

Blue
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CONSULTING GROUP

THE CAEATFA SALES TAX EXCLUSION PROGRAM

ASSESSMENT OF PROGRAM PERFORMANCE TO DATE

November 13, 2018

Prepared by

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EXECUTIVE SUMMARY

The California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA) offers financial assistance to California manufacturing businesses in the form a Sales and Use Tax Exclusion (STE) on property purchased as part of a qualifying alternative energy, advanced transportation, advanced manufacturing, or recycled feedstock project.¹ The STE Program has now been in operation for eight years; this report presents the results of an evaluation of the performance of the Program since its inception, specifically examining the economic, fiscal, and environmental impacts of the Program.

Overview of the STE Program

CAEATFA's Sales and Use Tax Exclusion Program allows manufacturers, recyclers, and other qualified applicants to make equipment purchases without paying otherwise applicable sales taxes (roughly 8.4% statewide, though the actual value of the benefit varies by jurisdiction depending on the applicable sales tax rate).² In order to qualify for the exclusion, companies must apply to CAEATFA and be approved by the CAEATFA Board.

CAEATFA's Method for Evaluating Manufacturing Projects

CAEATFA has developed a rigorous application process for approving businesses seeking the STE. Research from the Federal Reserve Bank of San Francisco shows that private sector firm capital investment decisions are responsive to changes in tax rates.³ Using this empirically-derived relationship between taxes and company capital equipment investments, CAEATFA staff estimate the amount of additional capital equipment applicant companies purchase as a result of the incentive provided by STE. CAEATFA staff then calculate the additional jobs and supplier purchasers that are expected to result from these marginal additional investments, as well as the resulting changes in tax revenue and environmental pollution. Applications are only recommended for approval if the anticipated marginal fiscal and environmental benefits of the project exceed the cost of the STE (in foregone sales tax revenue).⁴

CAEATFA's Program is unique in at least two important respects. First, the Program seeks to determine if an applicant's project is expected to produce net benefits. Most other economic development programs lack this evaluation component. Second, many other economic development programs claim credit for economic activity that would have occurred regardless of the incentive provided. However, CAEATFA's net

¹ Under authority granted by Senate Bill 71 (Padilla, 2010), Senate Bill 1128 (Padilla, 2012) and Assembly Bill 199 (Eggman, 2015).

² Specifically, the STE is awarded for purchases of tangible personal property.

³ Chirinko, Robert S. and Daniel J. Wilson, "State Investment Tax Incentives: A Zero-Sum Game?" Federal Reserve Bank of San Francisco Working Paper 2006-47, July 2008.

⁴ In some cases, CAEATFA may recommend a project for approval even if the projected net benefits are not positive if a determination is made that the project is in the state's interest and furthers the purposes of the Program. Because not all benefits can be quantified in dollar terms, fiscal and environmental benefits are monetized, converted to points, and combined with points awarded for other categories of benefits, such as the number of jobs created. The resulting sum of all points awarded is the applicant's final score. Projects with a final score that exceeds the threshold (1000 points, with at least 20 environmental benefit points) are recommended for approval.

benefits test compares the cost of the incentive to the benefits attributable only to the marginal (added) economic activity resulting from participation in the Program.

Other Incentives for Manufacturers in California

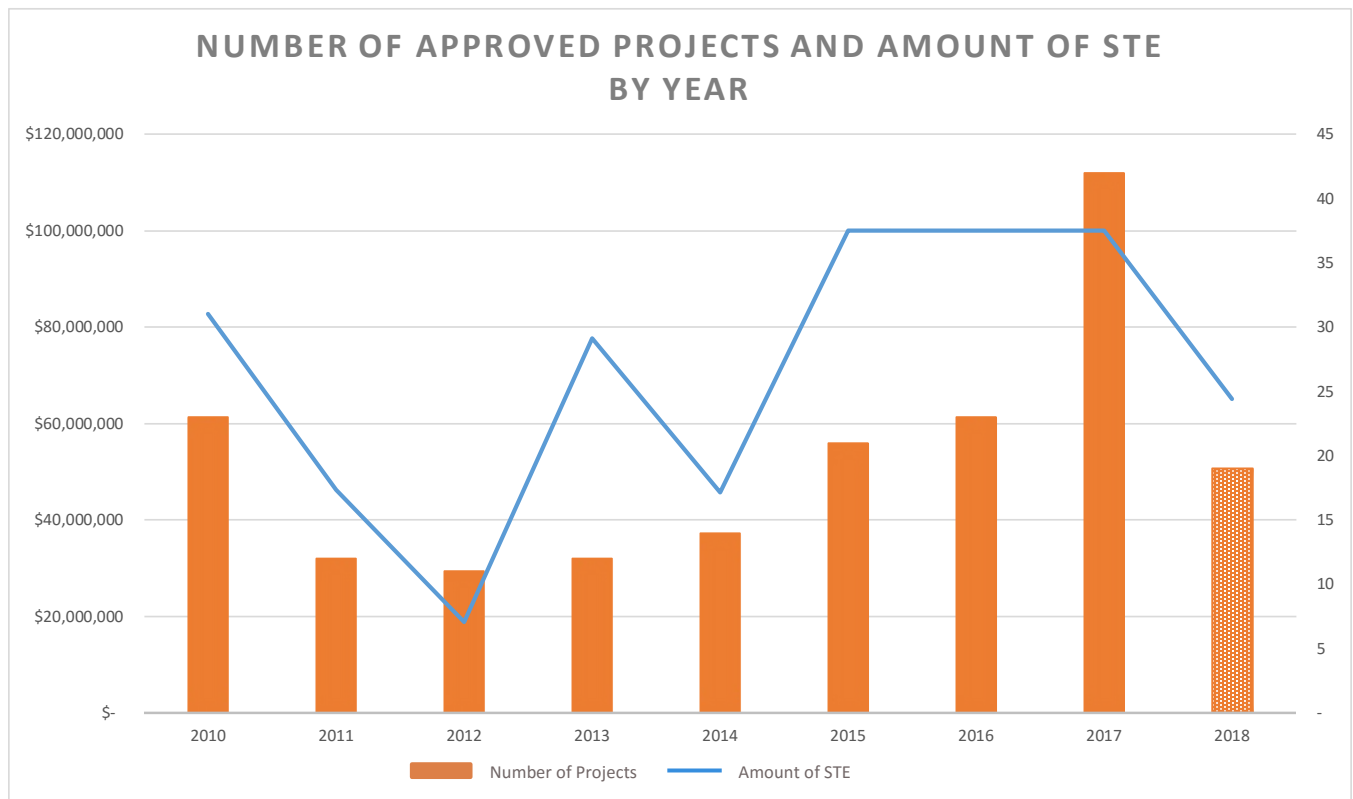
CAEATFA's sales tax exclusion is just one of several incentives for which California companies may qualify. One of these incentives is a partial exemption from sales taxes for manufacturing and research & development equipment. This program, administered by the California Department of Tax and Fee Administration (CDTFA), is similar in some respects to the CAEATFA STE in that it applies to manufacturing equipment. However, the program differs in several important respects. Under the CDTFA program, equipment is only exempt from a portion of the sales tax (a reduction in the otherwise applicable rate of 3.9375%). In addition, in order to qualify, firms must simply complete a form describing the equipment to be purchased and identifying the purpose for which the equipment will be used (i.e. there is no application process and no statutory requirement that the project generate net benefits for the State of California). Companies may use the exemption for up to \$200 million in eligible purchases each calendar year.

Another incentive program, California Competes, is administered by the Governor's Office of Business and Economic Development (GO-Biz), and awards income tax credits to businesses that meet hiring and investment targets. Both manufacturers and locally serving service businesses are potentially eligible for the tax credit. For the Fiscal Year 2018-19 almost \$220 million in California Competes Tax Credit is available for allocation.

Program Performance to Date

Since the STE Program began in 2010, CAEATFA's board has approved 186 projects for a maximum STE of \$691 million through September 2018. As shown in Figure 1 (next page), after the first year of the Program during which pent up demand resulted in a large number of applications, participation in the Program has increased each year. In 2015, 2016, and 2017 the Program awarded the maximum of \$100 million in sales tax exclusions. Alternative Source projects (such as solar panel manufacturers and biogas producers) account for about half of all approved applications. Advanced Manufacturing projects comprise about one-third of the total, and Advanced Transportation and Recycled Resource Extraction projects account for the rest.

