



# Workshop Agenda

### Workshop Introduction and Overview

9:00 am

- Introduction, logistics, agenda – Elyse Cheung-Sutton
- Workshop purpose and objectives – Elizabeth John
- Complimentary funding opportunities – EPIC

### Biofuels Activities

9:30 am

- Goals and progress of the Alternative and Renewable Fuel and Vehicle Technology (ARFVT) Biofuels program – Matthew Ong
- Recap of Biofuels Technical Merit Review – Matthew Ong
- Proposed Program goals, strategies, and performance metrics – Bill Kinney

### Break

10:00 am



# Workshop Agenda

**Discussion of Biofuels Draft Solicitation Concepts – Bill Kinney** 10:15 am

- Funding strategies
- Eligibility requirements
- Evaluation criteria
- Emerging issues and opportunities

**Public Comments** 12:00 pm

**Next Steps** 12:45 pm

**Adjourn** 1:00 pm



# Workshop Introduction/Overview

Elizabeth John

Biofuels Section Manager

Emerging Fuels & Technologies Office

Fuels & Transportation Division

2016 Biofuels Workshop

Art Rosenfeld Hearing Room, CEC

March 30, 2016



# Workshop Purpose

- Strengthen stakeholder partnerships by establishing a permanent, regular public forum for planning and strategizing California biofuels investments.
- Establish working groups to address specific sector performance.
- Incorporate the Merit Review Process.
- Integrate with the year investment plan process.



# Workshop Objectives

- Discuss biofuel program goals, strategies and performance metrics.
- Gather input for the upcoming biofuels production solicitation.
- Develop industry-sector working groups.



# Questions and Comments

Please send questions and comments to:

[biofuels@energy.ca.gov](mailto:biofuels@energy.ca.gov)

or

California Energy Commission  
c/o **Elizabeth John**

Emerging Fuels and Technologies Office

1516 Ninth Street, MS-27

Sacramento, CA 95814

Telephone: (916) 654-4639



# Biofuels In California

Matthew Ong

Air Pollution Specialist

Emerging Fuels & Technologies Office

Fuels & Transportation Division

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## Key Policies and Regulations

Policy Objectives	Policy Origin	Goals and Milestones
Greenhouse Gas Reduction	AB 32, Executive Order S-3-05, LCFS	Reduce greenhouse gas emissions to 1990 levels by 2020 and 80% below 1990 levels by 2050 in California
Petroleum Reduction	<i>California State Alternative Fuels Plan</i>	Reduce petroleum fuel use to 15% below 2003 levels by 2020 in California
Low Carbon Fuel Standard	AB 32, California Global Warming Solutions Act	10% reduction in carbon intensity of transportation fuels in California by 2020
Federal Renewable Fuel Standard	Energy Policy Act of 2005, Energy Independence and Security Act of 2007	36 billion gallons of renewable fuel by 2022
Air Quality	Clean Air Act	80% reduction in NOx from current levels by 2023
ZEV Mandate	California Executive Order B-16-2012	Accommodate 1 million EVs by 2020 and 1.5 million by 2025 in California



# Assembly Bill 8

## (Perea, Chapter 401, Statutes of 2013)

- Extends ARFVTP funding through January 1, 2024
  - ✓ \$100 million per year
- To transform California's transportation market into a diverse collection of alternative fuels and technologies and reduce California's dependence on petroleum.

***“...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))

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, 44299.1, and 44299.2 of, to add and repeal Section 43018.9 of, and to repeal Section 44299 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, 9261.1, and 9853.6 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 not-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 to the state board, and the number of hydrogen-fueled vehicles registered with 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

