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November 1, 2013

The Honorable Mary D. Nichols
Chairman
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: AB 32 Scoping Plan Update

Dear Chairman Nichols and Members of the Board:

The Union of Concerned Scientists (UCS) is pleased to have the opportunity to comment on the California Air Resources Board (CARB) Discussion Draft to the Climate Change Scoping Plan First Update (the Scoping Plan Update, or Update). As the Scoping Plan Update states, quoting Governor Brown, meeting the challenge of climate change will require "courage, creativity, and boldness." We believe that the Scoping Plan Update is a visionary document and we strongly support CARB's direction to move toward the goal of 80 percent emissions reductions by 2050 established by the Executive Order S-3-05 and Governor Brown's Executive Order B-16-2012 for vehicles.

The success of AB 32 implementation thus far is evidence that the transition to a low-carbon economy can have economic benefits. Most importantly, this suite of policies is necessary to address one of the most pressing public safety, public health, and environmental problems facing humanity in this century and beyond.

UCS believes the Scoping Plan Update presents a great opportunity to both lock in and expand upon the very strong start that CARB has made in lowering carbon emissions in California under AB 32, and sets the stage for the deep reductions that will be needed if we are to lower emissions to a level that reduces future risk of climate change. We agree with CARB that California's historic role as a leader and pioneer of forward-thinking environmental laws and regulations has had demonstrable impact on the rest of the nation, and the fact that we are one of the world's ten largest economies means that the actions we take, the technologies we develop and deploy, and the successful policies we implement can have significant impact regionally, nationally, and worldwide.

UCS's comments on the Scoping Plan Update briefly address some of the scientific and emissions analysis that CARB has done, and also comment specifically on the energy, transportation, agriculture, and water sections. Below is a summary of those recommendations, followed by detailed comments in each area.

Summary of Recommendations

- **Climate science:** UCS recommends that CARB update this section to include the most recent global assessments of climate change (see the Intergovernmental Panel on Climate Change's Fifth Assessment Report)[1] as well as the findings of numerous agency reports regarding current and future impacts associated with climate change in California (see the Third Assessment of the California Climate Change Center and Indicators of Climate Change in California). UCS comments include specific examples along with suggested text and graphics.

- **Setting an interim emissions target**: It is essential that CARB begin to plan for post-2020 emissions reductions, including a strong interim (e.g. 2030) target. Emissions of at least 80 percent below 1990 levels by 2050, and possibly more, will be necessary to have a high probability of avoiding the worst climate impacts. Accordingly, we believe the two emissions trajectories shown in Figure 6 (page 77) represent reasonable upper and lower bounds for an interim target.

- **Renewables Portfolio Standard**: The Scoping Plan Update should recommend the state evaluate a higher Renewables Portfolio Standard that ensures at least 50 percent of retail sales are supplied by renewables by 2030.

- **Combined heat and power**: To the extent that the state continues to pursue combined heat and power (CHP), it should prioritize CHP with zero carbon sources to ensure CHP investments do not hinder deeper emission reductions necessary to meet 2050 goals.

- **Light-duty vehicles**: We support inclusion of targets for further global warming emission reductions from light-duty vehicles beyond 2025 in the Scoping Plan Update as well as continuation of the Zero Emission Vehicle program. The Update should articulate interim emissions targets for the light-duty vehicle fleet in the 2025-2050 timeframe.

- **Heavy-duty vehicles and freight transport**: Heavy-duty vehicle global warming emissions standards alone are insufficient to achieve the transformation in the freight sector needed to achieve the state's climate and air quality goals. The development and deployment of zero and near-zero tailpipe emissions solutions are needed across the freight sector through a coordinated strategy of state and regional planning, financial incentives, and regulatory measures.

- **Transportation fuels**: The Low Carbon Fuel Standard and inclusion of fuels under California's cap and trade program are important for supporting and accelerating the development of cleaner alternatives. However, natural gas should only play a limited role in fueling cars and trucks, as it is not a good candidate for directly replacing gasoline or diesel at a large scale.

- **Agriculture**: The Scoping Plan Update should describe the results of research efforts undertaken by CARB since the last Scoping Plan to quantify benefits associated with

[1] Intergovernmental Panel on Climate Change. Working Group 1 Contribution to the IPCC Fifth Assessment Report. Climate Change 2013: The Physical Science Basis, available here: http://www.ipcc.ch/report/ar5/wg1/#.UmgWVfmkrw8

reduced nitrous oxide emissions, improved agricultural water use efficiency, and greater use of biomass-based fuels, and incorporate research findings into actionable items.

