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JOINT OVERSIGHT HEARING OF THE SENATE ENVIRONMENTAL QUALITY COMMITTEE AND THE SELECT COMMITTEE ON CLIMATE CHANGE AND AB 32 IMPLEMENTATION

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California State Capitol, Room 112

Thinking Globally, Acting Locally: The Paris Climate Accord and What it Means for California's Climate Investments

BACKGROUND INFORMATION

Introduction

Climate change is a defining environmental challenge of our time. Caused primarily by the collective activities of carbon-intensive economies in the developed world, climate change now requires solutions that range from international treaties, structural changes in how nations and subnational states transition to new energy supplies, how the public and private sectors do business, and how individuals live their lives.

At the international level, the United Nations Framework Convention on Climate Change (UNFCCC) held a climate change conference in Paris, France in December 2015. The outcome was a voluntary agreement for nations to work to limit the emissions of greenhouse gases (GHGs) to levels that would allow an average global increase of no more than 2 degrees Celsius (C), and with a hope to limit warming to a smaller increment of 1.5 degrees.

Two degrees C is the maximum warming threshold at which many scientists predict there will likely be major climate disruptions such as super droughts and catastrophically rising sea levels. Moreover, as articulated during the Paris meetings, many scientists estimate that a 1.5 degree warming would be far safer, albeit still risky, for the resilience of global coasts, food, water, and other environmental systems on which humans rely. Even if humans can manage to limit both short- and long-term warming to this lesser level, some ecosystems, such as coral reefs and many alpine and higher latitude polar zones, already appear to be highly stressed and are likely to be largely lost with future incremental climate changes.

California is also not immune to the widespread effects of climate change, including decreased snowpack in the Sierra Nevada, expected sea level rise between 17 and 66 inches by 2100, and more frequent extreme fires, droughts and floods.

Although the current international emission reduction pledges fall short of what is needed for a 2 degrees C warming limit, let alone 1.5 degrees C, the Paris Accords include an expectation and mechanism for countries to increase their commitments every five years, and the agreement was largely viewed as a critical first step in bringing the vast majority of countries together to agree to act to combat climate change.

This document includes a brief summary of the international context for California's efforts on climate change, the state's suite of policies aimed at reducing GHG emissions and provides an overview of the recently finalized Second Investment Plan — the topic of the Joint hearing.

International Efforts to Address Climate Change

In the late 1980s, countries recognized the potential for widespread, human-induced disruptions to the climate, and began to develop a cooperative, international framework to limit global temperature increases. In 1994, the first major step was the formation of the United Nations Framework Convention on Climate Change (UNFCCC), an international treaty that set a goal of stabilizing greenhouse gas concentrations to prevent substantial climate change. Over the next two decades, the international community sought to establish legally binding actions that countries could take to limit greenhouse gas emissions. Early negotiations culminating in the Kyoto Protocol in 1997 focused on developed countries that were major GHG emitters. Subsequent climate change conferences in Bali, Copenhagen, and Cancun, tried to include developing

countries — such as China and India, which have large emerging economies — into legally binding emissions reduction targets.

Under 2 MoU

In addition to the negotiations at the national level, subnational governments have also taken a leadership role in climate change policy. Governor Brown and California have led the way by establishing the *Under 2 MoU* (Subnational Global Climate Leadership Memorandum of Understanding). What started as an agreement between California and Baden-Württemberg in Germany now includes 123 jurisdictions that account for one quarter of the world's Gross Domestic Product (GDP). Subnational governments that sign on to *Under 2 MoU* pledge to reduce GHG emissions 80-95 percent, or 2 metric tons CO_2-equivalent ($MTCO_2E$) per capita, by 2050.

2015 Paris Climate Change Conference

As the subnational governments continued to increase their cooperation through the *Under 2 MoU* in Paris, the 2015 Paris Climate Change Conference culminated in commitments from nearly all nations to reduce GHG emissions to combat climate change — the first time all nations agreed to take action in some form or another. Each nation submitted a plan that outlined their strategy to reduce GHG emissions through 2025 or 2030. The plans varied in scope and no legally binding emission reductions were established. However, each nation is legally obligated to progressively increase the stringency of their climate change policies in the future. Starting in 2020, countries will reconvene every five years to report on their emission reductions to date, and to update their emission reduction plans.

California's Climate Change Policies

Within the United States (US), California has long led in environmental legislation. Since the late 1960s, California has implemented a series of policies to reduce its air pollution, diversify energy and fuels, and catalyze relevant technological innovation. This has continued into the era of global climate change, where the nation has, until recently, lagged most developed countries in developing national policies to address the environmental and human consequences of rising emissions of GHGs.