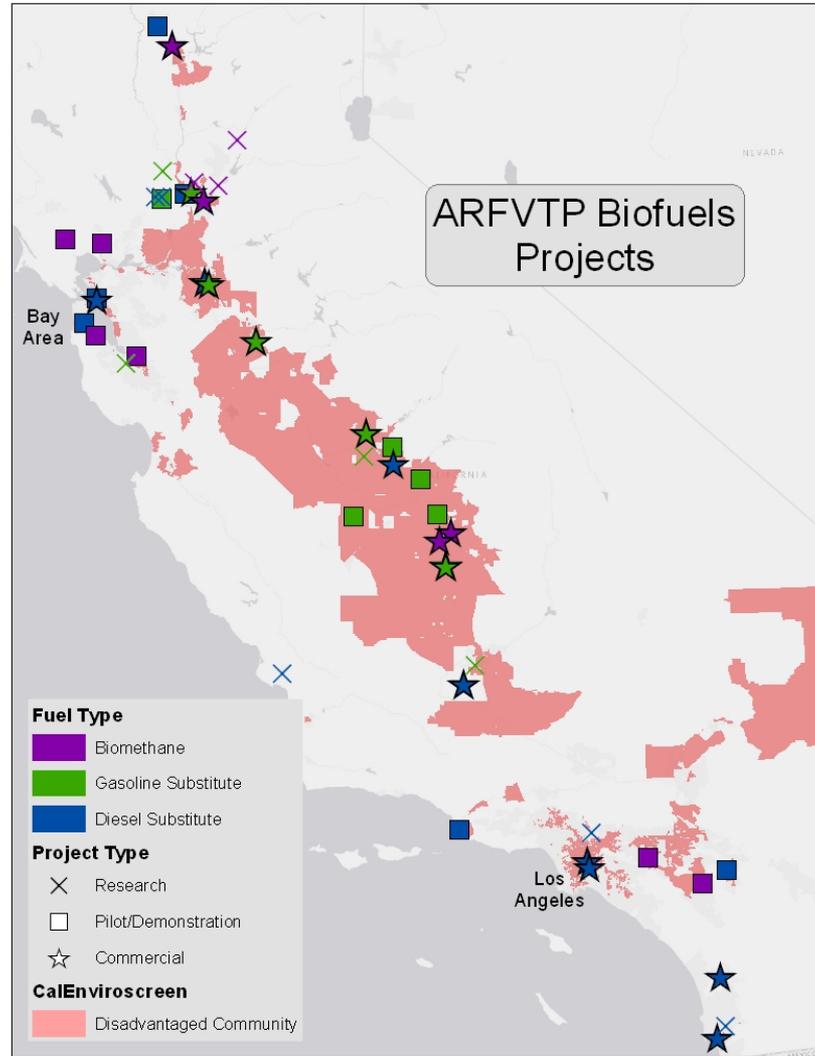


# ARFVTP Biofuels Awards

<b>Funded Activity</b>	<b>Cumulative Awards 2009-16 (\$ millions)</b>	<b>Percent of Total</b>	<b># of Projects Funded</b>	<b>Percent of Total</b>
Biomethane Production	\$50.9	37.0%	16	33.3%
Gasoline Substitutes	\$29.4	21.3%	12	25.0%
Diesel Substitutes	\$57.6	41.7%	20	42.7%
Total	\$137.9		48	



# California Energy Commission





# ARFVTP Biofuels Benefits and Co-Benefits (as of 3/29/16)

<b>Funded Activity</b>	<b>Jobs Created (Short-term)</b>	<b>Jobs Created (Long-term)</b>	<b>GHG Emission Reduction (tonnes CO<sub>2</sub>/yr per ARFVTP dollars)</b>	<b>Fuel displaced (DGE MGY)</b>
Biomethane Production	763	129	107,465	6.8
Gasoline Substitutes	161	50	37,664	5.2
Diesel Substitutes	261	260	754,667	72.5
<b>Total</b>	<b>1,185</b>	<b>439</b>	<b>899,796</b>	<b>84.5</b>



# Commitment to Diversity

The Energy Commission adopted a resolution on April 8, 2015, to firmly commit to:

- Increase participation of women, minority, disabled veteran and LGBT business enterprises in program funding opportunities.
- Increase outreach and participation by disadvantaged communities.
- Increase diversity in participation at Energy Commission proceedings.
- Increase diversity in employment and promotional opportunities.



