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**Background Slides
for Presentation to the AB 118
Advisory Committee
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Table 1. Light Duty GHG Emissions Reductions (2009 to 2020)

Category	GHG Emission Reduction (MMTCO ₂ e) ⁴	Percent GHG Emission Reduction
Super Ultra Low Carbon Fuels	11	33%
Ultra Low Carbon Fuels	9	27%
Low Carbon Fuels	3	10%
Fuel Economy Improvements	10	30%
Total	33	100%

Source: California Energy Commission

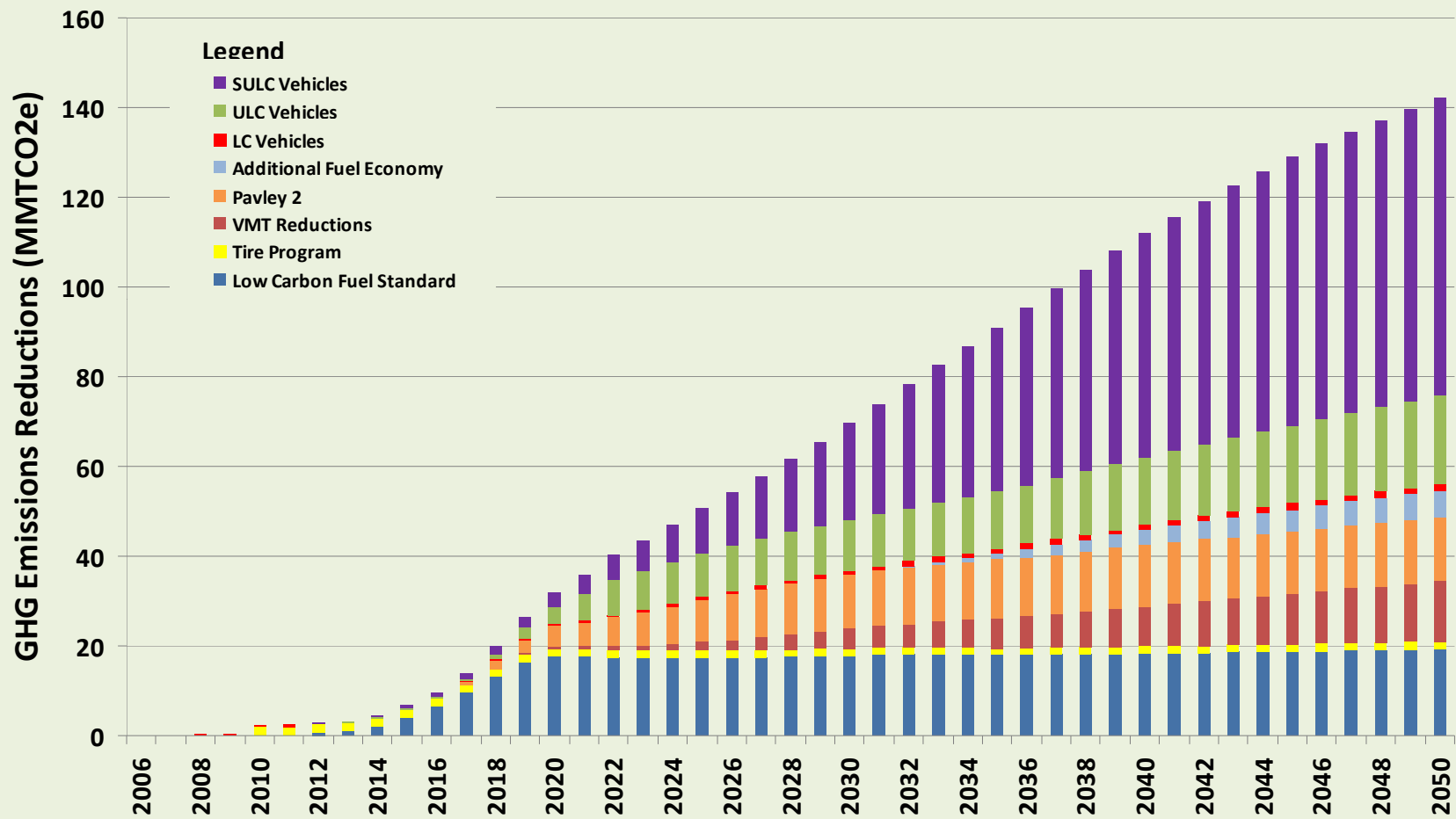
Table 3. Summary of GHG Emissions Reductions (2009 to 2020)

