



Incorporating GHG Benefit-Cost Criteria in ARFVTP

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California Energy Commission

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Assembly Bill 8

(Perea, Chapter 401, Statutes of 2013)

Assembly Bill No. 8

CHAPTER 401

An act to amend Sections 41081, 44060.5, 44125, 44225, 44229, 44270.3, 44271, 44272, 44273, 44274, 44275, 44280, 44281, 44282, 44283, 44287, 44289.1, and 44289.2 of, to add and repeal Section 43018.9 of, and to repeal Section 44289 of the Health and Safety Code, to amend Sections 42885 and 42889 of the Public Resources Code, and to amend Sections 9250.1, 9250.2, 9291.1, and 9833.6 of the Vehicle Code, relating to vehicular air pollution, and declaring the urgency thereof, to take effect immediately

[Approved by Governor September 28, 2013 Filed with Secretary of State September 28, 2013.]

LEGISLATIVE COUNSEL'S DIGEST

AB 8, Perea. Alternative fuel and vehicle technologies, funding programs.
(1) Existing law establishes the Alternative and Renewable Fuel and Vehicle Technology Program, administered by the State Energy Resources Conservation and Development Commission, to provide to specified entities, upon appropriation by the Legislature, grants, loans, loan guarantees, revolving loans, or other appropriate measures, for the development and deployment of innovative technologies that would transform California's fuel and vehicle types to help attain the state's climate change goals. Existing law specifies that only certain projects or programs are eligible for funding, including block grants administered by public entities or non-for-profit technology entities for multiple projects, education and program promotion within California, and development of alternative and renewable fuel and vehicle technology centers. Existing law requires the commission to develop and adopt an investment plan to determine priorities and opportunities for the program. Existing law also creates the Air Quality Improvement Program, administered by the State Air Resources Board, to fund air quality improvement projects related to fuel and vehicle technologies.

This bill would provide that the state board has no authority to enforce any element of its existing clean fuels outlet regulation or other regulation that requires or has the effect of requiring any supplier, as defined, to construct, operate, or provide funding for the construction or operation of any publicly available hydrogen-fueling station. The bill would require the state board to aggregate and make available to the public, no later than June 30, 2014, and every year thereafter, the number of hydrogen-fueled vehicles that motor vehicle manufacturers project to be sold or leased over the next 3 years, as reported by the Department of Motor Vehicles through April 30. The bill would require the commission to allocate \$20 million annually, as specified, until there are at least 100 publicly available hydrogen-fueling

- Extends ARFVTP funding through January 1, 2024

- \$100 million per year

- Introduces “Benefit-Cost Score” provision

“...develop and deploy innovative technologies that transform California’s fuel and vehicle types to help attain the state’s climate change policies.” (Health and Safety Code Section 44272(a))



GHG Benefit-Cost Score in AB 8

- Definition: “...a project’s expected or potential greenhouse gas emissions reduction per dollar awarded by the Commission to the project.” (Health and Safety Code, Sec. 44270.3[a])
- “Establish a competitive process for the allocation of funds for projects... which considers, among other factors, the benefit-cost score...” (Sec. 44271[a][2])
- “The commission shall rank applications for projects proposed for funding awards based on solicitation criteria developed in accordance with subdivision (c), and shall give additional preference to funding those projects with higher benefit-cost scores (Sec. 44272[d])