# Commitment to Diversity

**Fairness** – Increase funding accessibility to all Californians.

**Inclusion** – Small businesses make up a significant portion of the U.S. economy.

**Job Creation** – Projects can create jobs for residents of the underserved communities.

**Diversity of Ideas** – Great ideas occur in a variety of areas.

**Diversity in Communities' Needs** – Needs vary widely from one area to the next (air quality, socioeconomic, etc.).



# Diversity Data

- 52% of all ARFVTP funded biofuels projects have been in disadvantaged communities.
  - 87% of recent biofuel production awards (last 3 solicitations) were located in disadvantaged communities.
- Increase commitment in fairness, inclusion, job creation, diversity of ideas, and diversity of communities' needs through stakeholder workshops and solicitation opportunities.



# Recap of Technology Merit Review Workshop

## Sep. 17-18, 2015

- Critical barriers for commercialization
  - Uncertainty in government policies and regulations.
  - Technical and economic uncertainty.
  - Lack of technologies for drop-in liquid fuels from biomass.
  - Uncertainty in feedstock availability, source, and cost.
  - Infrastructure and market bottlenecks.
  - High cost and stringent requirements for RNG pipeline injection.



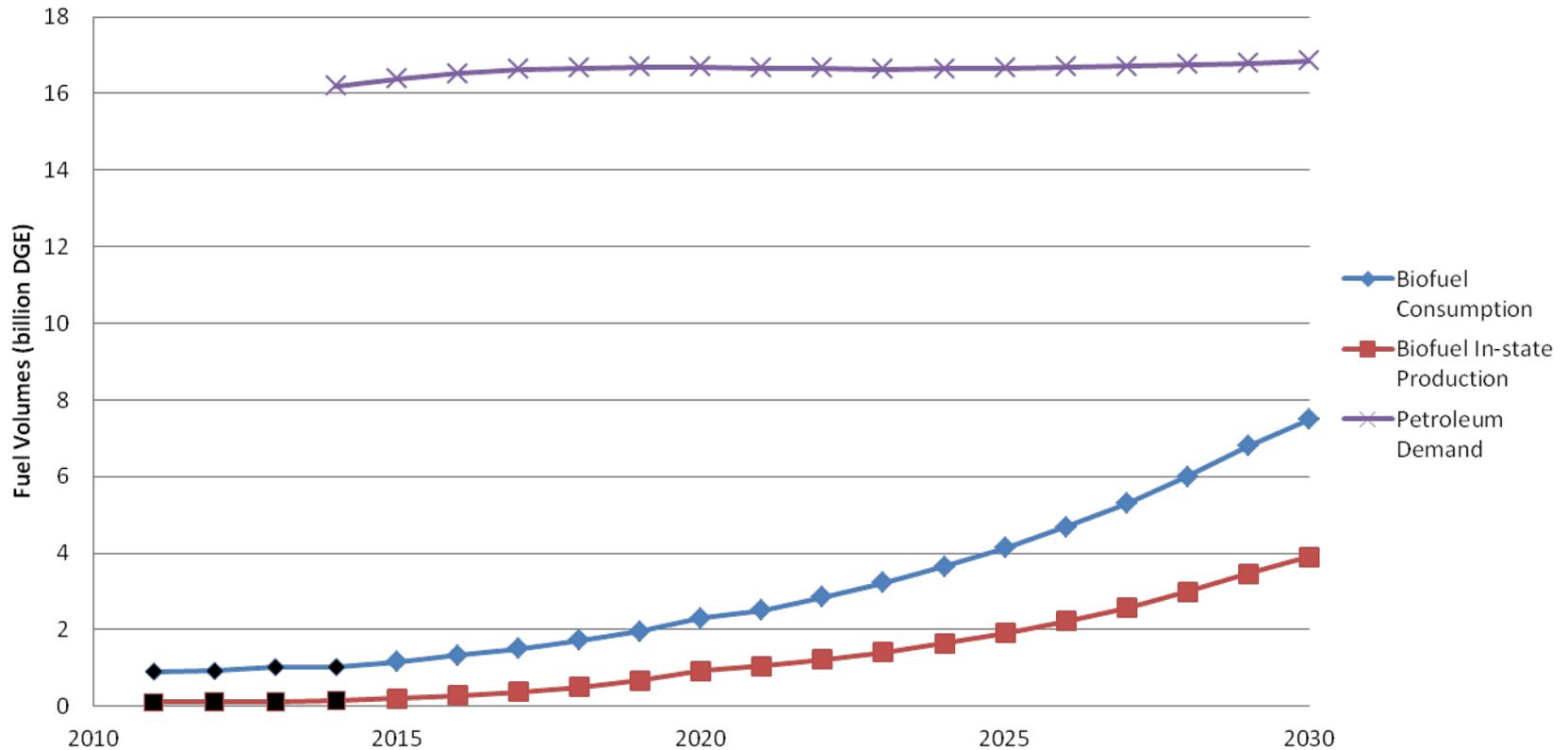
# Recap of Technology Merit Review Workshop

