California ISO

SB 350 Study: Economic Model & Methodology

Mapping BEAR Model Results to Disadvantaged Communities

(Early Release Materials to Stakeholders)

March 28, 2016

Berkeley Economic Advising and Research, LLC
1442A Walnut Street, Suite 108
Berkeley, CA 94705
www.bearecon.com

SB 350 Study: Economic Model & Methodology

Mapping BEAR Model Results to Disadvantaged Communities

(Early Release Materials to Stakeholders)

Prepared for:

California ISO

Berkeley Economic Advising and Research

1442A Walnut Street, Suite 108

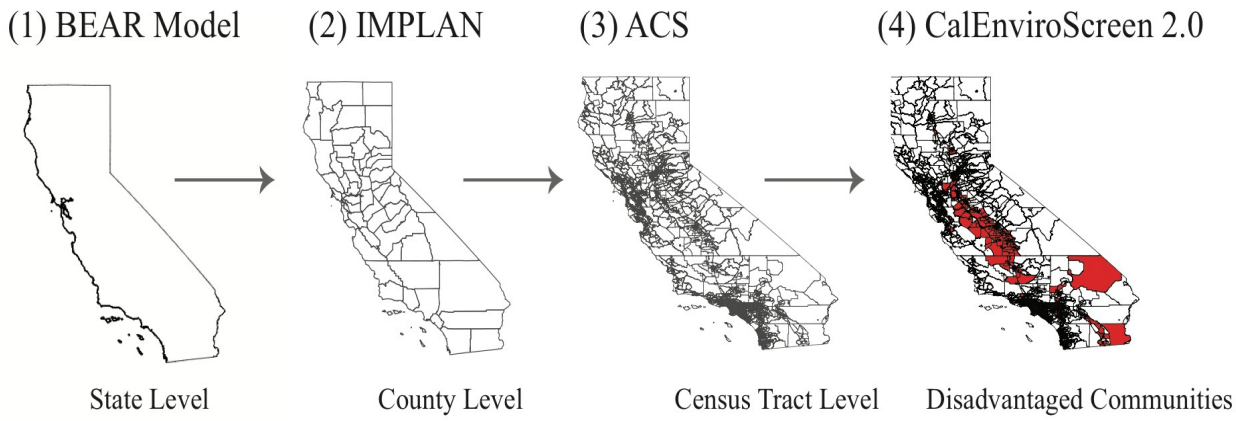
Berkeley, CA 94705

www.bearecon.com

March 28, 2016

The process of estimating economic impacts on disadvantaged communities is carried out in four steps. This assessment technique leverages available data to downscale state level estimates to the census tract level conforming to disadvantaged community definitions. Detailed descriptions of each step are presented below.

Figure 1: Downscaling results to identify impacts on disadvantaged communities



Step 1

The BEAR model produces results at the state level. Results are generated for the scenarios provided from the RESOLVE and PSO models across 3 time periods. The reporting years are: 2020, 2025, and 2030. Outcomes of interest are disaggregated to the county level in the second step.

Step 2

Using the IMPLAN[1] 2013 data, individual Social Accounting Matrices (SAMs) were constructed for every county in California. The county SAMs are structured identically to the statewide SAM that is the basis for the statewide assessment. For each county, the share of total state economic activity was calculated for all variables of interest (e.g. employment, income). In the absence of local labor market models, we assume baseline conditions determine income and job creation effects uniformly. For example, if Kern county employs 5 percent of California's agricultural workforce, then Kern county receives that share of statewide employment impacts on agricultural employment. We repeat this process for every variable of interest in every county. The shares of baseline economic activities and occupations are then used to distribute statewide economic activity accordingly to individual counties. Once the statewide results have been shared out to counties, we follow an analogous process to further downscale results of interest from individual counties to their constituent census tracts. This process implicitly assumes that, within income deciles (for example), benefits accrue in proportion to baseline values. In other words, if 1 percent of California households in the lowest income decile reside in Alameda county then we assume that these households are responsible for 1% of the economic activity generated by households in this income decile statewide. While this assumption may be violated under certain conditions, data limitations prevent us from implementing a more heterogeneous downscaling process.

Step 3

Complete data on economic activities are not available at the census tract level, so it is not possible to build SAMs for individual census tracts. Instead, we construct census tract shares of county level economic activity for select variables of interest, e.g. income by decile, sector of employment, and occupation. Census tract estimates of these values are derived from the American Communities Survey (ACS)[2] using the 5-year averages covering the period 2008-2013. The ACS reports income by tax bracket,

[1] http://www.implan.com
[2] http://factfinder.census.gov/

however, the BEAR model estimates impacts on income by decile. Consequently, tax brackets were converted to income decile according to the share of overlap in each category. Census-tract shares of relevant county economic activities are then used to calculate census tract economic activity for each scenario-year.

Table 1: Variables for Downscaling to Census Tracts

BEAR Model Variable	ACS Variable	Description
Household Income by decile	HC01_EST_VC02:VC11	Census tract income by tax bracket[3]
Employment by Occupation	HD01_VD01	Census tract employment by occupation
Gross State Product, Personal Income, Enterprise Income, and State Tax Revenue	DEC_10_SF2_SF2DP1	

Step 4

In the final step, we use CalEnviroScreen 2.0[4] to identify census tracts designated as disadvantaged communities. We define disadvantaged communities as census tracts in the top 25th percentile of CES scores. By this definition, there are 2,009 disadvantaged communities (census tracts) in California. Results for the subset of census tracts meeting this condition are presented.

[3] Income tax brackets reported in the census are recategorized to income deciles using the American Community Survey (ACS) Public Use Microdata Sample (PUMS).
[4] http://oehha.ca.gov/ej/pdf/CES2_0SHP.zip

Mapping impacts of renewable build-out to disadvantaged communities

Buildout of renewable energy generation facilities will inject resources into local economies. One way to measure the impact of this buildout would be to simply calculate the resources that are being deployed in each location and use these values as an impact estimate. However, the cumulative effect of injections are likely to be greater than their initial impacts, while aggregate assessment with the BEAR model can mask some detailed shifts in economic activity. Consequently, we directly model these injections into local economies in order to estimate both direct and indirect effects.

To more accurately capture local stimulus effects, we perform a SAM multiplier analysis at the county level to examine induced effects through income-expenditure linkages and distribution of income through institutional accounts. The location of the renewable buildout is designed to be consistent with the portfolio results generated by the RESOLVE model. We then use census tract level information on income and employment by sector to share out impacts by census tract.

The inputs to the multiplier analysis are (1) the locations of renewable buildouts.

(2) the county level SAMs that were constructed from IMPLAN 2013 data (described above) (3) ACS data on census tract level income and employment by occupation.

Inputs from (1) are modeled as income injections into counties and (2) form the basis of the multiplier analysis, which is used to estimate impacts at the county level.

Finally, in step (3) we downscale variables of interest to the census tract level so that we can subset California census tracts that have been designated as disadvantaged communities.