Economic and Fiscal Impact Statement (STD 399) Appendix

Department of Resources Recycling and Recovery (CalRecycle)
SB 54 Plastic Pollution Prevention and Packaging Producer Responsibility Act Regulations

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Please note that in this document, numerical superscripts (e.g., [1], [2], [3]) refer to references, and Roman numeral superscripts (e.g., [i], [ii], [iii]) refer to footnotes. Additionally, the numbers presented in the text and tables have been rounded for ease of readability. Please refer to the SB 54 Direct Impacts Model for exact totals.

Note on the STD 399 and Appendix

CalRecycle submitted the STD 399 and STD 399 Appendix documents along with the Standardized Regulatory Impact Assessment (SRIA) to the Department of Finance (DOF) for review on June 30, 2025. On July 15, 2025, DOF provided feedback on CalRecycle's submission, requesting minor changes to the analysis and clarification on methodology for certain calculations. In response, CalRecycle made small adjustments to the analysis, including incorporating the most recently available California population projections and economic forecast data. These adjustments do not materially alter the estimations reported in the STD 399 and STD 399 Appendix. The comments from DOF are provided below along with CalRecycle's responses.

DOF Comment #1:

First, the 42.1-percent downward revision to the total cost, from $36.3 billion in the original SRIA to $21 billion in this revised SRIA, is driven almost entirely by a lower estimate of annual plastic waste generated in California, decreasing from 5.5 million tons in the 2021 estimate to 2.9 million tons in 2023. Estimating plastic waste is difficult and subject to uncertainty and the SRIA must provide a detailed explanation for the significant difference between the two estimates as well as a justification for why the revised estimate is more appropriate.

CalRecycle Response:

Due to the lack of available data on plastic covered material generation in California at the time CalRecycle wrote the SRIA for the initial rulemaking in 2024, for that analysis CalRecycle estimated the amount of plastic covered material by adding together the amounts of plastic covered material disposed of and recycled. To estimate the amount of disposed plastic covered material, CalRecycle utilized the most recent waste characterization study, containing data from 2021 disposal surveys. To estimate the amount of recycled plastic covered material, CalRecycle utilized data in the Recycling and Disposal Reporting System (RDRS), which contains self-reported data from entities that recycle material. In both sources, material categories are broad and do not include information specific to the amounts of covered material present. This means that those source data included large quantities of materials that are not covered material. For example, the waste characterization study includes an estimate for "Other Film Bags and Plastic Mailing Pouches." This category may include both plastic bags that qualify as packaging under the Plastic Pollution Prevention and Packaging Producer Responsibility Act (the Act) and plastic bags purchased as consumer goods for home use, such as storing items, which would not qualify as packaging or food service ware. From these sources, CalRecycle estimated that approximately 5.5 million tons of plastic covered material was generated in California every year. However, due to the lack of specificity in

the available data, this estimate included materials that would not be covered materials under the Act. Since the time of the first SRIA analysis, CalRecycle has worked on developing more specific data on covered material generation as required by the Act.

Per Public Resources Code (PRC) section 42057(b), CalRecycle was required to establish a baseline for the 25 percent source reduction goal for plastic by January 1, 2025. This study was underway while CalRecycle was developing the first SRIA but it had not yet produced usable data. Since that time, updated data on plastic covered material generation became available when CalRecycle published its study in the Source Reduction Baseline (SRB) report at the end of 2024. This report estimated that nearly 2.9 million tons of plastic covered material were generated in California in 2023. The data in this report are specific to covered material and do not include non-covered materials, unlike the waste characterization study and RDRS data. As the data are specific to materials covered under the Act, this SRB report estimate for plastic covered material is more accurate and resulted in a number lower than CalRecycle's previous estimate. The majority of the costs identified in CalRecycle's economic impact analysis are costs to meet required source reduction and recycling rate goals, including costs to switch plastic covered materials to more recyclable forms and to set up infrastructure for collecting, sorting, and processing increased amounts of material. These cost calculations rely directly upon the plastic covered material estimate. Using the SRB estimate for plastic covered material enables CalRecycle to more accurately estimate the costs to meet the required source reduction and recycling rates for plastic covered material and provides a more accurate overall estimate of the Act's implementation cost.

DOF Comment #2:

The SRIA must also provide a detailed methodology for the change in revenues to the Integrated Waste Management Account due to less plastic waste entering landfills.

CalRecycle Response:

Landfill revenue is generated by tipping fees, and CalRecycle estimated the change to tipping fee revenue by calculating the difference between the baseline covered material disposal amount and the amount of covered material expected to be disposed in California at the end of the implementation period. CalRecycle's calculations for the baseline and end of implementation covered material disposal amounts are shown in the Capacity Needs Analysis worksheet in the Direct Impacts Model. Per PRC section 48000(b)(1), tipping fees shall not exceed $1.40 per ton of solid waste disposed. CalRecycle estimated that covered material disposal would decrease by 1.4 million tons annually by the end of the implementation period. CalRecycle multiplied the maximum tipping fee ($1.40) by the difference in covered material disposal amounts in the baseline and at the end of the implementation period to arrive at the conservative estimate of annual tipping fee loss of around $2 million.

DOF Comment #3:

Second, the estimate in the SRIA must be based on the most recently available data,

forecasts, and timelines. For instance, the revised SRIA's estimates are currently based on Finance's economic forecast released in May 2023 and population projections released in January 2021. However, the most up-to-date and published forecasts reflect lower economic growth and higher inflation due to tariffs as well as significantly lower population. Incorporating these recent forecasts would likely lead to lower baseline activity and thus smaller costs and benefits.

CalRecycle Response:

CalRecycle has revised the Direct Impacts Model to include the most recent population projections from DOF, published in April 2025. CalRecycle previously estimated the total direct cost of implementing the regulations to be $21,019,959,079 in the estimate submitted to DOF. Updating the economic impact analysis increased the total direct cost estimate to $21,071,298,874, an increase of approximately $59 million, which represents a percentage increase of only 0.28% in the cost estimation. Using the most recent population projections resulted in an increase to the direct cost estimates for collection, sortation, and processing infrastructure, but did not impact any of the other direct cost categories. CalRecycle's benefits estimate was also not impacted by using the most recent population projections. The revised calculations adjusted the net impact figure by only -0.18%. This change therefore does not materially alter the overall estimation of costs and benefits as projected by the economic analysis in the draft SRIA.[i]

CalRecycle has also revised the analysis of the macroeconomic impacts of the proposed regulations to include the most recent economic forecast from DOF. In the SRIA, CalRecycle presents data for years when macroeconomic impacts are at their peak in order to show which year incurs the greatest impacts. In the previous version of the analysis, the peak year was 2030, in the current version of the analysis, the peak year is 2031. A summary of the changes to the macroeconomic impact analysis is described below. The new numbers suggest that the macroeconomic benefits may be higher than projected in the draft SRIA, which presents the more conservative estimate in the second column below.

	2023 SRIA (Peak year 2030)	2025 SRIA (Peak year 2031)
Employment	220,000 jobs (through 2034)	229,000 jobs (through 2034)
Output growth	$8.3 billion	$10.4 billion

[i] Similarly, the revisions only marginally impact estimates for annual direct costs for households, large producers, small producers, and businesses that are not producers.

Investment	$952 million	$1.1 billion
Personal income	$3.1 billion	$3.7 billion
Gross State Product	$4.5 billion	$5.5 billion

The adjustments to the macroeconomic benefits estimates do not affect the core analysis of the direct economic impacts in the SRIA.

DOF Comment #4:

Additionally, the revised SRIA's total costs and benefits include estimates for previous fiscal years even though the proposed regulations have not been adopted yet.

CalRecycle Response:

For Extended Producer Responsibility (EPR) programs, unlike other regulatory programs, costs incurred prior to regulation adoption are billed to the Producer Responsibility Organization (PRO) after the regulations are in place and program implementation has begun and are therefore ultimately borne by industry. CalRecycle includes estimates in previous fiscal years in the economic impact analysis for program set up costs to establish and develop the program at CalRecycle and develop the implementing regulations. These costs are incurred during FY 2023-25. Costs including CalRecycle staff, Needs Assessment and CEQA contracts, and administrative overhead are shown for these years because they were incurred in these years. PRC Section 42053.5(b) contemplates the need for pre-implementation funding via a loan. Through a BCP CalRecycle borrowed the pre-implementation costs from the Beverage Container Recycling Fund which will ultimately be reimbursed by the PRO. PRC Section 42053.5(a)(1) requires the PRO to cover CalRecycle's full costs of implementing and enforcing this chapter, including the actual and reasonable costs associated with regulatory activities pursuant to this chapter before submission of producer responsibility plan. None of these costs have yet been reimbursed by the PRO.

Economic Impact Statement

A. Estimated Private Sector Cost Impacts

A.3. Number of Businesses Impacted

CalRecycle defines the typical businesses affected by the Plastic Pollution Prevention and Packaging Producer Responsibility Act (the Act), SB 54 (Allen, Chapter 75, Statutes of 2022), and the proposed regulations as those spanning various industry sectors, including manufacturing, retail, wholesale, and the food service industries. CalRecycle has identified two main categories of impacted businesses. The first category includes businesses that are producers of covered material who are directly regulated by the Act. The second category includes businesses that will be impacted by implementation of the Act through possible increased costs of goods and services.

On September 7, 2023, CalRecycle accessed the Data Axle database and collected data on the number of California businesses, their yearly revenue, and the industry sections that they are in. This data was used to estimate the number of large producers, small producers, and non-regulated businesses in California that would be impacted by SB 54 and calculate the estimated cost per producer or business.

Businesses that are producers of covered material are further separated into two groups, exempt and non-exempt. Producers with gross annual sales totaling more than $1 million in the state are responsible for funding the implementation costs of the Act (non-exempt producers). CalRecycle estimates there are 5,741 of these non-exempt producers. Producers with gross annual sales of less than $1 million are eligible for exemption from SB 54's requirements (exempt producers). CalRecycle estimates that 7,874 producers will be eligible for this exemption.[1]

Businesses that are not considered producers of covered material are also expected to experience economic impacts though they are not directly regulated by the Act. An estimated 546,269 businesses (230,360 large and 315,909 small businesses) may see the cost of goods increase if producers raise prices in response to fulfilling their regulatory requirements.[2][ii]

In summary, the total number of businesses impacted, 559,884, includes non-exempt producers of covered material (5,741), exempt producers of covered material (7,874), and both large (230,360) and small businesses (315,909) not considered producers of covered material. The total number of small businesses affected by the proposed regulations, 323,783, is comprised of exempt producers of covered material (7,874) and small businesses (315,909) not considered producers of covered material.