FIGURE 1: NUMBER OF APPROVED PROJECTS AND AMOUNT OF STE



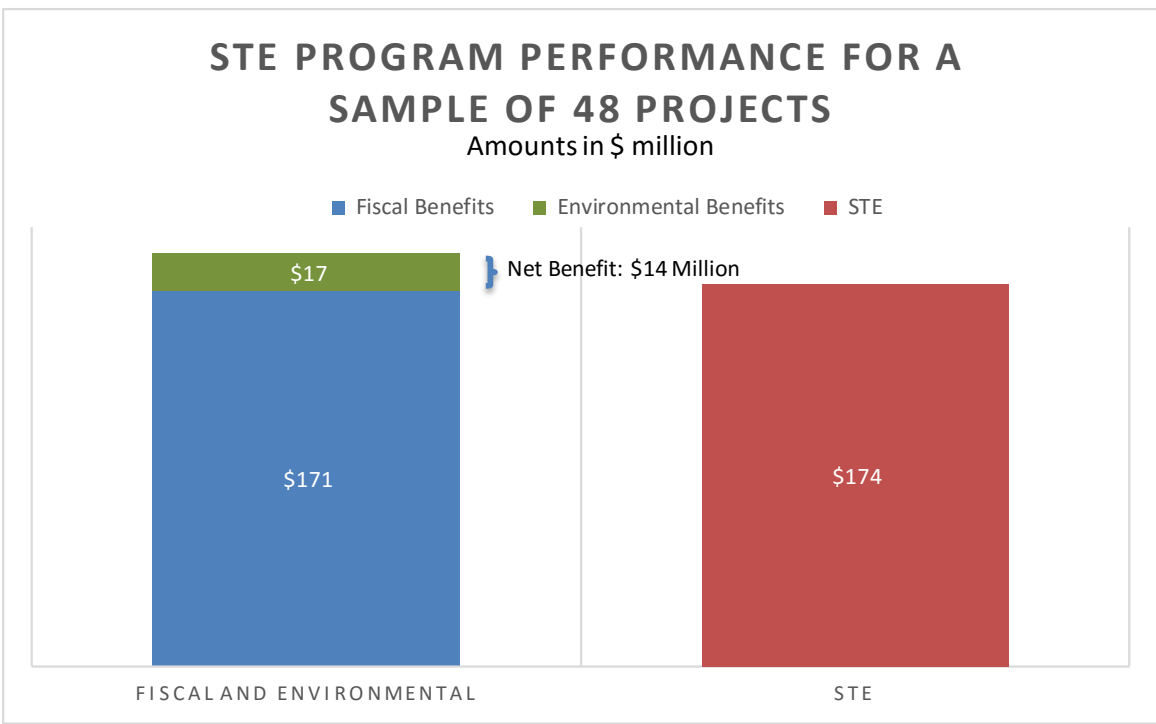
Note: 2018 reflects projects approved through September, 2018

Analysis of Program Data Shows Net Benefits

Although applicants must generally demonstrate net benefits, in some cases benefits projected at the time of application may not be realized, whether due to lower than expected sales, a slower than anticipated ramp-up period, the failure of a business, or a move out of state. In order to assess the actual performance of the Program, CAEATFA undertook an evaluation of data submitted by Program applicants (in required annual reports). These data reflect actual sales, job creation, supplier purchases, and other metrics.

An analysis of this actual performance data shows that, overall, the 48 applicants for whom complete annual report data were available produced \$171 million in total fiscal benefits, \$17 million in environmental benefits, and net benefits of \$14 million, as shown in Figure 2 on page 5.

FIGURE 2: STE PROGRAM PERFORMANCE BASED ON ACTUAL PROJECT RESULTS



Non-monetized Benefits

In addition to the fiscal and environmental benefits accounted for in the CAEATFA application scoring process, improved manufacturing processes deployed by CAEATFA applicants are expected to result in reductions in energy and water use, solid waste generation, and emissions of air pollutants. Approved STE Program applicants may also generate additional economic benefits, including patents and related new products, strengthened industry clusters, workforce training and partnerships, production process improvements, and benefits of the advanced manufacturing products themselves, such as cancer treatment and space exploration.

Conclusion

Manufacturing is an important sector of the California economy, accounting for a substantial fraction of the state’s output, supporting high wage jobs, and stimulating considerable ancillary economic activity through purchases from supplier firms. California businesses compete on a national or even a global stage. And while business location or expansion decisions are influenced by many factors, the relative tax burden companies face is one important factor. In this context, the CAEATFA STE can help to stimulate investment on the part of California manufacturers.

An analysis of the actual performance of approved applicants suggests that the STE Program has generated net benefits for the State of California. Specifically, analysis of a sample of 48 approved projects with complete performance data shows that these projects received sales tax exclusions worth \$174 million, but generated fiscal benefits of \$171 million and environmental benefits of \$17 million, for a total net benefit of \$14 million. These projects comprise about one-fourth of all approved projects. To the extent these

projects are representative of all approved projects, these results suggest that overall net benefits for the STE Program would be more than \$50 million.

To the extent economic development programs are evaluated, most simply report the gross amount of economic activity or tax revenues associated with the affected companies. Such a metric, however, does capture net benefits of a program. CAEATFA's STE Program is unique among economic development programs, both in California and nationally, in that projects are only approved if they are expected to produce a net benefit. The results presented in this report show that the STE Program has produced net benefits for the state.

I. INTRODUCTION

The California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA) was established in 1980 to promote the development and commercialization of alternative energy technologies and products. Under authority granted by Senate Bill 71 (Padilla, 2010), CAEATFA began offering financial assistance to businesses and other entities in the form of an exclusion from sales and use tax (known as a Sales and Use Tax Exclusion, or STE) for tangible personal property purchased as part of a qualifying alternative energy or advanced transportation project. Senate Bill 1128 (Padilla, 2012) expanded the application of the STE to advanced manufacturing projects. The Program was further modified by Assembly Bill 199 (Eggman, 2015), which expanded the CAEATFA Program to recycled feedstock projects.

Returns on Business Tax Incentives

Previous research on the impact of tax incentives on business location decisions suggests that the effects can be modest; for each location decision influenced by a tax incentive, many decisions go unchanged. In other words, some businesses receiving a tax incentive would still locate or expand in the jurisdiction awarding the incentive even if the tax incentive were not offered.⁵ And, because the costs of tax incentives (in terms of foregone tax revenue) can be high, many business tax incentives may not be worth the cost.⁶

This report seeks to quantify the impact of the CAEATFA STE. Although the STE is a business tax incentive, it has several features which may distinguish its impacts from business tax incentives generally. Specifically, the CAEATFA STE is only available to manufacturers, rather than to both locally serving and exporting businesses. Unlike locally serving (primarily service businesses), most manufacturers export goods outside of the state or produce goods which reduce the need for imports. As a result, sales revenues from manufacturers generally represent new revenue to the state's economy. In addition, because the STE is used by companies only at the time of equipment investment, companies only receive the incentive if they are investing their own resources in capital equipment. In essence, the STE serves as the "last dollar in" for moving the project forward, after applicants have secured their primary project financing independently. Rather than providing a benefit to companies who would have made these decisions with or without the incentive, CAEATFA's STE Program functions as an early incentive, encouraging companies to invest more than they otherwise would have at the outset.

⁵ For example, enterprise zones influenced the business location decision of 3 out of 10 businesses, on average. Bartik (2007) made calculations based on empirical research by Fisher and Peters (2002). Bartik, Timothy J.

⁶ Bartik (2007) summarized calculations of 15 empirical studies to estimate that on average business tax incentives cost around \$70,000 in foregone tax revenue per job. Bartik, Timothy J. "Solving the Problems of Economic Development Incentives," In *Reining in the Competition for Capital*, Ann Markusen, ed. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 2007, http://research.upjohn.org/cgi/viewcontent.cgi?article=1247&context=up_bookchapters

II. THE IMPORTANCE OF MANUFACTURING AND THE ROLE OF TAX INCENTIVES

The CAEATFA Sales and Use Tax Exclusion Program supports an important sector of the state's economy by reducing the cost of starting or expanding a manufacturing business, helping the state overcome perceptions of high taxes for businesses, and improving the state's ability to compete with other states that offer tax incentives to manufacturing businesses.

Manufacturing is an important sector of the California economy. Manufacturers frequently make investments in research and development that can lead to innovation, which makes the state's economy more competitive.⁷ The sector also accounts for a substantial fraction of the state's output, supports relatively high wage jobs, and stimulates considerable ancillary economic activity through purchases from supplier firms. The manufacturing sector generates a great deal of economic output per job. Indicative of this productivity, the average wage for employees in manufacturing is substantially higher than many other sectors in California.⁸ Manufacturing firms also purchase relatively more goods and services than many other industries, thus stimulating more jobs indirectly in supplier firms.⁹ Finally, most manufacturing firms produce products that are exported outside of California or, if the goods are sold locally, reduce the need for imports. As a result, the sales revenues from manufacturing largely represent an influx of new money into the California economy, in contrast to the sales revenues of primarily locally-serving service industries.

Perception of California's Business Climate

Growth in California's manufacturing sector may be hampered by negative perceptions of the state's business climate. For example, the Tax Foundation ranked California as one of the highest cost states for capital intensive manufacturing firms in 2015 (45th for a mature firm and 43rd for a new firm). These results were based on calculations of the total business tax on a model firm in all 50 states.¹⁰ Similarly, Forbes'

⁷ For the role of research and development in advanced manufacturing, see Cooper, Christine, Shannon M. Sedgwick, and Somjita Mitra, "California's Manufacturing Industries: Employment and Competitiveness in the 21st Century," Institute for Applied Economics, Los Angeles County Economic Development Corporation, June 2014, page 20, http://laedc.org/wp-content/uploads/2014/07/California_Manufacturing_2014.pdf (accessed October 2016) and Muro, Mark, Jonathan Rothwell, Scott Andes, Kenan Fikri, and Siddharth Kulkarni, "America's Advanced Industries," The Brookings Institute, February 2015, page 2, https://www.brookings.edu/wp-content/uploads/2015/02/AdvancedIndustry_FinalFeb2lores-1.pdf (accessed October 2016)

⁸ Cooper et al, "California's Manufacturing Industries: Employment and Competitiveness in the 21st Century," 2014,) http://laedc.org/wp-content/uploads/2014/07/California_Manufacturing_2014.pdf (accessed October 2016)

⁹ Muro, Mark, Jonathan Rothwell, Scott Andes, Kenan Fikri, and Siddharth Kulkarni, "America's Advanced Industries," The Brookings Institute, February 2015, page 3, https://www.brookings.edu/wp-content/uploads/2015/02/AdvancedIndustry_FinalFeb2lores-1.pdf (accessed October 2016)

¹⁰ The model capital-intensive manufacturer is a steel company with 200 positions, \$300 million in capital investment, \$200 million in revenue, a gross profit ratio of 25 percent, earnings before tax of 10 percent, and an equity ratio of 50 percent. The company is fully taxed in the state in which it is located and the sales are distributed to all 50 states according to the relative population sizes of each state. The Tax Foundation, "Location Matters: The State Tax Costs of Doing Business," 2015, page 19, <http://taxfoundation.org/location-matters/location-matters-2015.pdf> (accessed October 2016).

annual ranking of “The Best States for Business” ranked California 47th in regulatory environment and 44th in business costs.¹¹ Fortune Magazine came to a similar conclusion, ranking California’s taxation and regulatory environment last among the 50 states, based on an annual survey of approximately 500 CEOs asking respondents to rank states as good for business.¹² Regardless of whether California’s business climate is in fact worse than that of other states, the perception of California as an expensive and difficult state in which to do business nevertheless exists. CAEATFA’s STE Program is one tool at the state’s disposal to counter this perception.