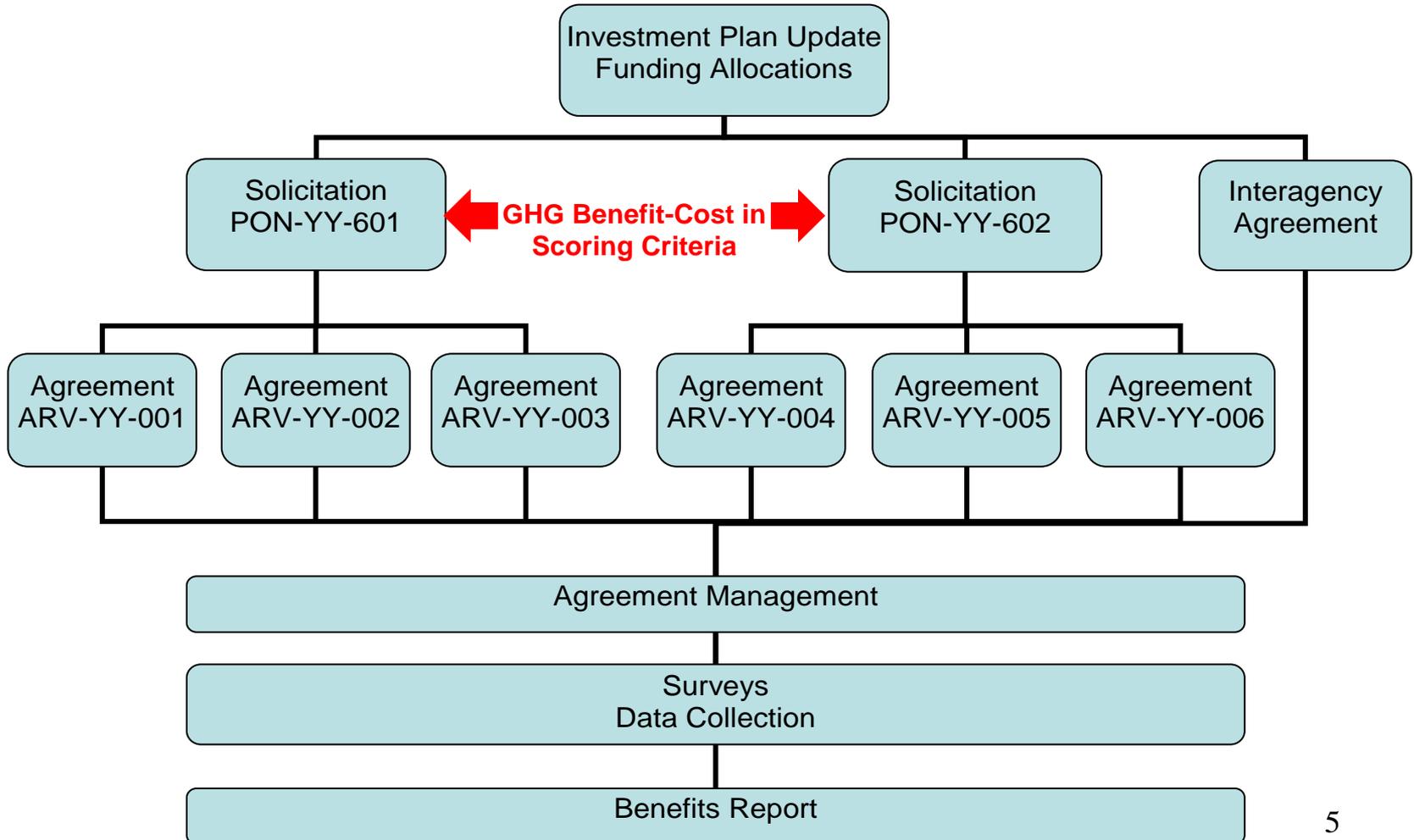


Project Preferences in Statute

Sec. 44272(c)(1) Transition to Alternative Fuels	The project's ability to provide a measurable transition from the nearly exclusive use of petroleum fuels to a diverse portfolio of viable alternative fuels that meet petroleum reduction and alternative fuel use goals.	Sec. 44272(c)(7) Economic Benefits	The project provides economic benefits for California by promoting California-based technology firms, jobs, and businesses.
Sec. 44272(c)(2) Consistency with Climate Policy	The project's consistency with existing and future state climate change policy and low-carbon fuel standards.	Sec. 44272(c)(8) Use of Existing Infrastructure	The project uses existing or proposed fueling infrastructure to maximize the outcome of the project.
Sec. 44272(c)(3) Reduce Criteria Pollutants	The project's ability to reduce criteria air pollutants and air toxics and reduce or avoid multimedia environmental impacts.	Sec. 44272(c)(9) Reduce Lifecycle GHG Emissions	The project's ability to reduce on a life-cycle assessment greenhouse gas emissions by at least 10 percent, and higher percentages in the future...
Sec. 44272(c)(4) Decrease Water Pollutants and Others	The project's ability to decrease, on a life-cycle basis, the discharge of water pollutants or any other substances known to damage human health or the environment...	Sec. 44272(c)(10) Alternative Fuel Use	The project's use of alternative fuel blends of at least 20 percent, and higher blend ratios in the future, with a preference for projects with higher blends.
Sec. 44272(c)(5) Natural Resource Sustainability	The project does not adversely impact the sustainability of the state's natural resources, especially state and federal lands.	Sec. 44272(c)(11) Technology Advancement	The project drives new technology advancement for vehicles, vessels, engines, and other equipment, and promotes the deployment of that technology in the marketplace.
Sec. 44272(c)(6) Matching Funds	The project provides nonstate matching funds. ...	Sec. 44272(d) Benefit-Cost Scores	The commission shall rank applications for projects proposed for funding awards based on solicitation criteria developed in accordance with subdivision (c), and shall give additional preference to funding those projects with higher benefit-cost scores.



Program Implementation