Category	GHG Emission Reduction (MMTCO ₂ e)	Percent GHG Emission Reduction
Super Ultra Low Carbon	12	16%
Ultra Low Carbon	9	12%
Low Carbon	25	33%
Fuel Economy Improvements	29	39%
Total	75	100%

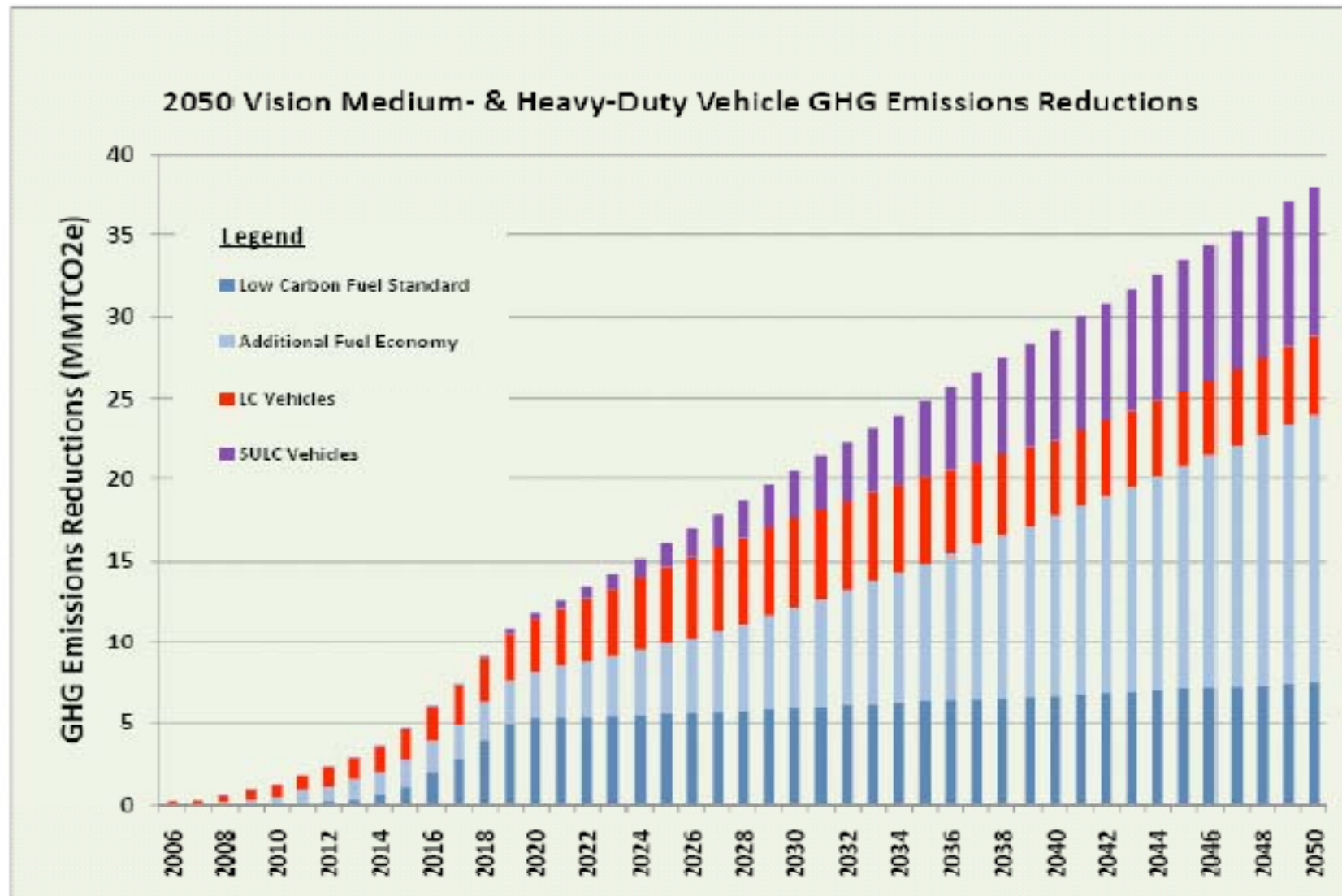
Source: California Energy Commission

Draft Investment Plan Proposed Funding Recommendations		
Category	Percent GHG Emission Reduction (2009 to 2020)	Proposed Funding Recommendations (Two Year)
Super Ultra Low Carbon	16%	23%
Ultra Low Carbon	12%	13%
Low Carbon	33%	35%
Fuel Economy Improvements	39%	13%
Non-GHG Categories	na	11%
Production Incentives	na	6%
Total	100%	100%