A.4. Number of Businesses Created

[ii] To quantify businesses, CalRecycle utilized an online database called Data Axle to assess the California business landscape. Data Axle quantifies the number of businesses by industry sector along with various user defined characteristics such as the location, the number of employees, and business' annual revenue. Additionally, CalRecycle utilized information and data reported by Recycle BC, a packaging EPR program in B.C., Canada, as a basis for estimating the number of non-exempt and exempt producers subject to SB 54 in these industries.

The Producer Responsibility Organization (PRO), a non-profit organization created by the Act, is tasked with developing and implementing an Extended Producer Responsibility (EPR) program for single-use packaging and plastic single-use food service ware. The PRO plays a central role in managing and overseeing compliance with the Act and the proposed regulations, ensuring that producers meet source reduction and recycling targets, and facilitating the shift of responsibility from local governments and consumers to packaging producers. The PRO is also responsible for registration, reporting, recordkeeping, and auditing requirements, surcharge remittance and budget preparation. It is a key element in the effort to reduce packaging pollution and promote sustainability.

CalRecycle expects the current sortation and composting infrastructure to expand due to the proposed regulations. The construction and development of 8 large, 4 medium, and 2 small material recovery facilities (MRFs) to handle recyclable materials by January 1, 2032, is expected to stimulate new businesses and economic opportunities. These MRFs will lead to job creation and support the increased need for recycling services. These businesses will also foster secondary markets for recycled materials.

In total, CalRecycle estimates that a minimum of 15 businesses (14 MRFs and one PRO) will be created as a result of the proposed regulations.[iii]

A.5. Geographic Extent of Impacts

CalRecycle used a per capita covered material generation estimate to determine infrastructure capacity needed by January 1, 2032, across five California regions: Bay Area, Coastal, Mountain, Southern, and Valley. These boundaries were informed by the current data infrastructure utilized for the 2021 Waste Characterization Study (WCS)[3]. California Department of Finance (DOF) population estimates were applied to these regions to create a more specialized analysis and a better understanding of covered material generation at the regional scale.[4]

Table 1 displays details on the estimated capacity needed for MRFs by region, including constructing large, medium, and small facilities, as well as expansions of existing facilities.

[iii] To ascertain the number of MRFs needed to manage the estimated additional capacity, CalRecycle leveraged population data from the California DOF for various pre-defined regions in California to estimate covered material generation rates in 2021 and January 1, 2032. The difference in values between January 1, 2032 and 2021 provided the needed sortation capacity for each region. To estimate the number of large, medium, and small facilities needed to meet each region's requirements, CalRecycle defined MRFs of different capacities using an analysis conducted by Resource Recycling and projected the extent of MRF expansion needs in each region.

Table 1: Estimated Number of MRFs to be Constructed and Expanded by 2032

Region	2032 Capacity Needs (tons)	Number of Large Facilities (160,000 tons per year)	Number of Medium Facilities (72,000 tons per year)	Number of Small Facilities (20,000 tons per year)	Expansion of Existing Facilities (tons needed)
Bay Area	318,434	1	2	0	14,434
Coastal	78,279	0	1	0	6,279
Mountain	22,672	0	0	1	2,672
Southern	910,918	5	1	1	18,918
Valley	330,858	2	0	0	10,858
Total	**1,661,160**	**8**	**4**	**2**	**53,160**

Table 2 provides capacity needs for compostable infrastructure for these regions. Rather than new facilities being constructed, CalRecycle assumed existing composting facilities will expand to accommodate the statewide 45,612 tons of compostable and organic covered materials determined by CalRecycle's capacity needs analysis.

Table 2: Estimated Capacity Needs for Compostable Infrastructure in 2032

Region	2032 Capacity Needs (tons)
Bay Area	8,412
Coastal	2,289
Mountain	404
Southern	23,545
Valley	10,962
Total	**45,612**

Tables 1 and 2 illustrate the regional distribution of facilities and where capacity will be needed to support the Act and implementation of the proposed regulations.

A.6. Number of Jobs Created

Table 3 provides an overview of the impact of the proposed regulations on overall employment in California, encompassing all industries. Employment estimates encompass both full-time and part-time positions and are distributed based on the place of work within the Regional Economic Models, Inc (REMI) industries.[iv] The REMI calculation includes employees, sole proprietors, and active partners but excludes unpaid family workers and

[iv] The REMI Policy Insight Plus Version 2.5.0 model was employed to estimate the macroeconomic repercussions of the Proposed Regulations on California's economy. REMI is a robust economic forecasting and policy analysis model, which integrates various methodologies, including input-output, computable general equilibrium, econometric, and economic geography approaches.

volunteers. The employment impacts reflect the net change in employment, encompassing positive effects on some industries and negative effects on others.

Table 3: Total California Employment Impacts

Year	California Employment	Percent Change	Change in Total Jobs
2024	25,179,690	0.01%	2,167
2025	25,374,035	0.02%	4,667
2026	25,471,879	0.03%	7,473
2027	25,553,769	0.08%	21,128
2028	25,723,179	0.09%	24,204
2029	25,911,172	0.11%	27,827
2030	26,111,652	0.12%	31,916
2031	26,278,501	0.14%	36,064
2032	26,507,957	0.09%	22,759
2033	26,684,315	0.08%	21,770
2034	26,852,837	0.07%	19,975

The proposed regulations are anticipated to yield a favorable employment impact starting in 2024 and continuing through 2034. These findings indicate that the estimated positive employment impact stems primarily from increased demand in the paper, glass, metal, and recyclable plastic product manufacturing sectors, in addition to growth in the construction industry. There is no indication that there will be an overall net elimination of jobs within California.

The value on the Economic Impact Statement (STD 399), A.6., considers values in the Change in Total Jobs column in Table 3 from 2024 through 2034. The resulting values were summed with totals shown in Table 3 (2,167 + 4,667 + 7,473 + 21,128 + 24,204 + 27,827 + 31,916 + 36,064 + 22,759 + 21,770 + 19,975 = 219,950 jobs).

Table 4 further elaborates on these employment changes at the industry level.

Table 4: Employment Impacts by Primary and Secondary Industries

Industry	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Food Manufacturing (% Change)	0.00%	0.01%	0.02%	0.06%	0.07%	0.09%	0.10%	0.11%	0.10%	0.10%	0.09%
Food Manufacturing (Change in Jobs)	7	18	32	108	129	153	180	208	185	178	170
Converted Paper Product Manufacturing (% Change)	0.63%	1.25%	1.87%	2.49%	3.08%	3.57%	4.49%	5.29%	0.02%	0.03%	0.03%
Converted Paper Product Manufacturing (Change in Jobs)	133	262	390	516	634	732	915	1,069	4	6	6
Construction (% Change)	0.03%	0.07%	0.11%	0.26%	0.32%	0.36%	0.40%	0.43%	0.25%	0.19%	0.14%
Construction (Change in Jobs)	378	851	1,380	3,338	4,046	4,620	5,174	5,670	3,292	2,558	1,843
Glass Product Manufacturing (% Change)	1.98%	3.86%	5.70%	7.49%	9.07%	10.67%	13.06%	15.40%	(0.07%)[v]	(0.04%)	(0.02%)
Glass Product Manufacturing	144	281	413	538	648	759	924	1,084	(5)	(3)	(1)

[v] Red values in parentheses indicate negative numbers which indicates a decrease in value over time.

(Change in Jobs)											
Plastics Product Manufacturing (% Change)	0.22%	0.45%	0.67%	0.92%	1.11%	1.29%	1.54%	1.80%	0.04%	0.04%	0.04%
Plastics Product Manufacturing (Change in Jobs)	90	180	267	366	440	513	611	710	14	15	14
Steel Product Manufacturing (% Change)	0.92%	1.73%	2.40%	2.65%	2.91%	3.05%	3.78%	4.64%	(0.03%)	(0.02%)	(0.01%)
Steel Product Manufacturing (Change in Jobs)	21	40	56	61	67	70	87	107	(1)	0	0
Aluminum Production and Processing (% Change)	0.58%	1.13%	1.63%	2.50%	3.26%	3.84%	4.11%	4.76%	(0.02%)	(0.01%)	(0.01%)
Aluminum Production and Processing (Change in Jobs)	19	38	54	82	106	123	132	151	(1)	0	0
Other Fabricated Metal Product Manufacturing (% Change)	0.24%	0.49%	0.74%	1.01%	1.24%	1.49%	1.88%	2.18%	(0.03%)	(0.02%)	(0.01%)

Other Fabricated Metal Product Manufacturing (Change in Jobs)	42	87	131	176	215	257	322	371	(5)	(3)	(2)
Wholesale Trade (% Change)	0.01%	0.01%	0.02%	0.06%	0.06%	0.07%	0.08%	0.09%	0.05%	0.05%	0.05%
Wholesale Trade (Change in Jobs)	52	107	165	432	487	555	634	715	383	383	356
Retail Trade (% Change)	0.00%	0.01%	0.01%	0.05%	0.06%	0.07%	0.07%	0.08%	0.07%	0.07%	0.06%
Retail Trade (Change in Jobs)	76	171	287	1,095	1,203	1,381	1,549	1,719	1,391	1,407	1,308
Food Services and Drinking Places ($ Change)	0.00%	0.01%	0.02%	0.06%	0.08%	0.10%	0.12%	0.15%	0.14%	0.13%	0.12%
Food Services and Drinking Places (Change in Jobs)	59	181	359	966	1,243	1,592	1,963	2,367	2,284	2,138	1,950

As the requirements of the proposed regulations take effect, the heightened demand within the paper, glass, metal, and recyclable plastic product manufacturing sectors, along with the expansion of construction, management of companies, retail trade, and paper products industries, will result in increased employment opportunities.