Recent GHG Benefit-Cost Scoring

PON	Subject Area	Relevant Scoring Element(s)	Part of...	Criterion Weight
PON-13-604	Federal Cost-Sharing	<i>“The proposed project demonstrates cost-effectiveness and efficient use of state and match share funds. Applicants demonstrating greater cost-effectiveness will be scored higher.”</i>	Cost-Effectiveness / Match Share	25 out of 100 total possible points
		<i>“Degree to which the project reduces GHG emission for each dollar of Energy Commission funds requested.”</i>	Cost-Effectiveness / Match Share	“ “ “
PON-13-607	Hydrogen Refueling Infrastructure	<i>“The proposed project demonstrates cost-effectiveness and efficient use of state and match share funds. Applicants demonstrating greater cost-effectiveness will be scored higher.”</i>	Project Budget	40 out of 380 total possible points
		<i>“Degree to which the project reduces GHG emission for each dollar of Energy Commission funds requested.”</i>	Economic Benefits	20 out of 380 total possible points



Recent GHG Benefit-Cost Scoring, cont.

PON	Subject Area	Relevant Scoring Element(s)	Part of...	Criterion Weight
PON-13-606	Electric Vehicle Charging Infrastructure	<i>“The proposed project results in a greater benefit-cost number as defined as the expected amount of GHG reductions per dollar of Energy Commission funding requested.”</i>	Project Budget and Economic Benefits	10 out of 100 total possible points
PON-13-609	Biofuel Production	<i>“Degree to which the proposed project results in a greater benefit-cost score defined as the proposed cost of GHG reductions in dollars of Energy Commission funding per ton of carbon reduced.”</i>	Project Budget	40 out of 300 total possible points
PON-13-610	Natural Gas Vehicle Incentives	No scoring criteria – first come, first served. Revised incentives to maximize benefit-cost ratio based on approximate fuel use by weight class.	Not applicable.	



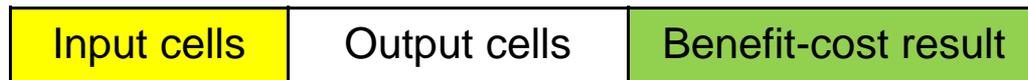
Review of GHG Benefit-Costs

- Benefits = (Amount of conventional fuel displaced per year by alternative fuel) * (Carbon intensity reduction) = GHG emissions reduced per year
- Benefits * 10 year life / (ARFVTP \$ in M) = Benefit-Cost
- Low Case and High Case reflect range of awards and assumptions
- **Only calculates an estimate of direct benefits**
- In examples, yellow cells are inputs, green cells are results