- **Water**: The Scoping Plan Update should recommend an additional 20 percent per capita conservation target for urban water suppliers by 2030. We also advocate introducing a 25 percent per connection conservation target for large agricultural water suppliers by 2030.

- **Groundwater**: The Scoping Plan Update should include a clear strategy to require the implementation of sustainable groundwater management (not just planning) and performance metrics to track progress (e.g., using groundwater levels and groundwater pumping data).

Climate Science

The Scoping Plan Update includes a relatively short section on climate science (Section II). This section would benefit from some updating to include the most recent global assessments of climate change (see the Intergovernmental Panel on Climate Change's Fifth Assessment Report)[2] as well as the findings of numerous agency reports regarding current and future impacts associated with climate change in California (see the Third Assessment of the California Climate Change Center and Indicators of Climate Change in California).[3]

Therefore, we suggest the following changes:

- In **Section II. A. Continuing Evidence of Climate Change** include relevant information and statements from the Intergovernmental Panel on Climate Change's 5th Assessment Summary for Policymakers (http://www.ipcc.ch/news_and_events/docs/ar5/ar5_wg1_headlines.pdf).

- Reorganize **Section II. C. Preparing for Climate Change in California** to reflect the Office of Environmental Health Hazard Assessment's Indicators of Climate Change in California, including:

    - Changes in California's Climate,
    - Impacts to California's Physical Systems,
    - Impacts to California's Biological Systems, and
    - Emerging Climate Change Issues in California.

- The executive summary of the report describes trends for each indicator, which can easily be summarized in a table like the one below.

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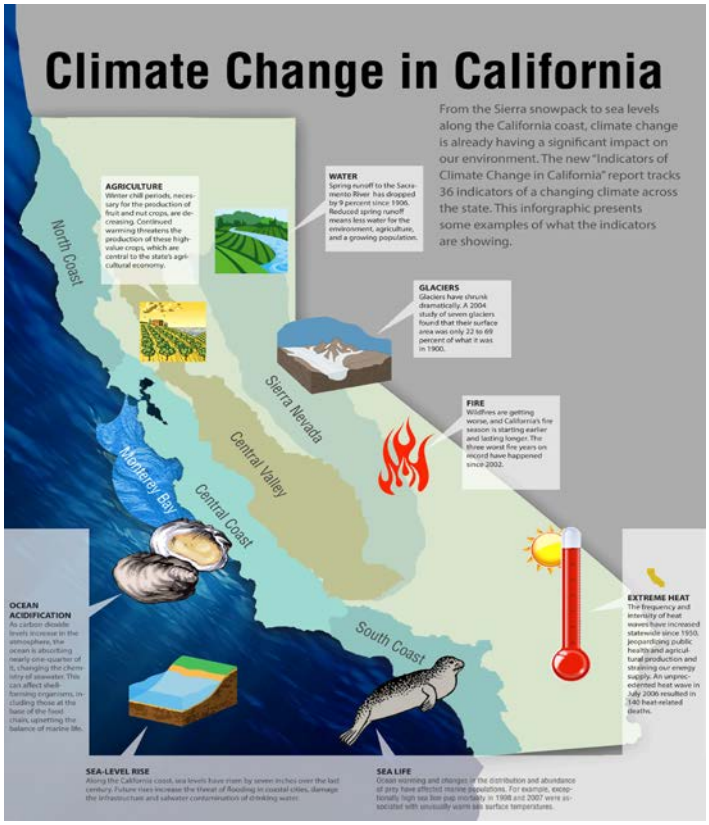
[2] Intergovernmental Panel on Climate Change. Working Group 1 Contribution to the IPCC Fifth Assessment Report. Climate Change 2013: The Physical Science Basis, available here: http://www.ipcc.ch/report/ar5/wg1/#.UmgWVfmkrw8

[3] Third Assessment from the California Climate Change Center. 2012. Our Changing Climate series, available at: http://climatechange.ca.gov/climate_action_team/reports/third_assessment/index.html. Office of Environmental Health Hazard Assessment. 2013. Indicators of Climate Change in California, available at: http://oehha.ca.gov/multimedia/epic/pdf/ClimateChangeIndicatorsReport2013.pdf