B. Estimated Costs

B.1. Other Economic Costs

Overview
The costs for multiple activities related to the Act and implementation of the proposed regulations are described below. CalRecycle assumes the costs for small and typical businesses will increase at a rate that is equal to the statutory goal requirements. While the costs for typical and small businesses are expected to be the same, the costs for non-exempt and exempt producers are expected to be significantly different.

PRO Operations
The expected cost for the PRO through implementation of the Act is estimated to total $117 million through calendar year 2031, at an average annual cost of $14.6 million.

To determine the types of expenses and estimate the operational cost for the PRO under the proposed regulations, CalRecycle reviewed the operational costs of several existing California EPR stewardship organizations,[5] including the Paint, Carpet, and Mattress EPR programs, as well as the operational costs from Recycle BC,[6] a packaging program operator in British Columbia, Canada. The availability of detailed category distribution of cost data allowed CalRecycle to use the Mattress EPR program as a model to estimate costs for the PRO. The proportions of cost for expenses in the Mattress EPR program were used to determine the cost and allocation of expenses for the PRO. CalRecycle grouped operation costs from the EPR program into seven categories: staffing, professional services, travel, database services and development, annual reporting, research and development, and education and outreach.

CalRecycle assumed that the number of participating producers would be linked to the overall operational cost for the PRO. The number of expected participant producers approved under the PRO's plan is expected to be much higher than the number of participants in other EPR programs. For this reason, CalRecycle's model was developed so that it would scale with the number of estimated participating entities. Several linear and logarithmic functions were evaluated to determine the represented relationship of cost and the number of participating entities. A logarithmic function with a best fit line having an R^2 value of 0.9865 most accurately represented this relationship. With this optimal correlation identified, CalRecycle inputted the estimated participating entities into the determined function, resulting in the total expenses for the PRO.

Environmental Mitigation Surcharge
The PRO is required to remit a surcharge of $500 million per year, starting on July 1,

2027, and ending on January 1, 2037, to the California Department of Tax and Fee Administration for environmental mitigation of plastic pollution. The PRO is authorized to collect up to $150 million of this yearly fee from the plastic resin manufacturers of participating producers who sell plastic covered materials. Independent producers are responsible for a portion of the surcharge, to be determined by CalRecycle. The environmental mitigation surcharge, if unchanged over the next 10 years, will total $5 billion. In 2030, CalRecycle may increase the surcharge amount to ensure that the plastic source reduction targets are maintained after January 1, 2032. This determination would be made based on the increase in number of plastic components and/or the increase in plastic covered material weight determined by CalRecycle in its investigation of plastic covered material in the state.

Circular Economy Fund

The Circular Economy Fund provides funding to CalRecycle and other state agencies for staffing, contracts, and fully implementing and enforcing the proposed regulations. The PRO is responsible for reimbursing costs incurred beginning January 1, 2023, and is required to begin paying the California circular economy administrative fee starting in Fiscal Year (FY) 2026-27 and every three months thereafter, to cover these implementation and enforcement costs. To calculate the Circular Economy Fund fee amounts for each year, CalRecycle used the 2022 Budget Change Proposal[7] and existing compliance and enforcement programs and contracting costs at CalRecycle to estimate the cost of staff salaries,[8] on-site inspections,[9] and contracting.[10] On June 26, 2023, CalRecycle accessed Southwest Airline's flight reservation system at https://www.southwest.com/air/booking/, collected data on the cost of a round-trip flight to Los Angeles using Southwest, and averaged the cost of both the Wanna Get Away and Anytime fares to estimate flight costs for long-range travel at $333 for 2024. On June 23, 2023, CalRecycle accessed AAA's Fuel Prices webpage at https://gasprices.aaa.com/?state=CA and collected data on the average price per gallon for Sacramento and Los Angeles for 2024. The price per gallon in Sacramento was used for calculations for short-range trips at $4.70, and the price per gallon in Los Angeles was used for medium-range and long-range trips at $4.90. On June 26, 2023, CalRecycle accessed Lyft's ride request system at https://www.lyft.com/ride-with-lyft and collected data on fare for travel to and from the Sacramento airport. This data was used to estimate travel costs for long-range trips where CalRecycle staff will be flying to inspection locations, and any other necessary long-range trips, at $50. Through FY 2031-32, the total cost of the Circular Economy Fund is anticipated to be $76.8 million.

Source Reduction Overview

By January 1, 2032, plastic covered material must be source reduced by at least 25 percent by weight and 25 percent by the number of plastic components generated in calendar year 2023. The Act requires that a minimum of 10 percent of the source reduction requirement must be met by either switching to a reusable or refillable system or through the elimination of a plastic component. The remainder shall be achieved through

other source reduction options, which include concentration, right-sizing, lightweighting, shifting to bulk or large format packaging, or from shifting plastic covered material to non-plastic covered material.

CalRecycle established a baseline[vi] for covered material to estimate each direct cost associated with meeting the following targets: reuse or refill, reduction of plastic covered material by weight, and the reduction of the number of plastic components. Through source reduction efforts, plastic covered material is estimated to reduce from 2.9 million to 1.9 million tons, equating to a 33 percent reduction from the baseline. The source reduction cost is estimated to be $5.4 billion.

The cost for each source reduction requirement is described in detail below.

Source Reduction by Reuse and Refill

The cost to implement and fund reuse and refill systems will differ as reuse infrastructure recovers and collects packaging materials to be returned to the producers for reuse, while refill systems allow consumers to bring their own containers to a refill location. There are various pathways and options available to meet reuse and refill requirements, including establishing or expanding systems for not only primary packaging and food-service ware, but also secondary or tertiary packaging and other types of transport packaging.

CalRecycle recognizes that there will be costs associated with establishing new and expanding existing reuse and refill infrastructure and programs. The cost associated with establishing, improving, and funding these systems will depend on various factors including whether the program will be implemented on an individual producer level or a statewide program, logistical arrangements with supplier and retailer locations, and the materials used for the reusable and refillable packaging or food-service ware. The Needs Assessment required by the Act will identify the investments needed to develop reuse and refill infrastructure and to provide consumers with convenient access to infrastructure to grow and market the use of reusable and refillable packaging and food-service ware.

CalRecycle estimated the cost to develop a reusable marketplace to be $575.5 million over the Act's implementation period. To quantify the cost of developing reusable infrastructure, CalRecycle relied upon a returnable packaging study.[11] The study focuses on modeling the economic and environmental performances of reusable packaging systems in France, where reusable packages are either returned from home or at a drop-off point, sorted, cleaned, filled at the manufacturer's production line, and redistributed to retail stores.[12] The study's model distributes packaging across four industry sectors:

[vi] CalRecycle evaluated the economic and waste generation impacts of the proposed regulations against a "business-as-usual" (BAU) scenario for each year from 2022 through 2032. The baseline for the proposed regulations assumes full compliance with the existing regulations governing plastic waste, recycling, and composting, including the recently implemented SB 1383 (Lara, Chapter 355, Statutes of 2015) Short-Lived Climate Pollutants regulations. For the BAU scenario, CalRecycle used the 2021 Waste Characterization Study,2021 Recycling and Disposal Reporting System (RDRS) data in CalRecycle's material reporting database, and CalRecycle's 2024 Source Reduction Baseline (SRB) Study to estimate a baseline for the covered material generated.

beverages, personal care, fresh food, and cupboard food. This study focused solely on primary packaging. While secondary and tertiary packaging may be included in California's reuse and refill marketplace, many of these packaging types have already been created to be reusable. CalRecycle's model was created based on the consumer-level primary packaging data included in the report from France and the industry sectors most likely to experience significant expansion because of the Act.

Consistent with the study's methodology, CalRecycle projected reuse and refill infrastructure costs across three scenarios (fragmented effort, collaborative approach, and system change), each of which assumed different scaling for packaging system efficiencies, return rates, and the number of times packaging is returned (reusable packaging use cycles). The fragmented effort scenario in which producers independently collect, transport, sanitize, and return packaging to shelves or consumers without sharing infrastructure with other producers, is the least efficient and most costly system. It is also the most likely system to be utilized during the early development period. The collaborative approach scenario in which producers collaborate to share reuse and refill infrastructure assumes a shared and expandable reuse system and is slightly more efficient compared to the fragmented effort scenario. This scenario represents the start of the evolution of the system to a more cooperative and cohesive system that is likely to represent the middle of the development period. The system change scenario utilizes a fully scaled and standardized effort and is the most efficient scenario modeled in the study. This is the fully developed scenario that is expected at full program maturity.

CalRecycle leveraged the study's methodology to calculate the total cost for the production, conversion, filling, collection, sorting, washing, and transportation of reusable packaging. To calculate direct cost, CalRecycle converted source reduction goals to comparable terms in the study's model. The statutorily mandated reuse or refill rates of 10 percent were multiplied by the baseline to calculate the weight and number of plastic packages needing to be converted to a reusable or refillable system, equating to 286,472 tons by weight or 6.1 billion plastic packages by count. The 6.1 billion plastic packages were distributed across the four industry sectors using the model in the study's distribution of packages. CalRecycle assumed, consistent with the study's assumption, that the 6.1 billion single-use packages were equivalent to 6.1 billion single-use cycles. This number was applied to the total cost values across all three scenarios for each industry sector to calculate the direct cost.

CalRecycle utilized the different packaging system efficiencies for the scenarios to model the cost of establishing reuse or refill system infrastructure through the implementation period in conjunction with the goals outlined in statute. CalRecycle assumed the fragmented effort scenario to be the primary reuse system from 2024 through 2026, shifting to the collaborative approach scenario for 2027 through 2029, and then shifting to the system change scenario for 2030 through 2031.

Source Reduction by Other Methods

The remaining source reduction requirement was calculated by applying a 15 percent rate to the total weight of plastic covered material in the baseline, which equates to 0.43 million

tons by weight or 9.1 billion plastic packages by count. It was assumed this material would switch from plastic covered material to non-plastic covered material. To estimate the cost associated from converting a package from one covered material to another, the cost per ton conversion provided by a packaging study were used.[13] By applying a conversion cost per package to the number of packages switched, the associated cost is estimated to be $3.1 billion.

Source Reduction of Plastic Components

Cost estimates for source reducing 25 percent of the number of plastic components required analysis of a packaging and component study to estimate the percentage of plastic components by weight across a sample of packages used in the study.[14] Analysis of data from this study was used to estimate that plastic components represent 9.8 percent of the total weight of packages. This ratio was applied to baseline data to calculate the weight of plastic components generated in 2021, which was divided by the average weight of a plastic component (4.98 grams). A 25 percent source reduction of the number of plastic components equates to 42.9 billion components, or 0.24 million tons by weight, and the associated cost is estimated to be $1.67 billion.