In contrast, over the last 20 years, California has developed a series of its own policies to address its carbon footprint and associated pollution, including legislation on clean car standards, AB 1493 (Pavley) Chapter 200, Statutes 2002; Executive Order B-16-2012, renewable energy procurement requirements SB 1078 (Sher) Chapter 516, Statutes of 2002; SB 107 (Simitian and Perata) Chapter 464, Statutes of 2006; SB 350 (de León and Leno) Chapter 547, Statutes of 2015, GHG performance standards for baseload electricity generation SB 1368 (Perata) Chapter 598, Statutes of 2006, coordinated transportation and land use planning SB 375 (Steinberg) Chapter 728, Statutes of 2008, and a host of other efforts.

In 2003, building on earlier efforts to inventory GHG emissions AB 4420 (Sher) Chapter 1506, Statutes of 1998; SB 1771 (Sher) Chapter 1018, Statutes of 2000, the governors of California, Washington, and Oregon created the West Coast Global Warming Initiative with provisions for the states to coordinate climate change-related programs. In 2005, Governor Schwarzenegger issued Executive Order S-3-05 that established a series of GHG emission reduction targets for California, including reducing emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. AB 32 (Núñez and Pavley) Chapter 488, Statutes of 2006, codifying the 2020 emissions target from Executive Order S-3-05, requires the Air Resources Board (ARB) to inventory GHGs, determine the 1990 statewide GHG emissions level, and approve a statewide GHG emissions limit equivalent to that level, to be achieved by 2020.

Most recently, in 2015, Governor Brown issued Executive Order B-30-15 that established an additional intermediate emissions reduction target of 40 percent below 1990 levels by 2030. This executive order aligned California's greenhouse gas reduction targets with those of leading international governments ahead of the 2015 Paris Climate Change Conference. The 28-nation European Union, for example, set the same target for 2030 in October 2014. The executive order also addressed the need for climate adaptation and directs state government to, among other measures, factor climate change into state agencies' planning and investment decisions.

Implementing AB 32: The California Global Warming Solutions Act of 2006

In addition to calling on ARB to inventory GHGs in California (including carbon dioxide [CO_2], methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) and approve a statewide GHG emissions limit, to be achieved by 2020, equivalent to the level of 1990 emissions, AB 32 also requires ARB to:

- implement regulations that achieve the maximum technologically feasible and cost-effective reduction of GHG emissions;
- identify and adopt regulations for discrete early-action measures; and
- prepare and approve a Scoping Plan, to be updated every five years, to achieve the maximum technologically feasible and cost-effective reduction of GHG emissions by 2020.

The statute also specifies that ARB may include market-based compliance mechanisms, including a cap-and-trade program (outlined in detail below), in the AB 32 regulations after considering the potential for direct, indirect, and cumulative emission impacts from these mechanisms, including localized impacts in communities that are already adversely impacted by air pollution.

Cap-and-Trade Program

The cap-and-trade program was recommended in the Scoping Plan as a central approach to flexibly and iteratively reduce emissions over time. Pursuant to legal authority under AB 32, ARB adopted cap-and-trade regulations and those regulations were approved on December 13, 2011.

Beginning on January 1, 2013, the cap-and-trade regulation sets a firm, declining cap on total GHG emissions from sources that make up approximately 85 percent of all statewide GHG emissions. Sources included under the cap are termed "covered" entities. The cap is enforced by requiring each covered entity to surrender one "compliance instrument" for every emissions unit (i.e., metric ton of carbon dioxide equivalent or $MTCO_2e$) that it emits at the end of a compliance period. Over time, the cap declines, resulting in GHG emission reductions. Two forms of compliance instruments are used: allowances and offsets. Allowances are generated by the state in an amount equal to the cap. An offset is a credit for a real, verified, permanent, and enforceable emission reduction project from a source outside a capped sector (e.g., a certified carbon-storing forestry project). Offsets may be used to satisfy up to 8 percent of a covered entity's compliance obligation. Some fraction of allowances is allocated freely to covered entities, a small portion is set aside as part of an allowance price-containment reserve, and the rest is auctioned off quarterly.

Cap-and-Trade Auction & Proceeds

Proceeds from cap-and-trade auctions provide an opportunity for the state to invest in projects that help California achieve its climate goals and provide benefits to disadvantaged communities. These investments are collectively referred to as California Climate Investments. Several bills were passed as a package in 2012 to create a fund for these proceeds and then provide legislative direction for their expenditure.

- **AB 1532** (J. Pérez) Chapter 807, Statutes of 2012, directs the Department of Finance to develop and periodically update a three-year investment plan that identifies feasible and cost-effective GHG emission reduction investments to be funded with revenues derived from cap-and-trade auction proceeds. The proceeds are placed in a Greenhouse Gas Reduction Fund (GGRF). Further details on these Investment Plans are presented below.