Indicator of Climate Change Impact	General Trend in California
Annual air temperature	↑
Extreme heat events	↑
Winter chill	↓
Freezing level elevation	↓
Precipitation	Varied

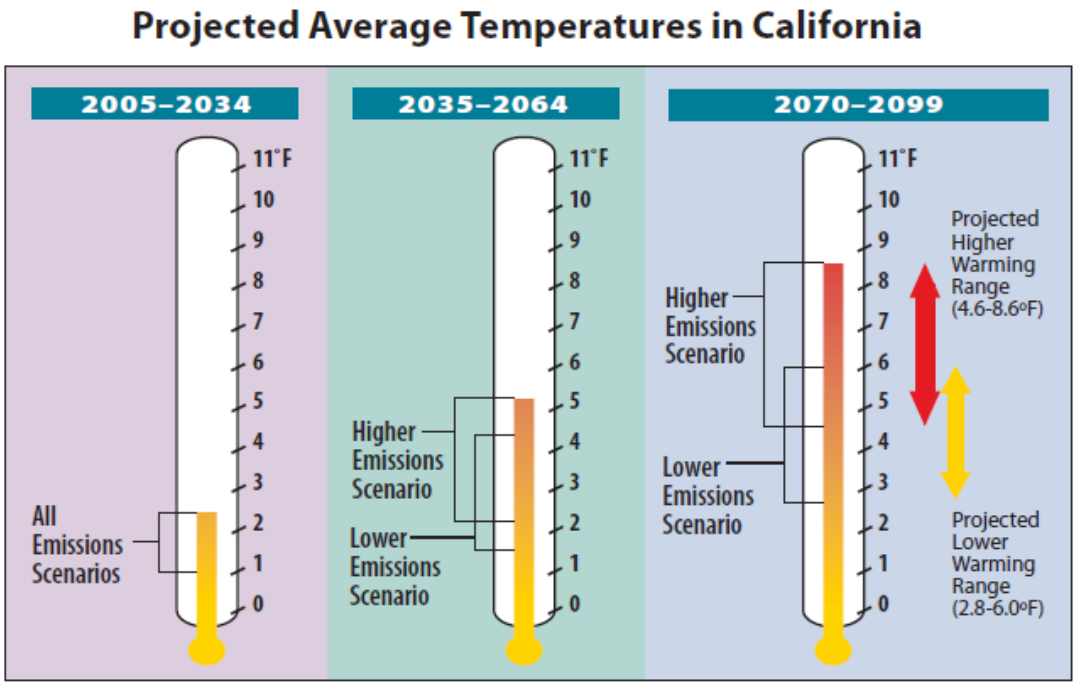
- In addition, the report provides several compelling summary graphics, such as the one below (high resolution version available at: http://oehha.ca.gov/multimedia/epic/images/2013infographic.gif), which could be included in Section II of the Scoping Plan.

    - Suggested text: Climate change is already having a significant impact on California's environment, economy, and people. The Office of Environmental Health Hazard Assessment is tracking over 30 indicators of climate change in California. This figure highlights some examples of what the indicators are showing, such as reduced snowpack in the Sierras to rising sea levels along the coasts to more frequent and intense of heat waves inland.



- A final section on **Looking Ahead** should make it clear that while there are already climate change impacts affecting California to which we will have to adapt and cope, we do have a choice about how serious the impacts will be by the end of this century.

- Suggested text: This "thermometer" graphic from the Third Assessment of the California Climate Change Center (http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf) shows projected increases for three different time periods: the next several decades (2005-2034), mid-century (2035-2064), and late century (2065-2099). By mid-century, today's choice of emissions becomes apparent, with differences in the higher and lower emissions scenarios occurring. By late century, projected temperatures under the higher emissions future (of up to 8.6°F above historic levels) are greater than those under the low emissions future (up to 6°F above historic levels).



Setting an Interim Emissions Target

It is essential that CARB begin to plan for post-2020 emissions reductions, and we strongly support the inclusion in the Scoping Plan Update of both a strong interim (e.g., 2030) target and of potential measures that will meet that target in a way that facilitates the even greater reductions that will be needed to meet 2050 goals.