Other States Compete for Businesses with Tax Incentives

CAEATFA’s STE Program does not exist in a vacuum. States across the country compete for businesses with tax benefits and other incentives that reduce the costs of starting or expanding businesses. Nationwide, 35 states exclude manufacturing machinery from the sales tax.¹³ In addition, some states have sought to promote manufacturing with other incentives, such as grants for developing advanced manufacturing training programs, early-stage capital for high-tech companies, and business and occupation tax credits for the aerospace industry.¹⁴ Though tax incentives are one of many considerations in a business location decision, California competes with other states that offer tax incentives. Therefore, reducing the cost for manufacturing companies through the STE Program can – other things equal – improve the state’s competitiveness in attracting and retaining businesses.

¹¹ Forbes. “Best States for Business,” <http://www.forbes.com/best-states-for-business/list/#tab:overall> and <http://www.forbes.com/places/ca/> and <http://www.forbes.com/sites/kurtbadenhausen/2015/10/21/ranking-the-best-states-for-business-2015-behind-the-numbers/#1988acaa228e> (accessed October 2016)

¹² Addady, Michal, “These are the Best and Worst States for Business,” Fortune, 2016, <http://fortune.com/2016/05/09/best-worst-states-business/> (accessed October 2016) ; Chief Executive, “California,” <http://chiefexecutive.net/california/> (accessed October 2016).

¹³ CCH Incorporated, “State Tax Handbook,” Chicago: Wolters Kluwer, 2015; Francis, Norton, “State Tax incentives for Economic Development,” Economic Development Strategies Information Brief 3, The Urban Institute, <http://www.urban.org/sites/default/files/alfresco/publication-pdfs/2000636-state-tax-incentives-for-economic-development.pdf> (accessed October 2016).

¹⁴ These incentives are from Massachusetts, Michigan, and Washington. Other states may have similar incentives. To read more about these incentives, see the following press release: Shore, Michael, “\$25 million now available to support Michigan entrepreneurs,” Michigan Economic Development Corporation, July 2011, [http://www.michiganbusiness.org/press-releases/\\$25-million-now-available-to-support-michigan-entrepreneurs/](http://www.michiganbusiness.org/press-releases/$25-million-now-available-to-support-michigan-entrepreneurs/) (accessed October 2016); and the following awards announcement in Massachusetts: “2016 Advanced Manufacturing Training Grant Awards,” <http://www.mass.gov/hed/community/funding/advanced-manufacturing-training-grant-awards.html> (accessed October 2016); and the following description of tax incentives for the aerospace industry in Washington: “Incentive Programs: Deferrals, Exemptions, and Credits: Aerospace Industry,” Department of Revenue Washington State, <http://dor.wa.gov/content/findtaxesandrates/taxincentives/incentiveprograms.aspx#General> (accessed October 2016).

IV. CAEATFA'S UNIQUE NET BENEFITS TEST

Most Programs Do Not Measure the Effectiveness of Tax Incentives

Historically, most states did not report foregone tax revenues due to tax incentives; California's legislature was the first state to require tax expenditure reports, starting in 1971.¹⁵ In the past few years, state legislatures across the country have shown an increasing interest in further analysis by passing laws that require evaluation of the effectiveness of tax incentives in stimulating economic growth.¹⁶ At least 23 states have passed laws that require regular independent evaluations of tax incentives,¹⁷ and, as of 2015, 12 states have produced reports on the performance of companies that receive tax incentives.¹⁸

Many of these evaluations of tax incentives, however, overestimate the effectiveness of programs by reporting the total number of jobs and capital investment associated with the new or expanded project, rather than the marginal benefit attributable to the incentive. For example, Massachusetts' annual report on the state's Economic Development Incentive Program provides the number of new jobs created after a firm receives the tax incentive, the number of jobs retained, and the total private investment in the project, but does not adjust these numbers for the economic activity that would have occurred without the tax incentive.¹⁹ Similarly, Florida's evaluation of seven economic development projects reports the total number of new jobs, jobs maintained, and capital investment in each approved project, but does not estimate the marginal effects of the incentives.²⁰ Like Florida and Massachusetts, Washington's evaluation

¹⁵ Connolly, Katrina D. and Michael E. Bell. (2012) "The Need for a Property Tax Expenditure Budget" State Tax Notes, 64(8), May 21. As of 2015, the Governmental Accounting Standards Board is requiring all state and local governments to report tax abatements in their comprehensive annual financial report (CAFR); Francis, Norton, "GASB 77: Reporting Rules on Tax Abatements," Economic Development Strategies Information Brief 1, Urban Institute, October 2015, <http://www.urban.org/sites/default/files/alfresco/publication-pdfs/2000474-GASB-77-Reporting-Rules-on-Tax-Abatements.pdf> (accessed October 2016).

¹⁶ Goodman, Josh and John Hamman, "Tax Incentive Evaluation in 2016: in Law and Practice," 2016, <http://www.pewtrusts.org/en/research-and-analysis/analysis/2016/09/14/tax-incentive-evaluation-in-2016-in-law-and-practice> (accessed October 2016) ; Goodman, Josh, "Tax Incentive Programs," The Pew Charitable Trusts, January 2015, <http://www.pewtrusts.org/~media/assets/2015/01/statetaxincentivesbriefjanuary2015.pdf?la=en> (accessed October 2016).

¹⁷ The Pew Charitable Trusts, "States Make Progress Evaluating Tax incentives," January 2015, <http://www.pewtrusts.org/en/research-and-analysis/fact-sheets/2015/01/tax-incentive-evaluation-law-state-fact-sheets> (accessed October 2016) ; Goodman, Josh and John Hamman, "Tax Incentive Evaluation in 2016: in Law and Practice," 2016, <http://www.pewtrusts.org/en/research-and-analysis/analysis/2016/09/14/tax-incentive-evaluation-in-2016-in-law-and-practice> (accessed October 2016)

¹⁸ Francis, Norton, "State Tax Incentives for Economic Development," Economic Development Strategies Information Brief 3, The Urban Institute, <http://www.urban.org/sites/default/files/alfresco/publication-pdfs/2000636-state-tax-incentives-for-economic-development.pdf> (accessed October 2016).

¹⁹ Massachusetts Office of Business Development, "Fiscal Year 2015 Annual Report," Economic Development Incentive Program (EDIP), September 2015, <http://www.mass.gov/hed/economic/eohed/bd/econ-development/results/fy15-economic-development-incentive-program-final-report.pdf> (accessed October 2016).

²⁰ Office of the Florida Legislature, "Florida Economic Development Program Evaluations – Year 1," *Report No. 14-01*, January 2014, <http://www.oppaga.state.fl.us/MonitorDocs/Reports/pdf/1401rpt.pdf> (accessed October 2016).

of tax incentives for high tech industries reports annually the number of new employees, but does not estimate the fraction of these new employees that is attributable to tax incentives.²¹ These reports may quantify the number of new jobs, but they lack analysis of the extent to which those jobs would have existed without the tax incentive.

Other Tax Incentive Programs in California

CAEATFA's sales tax exclusion is just one of several incentive programs in California, however, it is unique in its approach to evaluating net benefits at the time of application. For example, California manufacturers can qualify for a partial exemption from sales taxes under a program administered by the California Department of Tax and Fee Administration (CDTFA). This program is similar in some respects to the CAEATFA STE in that it applies to manufacturing equipment. However, the program differs in several important respects. Under the CDTFA program, equipment is only exempt from a portion of the sales tax (a reduction in the otherwise applicable rate of 3.9375%). In addition, in order to qualify for the CDTFA program, firms must simply complete a form describing the equipment to be purchased and identifying the purpose for which the equipment will be used (i.e. there is no application process and no statutory requirement that the project generate benefits for the State of California).

CAEATFA's Method Evaluates Marginal Impact

When it approved SB 71, the Legislature required CAEATFA to evaluate projects based on a number of factors, including expansion of manufacturing in California, job creation, environmental and fiscal benefits, and overall net benefits (Public Resources Code Sec. 26011.8). Based on these requirements, CAEATFA developed a transparent and rigorous application scoring process that requires projects to document net benefits to the state in order to be recommended for approval. These net benefits are calculated on a marginal rather than an aggregate basis. In other words, the cost of the Program in terms of foregone sales tax revenue is compared to the benefits attributable just to the marginal (additional) economic activity resulting from the incentive effects of the STE.