- **SB 535** (de León) Chapter 830, Statutes of 2012, requires that, in addition to reducing greenhouse gas emissions, 25 percent of spending from the proceeds be used on projects that benefit disadvantaged communities and that 10 percent of the proceeds be invested in projects located within those communities. These allocations have become known as the "SB 535 requirement."

- **SB 1018** (Committee on Budget and Fiscal Review) Chapter 39, Statutes of 2012, establishes, among many actions, the GGRF as a special fund in the State Treasury to hold the proceeds of the auction or sale of allowances from a greenhouse gas market-based compliance mechanism, such as a cap-and-trade program.

These statutes also require a state agency, prior to expending any money appropriated to it by the Legislature from the fund, to prepare a description of 1) proposed expenditures, 2) how they will further the regulatory purposes of AB 32, 3) how they will achieve specified greenhouse gas emission reductions, 4) how the agency considered other objectives of that act, and 5) how the agency will document expenditure results.

To date, the state has had 13 quarterly cap-and-trade allowance auctions and the GGRF has received over $2.3 billion.

Auction Proceeds and Disadvantaged Communities

As mentioned above, SB 535 requires that at least 25 percent of available moneys in the GGRF be allocated to projects that provide benefits to disadvantaged communities, and at least 10 percent are allocated to projects located within disadvantaged communities. In order to identify communities for GGRF investments, the Office of Environmental Health and Hazard Assessment, under CalEPA's guidance, developed a tool called *CalEnviroScreen* that uses 19 environmental and population indicators.

SB 862 (Committee on Budget and Fiscal Review) Chapter 36, Statutes of 2014, also provided further legislative guidance on maximizing benefits for disadvantaged communities and guidance for quantifying and reporting GHG emissions reductions. Late last year, ARB finalized funding guidelines to meet the requirements set out in SB 862. Under these guidelines there is preference for projects that exceed the minimum 10 and 25 percent investment targets and provide multiple benefits or the most significant benefits.

Investment Plans for Proceeds from Cap-and-Trade Auctions

First Investment Plan

Pursuant to AB 1532, the first three-year Investment Plan for cap-and-trade auction proceeds, developed by Department of Finance in consultation with ARB and other state agencies and covering 2013-2015, was submitted to the Legislature in May 2013. The plan identified 1) sustainable communities and clean transportation, 2) energy efficiency and clean energy, and 3) natural resources and waste diversion as the three broad categories that provide the best opportunities, in that order, for achieving the legislative goals of AB 32 via auction proceeds. In

addition, SB 535 directs that threshold levels of investment be made to benefit disadvantaged communities.

Specific strategies included many that continue and strengthen previous state programs to reduce air pollution, diversify energy and fuels, and catalyze relevant technological innovation.

Sustainable Communities and Clean Transportation

The Investment Plan recommended that sustainable land-use planning and transportation get the largest allocation because it represents the biggest contributor of GHGs, generates criteria air pollutants, and needs investments for transformation to reduce GHG emissions and meet air quality standards. The Plan also noted that these investments support the purposes of AB 32 and provide substantial air quality and public health co-benefits.

Recommended investments were rail modernization, such as expanded transit, passenger rail, high-speed rail service; and changes in land-use planning, including transit-oriented development, the creation of sustainable communities' strategies at the regional level, development of local planning efforts to reflect regional strategies, and implementation of specific projects at the local and regional levels to support developing sustainable communities.

Energy Efficiency and Clean Energy

The plan recommended that the energy efficiency and clean energy concept sector receive a significant allocation of auction proceeds, since the energy sector is responsible for the second largest fraction of GHG emissions in the state.

Energy efficiency/clean energy financing and weatherization retrofits for low-income households were recommended investments that complement existing programs in the residential sector. Improvements to water system and use efficiency, such as in water pumping/conveyance, and the use of biogas from wastewater treatment plants to generate energy or fuels were recommended projects for the public sector. Energy efficiency improvements in the industrial and agricultural sectors were recommended as well.

These investments offer significant opportunities to provide jobs and be located in disadvantaged communities. They also include reduced costs to consumers, energy independence/diversity, and reduced criteria pollutants.

Natural Resources and Waste Diversion

While the combined natural resources and waste diversion category represents less than 10 percent of GHG emissions, the Investment Plan notes that there is potential for achieving greater reductions and realizing significant co-benefits to human health and the environment. Globally, this category represents a major source of GHG emissions, and innovative sequestration or emissions reduction projects in this sector provide a significant leadership opportunity for California. These projects also offer many opportunities to be located in and benefit disadvantaged communities (e.g., urban forestry, agricultural land conservation), and waste diversion efforts would support California's statewide 75 percent recycling goal.

Recommended investments included management, restoration and conservation easements in forests and other carbon-storing ecosystems; other practices to sequester carbon and reduce black carbon (i.e., soot) through, for example, urban forestry and fire suppression; conservation easements for agricultural land; agricultural facilities and practices to reduce GHG emissions (e.g., fertilizing materials, dairy digesters); and reduction, recycling, and other diversion of wastes.