Recycling Rate

The Act requires that plastic covered material achieve a recycling rate of 30 percent by January 1, 2028, 40 percent by January 1, 2030, and 65 percent by January 1, 2032. Data from the 2024 SRB Study,[15] 2021 WCS,[16] and the RDRS[17] were used to estimate a current recycling rate of six percent for plastic covered material. On August 11, 2023 and April 3, 2025, CalRecycle accessed RDRS and collected data on weights of plastic, glass, paper, metal, and organics that were recycled in the year 2021, focusing on reporting categories that were likely to contain covered material. This data was used to estimate the amount of covered material that was recycled for each category and to estimate recycling rates for each material category.

CalRecycle assumed the technological and logistical conditions that currently render some plastic packages difficult or impossible to recycle will remain and those packages will need to be switched to recyclable packaging. CalRecycle also assumed that some, but not all plastics are recyclable, and that all non-plastic covered materials are either recyclable or compostable under existing conditions. In 2021, 0.17 million tons of plastic covered material were recycled, compared to an estimated 1.5 million tons needed by 2032, indicating a difference of 1.3 million tons of packaging needing to be switched to other materials.

Anticipating a source reduction in the plastic covered material, CalRecycle adjusted the baseline by accounting for plastic material estimated to exist following a 15 percent source reduction component and the amount of plastic covered material recycled in 2021. This shifts the baseline from 2.9 million tons of plastic to 2.3 million tons of plastic.

As infrastructure expansion for plastic covered material would be much more costly than switching to materials with existing infrastructure, a shift from plastic covered material to

recyclable plastics and other existing material categories, such as paper, metal, glass, and compostable packaging was modeled. To calculate the amount of material or packages that need to switch to achieve the required recycling rates, CalRecycle analyzed different packaging distribution scenarios like the methodology presented in the source reduction discussion. Furthermore, CalRecycle relied on data from a packaging study to estimate the conversion cost of going from one packaging type to another.[18]

The total estimated cost associated with switching packages from one covered material to another, factoring in a per ton conversion cost provided by a packaging study, equates to $10.2 billion. Approximately 1.5 million tons by weight, or 30 billion packages by count of difficult to recycle plastic covered material are expected to transition to recyclable packaging.

Collection Improvements

The proposed regulations require local jurisdictions to collect all covered material categories in their collection and recycling programs. Recycling stream collection costs are estimated to be $154.8 million; however, there will be savings of $201.2 million in the reduced disposal stream collection. The net savings associated with changes to collection infrastructure for both the recycling and disposal streams is estimated to be $46.47 million. These cost savings emphasize the need to both expand recycling infrastructure and source reduce the amount of solid waste being generated.

To estimate the administrative, collection, and transportation costs associated with the recycling and disposal streams, CalRecycle has used existing cost data from “Overview of Scenario Modeling: Oregon Plastic Pollution and Recycling Modernization Act” and its associated data model.[19] This report and model were developed by Cascadia Consultants for Oregon’s Department of Environmental Quality (DEQ).[20] The Cascadia model contains extensive data regarding Oregon’s collected tonnages for the disposal and recycling streams, as well as in-depth cost data for the collection process. CalRecycle extracted cost data from this model with the assumption that collection infrastructure in Oregon is like that in California. Using waste generation tonnage differences between the two states, CalRecycle scaled single family, multi family, and commercial collection and disposal fees in California across the years of implementation.

The Cascadia model contains a baseline scenario for collection costs projected statewide in 2026, using Oregon recovery and disposal tonnages and population estimates. These costs were separated into the recycling system and disposal system. In estimating the total collection cost per ton for the recovery and disposal stream in California, the following costs were extracted from the model: recycling customer engagement, collection, administration, and transportation. CalRecycle generated a cost per ton value for each category.

CalRecycle adjusted the inputs to account for the end of 2031 California disposal and recovery data from the 2024 SRB Study, 2021 WCS, and 2021 RDRS, as well as population increases, anticipated increases in recovery tonnage and decreases in disposal tonnages due to the Proposed Regulations. These values were applied to the

cost per ton values to generate total collection infrastructure costs needed for implementation of the Act.

Materials Recovery Facility Improvements

Expanded sortation infrastructure will be needed to sort and recover the increased tonnages of covered material due to the Proposed Regulations. The total infrastructure cost to meet the new sortation requirements is estimated to be $938.4 million. CalRecycle has assumed materials recovery facilities to be the primary infrastructure utilized to recover plastic, paper, glass and metal materials and composting facilities to be the primary infrastructure utilized to recover compostable and organic materials.

The direct impact analysis cost for sortation infrastructure relies on the report "MRF Feasibility Study" conducted by the Iowa Metro Waste Authority.[21] The study estimates the 2022 cost of single-stream MRF construction and expansion using a baseline throughput of 20,000 tons per year (TPY), then provides analysis on the cost to increase that capacity by three options (30,000 TPY, 45,000 TPY, and 60,000 TPY). The study focuses on capital, equipment, and operational cost per each option. It assumes that capital cost, which includes costs associated with site acquisition, development, and direct construction, remains constant throughout each option. It also assumes each option to utilize a 54,000 ft^2 structure, which has an average throughput of 72,000 TPY. Equipment cost varies by scenario and includes a process system, equipment installation, mobile equipment, and contingency costs. Operational cost also varies by scenario and includes labor, insurance, facility maintenance and utilities, equipment operating and management, residuals haul and disposal, and contingency cost. CalRecycle has extracted capital, equipment, and operational costs across each scenario to estimate the cost per ton of constructing a new MRF or expanding an existing facility. Construction cost per ton values were used to estimate the cost of constructing three different sized facilities: large facilities with an average throughput of 160,000 TPY, medium facilities with an average throughput of 72,000 TPY, and small facilities with an average throughput of 20,000 TPY. Facility sizes were informed by an assessment conducted by Resource Recycling, which quantifies annual throughput averages by 300 MRFs in the United States.[22] This study indicated the distribution of MRFs by throughput capacities. Based on the study's findings, CalRecycle classified MRFs into large, medium, and small throughput capacities.

CalRecycle used a per capita estimation to determine January 1, 2032, infrastructure capacity needs across the previously described five California regions: Bay Area, Coastal, Mountain, Southern, and Valley. Covered material generation estimates were used to determine the number of new large, medium, or small MRFs and the scale of expansion per each region. The construction of large facilities is assumed to be the most cost-effective pathway and is prioritized in its contribution to meeting each region's sortation infrastructure needs. Remainder tonnages for new construction are distributed across medium and small facilities. Direct cost for expansion was determined by applying the residual needed capacity after construction to achieve the Act's target to a fixed cost per ton ratio. By 2032, new construction of 8 large, 4 medium, and 2 small MRFs and a 53,000 TPY expansion of existing facilities are expected to come online to recover the additional plastic, paper, metal, and glass covered material in the 2031 estimation of 1.66

million tons.

Composting Improvements
The direct cost impact analysis for composting facilities was estimated using a cost per ton ratio across each of the region's generation. Compostable and organic covered material generation across implementation years was distributed across the previously described five regions. Capital, operational and transportation costs to run a composting facility were estimated by ton and adjusted to accommodate capacity needs.

CalRecycle averaged data from a San Diego organics processing facility proposal[23] and an Organic Waste Methane Emissions Reductions cost model by California Air Resources Board on SB 1383[24] to determine the cost per ton to process organic and compostable materials. Regional tonnages of additional covered material generation were applied to this cost per ton value to determine the total cost of processing compostable and organic covered materials needed to comply with Proposed Regulations.

CalRecycle assumed a single composting facility to have an average throughput of 100,000 TPY. To accommodate the statewide 45,612 tons of compostable and organic covered materials determined by the capacity needs assessment, CalRecycle expects existing composting facilities to expand. The cost associated with expanding existing composting facilities is estimated to be $10.6 million.

Processing Infrastructure Improvements
CalRecycle anticipates increased infrastructure is needed to process sorted plastic, paper, metal, and glass covered material into new feedstocks. The total cost for processing infrastructure is estimated to be $1.5 billion.

The processing infrastructure costs for 2021 were determined using baseline covered material generation tonnages and a sum of both baled material acquisition costs and conversion costs. CalRecycle used current regional industry sorted material values to determine the average value per ton for plastic, paper, metal, and glass baled material.[25] CalRecycle assumed the conversion system of materials includes but is not limited to the following mechanical processes: transportation, cleaning, shredding, melting, crushing, and remolding. The conversion cost to convert baled material into new feedstocks were estimated using the cost needed to convert raw material into new packages generated by Plastic IQ. CalRecycle assumes Plastic IQ conversion cost data includes additional mechanical processes, which are beyond the scope of proposed regulations, and used a small factor of the conversion cost when estimating the conversion cost of baled material into new feedstock.[26] CalRecycle experienced limited availability of processing industry data regarding the conversion of baled material into new feedstocks. Baseline recycled covered material tonnages were applied to the acquisition and conversion cost per ton values. These costs were compared against estimated January 1, 2032, projected volume processing costs to get the total cost of needed infrastructure to process anticipated tonnages of sorted material.

Transportation costs for transferring new recycled material feedstocks to manufacturers

were included in the total cost calculation for processing infrastructure needs It considered the cost per ton per mile needed to move recycled material feedstocks by truck or rail.[27] CalRecycle assumed the total mileage needed to transport recycled materials would encompass the greatest distance from Northern to Southern California and that newly recycled material would be sent to a manufacturing facility within the state. These costs per ton were applied to the difference between the baseline and end of 2031 generation tonnages to determine the cost to accommodate the increased transportation of recycled materials. The average between the transportation costs by rail and by truck was taken to determine the estimated transportation cost, which was $171,930 across implementation years.

Summary of the Estimated Costs

The estimated costs to businesses and individuals in this analysis includes many assumptions for factors that will affect the actual, realized impacts to businesses, most notably decisions by the PRO and producers regarding their compliance pathways, as well as individual consumer decisions. These decisions may result in the actual impacts to businesses potentially being different from the estimates presented here.