In addition to general information about the applicant's project, manufacturing process, and product, CAEATFA requires applicants to provide specific business plan data, including the expected cost for the capital equipment that will be purchased; projections on the number of units that will be sold each year; price, materials, and labor costs per unit; and full time-equivalent jobs at the facility, among other factors. Based on this information, CAEATFA analyzes the data provided to ensure that the anticipated revenues, profit margin, labor costs and other factors are both internally consistent and plausible. CAEATFA also requires detailed information about the projected environmental performance of the product and the production process (where relevant). These data are likewise checked for internal consistency and plausibility.

²¹ Washington State Department of Revenue, "High Tech Study: Analysis of High Technology Programs," December 2013, http://dor.wa.gov/Docs/Reports/2013/High_Tech_2013.pdf (accessed October 2016).

Net Benefits Test

Once the application data have passed CAEATFA's due diligence review, CAEATFA estimates the marginal additional economic output resulting from the STE's reduction in the cost of purchasing capital equipment. CAEATFA's estimate of the extent of these additional capital equipment purchases is based on a study conducted by the Federal Reserve Bank of San Francisco.²² This study analyzed the responsiveness of firms to changes in the cost of capital equipment stemming from tax changes. Using this study, CAEATFA is able to estimate how much additional equipment each applicant will purchase based on the reduction in equipment cost stemming from the STE.

Any increase in economic output due to the STE is predicted to result in a number of economic, fiscal, and environmental benefits, including increased economic activity, increased purchases of capital equipment and raw materials from suppliers, and increased sales of the applicant's product(s). These increases have secondary effects, such as increased employment at supplier firms; increased property, income, and sales tax revenues; and increases in environmental benefits, such as reductions in emissions of greenhouse gases and air pollutants. Together, all of these direct and indirect effects of the STE result in economic, fiscal, and environmental benefits to the state.

Marginal projected benefits attributable to the STE Program are estimated from an economic model developed by CAEATFA that estimates the size of the various fiscal and environmental benefit streams over the life of the project, monetizes non-monetary benefits, such as reductions in greenhouse gas emissions, and applies discounting of future benefits in order to estimate their net present value. In order for a project to be approved by the CAEATFA Board, the project must be projected to produce STE-induced fiscal and environmental benefits that exceed the cost of the STE in reduced sales tax revenues.²³ Calculating the net benefits on a marginal rather than an aggregate basis ensures an apples-to-apples comparison of project costs and benefits and reduces the risk of overestimating project benefits.

Projects scoring criteria are generally consistent in terms of fiscal benefits. However, due to the different eligibility criteria, Advanced Manufacturing projects are scored differently from Advanced Transportation, Alternative Source, and Recycled Feedstock projects in terms of environmental benefits. For non-Advanced Manufacturing projects, the products themselves produce environmental benefits, whereas the products produced by an Advanced Manufacturing process need not necessarily produce environmental benefits. Instead, for Advanced Manufacturing applicants, environmental benefits generally stem from improvements to the manufacturing process itself. As a result, the environmental benefits for Advanced Manufacturing projects are not monetized in the application scoring process as they are with Alternative

²² Chirinko, Robert S. and Daniel J. Wilson, "State Investment Tax Incentives: A Zero-Sum Game?" Federal Reserve Bank of San Francisco Working Paper 2006-47, July 2008.

²³ Note that in addition to points for fiscal and environmental benefits projects may be awarded points for such things as creating new jobs, locating in an area with high unemployment, or adding to a local industry cluster. These other benefits are added to the total fiscal and environmental benefits, and, in some cases, are the deciding factor in determining whether a project has produced a net benefit.

Source, Advanced Transportation and Recycled Feedstock projects. Instead, points are awarded for specific environmental process improvements and these are incorporated into the project's final benefit score.

The Nature of Uncertainty in Making Projections

In spite of the rigorous nature of the net benefits test developed and applied, there remains to be some uncertainties associated with estimating the impact of the STE Program.

First, the net benefits test is performed prospectively, based on information provided by applicants during the application process as well as due diligence performed by CAEATFA. However, the estimated costs and benefits of a project can change as the project evolves under real-world market conditions and individual project contingencies. These projected Program costs and benefits therefore may overstate (or understate) actual costs and benefits to the extent that projects do not achieve their full potential (or perform better than anticipated at the time of application).

Second, estimating the future fiscal and environmental benefits of projects based on currently available information requires economic modeling, which in turn requires assumptions regarding discount rates, multiplier effects, and the monetary value of environmental protection benefits. CAEATFA relies on estimates standard in economic modeling literature for these and other input parameters for the net benefits test, but the appropriate values for these factors are nevertheless uncertain.

In addition, CAEATFA requires applicants to file annual reports on their projects' status, both to ensure that applicants are complying with the conditions for receiving the STE, and also to determine whether there have been any material changes to projects that could affect Program costs or benefits.

V. ASSESSING THE IMPACT OF THE STE PROGRAM

Since its creation in 2010, the STE Program has awarded \$691 million in sales tax exclusions to 186 qualified applicants through September 2018. The largest category, accounting for more than half of approved applications, is Alternative Source. Advanced Manufacturing is the next largest category, accounting for 31% of approved projects. Advanced Transportation and Recycled Resource Extraction projects each accounted for less than 10 percent of the total. Figure 3 on page 14 presents the distribution of approved projects by type.

FIGURE 3: NUMBER APPROVED PROJECTS BY TYPE

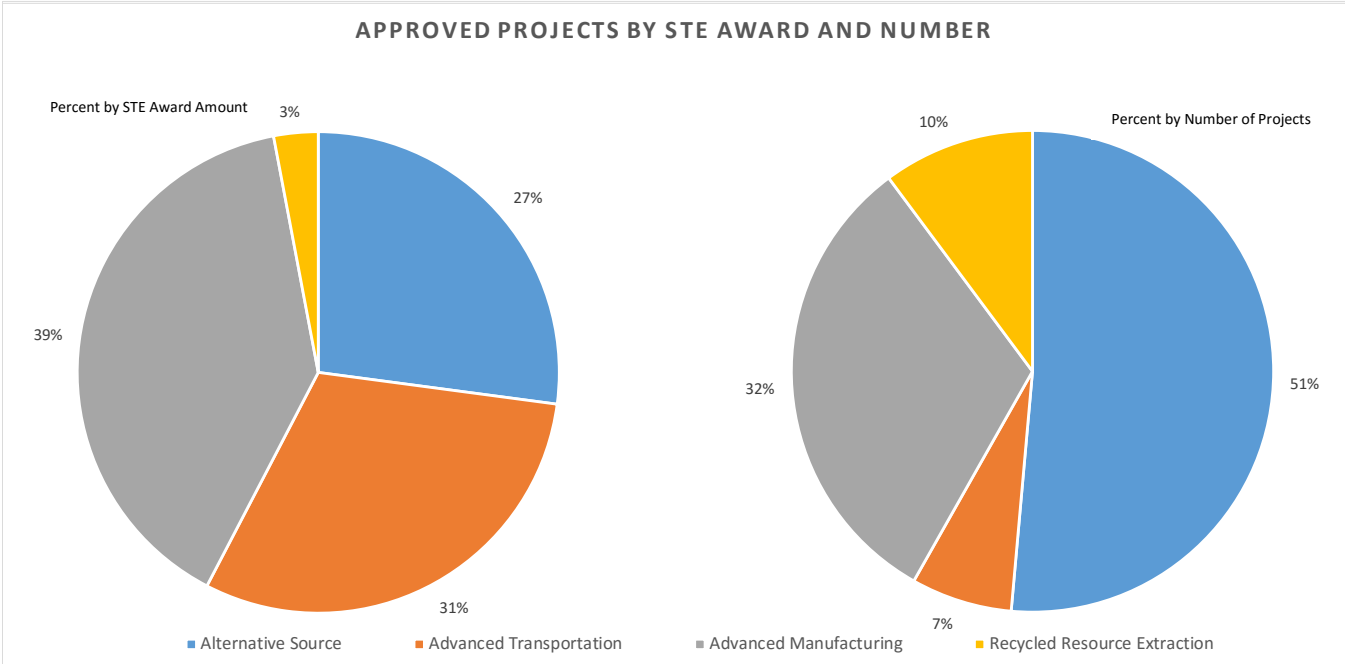
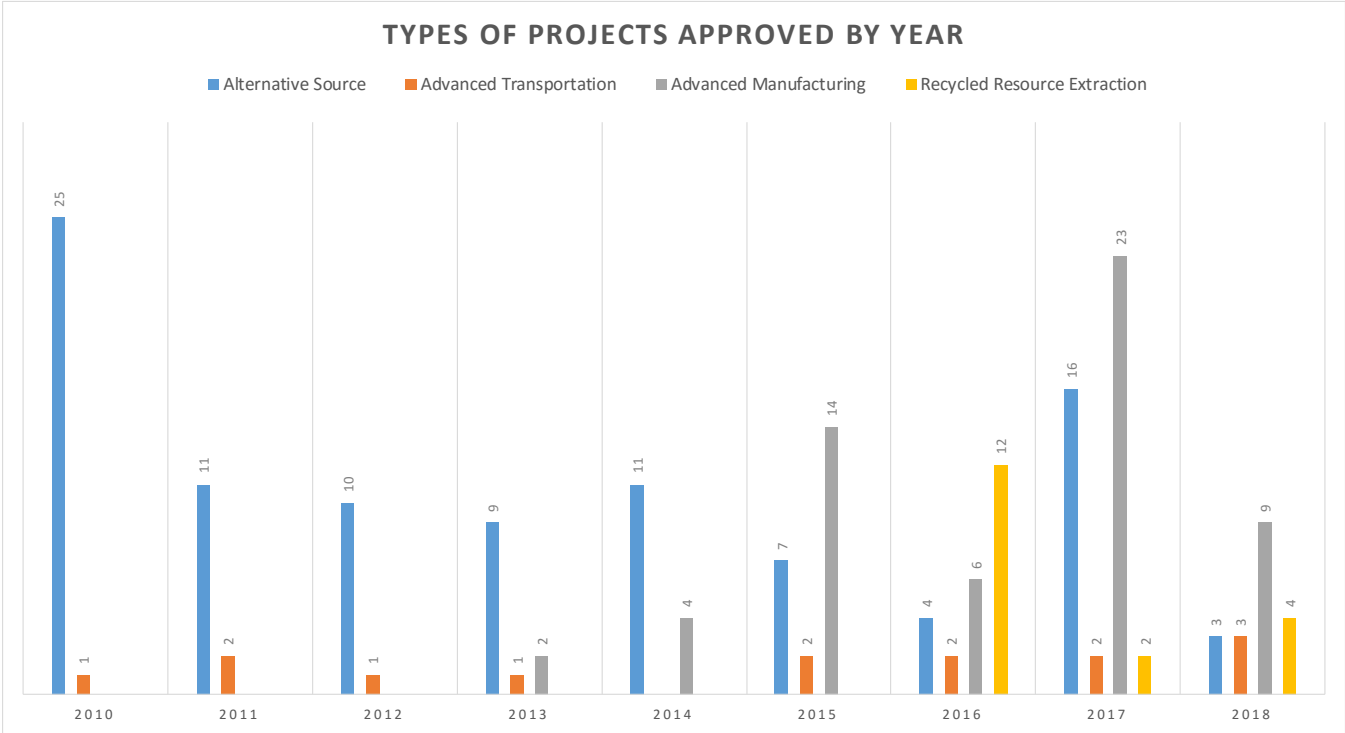