2050 Vision Light-Duty Vehicle GHG Emissions Reductions



**Figure 3. Estimated GHG Reductions
From Each Of The Four Categories**



Light Duty Percent GHG Emissions Reductions
(Values are summed from 2009 through year indicated)

Category	2020	2030	2040	2050	
Super Ultra Low Carbon Fuels	33%	37%	50%	56%	
Ultra Low Carbon Fuels	27%	30%	23%	21%	
Low Carbon Fuels	10%	3%	2%	2%	
Fuel Economy Improvements	30%	30%	25%	22%	
Total	100%	100%	100%	100%	

Allocating AB118 Funds GHG Reduction Potential: Constrained vs Unconstrained

TIAX, LLC Analysis July, 2008

Light-duty + Heavy-duty Buckets	Percent Allocation of AB 118 Funds	
	Unconstrained	Constrained
Improved vehicle efficiency	21%	25%
Blended biofuels	22%	16%
Nonrenewable alternative fuels	17%	5%
Advanced vehicle technologies	40%	54%
Total	100%	100%

“Advanced Vehicle Technologies” include on- and off-road, electric-drive applications and include vehicle technologies such as battery-electric, plug-in hybrids, and hydrogen fuel cells.

Conclusion

- The analysis demonstrates a large need for successful SULC Vehicles to meet California's GHG reductions goals.
- AB 118 investment in SULC vehicles should be increased to better reflect their contribution to meeting the 2050 goal.

Breakout of estimated **Achievable** reductions in GHG and Criteria Pollutant emissions by category / application

GHG (million tons per year, CO2 equivalent); Criteria (tons per day)

Electric Drive Technology or Application	Pollutant / Year	
	GHG / 2020	Criteria / 2020
Plug-In HEVs	10.8	5.72
Truck Stop Electrification	0.50	21.1
Off-Road Industrial Vehicles	2.90	17.1
On-Road Battery Electric Vehicles	1.24	1.23
Hydrogen FCVs	0.65	1.08
Lawn & Garden Equipment	0.39	18.6
Alternative Marine Power	0.85	49.6
Electric Transport Refrigeration Units	0.13	3.4
Other	0.23	2.24
TOTAL of Estimated Avg. Reductions	17.5	120

Electric Transportation Vehicle Deployment Funding

- Consumer incentives (grants) based upon advanced battery pack capacity (example: \$200-\$300 kW).
- Light-Duty PHEVs and EVs.
- Medium and Heavy-Duty PHEVs and EVs.
- Loans/grants for non-road ET.
- On-ship Alternative Marine Power grants.

Electric Transportation Infrastructure Deployment Funding

- Consumer incentives (grants) for on-road vehicle infrastructure.
- Infrastructure for multi-family buildings, workplace, and public charging.
- Non-road vehicle infrastructure grants.
- Off-ship Alternative Marine Power infrastructure grants.

Electric Transportation Demonstration Funding

- Advanced battery PHEVs in extended use.
 - Medium and Heavy-Duty.
 - Light-Duty.
- “Smart” Infrastructure
- New applications of non-road electric vehicles and equipment.

Electric Transportation R&D Funding

- Sub-metering hardware and software.
- Vehicle-to-home/grid energy transfer.
- Impacts of ET on CA electricity system/grid.
- Advanced battery cost-reduction, durability, secondary use.

Other Funding Recommendations

- Information and Education Program.
- “Adder” for vehicles and equipment made in California.
- Partner with utilities and other industries.

Other Comments

- The AB 118 Program should use “marginal” electric generation emissions, rather than “average” emissions, consistent with past CEC and ARB analysis.
- FFCA should reflect the inherent efficiency of electric vehicles (EER), consistent with past CEC and ARB analysis.