Tables 5 and 6 provide a summary of the estimated annual cost of the proposed regulations over its lifetime and its impact on various California entities. The estimated direct costs will fluctuate yearly due to inflation rates and the phased implementation schedule for recycling and source reduction goals established by statute.

Table 5 shows that the estimated annual cost of the proposed regulations over its lifetime is $21 billion, as also reflected in the STD 399, section B.1.

For small businesses, Table 6 shows that the initial costs will be $4,349 and annual ongoing costs will be $4,806 for the years 2024-2031 (also reflected on the STD 399, section B.1.a).

For typical businesses, Table 6 shows that the initial costs will be $4,349 and annual ongoing costs will be $4,806 for the years 2024-2031 (also reflected on the STD 399, section B.1.b).

For individuals, Table 6 shows that the initial costs will be $61 and annual ongoing costs will be $67 for the years 2024-2031 (also reflected on the STD 399, section B.1.c).

Table 5: Direct Costs Associated with the Proposed Regulations (in million $)

Impact Type	Impact Sub-Type	2024	2025	2026	2027	2028	2029	2030	2031	Total
Program Administration Costs	PRO Operations	$14.6	$14.6	$14.6	$14.6	$14.6	$14.6	$14.6	$14.6	$117
	Non-Exempt Producer Annual Reporting	N/A	$14.2	$14.2	$14.2	$14.2	$14.2	$14.2	$14.2	$99.6
	Exempt Producer Annual Reporting[vii]	N/A	N/A	$2.4	N/A	$2.4	N/A	$2.4	N/A	$7.3
Manufacturing and Production Costs	Source Reduction (Reuse and Refill, Other Methods, Plastic Components)	$861.8	$861.8	$861.8	$691.8	$691.8	$691.8	$351.9	$351.9	$5,365
	Recycling Rate Improvements	$1,182	$1,182	$1,182	$1,182	$788.3	$788.3	$1,971	$1,971	$10,248
Recycling and Composting Infrastructure Costs	Collection Improvements	$18.4	$18.1	$17.8	$17.5	$17.9	$16.8	$24.8	$24.4	$154.8
	MRF and Composting Facility Improvements	$112.6	$110.9	$109.2	$107.5	$104.3	$102.9	$152.2	$149.4	$949
	Processing Infrastructure Improvements	$178.3	$175.6	$173	$170.3	$165.2	$162.9	$241	$236.6	$1,503
Fees, Surcharges, Assessments	Environmental Mitigation Surcharge	N/A	N/A	N/A	$500	$500	$500	$500	$500	$2,500
	Circular Economy Fund	$7.6	$7.5	$7.5	$7.1	$7.5	$7.5	$7.5	$7.5	$59.7
Total		**$2,375**	**$2,385**	**$2,383**	**$2,705**	**$2,306**	**$2,299**	**$3,280**	**$3,270**	**$21,003**

[vii] Annual producer reporting costs are discussed in section B.3.

Table 6: Direct Costs on Businesses and Individuals in California

Calendar Year	Annual Cost (in million $)[viii]	Small Businesses	Typical Businesses	Individuals [28]	Exempt Producers	Non-Exempt Producers
2024	$2,375	$4,349	$4,349	$61	$4,504	$413,785
2025	$2,385	$4,366	$4,366	$61	$4,521	$415,440
2026	$2,383	$4,362	$4,362	$61	$4,517	$414,633
2027	$2,705	$4,953	$4,953	$69	$5,107	$471,237
2028	$2,306	$4,220	$4,220	$59	$4,375	$401,133
2029	$2,299	$4,209	$4,209	$59	$4,363	$400,426
2030	$3,280	$6,004	$6,004	$84	$6,158	$570,792
2031	$3,270	$5,985	$5,985	$83	$6,140	$569,467
Annual Ongoing Cost (Avg)	**$2,625**	**$4,806**	**$4,806**	**$67**	**$4,961**	**$457,114**

To determine the annual cost for different groups, the total annual cost for each year of implementation was divided by the number of small businesses, typical businesses, individuals, and exempt and non-exempt producers of covered material. Section A.3 discusses the number and types of businesses affected by the proposed regulations. Population estimates were provided by the California DOF.[29] The cost is the same for small and typical businesses that are not producers of covered material because these businesses do not have specific requirements imposed by the proposed regulations. They will be impacted by the potential increased costs of goods and services. The main difference between small businesses, typical businesses, and exempt producers lies in the fact that exempt producers will incur a small annual cost of approximately $155 for record-keeping and application costs, as discussed further in section B.3.

The totals reflected in Table 6 assume an equal distribution of cost across all non-exempt producers of covered material. However, the actual costs for each non-exempt producer will vary based on several factors, including the type and amount of covered material they represent, their chosen compliance pathways, and fee decisions made by the PRO. At the time of this analysis, it is not possible to know the exact impact of the proposed regulations on any individual non-exempt producer of covered material.

B.2. Share of Total Costs for Each Industry

To assess the impact on California-based businesses, CalRecycle calculated California's proportionate share of production costs by comparing the number of entities in affected industries in California to the national industry total, as shown in Table 7.[30] This analysis helped identify the specific financial burden placed on different California industry sectors as a result of the proposed regulations.

[viii] Annual totals are from Table 5.

Table 7: Direct Production Costs Attributed to California

Industry	US Total Entities	CA Total Entities	Factor	US Total Estimated Production Cost	CA Total Estimated Production Cost
Food Manufacturing	54,406	10,383	0.19	$389.7 million	$74.4 million
Converted Paper Product Manufacturing	11,148	1,230	0.11	$46.2 million	$5.1 million
Plastics Product Manufacturing	13,336	1425	0.11	$53.5 million	$5.7 million
Glass and Glass Product Manufacturing	3,832	532	0.14	$20.0 million	$2.8 million
Other Fabricated Metal Product Manufacturing	75,330	8,723	0.12	$327.4 million	$37.9 million
Wholesale Trade	914,139	115,416	0.13	$4.3 billion	$546.9 million
Retail Trade	2,601,569	314,906	0.12	$11.8 billion	$1.4 billion
Food Services & Drinking Places	834,022	107,269	0.13	$4.0 billion	$517.8 million

B.3. Annual Reporting Requirement Costs

The proposed regulations impose reporting requirements on three types of entities: eligible exempt producers, non-exempt producers, and the PRO.

Under the proposed regulations, small producers are eligible to submit a biennial exemption application to CalRecycle, and non-exempt producers must submit annual reports to the PRO or CalRecycle that disclose their covered material details, maintain registration information, and provide data and records related to demonstrating compliance. Since the Act and the proposed regulations aim to hold non-exempt producers of covered material accountable for the end-of-life management of their products, CalRecycle considers these non-exempt producers to be the typical businesses most significantly impacted. Therefore, their reporting costs are reported in the Economic Impact Statement, B.3. The PRO is also required to submit an annual report and budgets to CalRecycle that discloses details of the progress made in reaching the statutory goals.

The estimated annual cost for small producers, non-exempt producers, and the PRO to

report is $155; $2,478; and $54,839; respectively.[ix]

C. Estimated Benefits

C.2. Statewide Benefits from the Statutory Requirements

Overview

CalRecycle finds that the proposed regulations will provide benefits to the health, safety, and welfare of California residents, and the state's environment and quality of life. Pollution associated with single-use packaging and plastic food service ware will decrease because of source reduction and recycling rate increases, leading to a decrease in negative human health and environmental impacts. The reduction in single-use plastic packaging and food service ware will result in less material being disposed of in landfills and will lead to a decrease in greenhouse gas (GHG) emissions. Reducing virgin plastic production will also decrease the amount of crude oil consumption. The proposed regulations will help California shift to a circular economy as it will hold the producers of covered material responsible for its management rather than local jurisdictions and consumers. California residents will benefit from having a consistent recycling system and increased access to reuse and refill packaging infrastructure. CalRecycle also expects a decrease in pollution resulting from reduced litter. Because this regulation doesn't directly impact workers, CalRecycle does not anticipate any direct benefits to worker safety as a result of this regulation.

Avoided Costs

Benefits from implementing the Act are expected to be the result of several changes to the solid waste system, namely:

1. As the recycling rate targets are met, less virgin material will be manufactured as it is replaced with recycled material. This results in fewer emissions to the environment.
2. The source reduction targets will result in less litter and fewer manufacturing emissions.
3. As packaging material becomes consistently recyclable or compostable and as access to recycling and composting infrastructure becomes more universal, there will be fewer instances of contamination in the recycling streams, resulting in greater efficiency.

The expected benefits can be categorized into three main groups:

1. Lifecycle model impacts to the environment and human health based on the State of Oregon's Waste Impact Calculator (WIC) tool and informed by the United States Environmental Protection Agency's Tool for Reduction and Assessment of Chemicals and Other Environmental Impacts tool.
2. Infrastructure and process management impacts associated with reduced litter and

[ix] To determine the cost of reporting for non-exempt and small producers, CalRecycle estimated the number of hours it would take to complete the task and multiplied that value by the estimated hourly salaries of the individuals involved in preparing the report.

greater efficiency at recycling facilities.

3. Chemical pollution impacts that are not accounted for in the Oregon lifecycle analysis tool, specifically, Per- and Polyfluorinated Substances (PFAS).

Table 8 provides an overview of the avoided costs and their associated impact category. Each impact category listed includes the total amount of chemical or chemical category in column 2 (quantity reduced) along with the economic impact or damage valuation in column 3 (damage costs per impact unit).[31] These two numbers are multiplied to provide a total economic impact avoided as a result of implementing the Act for each impact category. California residents will experience these savings as a result of the proposed regulations in the form of reduced incidences of health impacts and reduced impacts to the environment. CalRecycle does not anticipate that most of these savings will be passed on to local or state government agencies. Government agencies may experience savings in the form of reduced litter cleanup resulting from plastic source reduction, but CalRecycle is currently unable to estimate exactly how much agencies would save.

Additional details for each impact category are provided below in Table 8.