As CARB has acknowledged in its draft Update, California plays a leadership role at many levels, from the regional to the international. This gives its post-2020 planning disproportionate significance in terms of both political consensus-building and policy innovation. California's progress towards deep emissions reductions has been path-breaking in the US context. It is critical that our post-2020 targets be ambitious and that the state presses ahead with the groundbreaking policy s that will be necessary to achieve those ambitious goals. Planning for the mitigation of climate risk means the State should consider its targets from the perspective of the necessary national and global action. To continue to play a leadership role, its own actions must at least be consistent with the actions that would be required of others to meet emissions targets.

As the Scoping Plan Update demonstrates, the state already has made very significant progress in adopting low- and no-carbon technologies and practices, creating a glide-path for additional measures that can deepen and further institutionalize these changes. It is also important to note that this has been accomplished with a price on carbon that is not far above the floor price set by CARB, which suggests that the cap on carbon emissions could be lowered quite affordably. At the same time, as the OEHHA "Indicators of Climate Change" and the 3rd Assessment reports referenced in the last section of our comments demonstrate in detail, the impacts and associated costs of climate change are already occurring and likely to grow substantially, though if we work now to aggressively reduce emissions we can not only avoid the worst and most expensive impacts but we can do it with lower costs than if we wait or go more slowly.

While the target of 80 percent below 1990 levels by 2050 established by the Executive Order S-3-05 and Governor Brown's Executive Order B-16-2012 establish long-term climate goals for California to reduce GHG emissions to 80 percent below 1990 levels by 2050 does not have the same legal authority as AB32, the newest scientific analyses as reported in the Intergovernmental Panel on Climate Change's Fifth Assessment Report suggest that at least this level of reductions, and possibly more, will be necessary to have a high probability of avoiding the worst climate impacts. Further work on global targets is ongoing at UCS and elsewhere, and we encourage the CARB to propose a strong interim target in the scoping plan update consistent with the need for aggressive, large-scale reductions to meet the 2050 goal..

Figure 6 in the draft Scoping Plan Update (page 77) shows two alternative ways – in simple numeric terms, not taking into account any policy implications – to define a pathway from 2020 emissions (431 MtCO2e if the target of 1990 levels is met) to the 2050 goal of 80 percent below 1990 levels (86 MtCO2e). On the straight line path, our calculations show annual emissions reductions of 11.5 MtCO2, equivalent to 2.67 percent of 1990 emissions every year. On the exponential (annual percentage reduction) path, our calculations show an annual reduction of 5.36 percent. **These two figures post reasonable upper and lower bounds for a 2030 interim target; we argue that for many reasons a target as low as technologically and economically feasible within these bounds should be established.**

Clean Electricity Generation

Renewables Portfolio Standard

California has made tremendous strides in clean energy generation investments in the past decade due largely to the successful implementation of the Renewables Portfolio Standard (RPS), which has positioned the state as a global leader in renewable energy investments. The 33 percent by 2020 RPS mandate has been a cornerstone program that has helped the state reach the greenhouse gas emission reductions required by AB 32 through investments in cleaner generation resources that, as an added benefit, make the electricity grid more diverse and resilient.

California's utilities are well on their way to achieving the 33 percent RPS requirement, and some are even on track to surpass this mandate in that timeframe. However, the momentum and success of the RPS are only certain through 2020 at this point. Since the RPS does not require utilities to supply greater portions of retail electricity sales with renewables after 2020, the greenhouse gas emission reductions achieved by the program could experience a

relative decline over time if electricity loads continue to grow and those needs are met by fossil generation.

UCS commends the CARB for recommending that the state evaluate the potential to expand and update the RPS (page 85). To ensure adequate plans are made to expand renewable energy deployment in a cost-effective and orderly manner, **UCS recommends the Scoping Plan Update recommend the state evaluate a minimum 50 percent RPS by 2030**, which would be consistent with California's 2050 emission reduction goals and provide a mid-term deadline between the current 2020 program and 2050. In addition, UCS suggests that the Scoping Plan Update identify specific actions that state energy planning entities, including the California Public Utilities Commission (CPUC), the California Energy Commission (CEC) and the California Independent System Operator (CAISO), should take to make plans for a 50 percent RPS.

UCS believes that a 50 percent RPS is not only achievable, but essential to reducing greenhouse emissions traditionally associated with the electricity sector, as well as the transportation sector through vehicle electrification (page 25). A transition of this magnitude requires long-term policy signals to shape necessary planning and investments. Without a clear RPS mandate for 2030, nearer term decisions and investments in electricity generation resources and related infrastructure could preclude a cost-effective transition to clean energy.