FIGURE 4: COUNT OF PROJECTS BY YEAR

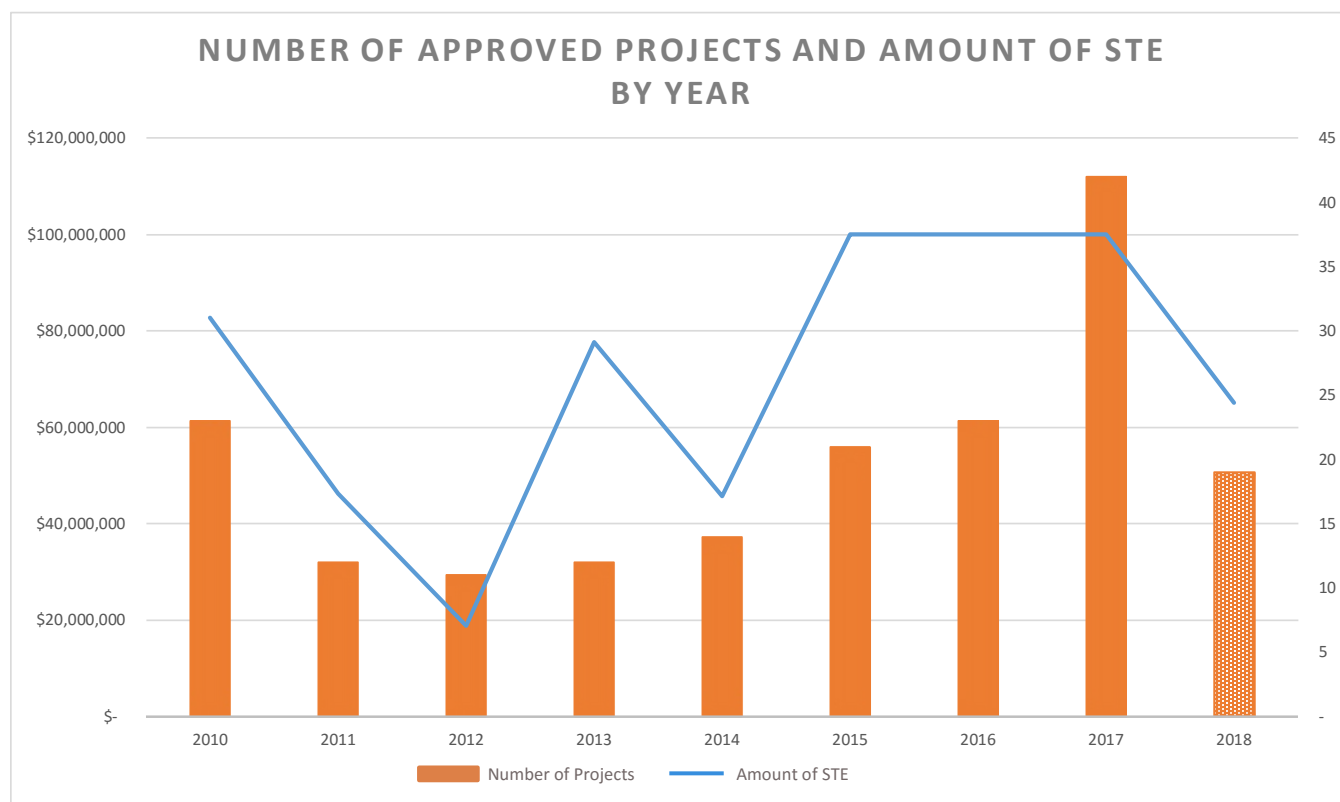


Note: 2018 reflects projects approved through September, 2018. Additionally, CAEATFA began considering Advanced Manufacturing projects in December 2013, and began considering Recycled Resource Extraction projects in October 2016.

Figure 4 on page 15 shows the distribution of project types by year. During the early years of the Program, the majority of projects were in the Alternative Source category. These projects include such activities as solar panel manufacturing and biogas production. More recently, Advanced Manufacturing has become the largest category of projects (measured by the number of approved projects).

During the course of the STE Program, not only has the nature of the approved projects changed, but so too has the participation in the Program. As shown in Figure 5, after the initial year in which a large number of projects was approved as a result of pent up demand for the Program, the number of approved projects has increased steadily. As the number of projects has increased, so has the amount of STE awarded. In 2015, 2016, and 2017, the STE Program awarded the maximum allowable award amount: \$100 million in STE per year.

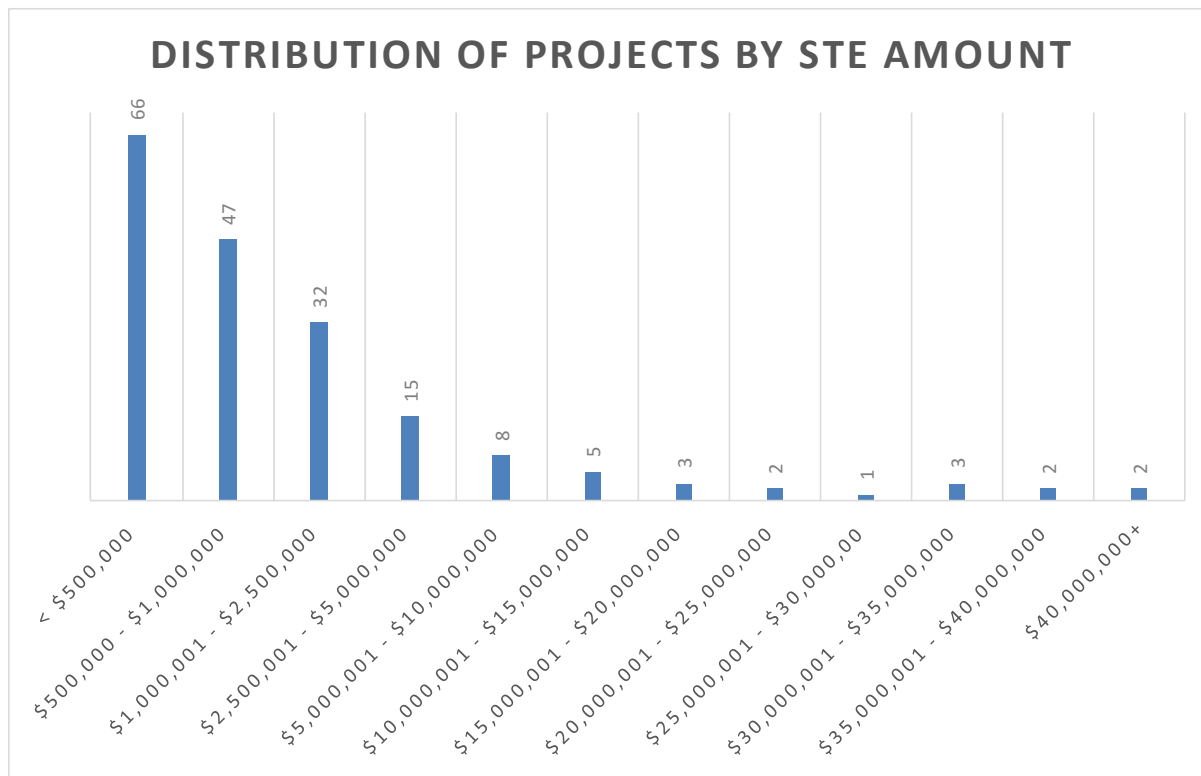
FIGURE 5: NUMBER OF APPROVED PROJECTS AND AMOUNT OF STE



Note: 2018 reflects projects approved through September, 2018.

