	**	**	**	**
Tehama	**	**	**	**	**	**	**	**	**	$1.6 M
Trinity	**	**	**	**	**	**	**	**	**	**
Tulare	**	**	**	**	**	$3.9 M	$1.1 M	$2.7 M	**	$30 M
Tuolumne	**	**	**	**	**	**	**	**	**	**
Ventura	**	**	**	**	**	**	**	**	**	$4.8 M
Yolo	**	**	**	**	**	**	**	**	**	$2.6 M
Yuba	**	**	**	**	**	**	**	**	**	$2.1 M

*** Indicates less than $100,000*

Appendix 4: Literature Review – Revenue Estimates

Source	Estimate	Notes
Legislative Analyst's Office (2014) The 2014-15 Budget: Cap-and-Trade Auction Revenue Expenditure Plan	$15 Billion total through 2020	▪ "The ARB has adopted regulations to keep auction prices within a certain range by setting a minimum and maximum price for allowances sold at auctions—from $10 per ton of emissions to $40 per ton of emissions. Under ARB's current auction schedule, over the life of the program, roughly half of all allowances will be allocated at auctions, with the remainder allocated for free. We note, however, that ARB is currently considering a change to increase the amount of allowances allocated for free to 60%. ▪ "California's cap-and-trade program is expected to raise billions of dollars in auction revenues from 2012 through 2020. The actual amount of revenue that will be raised is difficult to predict, particularly because of the uncertainty about future allowance prices. Using ARB's floor and ceiling prices for allowances, and assuming that ARB provides 60% of all allowance for free, the total cap-and-trade revenues from all auctions through 2020 could range from $12 billion to $45 billion. Several economists who have evaluated California's cap-and-trade program have estimated that, over the life of the program, average allowance price may be in the $15 to $20 range. If this were to occur, total revenue for the program through 2020 could be roughly $15 billion. To the extent that ARB does not increase the percentage of free allowances, the above revenue estimates would be higher."
Horowitz, C., et al (2012) Spending California's Cap-and-Trade Auction Revenue: Understanding the Sinclair Paint Risk Spectrum	Close to zero initially, $3 Billion per year from 2015 – 2020 (Implies $18 Billion total)	▪ "The Governor's office and the Legislative Analyst's Office have both recently estimated auction proceeds. The Governor's budget estimates that the revenue generated in 2012–2013 from cap-and-trade auctions will be approximately $1 billion. LAO put the range of revenue at between $1 and $3 billion for fiscal year 2012–2013.31 For fiscal year 2015–2016, its range is much broader, between $2 and $14 billion. Neither set of figures clearly distinguishes between consignment revenue and other allowance auction revenue. ▪ "Assuming a $15 auction settlement price, CARB would raise $590 million in the advance allowance auction in 2012, and $570 million in 2013. As noted above, auctioning remainder allowances not allocated to industry in 2013 could raise an additional unknown amount, likely not very large. Remainder allowance revenue may be close to zero for 2013 and 2014. Because remainder allowances are projected to increase by approximately 200 million in 2015, revenue from remainder allowances could easily exceed $3 billion in 2015, again assuming a $15 auction settlement price."

Appendix 5: CalEnviroScreen



- CalEnviroScreen is a screening methodology that can be used to help identify California communities that are disproportionately burdened by multiple sources of pollution
- CalEPA has used the tool to designate California communities as disadvantaged pursuant to Senate Bill 535

> Areas disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure or environmental degradation

Areas with concentrations of people that are of low income, high unemployment, low levels of home ownership, high rent burden, sensitive populations or low levels of educational attainment

- The tool was updated in October 2014 to include additional data along the US-Mexico border