Sep. 17-18, 2015

- Solutions to overcome the barriers
  - Consistent, long-term supporting regulations and incentives.
  - Coordinated regulations and compliance requirements.
  - State loan guarantees and long-term debt financing.
  - Incentives for R&D, feedstock suppliers, and fuel infrastructure (+ current capital funding).
  - Improved access and support for in-state feedstock and facilities.
  - State collaboration with private funders and third-party review.



# How Biofuels Will Supplement Petroleum Demand





# Discussion of Biofuels Program Goals

Bill Kinney

Biofuels Technical Lead

Emerging Fuels & Technologies Office

Fuels & Transportation Division

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# ARFVTP Drivers

- Reduce dependence on petroleum in transportation energy.
  - 50% by 2030.
- Reduce GHG transportation emissions to further State climate goals.
  - LCFS: Reduce carbon intensity in CA transportation fuel at least 10% by 2020.



# Biofuels Core Objectives

- Maximize investment cost-effectiveness.
- Balance investment across multiple needs.
  - Fuel types
  - Scales of production – community and commercial
  - Stages of development:
    - Technology demonstration
    - Commercial deployment



# Biofuels Core Objectives (cont.)

- Support transformative and innovative technologies.
- Establish sustainable in-State biofuels production infrastructure.
- Coordinate with other agency funding for maximum leverage and benefit.



# Emerging Program Objectives

- Leverage existing ARFVTP funding by stretching applicants with award incentives
- Recruit larger capacity applicants and alternative investment funding sources
- Transition applicants from grants to debt financing with greater capacity / public \$



# Setting Interim Project Goals

- Add 100 million DGE of biofuel of in-state producing per funding cycle (or 50 million DGE per funding year).
- Focus on waste-based feedstocks.
- Lower carbon intensity of fuel produced.
- Recruit and develop market transforming technologies in renewable gasoline, biogas production technology, and woody biomass conversion technology.