Table 8: Avoided Costs through Implementation of the Act

Impact Category	Quantity reduced (units)	Damage cost per impact unit (Average)	Benefits through Implementation of the Act (Avoided Cost)
Per- and Polyfluorinated Substances	1,274,221 kg	$19,943	$25,412,377,447
Litter Cleanup	381 days	$1,172,603	$447,022,222
Double Handling Material	107,850 tons per year	$56	$6,058,363
Carbon Dioxide (CO_2 equivalents)	13,127,904 metric tons	$251	$3,295,103,991
Non-Carcinogenic Effects from Toxics	4,463 cases	$3,565,489	$15,914,388,431
Respiratory Effects from Particulates (Particulate Matter 2.5 equivalents)	7,656 metric tons	$607,000	$4,646,935,012
Carcinogenic Effects from Toxics	623 cases	$5,181,435	$3,225,550,387
Ground Level Smog Formation (ozone equivalents)	726,915 metric tons	$245	$177,730,769
Waterways Eutrophication (nitrogen equivalents)	6,094 metric tons	$24,963	$152,113,613
Aquatic Ecosystems Toxicity (comparative toxicity units)	6,508,487,833 units	$0.01	$32,542,439

Impact Category	Quantity reduced (units)	Damage cost per impact unit (Average)	Benefits through Implementation of the Act (Avoided Cost)
Acidification (sulfur dioxide equivalents)	68,610 metric tons	$412	$28,233,207
Ozone Layer Depletion (Chlorofluorocarbons equivalents)	0.19 metric tons	$56,880	$10,731
Total	**N/A**	**N/A**	**$53,338,066,613**

Per- and Polyfluorinated Substances (PFAS)

PFAS are a group of synthetic chemicals widely used in various industrial and consumer plastic products for their water and grease resistant properties. Despite their usefulness, PFAS have raised significant concerns due to their persistence in the environment and bioaccumulation in living organisms. The contamination of water supplies with PFAS has led to widespread environmental and public health challenges, prompting regulatory efforts to mitigate their usage and address the associated societal impacts. Limited methodologies are available to assess the costs associated with PFAS impacts on society. CalRecycle chose an approach that closely aligns with the prevailing waste system in the California economy to quantify these costs. Additional studies indicate impacts of PFAS, including water clean-up, resulting in much higher costs than estimated in this report. CalRecycle is using a conservative approach and utilizing information that reflects the impacts from waste systems for this analysis. CalRecycle expects that through source reduction efforts, the amount of PFAS introduced into the California market will decrease and ultimately lead to a decrease in these negative effects. The average damage cost associated with negative effects of PFAS is approximately $20,000 per kg. CalRecycle estimates a reduction of approximately 1.3 million kg of PFAS as a result of plastic source reduction, leading to a saving of over $25 billion over the implementation period. [32]

Litter Cleanup

Litter poses a dual threat to both land and aquatic environments, with significant implications for ecosystems. The costs associated with cleaning up litter are substantial and encompass various aspects, reflecting both direct financial expenditures and indirect societal and environmental impacts. Direct costs involve manpower, equipment, and disposal expenses associated with the collection and removal of litter from public spaces, water bodies, and natural environments. Municipalities often bear the financial burden of these cleanup efforts, allocating funds for regular maintenance and waste management. Additionally, there are indirect economic ramifications, such as reduced property values and tourism revenues in areas marred by litter. The environmental toll includes the expenses related to the impacts of litter on ecosystems, biodiversity, and soil and water quality. CalRecycle estimates 381 fewer days of litter cleanup over the implementation period as a result of plastic source reduction and increased recycling of covered material, a savings of $447 million. [33, 34]

Double Handling Recycled Material
Currently, materials collected in the recycling bin system must be sorted and screened before further processing. Sometimes, consumers mistakenly include non-recyclable items (contaminants) within the bins. This leads to some material being handled twice; first through the recycling collection and sortation system and second as those contaminants are sent through a disposal system. This two-step handling process has increased expenses associated with it. The implementation of the Act will mandate the use of recyclable or compostable packaging, reducing consumer confusion and, by extension, contamination of the recycling bins. This is expected to reduce the incidence of inappropriate placement in the recycling bin and consequent double handling costs. The average cost of sorting material in a recycling stream is $56 per ton. CalRecycle anticipates that approximately 107,850 tons of material per year would avoid these duplicated handling expenses, resulting in a projected savings of $6.1 million over the Act's implementation period.[x]

The Social Cost of Carbon (SCC)
The SCC is a metric used to estimate the economic damage associated with each additional ton of carbon dioxide (CO_2) emitted into the atmosphere. It reflects the broader societal impact of climate change, encompassing factors like health, agriculture, property damage, and other related consequences. Essentially, it quantifies the long-term economic harm caused by the release of carbon dioxide, offering a means to assess the true cost of climate change and guide efforts to reduce GHG emissions. The estimated damage cost of GHG emissions over the implementation period is $251 per metric ton of carbon dioxide equivalents. CalRecycle estimates that the 25 percent source reduction of plastic would lead to a decrease in GHG emissions of over 13.1 million metric tons through implementation period, resulting in savings of over $3.3 billion.[35]

Lifecycle Model Benefits Determined by Waste Characterization Study (WCS) and Waste Impact Calculator (WIC)
The production, transport, and end-of-life management of covered material contribute to negative environmental and human health effects, including ozone depletion, ground level smog formation, eutrophication, respiratory diseases, and cancer. CalRecycle quantified the benefit that the recycling and source reduction of covered material would have on these negative impacts using the methods developed by the Oregon DEQ in their WIC. While there are several approaches to approximate costs associated with similar impact factors under different programs, there are fewer that apply directly to the Proposed Regulations. CalRecycle chose to use the WIC as it is the most relevant tool for evaluating the environmental and human health impacts of waste materials throughout their lifecycles and is the most appropriate tool to use to model the avoided impacts associated with the Proposed Regulations.

CalRecycle identified covered materials examined in the WCS that were represented in the impact factors table from the WIC to estimate the impacts. Impact factors representing

[x] CalRecycle utilized the Materials Recovery Facility (MRF) Feasibility Study, Metro Waste Authority, June 2018 and RDRS data to determine the costs associated with the double handling of material.

covered materials were summed to provide a single impact factor for each material for disposal (production + production transport + landfilling + landfilling transport) and for recycling/composting/reuse (production + production transport + recycling/composting/reuse + recycling/composting/reuse transport). For landfilling, the impact factors for each material were multiplied by the weight of the material from the WCS. For recycling/composting/reuse, the impact factors for the non-plastic materials were multiplied by the weight of the material from the WCS. For plastic recycling, the impact factors were multiplied by the weight of the material times 0.75, representing the 25 percent plastic source reduction goal.

The impacts were translated into monetary benefits by using the recommended damage cost per impact unit for each impact category by the Source Resource Management Group in a report prepared for DEQ. Average damage costs per unit estimates are shown in Table 8. Impact values were multiplied by the average damage cost to obtain the avoided cost (benefit) for each category, which are described in their respective sections below. [36, 37]

Non-Carcinogenic Effects from Toxics

The manufacturing of covered materials causes the release of several toxic materials and pollutants. Human exposure to these pollutants is associated with a range of adverse health effects, including heart diseases, kidney failure, reproductive disorders, and cognitive impairments. The average damage cost per case of disease from these toxins is approximately $3.6 million. CalRecycle estimates that 4,463 cases of disease will be avoided due to recycling of covered material and plastic source reduction, resulting in savings of $15.9 billion.

Carcinogenic Effects from Toxics

The manufacturing of covered materials releases various pollutants, which are identified as carcinogens. The average damage cost per case of cancer for these toxins is approximately $5.2 million. CalRecycle estimates that 623 cases of disease from carcinogens will be avoided as a result of increased recycling of covered material and plastic source reduction, resulting in savings of $3.2 billion.

Respiratory Effects from Particulates

The release of particulate matter through production and manufacturing processes poses a potential human health risk including respiratory conditions, symptoms, and diseases. The negative effects of particulate matter on respiratory health can be evaluated using a variety of methods, some of which have higher estimates than those used in this analysis. CalRecycle used the WIC lifecycle analysis tool to estimate the avoided cost of particulate matter on respiratory health as the WIC is specifically designed for evaluating environmental and human health impacts of waste materials, including packaging and single-use food service ware, and most accurately reflect the expected impacts associated with the recycling and manufacturing activities. The average damage cost per metric ton of particulates is $607,000. CalRecycle estimates that 7,656 metric tons of particulates will be avoided throughout the Act's implementation period, with a savings of $4.6 billion.

Ground Level Smog Formation
Ground-level smog forms when pollutants such as nitrogen oxides and volatile organic compounds are emitted from vehicles, industrial facilities, and other sources react in the presence of sunlight. Ground-level smog can have adverse effects on air quality, posing human health risks such as respiratory problems and aggravating pre-existing conditions. Urban areas with high concentrations of traffic and industrial activities are particularly susceptible to ground-level smog formation. The average damage cost per metric ton of ozone equivalents is $245. Through recycling of covered material and source reduction, CalRecycle estimates a reduction of approximately 727,000 metric tons of ozone equivalents and a savings of approximately $178 million.

Waterway Eutrophication
Waterway eutrophication is a process in which water bodies, such as lakes, rivers, and estuaries, become enriched with excess nutrients, particularly nitrogen and phosphorus. These nutrients often originate from agricultural runoff, sewage discharges, and other human activities. As nutrient levels increase, they stimulate the rapid growth of algae and other aquatic plants in the water. The subsequent decay of these plants depletes oxygen levels, negatively impacting fish and other aquatic organisms. Eutrophication can result in harmful algal blooms, loss of biodiversity, and a decline in water quality, posing ecological and economic challenges for affected ecosystems. Average damage cost for eutrophication is approximately $25,000 per metric ton of nitrogen equivalents and CalRecycle estimates approximately 6,094 tons of nitrogen equivalent emissions will be avoided over the implementation period. This results in savings of $152.1 million.

Aquatic Ecosystems Toxicity
Disposal practices and production processes of covered material contribute to aquatic ecosystems' toxicity through the release of harmful substances into water bodies. Improper disposal of industrial waste, including chemicals and pollutants, often leads to the contamination of rivers, lakes, and oceans. Industrial production processes, such as manufacturing and mining, release liquid wastes containing heavy metals and toxic compounds that can accumulate in aquatic ecosystems, posing serious threats to aquatic life and the overall health of the ecosystem. Aquatic ecosystems toxicity is measured in comparative toxicity units (CTU), which is a measure of the potentially affected fraction of aquatic species. Average damage cost per CTU is $0.005. CalRecycle estimates savings of $32.5 million over the implementation for avoided aquatic ecosystems toxicity.