While some larger projects have received a STE, most awards are relatively small. As shown in Figure 6 on page 16, roughly one-third of all projects have received an STE of less than \$500,000 and 90 percent of all projects (168 projects) have received an STE of less than \$10 million.

FIGURE 6: DISTRIBUTION OF PROJECTS BY STE AMOUNT



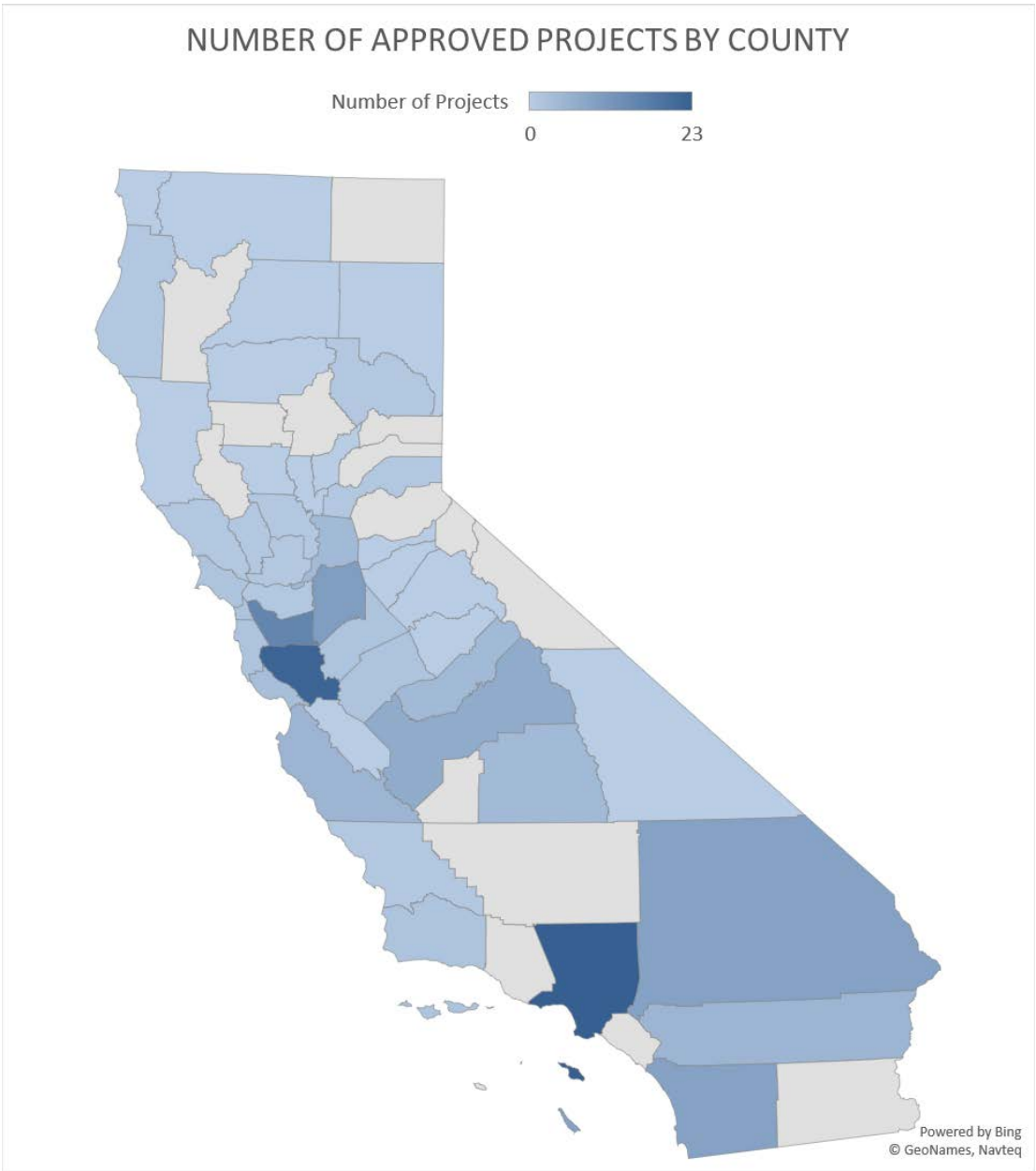
CAEATFA has approved projects throughout the state, as shown in Figure 7 on page 17.

Impact of the STE Program

As shown above, CAEATFA has provided financial assistance in the form of a sales tax exclusion to nearly 200 companies located throughout the state. At the time of application, each of these projects demonstrated anticipated fiscal and environmental benefits that would exceed the cost of the foregone sales tax revenue.²⁴ In some cases, however, benefits projected at the time of application may not be realized, whether due to lower than expected sales, a slower than anticipated ramp-up period, the failure of a business, or a move out of state. An assessment of Program performance based on actual project data rather than application projections can help to demonstrate whether the STE Program has in fact produced a net benefit as anticipated.

²⁴ Note that in some cases projects achieve the net benefits threshold as a result of supplemental benefits points for such things as locating in a high unemployment area or contributing to a local industry cluster.

FIGURE 7: APPROVED PROJECTS BY COUNTY



CAEATFA requires that approved applicants submit annual reports following project approval. These annual reports contain important information about the performance of the applicants' projects, including actual sales, number of employees, wages paid, and purchases from supplier firms. Using this annual report data, it is possible to develop an estimate of the actual performance of the approved applicants, and an estimate of the net benefits of these applicants' projects based on actual performance. Specifically, by substituting the actual annual report data for projections prepared at the time of application, it is possible to analyze whether projects have produced a net benefit using CAEATFA's application scoring methodology.

Data was analyzed for 48 projects (about 27% of applications approved through 2017, both in terms of number and amount of STE) with total equipment purchases of about \$2 billion.²⁵ Although all applicants are required to submit annual reports, some applicants have only recently been approved, have not yet completed making their equipment purchases, or are otherwise not fully “ramped-up.” In other cases, applicants submitted annual reports with incomplete or otherwise unusable data. For purposes of this analysis, projects are considered to be ramped-up if the timeframe for purchasing equipment has expired, they have made at least 90 percent of expected equipment purchases, or they have not made an equipment purchase in the past year.²⁶ Using data for applicants that submitted complete annual reports and have fully ramped-up production provides a mechanism for assessing the actual performance of the Program.²⁷ Note that in some cases projects have gone out of business, moved out of the state, or otherwise failed to produce the benefits anticipated at the time of application. These projects are included in the analysis presented in this section as long as annual report data were available or the fate of the company was known. Where companies went out of business or left the state, fiscal and environmental benefits are assumed to be zero; costs for these projects were included. In other cases, approved projects have not moved forward. In these cases both costs and benefits are zero, and the project was excluded from the analysis.

Analysis of Actual Performance Data Indicates STE Program Has Produced a Net Benefit

Data was analyzed for 48 projects which submitted complete annual reports and had finished equipment purchases (and so were assumed to be ramped-up). These projects employed 6,439 full time equivalent workers at an average salary of nearly \$58,000, purchased \$2.7 billion in supplies, and sold \$6.7 billion in goods. Some of this activity would have occurred, however, without the sales tax exclusion. CAEATFA’s scoring methodology allows for estimates of the portion of this activity attributable to the tax incentive (on average about 10 percent based CAEATFA’s application of the San Francisco Federal Reserve Bank study). Applying this methodology suggests that the STE Program stimulated \$185 million in equipment purchases, the creation of 510 full time equivalent positions, \$205 million in supply purchases, and \$509 million in sales. The total STE utilized by these applicants was about \$174 million, with total fiscal benefits of \$171 million. Environmental benefits comprised an additional \$17 million, for total benefits of \$188 million and net benefits of \$14 million.²⁸ Figure 8 presents the results of the analysis of actual Program performance to data for 48 companies. To the extent these 48 projects are representative of all approved projects, these results suggest that the STE Program overall has produced a net benefit of more than \$52 million.

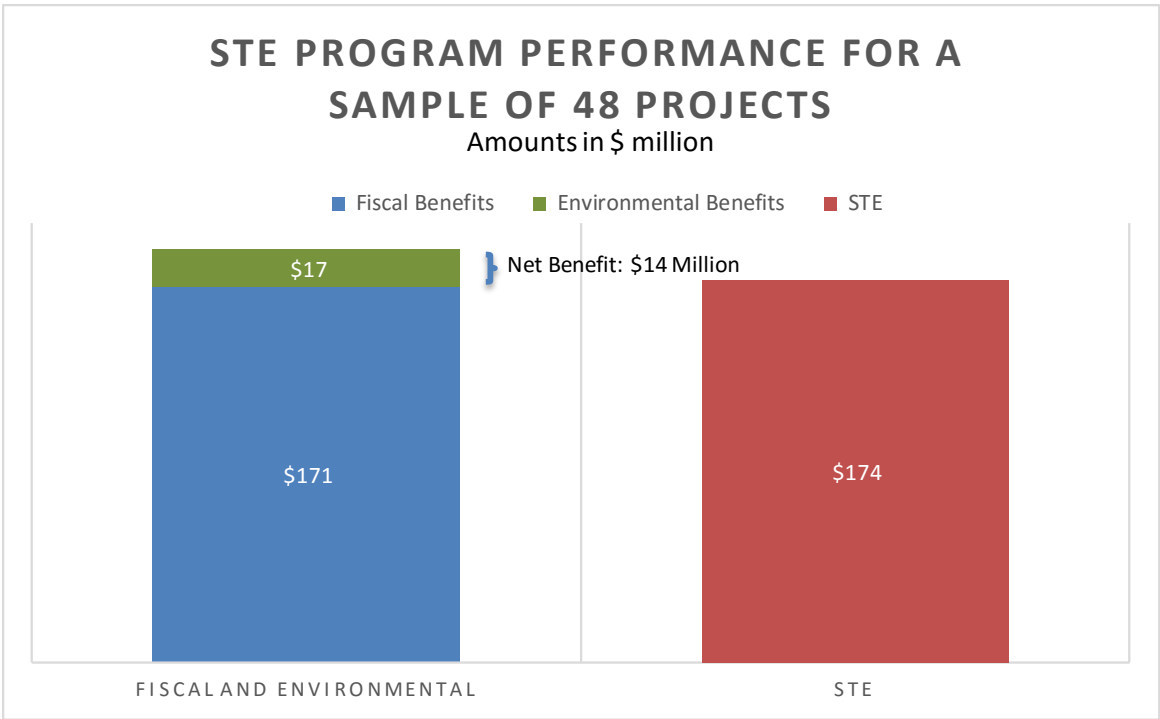
²⁵ The Tesla Model 3 project is not included in this analysis. Approval for the full amount of qualified property for the Model 3 project will span 3 years from 2016 to 2018. The Model 3 project will be included and evaluated as one project upon full approval and purchase of the project’s qualified property.