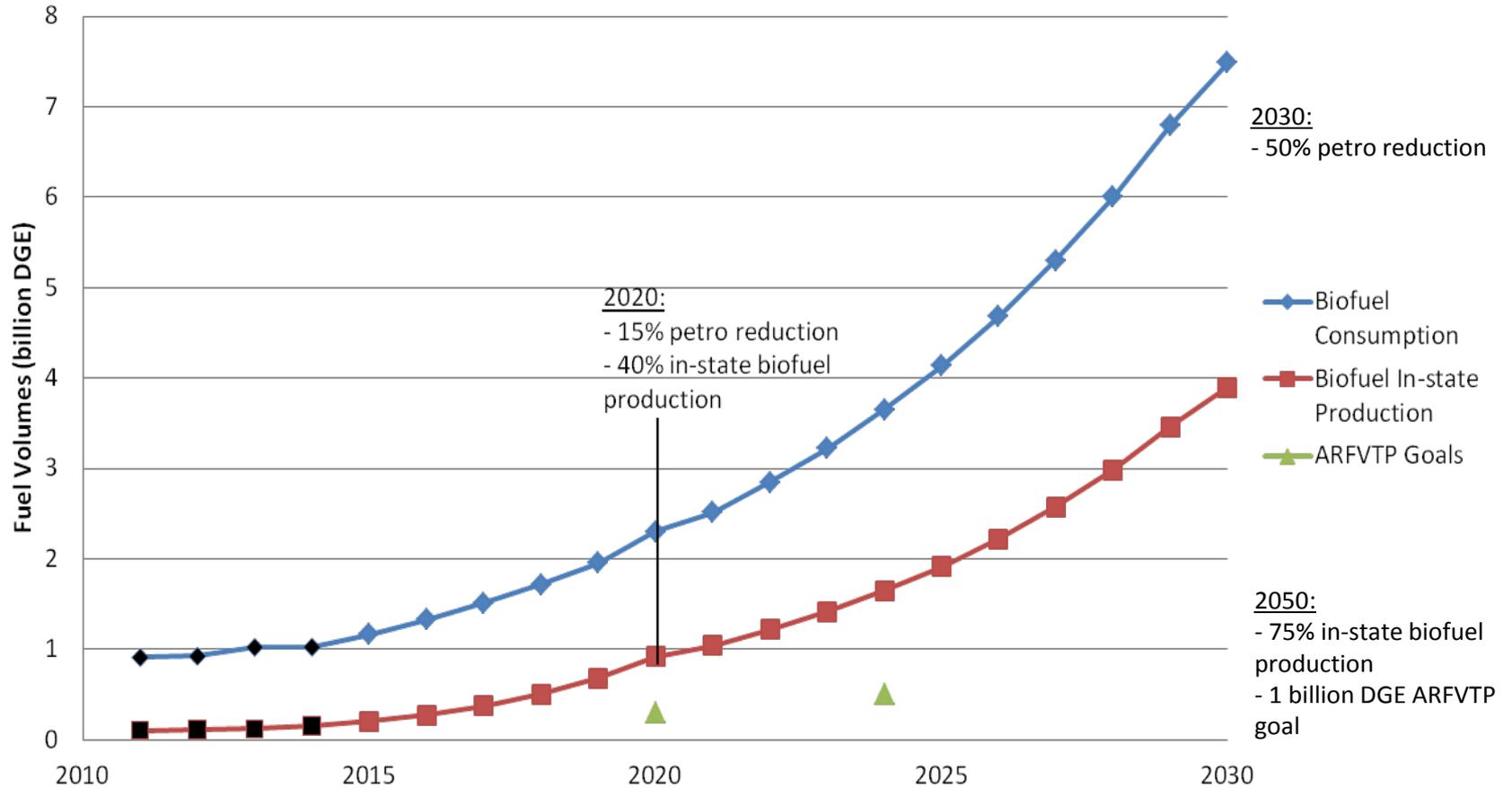


# Setting Program Goals for the 2020s

- At least 300 million DGE of increased biofuels capacity in California by 2020.
- BioEnergy Action Plan: 40% of CA biofuel produced in-state.
  - ARFVTP funds increased share of all fuel types, up to 500 million DGEs by 2024 and up to 1 billion DGEs by 2050.
- Demonstrate significant GHG reduction -- displace at least 5 million metric tons (cumulative 20 MMT).



## Trajectory to State Policy and Program Goals





# Setting the Vision for 2030 and Beyond

- A self-sufficient, competitive biofuels market.
- Influence market transformation and market conditions to accelerate the adoption of biofuel and innovative biofuels technologies to move California towards its goals to combat climate change.
- Achieve 50% petroleum reduction by 2030.
- Achieve deep reductions in GHGs by 2030.



