

## STUDY: AB 398 - Allowance Ceiling Prices and Speed Bumps

### **Purpose of the Study:**

Assembly Bill (AB) 398 has two provisions to contain the costs of California's climate change program: it requires the California Air Resources Board (ARB) to establish a firm price (ceiling) on cap-and-trade allowance prices and set two intermediary containment prices (speed bump prices) at which allowances would be available for sale. To help inform regulators in setting the ceiling and speed bump prices, NERA Economic Consulting undertook a study to estimate the economic impacts of range of values for these prices. NERA analyzed four scenarios that differ only in the level of these prices. All scenarios include a suite of the California specific complementary measures and the cap-and-trade program with a 2030 target of 40% below 1990 level greenhouse gas (GHG) emissions (see Tables 2 through 4 for further description of the scenarios). This study was funded by the California Manufacturers & Technology Association (CMTA).

NERA analyzed four scenarios, which vary in their ceiling and speed bump prices. For all scenarios, the speed bump prices were set at one-third and two-thirds of the difference between the floor and ceiling prices with one-third of the containment reserve allowances accrued through 2020 made available at each of these prices. The remaining APCR allowances are assumed available for purchase at the ceiling price. In regards to the allowance market, the study assumes myopic behavior on the part of consumers and producers to capture market expectations about the uncertainties surrounding California's GHG policy. The study finds that the economic costs of California's greenhouse gas policies decline as the ceiling and speed bump prices are lowered (see Table 1).

### **Key Findings and Results:**

1. As ceiling prices increase, negative economic impacts to California's economy and households increase. By 2030, the loss in household income is about \$190 greater in the \$166 case than it is in the \$92 case (see Table 1).
2. Speed bumps, when placed at 1/3 and 2/3 between the ceiling and floor, help maintain lower near-term allowance prices and delay the year in which the ceiling price is reached thus providing for a relatively smooth escalation in allowance prices. Put differently, proposals to set the speed bumps closer to the ceiling or otherwise eliminate the unused allowances would likely lead to a more rapid ascent in allowance prices.
3. The model finds the price ceiling is reached a couple years prior to 2030 in the \$39 case, around 2030 for the \$67 and \$92 cases, and a few years after 2030 in the \$166 case.<sup>1</sup>

**Table 1: Macroeconomic Results (2021\$)**

Ceiling Price Scenarios (\$/MT CO <sub>2</sub> ):	\$39		\$67		\$92		\$166	
Impacts	2025	2030	2025	2030	2025	2030	2025	2030
Allowance Price (\$/MT CO <sub>2</sub> )	\$33	\$39	\$39	\$67	\$47	\$92	\$56	\$150
Change in Household Income (\$/HH)	N/A		-\$83	-\$160	-\$110	-\$260	-\$210	-\$450
Change in Gross State Product (Billion \$s)			-\$3	-\$5	-\$4	-\$6	-\$3	-\$7
Change in Job Equivalents ('000 jobs) <sup>1</sup>			-6	-26	-12	-48	-29	-94

\*All macroeconomic impacts except the allowance price are measured relative to the "\$39 Price Ceiling" scenario.

<sup>1</sup> AB398 provides for a mechanism whereby *if* the price ceiling is reached, unlimited allowances can be purchased by obligated parties. AB398 directs that the proceeds of the sale of those allowances are to be used to fund additional emission reductions in order to maintain the environmental integrity of the program. The allowance price is endogenously determined and not equal to the ceiling price until the allowance price reaches this price.

## **Model, Scenarios, and Assumptions**

This study employs NERA’s proprietary N<sub>ew</sub>ERA modeling system<sup>ii</sup> to analyze the four scenarios (see Table 2). All scenarios impose the current program’s 2030 GHG emissions target of 40% below 1990 levels and assume the emissions cap continues to declines toward the 2050 target of 80% below 1990 levels. To reflect existing law, all scenarios employ an economy-wide cap-and-trade program<sup>iii</sup> and allow for fixed percentages of offsets that vary by year (see Table 3). Additionally, all scenarios employ a 50% renewable portfolio standard (RPS) target, a doubling of energy efficiency in commercial buildings by 2030, a low carbon fuel standard (LCFS), and a zero-emission vehicle (ZEV) requirement (see Table 4).

**Table 2: Price Ceiling and Speed Bump Prices for all Scenarios (2021\$)**

	Price Ceiling (2021\$/MT CO <sub>2</sub> )	2021 Speed Bump Prices (2021\$/MT CO <sub>2</sub> )	
Scenarios	2021 - 2030	Speed Bump 1	Speed Bump 2
\$39 Price Ceiling	\$39	\$25	\$32
\$67 Price Ceiling	\$67	\$35	\$51
\$92 Price Ceiling	\$92	\$43	\$68
\$166 Price Ceiling	\$166	\$68	\$116

**Table 3: Assumptions about Cap-and-Trade Program Common to all Scenarios**

GHG Target		Cap-and-Trade	Offsets Allowed (% Obligation)		
2020	2030	All Years	2018-2020	2021-2025	Post 2025
1990 levels	40% below 1990 levels	Economy-wide	8%	4%	6%

**Table 4: Complementary Measures Common to all Scenarios**

LCFS (Improvement in Carbon Intensity from 2010)		ZEV Requirement (Millions of ZEVs)		Efficiency Standard (Improvement from 2010)	RPS Program Renewables Requirement	
2020	2030	2025	2030	2030	2020	2030
10%	18%	1.5	4.2	Double	33%	50%

<sup>i</sup> The number of job-equivalents equals total labor income change divided by the average annual income per job. This does not represent a projection of the numbers of workers that may need to change jobs and/or be unemployed, as some or all of the loss in labor income could take the form of lower wages and be spread across workers who remain employed.

<sup>ii</sup> The N<sub>ew</sub>ERA model fully integrates a detailed bottom-up, unit level electricity sector model with a top-down macroeconomic model of the U.S. economy.

<sup>iii</sup> In this study, NERA assumes that all revenues from the sale of cap-and-trade allowances and ceiling price allowances are recycled back to households in a lump sum manner, which in general is economically more efficient than a policy to expend the revenues on specific projects. If we were to instead model the current implementation of earmarking revenues for specific projects, we would most likely project larger negative impacts.