²⁶ In addition, applicants were excluded from the analysis if they became inactive without making any equipment purchases (and therefore did not impose any costs in terms of foregone sales tax revenue).

²⁷ Projects that purchased equipment and are known to have gone bankrupt or moved out of state are included in the analysis assuming zero benefits associated with their purchases.

²⁸ Two projects that submitted annual reports in 2015 and 2016, but made additional equipment purchases in 2017. These projects were excluded from the analysis for missing performance data concurrent with purchases.

FIGURE 8: PROGRAM PERFORMANCE BASED ON ANNUAL REPORT DATA

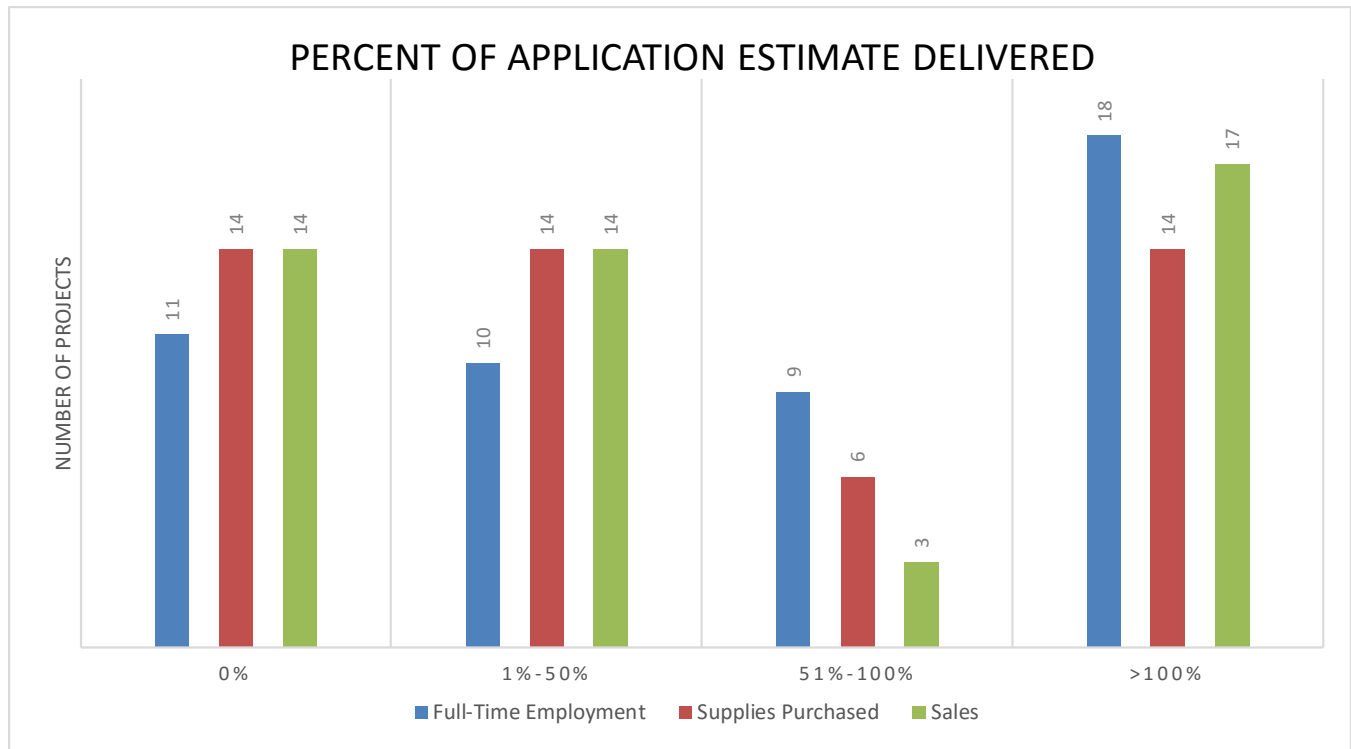


Project Performance: Actual Compared to Projected

As shown above, the sample of projects analyzed produced a net benefit for the State of California, however, the extent of these benefits was lower than anticipated at the time of application. By way of comparison, at the time of application, these applicants were expected to produce nearly \$264 million in fiscal benefits, almost \$64 million in environmental benefits, and about \$133 million in net benefits. The 48 projects analyzed based on annual report data created 84 percent of the positions expected, purchased 50 percent of expected supplies, and made 58 percent of expected sales.²⁹

²⁹ These percentages adjust projections by the percent of expected qualified property purchased at the time of reported performance. These averages are also weighted by the amount of QP purchased.

FIGURE 9: ESTIMATED COMPRED TO ACTUAL PERCENT OF JOBS, SUPPLIES, AND SALES



When examining the performance of these companies at a more granular level, the variation in company performance becomes apparent. Specifically, some companies failed to produce any benefits, while others produced more than 100 percent of the jobs, supply purchases, and sales anticipated at the time of application. As shown in Figure 9, the largest category of project based on performance includes those companies that produced more than 100 percent of anticipated jobs and sales. Specifically, 18 of 48 companies analyzed, or 38 percent of the total, produced more than 100 percent of the anticipated number of jobs. Similarly, 17 of 48 companies (35 percent) produced more than 100 percent of the sales anticipated at the time of application.

These results notwithstanding, there were also some companies that failed to produce any benefits or produced less than the anticipated benefits. As shown in Figure 9, 11 companies did not have any current employees in California, and 14 companies had no supplier purchases or sales. These companies were either sold, went out of business after receiving the STE award, or were moved out of state. Most of these companies did employ workers for at least a period of time, and many also made supplier purchases and sold some products. However, without ongoing operations in California, the benefits for these companies were assumed to be zero. In addition, CAEATFA regulations require that if a company moves out of the state after receiving an STE, it must pay back a portion of the benefits received. Any such repayments are not reflected in the net benefit calculations presented above, which can therefore be considered a conservative estimate.

Should CAEATFA Adjust the Scoring Process Based on Program Performance?

In spite of the fact that some companies receiving a STE went out of business or moved out of the state while others produced less than the anticipated amount of jobs, purchases, and sales, the overall performance of these 48 companies shows a net benefit to the State of California. Nevertheless, the comparison of actual to estimated performance raises the question of whether the CAEATFA application or award process could be amended based on the likelihood that some applicants will not meet the expectations laid out in their applications. A review of CAEATFA's approach, however, suggests that, while some applicants do not meet the performance expectations presented in applications, changes to this approach would produce inferior results.

SOUND BASIS FOR APPLICATION PROJECTIONS

Applicants to the STE Program – entrepreneurs by definition – are generally optimistic when making projections at the time of application and may present the best-case scenario for future growth for their projects. These applicants of course project that their businesses will be successful; otherwise, they would not invest their own (or their investor's) money in starting or expanding their businesses. CAEATFA staff review applicant sales projections and compare these projections to those for competitors, overall industry growth or other benchmarks where possible. Ultimately, however, there is no way for anyone – CAEATFA staff, applicants, or their investors – to know with certainty whether the projections are accurate. In order to ensure that applicant projections are as accurate as possible, CAEATFA requires that applicants submit to CAEATFA the same financial projections that are submitted to investors. The penalties that applicants would face for deceiving investors provide a check on any exaggerated or fraudulent projections that might be submitted to CAEATFA. Furthermore, CAEATFA only “invests” in a company if the company is also investing resources in a capital equipment purchase. In other words, the company's owners – those in the best position to assess the likelihood of future success – must decide that an equipment purchase represents a sound investment an applicant can take advantage of the STE.

Early on in the Program's history, in 2011, a large STE awardee, Solyndra, filed for bankruptcy. At the time, the legislature convened a hearing to investigate the issue, and the CAEATFA staff and board considered whether Program changes were warranted. Ultimately, however, it was determined that, rather than having CAEATFA staff “pick winners” by projecting which businesses were likely to be successful and which were likely to fail, the judgement of applicants and their investors should prevail.

Therefore, while CAEATFA is aware that, overall, applicant projections may present a best-case scenario and be overly optimistic, it is not feasible to determine in advance which projections will turn out to be too optimistic or by how much. Nor is it desirable for CAEATFA to substitute its judgement about the likelihood of success for a company or industry (i.e. pick winners) for that of investors themselves.