Acidification
Disposal practices and manufacturing processes contribute to acidification through the release of sulfur dioxide and nitrogen oxides, leading to the formation of acid rain. This phenomenon adversely affects trees by leaching nutrients, weakens soil structure, corrodes buildings and infrastructure, and disrupts aquatic ecosystems. Human health is indirectly impacted through the consumption of contaminated water and crops, and respiratory issues can arise from the release of acidifying pollutants. Mitigating these effects requires sustainable waste management and pollution control measures to

minimize the environmental and health consequences of acidification. Average damage cost per metric ton of sulfur dioxide equivalents is $412. CalRecycle estimates a reduction of 68,600 metric tons of sulfur dioxide equivalents over the implementation period, leading to savings of approximately $28 million.

Ozone Layer Depletion
Current waste disposal practices contribute to ozone depletion primarily through the emission of chlorofluorocarbons (CFCs) and halons. CFCs, commonly used in refrigeration, air conditioning, and aerosol propellants, are released into the atmosphere during product disposal and can persist for long periods, eventually reaching the stratosphere. Once in the stratosphere, CFCs release chlorine atoms that break down ozone molecules, contributing to the depletion of the ozone layer. Average damage cost per metric ton of ozone equivalents is $56,880. CalRecycle estimates savings of approximately $10,700 over the implementation period in avoided ozone layer depletion.

D. Alternatives to the Regulation

D.1 Alternatives Considered

Alternative 1 differs from the proposed regulations in that it would allow covered materials composed mostly of paper to contain less than 20 percent plastic by weight without being categorized as plastic covered material. These materials would be categorized as paper covered material and would not be subject to source reduction or meeting the plastic recycling rate requirement. These materials would still need to be recyclable by the January 1, 2032, statutory deadline, but they would not be categorized as plastic. This would result in approximately 1,138 tons less material categorized as plastic covered material in Alternative 1 than in the proposed regulations. As a result of this material not being categorized as plastic covered material, the amount of material subject to the source reduction and recycling rate requirements would be reduced, which would lower the burden to comply and the associated cost. This alternative results in fewer benefits as compared to the proposed regulations.

Alternative 2 differs from the proposed regulations in that it requires producers to submit quarterly reports to the PRO as opposed to annual reports. Alternative 2 does not include a change in the amount of material categorized as plastic covered material, nor does it include any change in the source reduction or recycling rate requirements. The increased producer reporting requirements would increase the burden of complying with the proposed regulations. This alternative does not result in increased or decreased benefits as compared to the proposed regulations.

A summary of the alternatives and how they relate to the proposed regulations in terms of cost and benefits is provided in Tables 9 and 10. The methodologies described in sections B and C were utilized to determine the costs and benefits associated with both alternatives. Table 9 indicates the total costs for the proposed regulations, Alternative 1, and Alternative 2 are $21 billion, $20.5 billion, and $21.2 billion, respectively. Similarly, Table 10 shows the total benefits for the proposed regulations, Alternative 1, and

Alternative 2 as $53.3 billion, $50.8 billion, and $53.3 billion, respectively.

Table 9: Direct Cost for the Proposed Regulations and Alternatives (in billion $)

Impact Type	Impact Sub-Type	Proposed Regulations Cost[xi]	Alternative 1 Cost	Alternative 2 Cost
Program Administration Costs	PRO Operations	$0.117	$0.117	$0.117
	Non-Exempt Producer Annual Reporting	$0.100	$0.100	$0.318
	Exempt Producer Annual Reporting	$0.073	$0.073	$0.073
Manufacturing and Production Costs	Source Reduction (Reuse and Refill, Other Methods, Plastic Components)	$5.36	$5.36	$5.36
	Recycling Rate Improvements	$10.2	$9.83	$10.2
Recycling and Composting Infrastructure Costs	Collection Improvements	$0.155	$0.149	$0.155
	MRF and Composting Facility Improvements	$0.95	$0.92	$0.95
	Processing Infrastructure Improvements	$1.5	$1.45	$1.5
Fees, Surcharges, Assessments	Environmental Mitigation Surcharge	$2.5	$2.5	$2.5
	Circular Economy Fund	$0.07	$0.07	$0.07
Total		**$21**	**$20.5**	**$21.2**

Table 10: Benefits for the Proposed Regulations and Alternatives

Impact Category	Proposed Regulation Benefits[xii]	Alternative 1 Benefits	Alternative 2 Benefits
Per- and Polyfluorinated Substances (kg) (in billion $)	$25.4	$22.9	$25.4
Litter Cleanup (days) (in million $)	$447	$447	$477

[xi] Data from Table 5.
[xii] Data from Table 8.

Impact Category	Proposed Regulation Benefits[xii]	Alternative 1 Benefits	Alternative 2 Benefits
Double Handling Material (tons per year) (in million $)	$6.06	$6.06	$6.06
Carbon Dioxide (CO_2 equivalents) (metric tons) (in billion $)	$3.30	$3.29	$3.30
Non-Carcinogenic Effects from Toxics (cases) (in billion $)	$15.9	$15.9	$15.9
Carcinogenic Effects from Toxics (cases) (in billion $)	$3.23	$3.23	$3.23
Respiratory Effects from Particulates (Particulate Matter 2.5 equivalents) (metric tons) (in billion $)	$4.65	$4.65	$4.65
Ground Level Smog Formation (ozone equivalents) (metric tons) (in million $)	$178	$178	$178
Waterways Eutrophication (nitrogen equivalents) (metric tons) (in million $)	$152	$152	$152
Aquatic Ecosystems Toxicity (comparative toxicity units) (in million $)	$32.5	$32.5	$32.5
Acidification (sulfur dioxide equivalents) (metric tons) (in million $)	$28.2	$28.2	$28.2
Ozone Layer Depletion (Chlorofluorocarbons equivalents) (metric tons) (in million $)	$10,731	$10,731	$10,731
Total (in billion $)	**$50.3**	**$50.8**	**$53.3**

E. Major Regulations

E.3. Cost-effectiveness Ratio

A cost-effectiveness analysis was conducted to compare alternative pathways to the proposed regulations. The assessment examines the total implementation cost per ton of recycled plastic, cost per ton of GHG reduced, and cost per ton of material diverted from landfills for each scenario.

Alternative 1 presents a notable cost reduction compared to the proposed regulations, with an estimated implementation cost of $20.5 billion to achieve the source reduction and recycling rate goals outlined in the statute. Conversely, the proposed regulations entail an estimated cost of $21 billion to achieve the same objectives. Specifically, Alternative 1 results in recycling nearly 1.5 million tons of plastic, reducing 2.1 million metric tons CO_2 equivalents, and diverting a total of 1.5 million tons of material from the landfill. In contrast, the proposed regulations result in recycling 1.5 million tons of plastic, reducing 2.2 million metric tons of CO_2 equivalents, and diverting 1.5 million tons of material from the landfill.

Alternative 1 benefits from reduced implementation cost due to reclassification of material as non-plastic covered material. It is important to note that the cost per ton for recycling plastic decreases by $432 when compared to the proposed regulations. Costs to reduce GHG emissions and diverting material is higher compared to the proposed regulations at $39 and $411, respectively.

Alternative 2 demonstrates a cost increase compared to the proposed regulations, with an implementation cost of $21.2 billion to achieve the goals outlined in the statute. Conversely, the proposed regulations entail an estimated cost of $21 billion to achieve the same objectives. In terms of the quantity of plastic covered material recycled, the amount of GHG reduction, and the amount of material diverted from the landfill, Alternative 2 and the proposed regulations achieve the same results. Alternative 2 requires producers to provide updates to the PRO and CalRecycle more frequently, increasing their administrative cost and the overall cost per ton basis for the metrics previously mentioned.

Alternative 2 and the proposed regulations achieve the same results but differ in cost because of increased requirements for producers. The cost per ton for recycling plastic, reducing GHG emissions, and diverting material are higher at $146, $100, and $148, respectively, compared to the proposed regulations.

To establish a cost-effectiveness ratio, CalRecycle calculated the average cost per ton for recycled plastic, GHG reduction, and material diverted from landfill for the proposed regulations, Alternative 1, and Alternative 2. This equates to values of $12,638, $12,643, and $12,769 for each scenario, respectively. The proposed regulation's baseline value is assigned 1 (calculated by dividing $12,638 by $12,638). The ratio for Alternative 1 is 0.9995 (calculated by dividing $12,638 by $12,643), which indicates that despite a lower implementation cost, the cost-effectiveness is lower compared to the proposed regulations. The calculated ratio for Alternative 2 is 0.9897 (calculated by dividing $12,638 by $12,769), indicating a slightly lower cost-effectiveness compared to the proposed regulations without any added benefits.

E.5.a. Investment in the State

Private domestic investment consists of purchases of residential and nonresidential structures and of equipment and software by private businesses and nonprofit institutions. It is used as a proxy for impacts on investments in California because it provides an

indicator of the future productive capacity of the economy.

The relative changes in private investment growth attributable to the proposed regulations are detailed in Table 11. They indicate an initial rise in private investment of approximately $49 million in 2024, followed by a positive trajectory, peaking at an increase of $952 million in 2030. It is noteworthy that these shifts in investment do not surpass 0.15 percent of the baseline investment figures throughout the entire regulatory timeline. There is no indication that there will be a net decrease in investment in the state as a result of the proposed regulations.

Table 11: Change in Gross Domestic Investment Growth

Impact Category	2024	2026	2028	2030	2032	2034
Private Investment (Current M$)	488,889	553,368	597,085	631,447	662,325	690,269
% Change	0.01%	0.04%	0.12%	0.15%	0.12%	0.06%
Change (Current M$)	**49**	**216**	**710**	**952**	**769**	**420**

E.5.b. Incentive for Innovation

The proposed regulations establish material packaging standards, creating an incentive for manufacturers to explore innovative and cost-effective approaches to meet these standards, thereby mitigating compliance expenses. Manufacturers who invest in and gain expertise in technologies that lower compliance cost stand to gain advantages as the market expands. Covered material producers will have increased incentive to develop new products and materials that are compliant with the proposed regulations and function as well as the packaging and food service ware currently in the market. By innovating, these covered material producers will ensure that companies will continue to buy their packaging and food service ware for their own products, which are required to be packaged with compliant covered material. CalRecycle expects that there will be increased incentive to develop new processes for recycling covered material as well. It may be more cost-effective to develop a recycling process for a material that isn't recyclable currently rather than developing an entirely new material that performs the same function.