Example: Diesel Substitute Production (Commercial Scale)

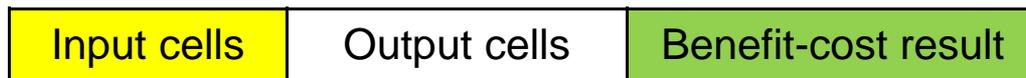
Diesel Sub Production Facility - Commercial	Low Case	High Case
ARFVTP share:	\$5,000,000	\$2,600,000
Annual production (DGE):	365,000	4,800,000
Annual DGE displaced:	365,000	4,800,000
gCO ₂ e/MJ of alternative fuel:	30	15
GHG emission reductions/year (tonnes):	3,351	53,784
10 year GHG emission reductions (tonnes):	33,507	537,840
10 year GHG benefit cost (tonnes/\$1M):	6,701	206,862





Example: Workplace EVSE

Workplace EVSE (Level 2)	Low Case	High Case
ARFVTP cost:	\$8,000	\$3,000
KWh charged per day:	7.0	20.0
Work days per year:	250	250
KWh charged per year:	1,750	5,000
GGE displaced per year (inc. EER):	178	509
gCO ₂ e/MJ of alternative fuel (inc. EER):	36.5	30.8
GHG emission reductions/year:	1.3	4.2
10 year GHG emission reductions:	13.4	41.7
10 year GHG benefit cost (tonne/\$1M):	1,670	13,886





Example: Heavy-Duty CNG Truck Incentive

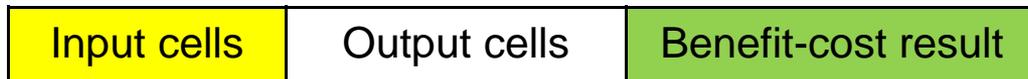
Heavy-Duty CNG Truck Incentive	Low Case	High Case
ARFVTP share:	\$20,000	\$20,000
Displaced vehicle's annual VMT:	15,000	50,000
Displaced vehicle's miles per DGE:	7.0	4.0
Annual DGE displaced:	2,143	12,500
EER of NG Vehicles:	0.95	0.95
gCO ₂ e/MJ of alternative fuel (inc. EER):	71.58	71.58
GHG emission reductions/year (tonnes):	7.6	44.6
10 year GHG emission reductions (tonnes):	76	446
10 year GHG benefit cost (tonnes/\$1M):	3,822	22,293

Input cells	Output cells	Benefit-cost result
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Example: Hydrogen Fueling Station

Hydrogen Fueling Station	Low Case	High Case
ARFVTP share:	\$2,000,000	\$1,500,000
Daily station capacity (kg):	180	300
Annual station capacity (kg):	64,800	108,000
Miles per kg of average FCV:	65	65
MPG of displaced conventional vehicle:	25	25
Annual GGE displaced:	168,480	280,800
gCO ₂ e/MJ of alternative fuel (inc. EER):	40.9	29.2
GHG emission reductions/year (tonnes):	1,175	2,353
10 year GHG emission reductions (tonnes):	11,753	23,533
10 year GHG benefit cost (tonnes/\$1M):	5,877	15,689





Review of GHG Benefit-Cost Ranges

- Large range within each project type
 - But – even within a project type, not all apples-to-apples
- Missing from these ranges:
 - Projects' contribution to market transformation
 - Projects' contribution to technology advancement
 - Insufficient to meeting 80% GHG reduction by 2050
 - Potential changes in assumptions
 - Attribution of benefits
 - Value of critical, non-quantifiable project types



Summary

- Continue to incorporate benefit-cost in scoring criteria
- “Low Case” and “High Case” ranges may be helpful benchmarks in evaluating future solicitations
- Benefit-cost ratio is most helpful when comparing similar projects, and when a fuel/technology is commercially mature
- Seek input on how to improve the calculation and use of benefit-cost scores
 - Also: other measurements of success