Combined heat and power

In order to reduce greenhouse gas emissions enough to achieve the state's long-term 2050 emission reduction goals, California must consider how future energy investments will impact both near- and long-term emission reduction efforts. Combined heat and power (CHP) has substantial cost, efficiency, and emissions benefits in the near-term (2020-2030 timeframe), but without a shift away from natural gas to low or zero-carbon fuel sources, greenhouse gas emissions from this technology could comprise an unacceptably large fraction of the state's 2050 emission reduction goals. Governor Brown's goal to add an additional 6,500 megawatts of CHP by 2030 would almost double the current installed capacity of CHP. UCS believes that if California is to increase the amount of in-state CHP in a manner that does not significantly challenge the state's overall effort to reach 2050 emission reduction goals, it must also adopt a viable pathway to drastically reduce greenhouse gas emissions from this technology to near zero between present-day and 2050.

Quantity	Value
Percentage of CHP that uses natural gas as a fuel	90 percent
Future fleet-average gas CHP electricity heat rate	9,000 Btu/kWh
Natural gas carbon content	0.053 tCO_2/MMBtu
Fleet-average CHP capacity factor	85 percent
Carbon emissions per year per MW online CHP	3,200 tCO_2/Yr*MW
Current installed CHP capacity	8518 MW
New CHP target	6500 MW
Total CHP online in 2050 (assuming no retirements)	15018 MW
Carbon emissions from CHP in 2050	48 $MtCO_2$/Yr
2050 California economy-wide GHG target	86 $MtCO_2$-eq/Yr
Percentage of economy-wide 2050 GHG target from CHP	**56 percent**

UCS has performed a back-of-the-envelope analysis in the table above to highlight the uneasy long-term intersection of greenhouse gas emissions and CHP targets. While UCS recognizes that different types of CHP have different characteristics, for simplicity we estimate fleet-average capacity factors and heat rates. These values are approximations made by UCS from a recent California Energy Commission report[4] and are for the purpose of illustration only. We assume that 10 percent of the CHP fleet has a carbon-neutral fuel source, and that the remaining 90 percent is powered by natural gas.

UCS is concerned that if the state continues pursuing aggressive CHP goals through technologies that rely on natural gas, **in 2050 CHP alone could contribute more than half of the entire economy's greenhouse gas emission budget**. While bioenergy, geothermal, and solar thermal could be zero carbon sources of heat for CHP, their limited potential and geographic specificity may restrict their use. Therefore, **UCS suggests that to the extent that the state continues to pursue CHP, it should prioritize CHP with zero carbon fuel sources to the extent feasible while keeping in mind resource constraints.**

One option to consider for industries that are unable to switch to zero carbon sources to meet their heat demand is the possibility of investing in natural gas CHP systems with carbon capture and sequestration (CCS). In order to enable the integration of large amounts of wind and solar power, CHP-CCS systems would ideally be flexible, though some baseload CHP-CCS could be consistent with long-term climate goals. Recent research also highlights the possibility of a net carbon negative electric sector through CCS of biomass.[5]

Transportation and Fuels

Through a combination of measures to improve efficiency and deploy innovative technologies and strategies California can get on the path to a more sustainable transportation future. UCS analysis shows that over the next 20 years, through efficiency improvements and innovation the US can cut its projected oil consumption in half.[6] Many of the strategies to achieve that goal are articulated in the draft Scoping Plan Update, including more efficient cars and trucks; smarter transportation and land use planning; expansion of vehicle electrification options, including hydrogen; and the advancement and deployment of low-carbon fuels. All of these strategies, implemented through coordinated planning efforts, incentive structures, and regulatory measures, will be necessary to avoid the worst consequences of climate change and meet California's 2050 emission reduction goals.