Budget Allocations

Consistent with the 2013 First Investment Plan, the 2014-15 Budget allocated $832 million in GGRF revenues to a variety of transportation, energy, and resources programs aimed at reducing GHG emissions. SB 862 (Committee on Budget and Fiscal Review), the 2014 Budget trailer bill, established a long-term cap-and-trade expenditure plan by continuously appropriating portions of the funds for designated programs or purposes. The legislation continuously appropriates 25 percent for the state's high-speed rail project (starting in 2015-16), 20 percent for affordable housing and sustainable communities grants, 10 percent to the Transit and Intercity Rail Capital Program, and 5 percent for low-carbon transit operations.

The remaining 40 percent is available for annual appropriation by the Legislature, and is the focus of Investment Plan discussion below.

The 2014-15 and 2015-16 enacted budgets appropriated these funds to the categories below.

	2014-15	2015-16
Low-carbon transportation	$200 *	90
Low –income weatherization and solar	75	70
Agricultural energy and operational efficiency	15	40
Urban water efficiency / energy efficiency for public buildings	20	20
Sustainable forests and urban forestry	42	–
Waste diversion	25	–
Wetlands and watershed restoration	25	–

** all numbers in millions of dollars*

Second Investment Plan

The purpose of the Second Investment Plan, released in draft form in October 2015 and submitted to the Legislature in final form in January 2016, is to identify both ongoing and new opportunities for GHG emission reductions, and identify potential state investment priorities for both the current budget year as well as the longer three-year period from 2016-2018. These proposed investments are intended to help the state 1) achieve GHG emission reductions, 2) benefit disadvantaged communities, 3) increase rural community participation, and 4) yield valuable co-benefits.

Like the First Investment Plan, the Second Plan groups diverse strategies under the same three major investment categories, identifies gaps in the current investment portfolio, and suggests potential strategic areas that would help address these gaps. In addition, the Second Investment Plan highlights new cross-cutting approaches that are applicable across the three major themes, including supporting local climate action in disadvantaged communities and developing efficient financing mechanisms to maximize investments.

Since the publication of the First Investment Plan, state and other funding sources have emerged to complement certain identified GHG reduction programs. For example, Proposition 1 supported programs to alleviate issues emerging from prolonged drought. Proposition 39 supported energy efficiency gains in educational institutions. Nevertheless, funding gaps remain to realize all of the state's goals. As mentioned above, SB 862 established continuing appropriations totaling 60 percent of the GGRF proceeds, so the Second Investment Plan focuses on discussion of priorities for investment of the remaining 40 percent of GGRF proceeds.

This Second Investment Plan builds on the First and posits a more diversified approach to achieving our climate targets. Suggested investments all lead to GHG emission reductions, but also emphasize to a greater extent co-benefits such as disadvantaged community support, public

health, water quality and supply, urban and rural greening, climate resilience, and habitat protection.

For example, within the concept area of energy efficiency and clean energy, the Second Investment Plan contains new emphases on supporting low-carbon water systems, including:

- renewable energy generation by water agencies and water suppliers;
- more energy efficient pumps, turbines, and existing desalination plants;
- reduced demand for carbon-intensive water; and
- on-farm water and energy conservation.

Within natural resources and waste diversion, the Second Investment Plan places new emphasis on:

- targeted investment toward private landowners for conservation of forest and agricultural lands that are in danger of conversion, including the Healthy Soils Initiative;
- reducing GHG and black carbon emissions from wildfire and open biomass burning through increased forest resilience and new, cleaner biomass facilities;
- increasing urban tree canopies and expanding green infrastructure to sequester carbon and increase energy efficiency of the built environment; and
- reducing methane emissions through support for an increase in compost and anaerobic digestion capacities and the use of organic waste and residues from dairies, farms, and forests, to help meet renewable electricity and bioenergy targets.

This Second Investment Plan suggests a strategic investment portfolio intended to support measures that will deeply reduce emissions in the near term, but also facilitates ongoing emission reductions in the mid- and long-term.

Concluding Remarks and Questions

The Second Investment Plan, especially in the context of California's recent participation in international discussions in Paris, poses important questions for the Legislature to consider.

For example, has California identified the best coordinated package of strategies that balance its range of goals, including short- and long-term cost-effectiveness in achieving GHG reductions and the creation of environmental and economic benefits for disadvantaged communities and other communities? Is there enough investment in existing approaches that, if scaled up, offer the ability to quickly achieve emissions reductions and maximize co-benefits? Is there enough investment in new technologies and approaches that offer potential to help achieve California's longer-term climate goals? Is the state adequately considering both emissions reductions and carbon sequestration?