SHOULD CAEATFA MAKE AWARDS BASED ON ACTUAL RATHER THAN ESTIMATED PERFORMANCE?

Another potential response to the issue of overly optimistic or best-case projections is to reward actual success rather than invest in potential success. However, CAEATFA's STE Program is designed to encourage economic activity that would not occur absent the Program, by serving as an early incentive for additional equipment investments. If economic development awards are only made after the fact to companies that

have been successful in hiring workers and selling products, then, by definition, the incentive is not needed because these companies have already made the decision to locate or expand their business in the state. In contrast, an award made coincident with a company's decision to invest its own resources (i.e., CAEATFA's approach) can help to incentivize different behavior in the form of increased capital equipment investments. Additionally, the industries and production processes represented by CAEATFA applicants – companies that make environmentally beneficial products or have innovative production processes – may tend to be more risky or uncertain relative to more traditional manufacturers. However, encouraging growth in these innovative industries is precisely the purpose of the STE Program.

Other Benefits Generated by Advanced Manufacturing Projects

In addition to creating jobs and generating fiscal benefits, approved STE Program applicants may also produce environmental benefits and additional economic benefits, including patents, industry network or cluster benefits, spin-off companies, workforce training and partnerships, location in economically distressed communities with high unemployment rates, production process improvements, and benefits of the advanced manufacturing products themselves, such as cancer treatment and space exploration. The application credits applicants with additional points in the scoring process associated with these types of benefits.

Environmental Benefits

Many advanced manufacturing applicants have deployed improvements in their manufacturing processes that reduce the impact on the environment. The application scoring process awards points for specific environmental process improvements and incorporates these points into the project's final score. These environmental improvements may include reductions in water or energy use, use of hazardous chemicals, waste generation, and emissions of air pollutants. For example, Monolith Materials, Inc. replaces crude oil as the energy source for producing carbon black with natural gas, which reduces carbon dioxide emissions during the manufacturing process by 70 percent, nitrous oxide emissions by 76 percent, and Sulphur dioxide emission by 95 percent.³⁰

Another recipient of the STE, nanoPrecision, is reducing the environmental impact of the manufacturing process that produces fiber optic connectors. The new advanced manufacturing process self-aligns metal connectors during assembly rather than manually connecting fiber optic cables using epoxy and ceramic connectors. This advanced process improves the impact of manufacturing on the environment because the raw material of the new connector consists of metal rather than ceramic, which can be melted at a temperature that is 40 percent lower than that required to melt ceramic and therefore uses less energy during the manufacturing process. Further energy is saved by eliminating the heating step during the epoxy process. The company's sustainability plan calls for recycling of all metal scrap, tracks energy use, solid waste and hazardous waste generation, and includes initiatives for reduction in environmental impacts over the long-term.

³⁰ See Monolith Inc. website: <http://monolithmaterials.com/innovative-technology/>

Industry Clusters

The application scoring process also allocates points to projects for additional economic activities that contribute to growth in the advanced manufacturing sector. By locating in an area considered an industry cluster, a manufacturing facility contributes to the geographic aggregation of firms in the same industry (i.e. “clustering”). Clustering contributes to economic growth because it drives increased investment and encourages business formation through the accumulation of resources such as information spillover, local training programs, a skilled workforce, local supply chain density, and specialized suppliers. An indicator of clustering, and thus a region’s competitiveness, is advanced manufacturing employment as a proportion of regional employment.³¹ Using this metric, California hosts 3 of the 10 highest ranked advanced industry clusters nationwide in terms of the share of metropolitan area employment in San Jose, San Francisco, and San Diego.

Though CAEATFA does not explicitly model the STE Program’s impact on industry clusters, the STE Program supports the development of these clusters to the extent that the Program stimulates economic activity that would otherwise not exist in California. Many of the companies in the STE Program are part of an industry cluster that has been identified by a California state or local government entity or regional economic development authority. Several companies are located in the southern California aerospace industry cluster, identified as such by the Los Angeles Economic Development Corporation.³² Some of these companies include nanoPrecision, Hi-Shear Corporation, The Monadnock Company, Orbital ATK DES/Northridge, Rolls-Royce High Temperature Composites, Inc., Space Exploration Technologies Corp, Weber Metals, Inc., GKN Aerospace Chem-Tronics, Millennium Space Systems, Inc., and The Gill Corporation.

Research and Development

The application scoring process also awards points for facilities engaged in research and development (R&D) related to the approved project. Such investment can contribute not only to growing the firm itself, but also to growing the state’s economy to the extent that new products or production processes are the result.³³ The advanced manufacturing industry invests a relatively high proportion of revenues in research and development when compared to other industries. Many of the advanced manufacturing companies in the STE Program perform research and development related to the product or production process in

³¹ Cooper, Christine, Shannon M. Sedgwick, and Somjita Mitra, “California’s Manufacturing Industries: Employment and Competitiveness in the 21st Century,” Institute for Applied Economics, Los Angeles County Economic Development Corporation, June 2014, page 20, http://laedc.org/wp-content/uploads/2014/07/California_Manufacturing_2014.pdf (accessed October 2016)

³² Cooper, Christine, Shannon M. Sedgwick, and Somjita Mitra, “California’s Manufacturing Industries: Employment and Competitiveness in the 21st Century,” Institute for Applied Economics, Los Angeles County Economic Development Corporation, June 2014, page 20-21, http://laedc.org/wp-content/uploads/2014/07/California_Manufacturing_2014.pdf (accessed October 2016)

³³ Cooper, Christine, Shannon M. Sedgwick, and Somjita Mitra, “California’s Manufacturing Industries: Employment and Competitiveness in the 21st Century,” Institute for Applied Economics, Los Angeles County Economic Development Corporation, June 2014, page 20-21, http://laedc.org/wp-content/uploads/2014/07/California_Manufacturing_2014.pdf (accessed October 2016)

California. For example, The Gill Corporation's facility in California, which supplies commercial aircraft and aerospace industries with high performance composite products, engages in research, materials development, and testing as well as efforts to improve its manufacturing processes and tooling using Computer Aided Design (CAD) and non-destructive testing methods.

Workforce Partnerships

The application also allocates extra points for companies that have local partnerships with educational institutions for the purpose of training current workers or assisting in the training of potential future workers. These partnerships contribute to local employment by developing a match between the skills of the local labor pool and those needed by local employers. Many applicants have these types of partnerships. For example, Weber Metals, Inc. receives the STE on machinery used to produce Hand and Die Forged Metal, which is a supply for aerospace manufacturers, and has partnerships with several colleges and universities in California. For their current employees, Weber partners with El Camino College to provide on-sight training. For potential future employees, Weber partners with WYO Tech Trade School to cultivate new technicians, and also participates in job fairs such as CalPoly San Luis Obispo Winter Career Fair and Cerritos College job placement fair. Weber is also a major sponsor for the Paramount Education Partnership, an alliance between the City of Paramount, the Paramount Unified School District, and the Paramount Chamber of Commerce, which is "dedicated to providing programs and services that increase the academic achievement and educational expectations of the City's residents."³⁴

Approved Projects Generate Benefits Beyond Those Scored in the Application

Some of the benefits that accrue to the state extend beyond those captured by the application process. The approved projects pass the net benefits test according to those benefits captured by the scoring process, but they likely generate additional benefits as well, such as patents, spin-off companies, production process improvements, and benefits of the advanced manufacturing products themselves.

By supporting manufacturing process improvements, the STE Program also supports the technological advancement of a wide range of products that benefit society, such as cancer treatment, shuttles for space exploration, and satellites for world communications. These products and the commercialized manufacturing process to genetically engineer T-cells to recognize and destroy cancer cells, currently in clinical trials, are entirely new. This immunotherapy is intended to fight even the most aggressive cancers quickly and reduce the need for chemotherapy. As another example, SpaceX manufactures advanced rockets and spacecraft for space exploration. One of the company's space shuttles has made multiple trips to the international space station delivering supplies and returning with cargo containing materials used for the advancement of science. In 2016, one of the company's rockets launched a satellite for commercial communications into orbit.

³⁴ City of Paramount, "Paramount Education Partnership (PEP)," <http://www.paramountcity.com/ps.educationpartnership.cfm?ID=29> (accessed October 2016).

VII. CONCLUSION

Manufacturing is an important sector of the California economy, accounting for a substantial fraction of the state's output, supporting high wage jobs, and stimulating considerable ancillary economic activity through purchases from supplier firms. California businesses compete on a national or even a global stage. And while business location or expansion decisions are influenced by many factors, the relative tax burden companies face is one important factor. In this context, the CAEATFA STE can help to stimulate investment on the part of California manufacturers.

An analysis of the actual performance of approved applicants suggests that the STE Program has generated net benefits for the State of California. Specifically, analysis of a sample of 48 approved projects with complete performance data shows that these projects received sales tax exclusions worth \$174 million, but generated fiscal benefits of \$171 million and environmental benefits of \$17 million, for a total net benefit of \$14 million. These projects comprise about one-fourth of all approved projects. To the extent these projects are representative of all approved projects, these results suggest that overall net benefits for the STE Program would be more than \$50 million.

To the extent economic development programs are evaluated, most simply report the gross amount of economic activity or tax revenues associated with the affected companies. Such a metric, however, does capture net benefits of a program. CAEATFA's STE Program is unique among economic development programs, both in California and nationally, in that projects are only approved if they are expected to produce a net benefit. The results presented in this report show that the STE Program has produced net benefits for the state.