Light-Duty

The establishment of light-duty vehicle standards for 2017-2025 in coordination with the federal agencies (EPA, NHTSA) is a key policy for reducing one of the largest sources of global warming emissions in the state and the country. Fuel economy and greenhouse gas standards for light-duty vehicles are driving auto manufacturers to improve the efficiency and reduce emissions across the range of vehicles they offer for sale. Over the next several years,

[4] Hedman, Bruce, Ken Darrow, Eric Wong, Anne Hampson. ICF International, Inc. 2012. Combined Heat and Power: 2011-2030 Market Assessment. California Energy Commission. CEC-200-2012-002.
[5] James H. Nelson, Ana Mileva, Josiah Johnston, Max Wei, Jeff Greenblatt, Daniel M. Kammen. Forthcoming. Scenarios for deep carbon emission reductions from electricity by 2050 in Western North America using the SWITCH electric power sector planning model. Volume II of the California's Carbon Challenge Phase II report. California Energy Commission.
[6] www.ucsusa.org/halftheoil

it will be imperative for CARB and the federal agencies to ensure that the integrity of these standards are being maintained to ensure they are delivering as expected through 2025.

The light-duty vehicle standards are a good foundation, but in order to meet the 2050 emission targets, we need to do more. CARB has a proven track record in the successful implementation of both global warming standards and the Zero Emission Vehicle (ZEV) program, but technology progress must continue beyond 2025 to achieve the low-carbon transformation of the passenger vehicle fleet. As such, **we support CARB's inclusion of targets for further global warming emission reductions from light-duty vehicles beyond 2025 in the scoping plan as well as continuation of the ZEV program.**

In addition to indicating the need for vehicle standards beyond the horizon of existing regulations, **the Scoping Plan Update should articulate interim emissions targets for the light-duty vehicle fleet.** Inclusion of intermediary goals in the 2025-2050 timeframe for light-duty vehicle emissions would help illustrate the need for the current vehicle standards, as well as provide guidance for post-2025 vehicle standards.

Beyond regulatory standards, we also agree with CARB's conclusion that further market support is needed for electrification of the light-duty vehicle fleet. Support should include sustainable funding for new vehicle incentives as well as measures that encourage non-traditional uses like car sharing, rentals, and transit-connected projects.

Heavy-Duty Vehicles and Freight Transportation

Heavy-duty trucks and other freight movement emission sources, including trains, ships, and cargo-handling equipment, are a growing source of global warming emissions and oil consumption and are a major contributor to California's regional air quality problems. To address climate change and poor air quality, as well as the disproportionate impacts of the freight system on communities, a major effort by state and regional agencies is needed to address emissions from these sources. Strategies articulated in the discussion draft such as improved efficiency, lower-carbon fuels, and the continued development and deployment of zero and near-zero tailpipe emission technologies and infrastructure will all be needed along with a combination of regulatory requirements and incentives to implement these strategies.

Global warming emission and fuel efficiency standards for heavy-duty vehicles offer the greatest near term opportunity for reducing global warming emissions and oil consumption from the freight sector. For example, doubling the fuel efficiency of commercial vehicles nationally from 2013 levels could reduce oil consumption by an estimated 1 million barrels per day by 2035.[7] CARB, working with federal partners, should build on the successful first round of standards to implement a second round of standards that captures the emissions and fuel savings benefits of existing and emerging truck and trailer technologies to achieve the maximum feasible reductions.

Heavy-duty vehicle global warming emissions standards alone are insufficient to achieve the transformation in the freight sector needed to achieve the state's air quality and climate goals. CARB's Vision for Clean Air analysis clearly shows that the development and deployment of zero and near-zero tailpipe emissions solutions are needed across the freight sector.[8] To solidify the actions needed to achieve this transformation, CARB's planned Sustainable Freight Initiative must move forward quickly to identify the

[7] http://www.ucsusa.org/assets/documents/clean_vehicles/Heavy-Duty-Vehicles-Truck-Standards-Factsheet.pdf
[8] CARB Vision For Clean Air http://www.arb.ca.gov/planning/vision/vision.htm

specific strategies, timelines, and investments that are needed. Large freight infrastructure projects at port facilities and rail yards, as well as along freight highway corridors, built in the near future will impact emissions from freight transportation for decades to come and therefore must be implemented in a manner consistent with meeting health-based air quality standard deadlines in the 2020 and 2030 time frame as well as climate change goals.

A coordinated strategy of state and regional planning, financial incentives, and regulatory measures will be needed to address climate and air quality related emissions from trucks and other freight sources. The Key Recommended Actions for Transportation, Land Use, Fuels, and Infrastructure (page 90) articulate a suite of actions in these three categories to support this transformation. However, the recommended actions fail to capture any regulatory measures to address freight transportation sources beyond heavy-duty vehicle greenhouse gas standards. Regulatory measures are a key strategy for reducing emissions and as such, should be added to the scoping plan update as a critical action for reducing freight transportation emissions and developed in further detail as part the CARB-led Sustainable Freight Initiative.