# Recent Trends – Market Support

- Regulatory certainty is contributing to higher RFS2 and LCFS credit prices.
- One of Governor's Five Pillars – decreased petroleum use.
- Other federal incentives:
  - Blender's credit
  - Cellulosic incentive



# Balancing Choices

- Large commercial facility impacts:
  - Larger economic footprint and visibility promote increased program support
- Transformative technology impacts:
  - Hurdle the blend wall – renewable gasoline
  - Forest biomass – large new feedstock source
  - Increase productivity of existing feedstocks
- Community scale facilities match production with locally available feedstock supply



California Energy Commission

# Discussion of Biofuels Draft Solicitation Concepts

Bill Kinney

Biofuels Technical Lead

Emerging Fuels & Technologies Office

Fuels & Transportation Division

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# Major Changes

- Cost-effectiveness / cap incentive
- Two-stage scoring process
- Both production and GHG reduction cost-effectiveness are important scoring metrics
- Project implementation schedule will be increasingly important



# Biofuels Strategic Investment Goals

1. Build capacity of California firms producing second and third generation biofuels using advanced technologies and waste-based / alternative feedstocks.
2. Balance investments among competing needs across different stages of development, fuel types, project scales, and feedstocks – silos by fuel type or scale?
3. Leverage scarce ARFVTP resources.
4. Strengthen recipient project performance.



### Funding Allocations—Approved / Anticipated

- **15/16 Investment Plan:** \$17,096,215
- **16/17 IP (Anticipated):** \$20,000,000
- **GGRF (Anticipated):** \$25,000,000
- **Total Possible:** \$62,096,215



# Available Funding

- Approximately \$17 million (15/16) funding is available.
- Funds would be divided into two funding categories based on annual production capacity.

Annual Production Capacity (diesel gallon equivalent)	Available Funding
100,000 to 1.0 million DGE	\$5 million
Above 1.0 million DGE	\$12 million



# Solicitation Goals

- Increase leverage by offering higher award amounts for achieving greater cost effectiveness.
- Monitor incentive impacts on carbon intensity of funded projects.



## Maximum Award

- All applicants are eligible for up to \$3 million.

- Funding scale:

Proposed Annual Fuel Production Capacity (MGPY DGE)	Capacity Multiplier (\$/DGE)
20.0+	\$0.15
≥17.0	\$0.14
≥14.0	\$0.13
≥11.0	\$0.12
≥8.0	\$0.11
>1.0	\$0.10
0.1 – 1.0	None



# California Energy Commission

gpy	Capacity Incentive	Capacity Funding	Base Funding	Total Funding	ARFVTP Investment per Gallon	Avg Annual GHG Displacement (lbs./gal)	Carbon Reduction per ARFVTP \$
20,000,000	0.15	3,000,000	\$ 3,000,000	\$ 6,000,000	\$ 0.30	33.15	110.50
19,000,000	0.14	2,660,000	\$ 3,000,000	\$ 5,660,000	\$ 0.30	31.27	104.98
18,000,000	0.14	2,520,000	\$ 3,000,000	\$ 5,520,000	\$ 0.31	30.50	99.45
17,000,000	0.14	2,380,000	\$ 3,000,000	\$ 5,380,000	\$ 0.32	29.73	93.93
16,000,000	0.13	2,080,000	\$ 3,000,000	\$ 5,080,000	\$ 0.32	28.07	88.40
15,000,000	0.13	1,950,000	\$ 3,000,000	\$ 4,950,000	\$ 0.33	27.35	82.88
14,000,000	0.13	1,820,000	\$ 3,000,000	\$ 4,820,000	\$ 0.34	26.63	77.35
13,000,000	0.12	1,560,000	\$ 3,000,000	\$ 4,560,000	\$ 0.35	25.19	71.83
12,000,000	0.12	1,440,000	\$ 3,000,000	\$ 4,440,000	\$ 0.37	24.53	66.30
11,000,000	0.12	1,320,000	\$ 3,000,000	\$ 4,320,000	\$ 0.39	23.87	60.78
10,000,000	0.11	1,100,000	\$ 3,000,000	\$ 4,100,000	\$ 0.41	22.65	55.25
9,000,000	0.11	990,000	\$ 3,000,000	\$ 3,990,000	\$ 0.44	22.05	49.73
8,000,000	0.11	880,000	\$ 3,000,000	\$ 3,880,000	\$ 0.49	21.44	44.20
7,000,000	0.1	700,000	\$ 3,000,000	\$ 3,700,000	\$ 0.53	20.44	38.68
6,000,000	0.1	600,000	\$ 3,000,000	\$ 3,600,000	\$ 0.60	19.89	33.15
5,000,000	0.1	500,000	\$ 3,000,000	\$ 3,500,000	\$ 0.70	19.34	27.63
4,000,000	0.1	400,000	\$ 3,000,000	\$ 3,400,000	\$ 0.85	18.79	22.10
3,000,000	0.1	300,000	\$ 3,000,000	\$ 3,300,000	\$ 1.10	18.23	16.58
2,000,000	0.1	200,000	\$ 3,000,000	\$ 3,200,000	\$ 1.60	17.68	11.05
1,000,000	0	-	\$ 3,000,000	\$ 3,000,000	\$ 3.00	16.58	5.53
500,000	0	-	\$ 3,000,000	\$ 3,000,000	\$ 6.00	25.46	4.24
300,000	0	-	\$ 3,000,000	\$ 3,000,000	\$ 10.00	25.46	2.55
100,000	0	-	\$ 3,000,000	\$ 3,000,000	\$ 30.00	25.46	0.85