E.5.c. Other Benefits

In addition to the benefits described in Section C.2, benefits to the health, safety, and welfare of California residents, and the state's environment and quality of life are further discussed below.[xiii]

[xiii] Responses to sections E.5.a-c. are based on results from REMI.

Plastic Pollution
The landfill disposal of plastics releases methane and carbon dioxide into the atmosphere, and percolation of fluids through trash leaches contaminants that if not controlled can enter soil and groundwater. These pollutants are an environmental and public health concern and can lead to adverse effects on human health such as cancer, asthma, and birth defects.[38] The proposed regulations would reduce the disposal of plastic material, decreasing these negative impacts.

Source reduction reduces the amount of material in the disposal stream by reducing the amount of material that is generated. The proposed regulations implement the requirement that plastic covered material to be source reduced by 25 percent. This will require the elimination of approximately 716,179 tons of plastic material. As a result of plastic source reduction, there will be less plastic in the system that could potentially make its way into the environment. CalRecycle expects that there will also be a decrease in the amount of plastic litter.

The proposed regulations implement not only the requirement for the source reduction of plastic covered material, but also the Act's requirement that all covered material, including plastics, must be recyclable or compostable by January 1, 2032. However, not all materials that can be recycled or composted end up being recycled or composted. The proposed regulations implement the Act's requirement to increase the recycling rate by requiring that plastic covered material meet a minimum 65 percent recycling rate by the beginning of 2032. As previously described, CalRecycle estimated that plastic covered material was recycled at a rate of six percent in 2021. To meet the recycling rate requirement, approximately 0.72 million tons of plastic covered material must be diverted from disposal each year. The expansion of new infrastructure that improves the recycling capacity for plastic will also likely lead to an increase in recycling of other materials, such as glass and metals. These covered materials do not have statutory recycling rate requirements, but the increase in infrastructure to meet the plastic recycling rate requirement will allow for a higher volume of other materials to be recycled.

The increased recycling rate of plastic packaging and plastic single-use food service ware would increase the volume of plastic material that is captured and processed, leading to a further decrease in plastic pollution. Through source reduction and increased recycling, the proposed regulations would lead to a decrease in contaminants released, thus reducing the associated environmental and public health risks.

Greenhouse Gas (GHG) Emissions
Eliminating plastic packaging has the potential to reduce emissions up to 4.3 metric tons of CO_2 equivalents (t CO_2 eq) per metric ton of plastic avoided if no replacement technology is needed.[39] CalRecycle estimates that the decrease in plastic covered material will result in a reduction of approximately 13.1 million t CO_2 eq emissions by 2032. CalRecycle expects that the increase in recycling of covered materials will also lead to a decrease in GHG emissions over what is saved from source reduction. Switching from lighter packaging to other types of packaging which may be heavier, is expected to result in an increase in transportation emissions. This may result in lower net emissions

reductions than expected from the reduction due to plastic packaging elimination and recycling alone.

Resource Conservation
Recycling leads to a decrease in virgin material resource use. It takes 0.4 gallons of crude oil to make one pound of plastic.[40] Through the implementation of the Act, CalRecycle estimates there will be a reduction of 1.43 billion pounds of plastic material, equating to a reduction of 573 million gallons of crude oil.

Economic Resilience and Responsibility
CalRecycle is committed to helping California transition to a circular economy. A circular economy supports the reduction in use of new virgin plastic, increases plastic reuse, improves recycling, and reduces the amount of waste generated. Moving to a circular economy can shift the responsibility of product management to the producers of the products. Frameworks such as EPR hold producers responsible for product management throughout the product's lifecycle. EPR supports recycling and materials management goals that contribute to a circular economy and can also encourage product design changes that minimize environmental impacts.[41] With the construction and support of diverse recycling and composting infrastructure, California's recycling system will be more stable and less dependent on large foreign recycling infrastructure.

Social Benefits
Currently, acceptance of covered materials for recycling varies from jurisdiction to jurisdiction. CalRecycle expects that the proposed regulations will create a more consistent recycling system within California, reducing confusion around the recyclability of covered material. Implementing the Act's regulations will ensure consistency by ensuring uniform acceptance of recyclable covered materials in every jurisdiction's collection program by January 1, 2032. Increased access to reuse and refill infrastructure will allow more consumers to make the switch from disposable materials to recyclable or reusable materials. The decline in pollution and litter resulting from plastic source reduction will lead to cleaner public spaces, like roads and parks, and cleaner waterways.

Benefits to Businesses
Plastic packaging is ubiquitous in the marketplace. CalRecycle expects that a wide range of businesses would see benefits from the proposed regulations. The proposed regulations would increase revenue from the sale of products made from recycled materials. Businesses will have to expend less effort to review claims from producers regarding recyclability of packaging and it will be easier to provide products packaged in a way that consumers want. California businesses are also likely to observe a reduction in the cost of disposal services as they will be generating more recyclables rather than disposables. However, this material may shift to recycling and composting streams, and businesses may also see cost increases in those collection services.

Packaging manufacturers would need to design and engineer new packaging that is compliant with the regulations, providing opportunities for innovation. An increase in recyclable and compostable materials would increase the demand for responsible end

markets to process both the existing and new packaging and food service ware types.

In addition to receiving the benefits described above, producers of covered material with gross sales of less than $1 million in the most recent calendar year may be exempt from the requirement to join a PRO and the requirement to report information to CalRecycle, except for reporting information relevant to prove their status as a small business as defined in statute.[42]

Benefits to Individuals
In addition to the environmental, social, health, safety, and welfare benefits mentioned above, California residents will also benefit from greater accessibility to recycling and composting due to the increase in infrastructure for collection, sortation, and processing of recyclable and compostable materials. Greater reliance on local recycling and composting facilities can create more jobs locally and reduce emissions from the transport of recyclable and compostable materials. CalRecycle anticipates that new jobs will be created as a result of the proposed regulations, especially in the collection and recycling industries, due to the increased amount of recyclable and compostable material that will need to be properly managed. Low-income communities will have more access to the monetary resources of covered material producers through the PRO to build up infrastructure for recycling and composting that was previously unavailable due to lack of funding. These communities will also benefit from the funds set aside in the California Plastic Pollution Mitigation Fund for disadvantaged and low-income areas to reduce the environmental and public health impacts of plastic pollution.

Fiscal Impact Statement

A. Fiscal Effect on Local Government

A.6. Other

The PRO is responsible for fully reimbursing the costs incurred by local jurisdictions in meeting the requirements of the proposed regulations. Additionally, a portion of California Plastic Pollution Mitigation Funds, upon appropriation by the Legislature, may be used to support grants for tribes, non-governmental organizations, community-based organizations, land trusts, and local jurisdictions. The proposed regulations implement the statutory requirement on local jurisdictions and recycling service providers as defined, to include in their collection and recycling programs, all covered material contained on the covered material category lists published by CalRecycle. Implementing the proposed regulations will require coordination between the PRO, Independent Producers, local jurisdictions, and recycling service providers to provide education and outreach; process and transport of covered materials; perform waste stream sampling and reporting; mitigate contamination; improve collection, sorting, decontamination, and remanufacturing; expand curbside collection programs; and other infrastructure necessary or appropriate to achieve recycling rate target goals. These costs include costs related to both curbside and non-curbside collection programs and may be varied based on population density, distance to

a viable responsible end market, and other relevant factors. As local jurisdictions and recycling service providers will be reimbursed for these costs by the PRO, CalRecycle does not anticipate any direct savings to local jurisdictions and recycling service providers as a result of the proposed regulations.

CalRecycle estimates that the average annual cost to improve and expand recycling collection services may be as much as $18.4 million through FY 2023-24, 2024-25, and 2025-26. For a detailed description of CalRecycle's methodology for estimating collection costs, see the Collection Improvements section above. Table 5 shows the annual cost estimates for collection services through the end of the implementation period.

B. Fiscal Effect on State Government

B.4. Other

The Circular Economy Fund provides funding to CalRecycle and other state agencies for staffing, contracts, and fully implementing and enforcing the proposed regulations. The PRO is responsible for reimbursing costs incurred beginning January 1, 2023, and is required to begin paying the California circular economy administrative fee starting in FY 2026-27 and every three months thereafter, to cover these implementation and enforcement costs. The total staffing cost for CalRecycle is estimated to be $63.4 million. On-site inspections are estimated to be $5.95 million across implementation years, and contracts hired to conduct the Needs Assessment, economic impact reports, and Information Technology infrastructure are estimated to total $7.4 million.

Moneys in the California Plastic Pollution Mitigation Fund will be distributed to various government agencies to monitor and reduce the negative environmental and human health impacts and to mitigate the historical and current environmental justice and public health impacts of plastic pollution. From 2027 to 2037, the Department of Fish and Wildlife, the Wildlife Conservation Board, the State Coastal Conservancy, the California Coastal Commission, the Ocean Protection Council, the Department of Parks and Recreation, the Natural Resources Agency, and the California Environmental Protection Agency (EPA) will receive 40 percent (at least $200 million annually) of these funds to monitor the impacts of plastic pollution. The Strategic Growth Council, the California EPA, the Natural Resources Agency, and the Department of Justice will receive 60 percent (at least $300 million annually) of the moneys in the California Plastic Pollution Mitigation Fund to mitigate the current and historical impacts of plastic pollution on disadvantaged, low-income, and rural communities between 2027 and 2037.

State government would see a decrease in revenue from disposal stream tipping fees of approximately $2.1 million, as the anticipated tonnages of covered material entering the landfill should decrease due to the Act. A loss of tip fee revenues for the disposal stream was calculated by applying the difference between the baseline and the end of 2031 disposal tonnages to the $1.40 fee per ton outlined in Public Resources Code section 48000(b)(1). Additionally, the estimated state income tax revenue is projected to increase by $574.7 million through the implementation period because of jobs created by the

statutory mandate and the promulgation of these proposed regulations.

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