Fuels

The policy framework for fuels, including the low-carbon fuel standard (LCFS) and inclusion of fuels under California's cap and trade program, are important for supporting and accelerating the development of cleaner alternatives. The early years of the LCFS have already illustrated the advantages of a flexible performance based policy framework through the support for and use of a number of low-carbon fuels, including low-carbon bioethanol, renewable gasoline and diesel, renewable natural gas, and low-carbon electricity. By accelerating the development of these varied low-carbon transportation fuel technologies and continuing to allow them to compete, California can lower the cost of achieving its 2050 objectives.

Natural gas can play a limited role in fueling cars and trucks, but it is not a good candidate for directly replacing gasoline or diesel at a large scale. As CARB notes[9], natural gas-powered heavy-duty vehicles may provide short-term criteria pollution benefits if certified to lower emissions levels than those currently required, and there may also be niche uses for liquefied natural gas such as in shipping where a low-carbon substitute may not be available. However, the emissions benefits of burning natural gas in a car or truck are limited, raising concerns about making investments in large scale natural gas vehicle and infrastructure deployment.[10] Because the majority of natural gas use in transportation will need to be phased out by 2050 to meet global warming emissions targets, public investment in natural gas-based transportation (both light- and heavy-duty) is at odds with sustainable, long-term transportation solutions. Incentives for vehicles, fuels, and fueling infrastructure should be based on full fuel cycle climate and local air quality performance and should therefore prioritize efficiency, electricity, hydrogen, and low-carbon non-food based biofuels over natural gas, as these efforts will produce both short-term and long-term air quality and climate benefits.

[9] Pg 88, Climate Change Scoping Plan First Update: Discussion Draft for Public Review and Comment. http://www.arb.ca.gov/cc/scopingplan/2013_update/discussion_draft.pdf

[10] See *UCS Position on Natural Gas Extraction and Use for Electricity and Transportation in the United States.* http://www.ucsusa.org/assets/documents/clean_energy/UCS-Position-on-Natural-Gas-Extraction-and-Use-for-Electricity-and-Transportation-in-the-United-States.pdf

Agriculture

UCS supports the inclusion of agricultural goals in the Scoping Plan Update since the agricultural sector is a significant source of greenhouse gas emissions. The Scoping Plan Update would benefit from a more detail and specificity on agriculture. The Update already documents a few research efforts undertaken by CARB since the last Scoping Plan to quantify benefits associated with reduced nitrous oxide emissions, improved agricultural water use efficiency, and greater use of biomass-based fuels. In addition, **the Update should describe any results of this work and incorporate research findings into any actionable items.** Therefore, we suggest the following changes:

- Summarize research findings regarding the benefits associated with reduced nitrous oxide emissions, improved agricultural water use efficiency, and greater use of biomass-based fuels;
- Include a standardized GHG accounting and reporting protocol for tracking energy and GHG emissions embedded in agricultural water use;
- Include a standardized synthetic fertilizer application reporting protocol to provide empirical data for baseline emissions assessments;
- Include quantitative targets for urban and agricultural water efficiency improvements beyond 2020; and
- Call for additional research to quantify sustainable biogeneration opportunities (generating electricity through biomass and biogas) and establish a clear plan for incentivizing cost-effective biogeneration.

Water

The Scoping Plan Update addresses key recommendations for the water sector. UCS believes this section would benefit from greater specificity and should take advantage of state research that has been done that details how climate change mitigation and adaptation will take place in the water sector. We also would recommend including guidance on critical issues at the heart of the water-climate nexus: urban water efficiency, agricultural water use, and groundwater management.