# Funding Calculation

***Maximum grant award = \$3 million + Cost-Effectiveness Incentive***

**Cost-Effectiveness Incentive = (Proposed Increase to Annual Fuel Production Capacity \* Capacity Multiplier)**



# Challenges in Solicitation Implementation

- Proposed projects are evaluated based on business viability, cost effectiveness in meeting policy goals, project readiness, economic impacts and environmental sustainability.
- Process is information- and labor-intensive for applicants and evaluation teams alike.
  - Can lead to applications with insufficient resources and unrealistic goals.
  - Scoring teams can benefit from deeper tech reviews.
- Grant funding is often not adequate for large commercial scale.
- Alternative scoring and funding mechanisms have been developed.



## Two-Stage Scoring Process

- **Pre-Proposal Abstract Technical Scoring**
  - 10 page project abstract
- **Full Proposal Screening and Scoring:**
  - Passing proposals (abstracts receiving a 70% or higher) will be eligible to submit a full proposal.  
***Full proposals must be consistent with previously submitted and passing pre-proposal abstract.***



# Pre-Proposal Scoring Criteria

Scoring Criteria	Points
Project Summary	15
Project Readiness and Implementation Schedule	15
Project Budget and Cost Effectiveness	15
Project Benefits	5
<b>TOTAL POSSIBLE POINTS:</b>	<b>50</b>



# Full Proposal Scoring Criteria

Scoring Criteria	Points
Qualifications of Project Team	25
Business Plan (Technology Plan, Marketing Plan, and Financial Plan)	90 (30 each)
Project Readiness and Implementation	45
Project Budget and Cost Effectiveness	50
Project Benefits	40
Sustainability	50
<b>TOTAL POSSIBLE POINTS:</b>	<b>300</b>



# Tentative Schedule

ACTIVITY	ACTION DATE
<b>Biofuels Vision and Solicitation Concepts Workshop</b>	March 30, 2016
<b>Deadline for Comments on Draft Solicitation Concepts</b>	April 6, 2016
<b>Solicitation Release</b>	Q2
<b>Pre-Proposal Abstract Due</b>	June 2016
<b>Anticipated Pre-Proposal Abstract Results</b>	July 2016
<b>Deadline to Submit Full Proposals</b>	September 2016
<b>Anticipated Notice of Proposed Award Posting Date</b>	November 2016
<b>Anticipated Energy Commission Business Meeting Date</b>	Before April 2017



Discussion of Biofuels Draft Solicitation Concepts

## **DISCUSSION**



Public Comment

# **DISCUSSION**



# Questions and Comments

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