Water use efficiency

The draft Scoping Plan Update only commits to achieving one quantitative goal, which is already required by existing law: 20 percent per capita water conservation by 2020, as required by SB x7-7, The Water Conservation Act of 2009. The recommended actions say nothing about extending these quantitative targets or others beyond the 2020 deadline which is already required by law. **We suggest an additional 20 percent per capita conservation target for urban water suppliers by 2030.**

The draft Update should also address agricultural water use which comprises 80 percent of human water use in California. Currently, only 30 percent of large agricultural water suppliers are in compliance with existing law (see Implementation of the Agricultural Water

Management Planning Act: A Review of Agricultural Water Management Plans).[11] It is clear that the agricultural sector, in particular, requires additional financial and regulatory incentives and/or oversight. In particular, the Scoping Plan Update needs to be clear about quantitative targets to drive more efficient agricultural water use and to compare performance. **We suggest introducing a 25 percent per connection conservation target for large agricultural water suppliers by 2030 – giving agricultural water suppliers a full 15 years to reach this goal, if adopted in 2015.** It is worth noting that that the conservation target is significantly lower than that of the urban sector (as urban water suppliers would be asked to reduce per capita water use by a cumulative 40 percent from baseline levels by 2030).

Groundwater

The draft Scoping Plan Update should include a recommendation to require better groundwater regulation or oversight, which is widely acknowledged to be lacking and to be necessary for successful adaptation to climate change impacts in California**.** Better statewide groundwater management has been called for by everyone from the Legislative Analyst's Office (see Liquid Assets: Improving the State's Groundwater Management)[12] to the State Water Resources Control Board (see Groundwater Workplan Concept Paper)[13] to community-based organizations (see Community Water Center and the Environmental Justice Coalition of California's op-ed: California's Real Water War).[14] The state's own studies have documented that improved groundwater management is necessary to successfully adapt to climate change impacts on water in California (see Climate Change and Water Supply Security: Reconfiguring Groundwater Management to Reduce Drought Vulnerability and Climate Vulnerability and Adaptation Study for California: Legal Analysis of Barriers to Adaptation for California's Water Sector).[15] Consequently, **UCS believes the Scoping Plan Update should include a clear strategy to require the implementation of sustainable groundwater management (not just planning), performance metrics to track progress (e.g., using groundwater levels and groundwater pumping data), and enforcement mechanisms to ensure compliance.**

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[11] Clair O'Connor (Natural Resources Defense Council) and Juliet Christian-Smith (Pacific Institute). 2013. Implementation of the Agricultural Water Management Planning Act: A Review of Agricultural Water Management Plans, available at: http://www.pacinst.org/wp-content/uploads/2013/08/agricultural-water-management-plans.pdf

[12] Legislative Analyst's Office. 2010. Liquid Assets: Improving the State's Groundwater Management, available at: http://www.lao.ca.gov/reports/2010/rsrc/groundwater/groundwater_032410.aspx

[13] State Water Resources Control Board. 2013. Discussion Draft: Groundwater Workplan Concept Paper, available at: http://www.waterboards.ca.gov/water_issues/programs/groundwater/docs/gw_workplan100713.pdf

[14] Laurel Firestone (Community Water Center) and Amy Vanderwarker (Enviornmental Justice Coalition of California). 2007. California's Real Water War, available at: http://sfgate.com/cgi-bin/article.cgi?f=/c/a/2007/08/27/EDDMRP3I1.DTL

[15] Ruth Langridge, Andrew Fisher, Andrew Racz, Bruce Daniels, Kirsten Rudestam, and Blake Hihara. 2012. Climate Change and Water Supply Security: Reconfiguring Groundwater Management to Reduce Drought Vulnerability. California Energy Commission Publication Number: CEC-500-2012-017, available at: http://www.energy.ca.gov/2012publications/CEC-500-2012-017/CEC-500-2012-017.pdf. Michael Hanemann, Deborah Lambe, and Daniel Farber. 2012. Climate Vulnerability and Adaptation Study for California: Legal Analysis of Barriers to Adaptation for California's Water Sector. California Energy Commission. Publication number: CEC-500-2012-019, available at: http://www.energy.ca.gov/2012publications/CEC-500-2012-019/CEC-500-2012-019.pdf

Conclusion

Overall, UCS finds that CARB's Scoping Plan Update is a strong and visionary document in furthering California's efforts to address climate change and decarbonize our economy over the next decades. We applaud the leadership that the Board has taken and the courage and commitment both CARB staff and the Board have shown in implementing AB 32 in such a way that we can now contemplate, well before the 2020 target date in statute, further beneficial and achievable reductions in emissions beyond 2020 that are also envisioned in AB 32. We hope our comments and suggestions are helpful to the Board in strengthening and refining a fine starting document, and look forward to working with staff and the Board as this Plan is developed further.

Below find UCS contacts if CARB staff would like to engage in further discussion of our comments:

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