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INFORMATIONAL HEARING:
THE GOVERNOR'S CLIMATE BUDGET PROPOSAL

Tuesday, February 18, 2020
State Capitol, Room 112
2:30 p.m. or Upon Adjournment of Session

AGENDA

I. The Governor's Climate Budget Proposal

a. The Legislative Analyst's Office
- Ross Brown, Principal Fiscal & Policy Analyst
- Rachel Ehlers, Principal Fiscal & Policy Analyst
- Brian Weatherford, Senior Fiscal & Policy Analyst

b. The Administration
- Vivek Viswanathan, Chief Deputy Director, Department of Finance
- Kate Gordon, Director, Governor's Office of Planning and Research
- Jared Blumenfeld, Secretary for Environmental Protection
- Wade Crowfoot, Secretary for Natural Resources
- Karen Ross, Secretary for Food and Agriculture

II. Perspectives on the Climate Budget Proposal
- Danny Cullenward, Lecturer, Stanford Law School
- Bruce Riordan, Program Director, Climate Readiness Institute at UC Berkeley

III. Public Comment

The Governor's Climate Budget Proposal

BACKGROUND

According to the National Aeronautic and Space Administration (NASA), scientists attribute the global warming trend observed since the mid-20th century to the human expansion of the "greenhouse effect" – warming that results when the atmosphere traps heat radiating from Earth toward space. In its Fifth Assessment Report, the Intergovernmental Panel on Climate Change, a group of 1,300 independent scientific experts from countries all over the world under the auspices of the United Nations, concluded there is more than 95 percent probability that human-produced greenhouse gases such as carbon dioxide, methane, and nitrous oxide have caused much of the observed increase in Earth's temperatures over the past 50 years. Climate change is complex and has many facets, including science, economics, society, politics, and moral and ethical questions. It is a global problem felt on local scales.

Responding to climate change involves two general approaches: (1) mitigating greenhouse gas emissions (particularly reduction), and (2) adapting to actual or expected impacts created by climate change.

MITIGATING GREENHOUSE GAS (GHG) EMISSIONS

GHG Emission Sources. GHG emissions are derived from a wide variety of sources. According to the California Air Resources Board (ARB), 2017 California carbon emissions totaled 424.1 MMTCO2e (million metric tons of carbon dioxide equivalents). A breakdown of sources of GHG emissions by economic sector is as follows:

- Transportation 41 percent
- Industrial 24
- Electricity (in-state generation) 9
- Electricity (imported) 6
- Agriculture 8
- Residential 7
- Commercial 5

The significant majority of transportation emissions is generated by light duty vehicles. Examples of industrial sources include refineries, general fuse use, oil and gas extraction, and cement production.

Key Legislation Addressing GHG Emissions. Over the last two decades, California has developed a series of policies and legislation to address its carbon footprint and associated pollution, most notably AB 32 (Núñez and Pavley), Chapter 488, Statutes of 2006. AB 32 requires ARB to determine the 1990 statewide GHG emission level and achieve a reduction in GHG emissions to that level by 2020.

AB 32 requires ARB to inventory GHGs in California (including carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) and approve the aforementioned statewide GHG emissions limit. In addition, AB 32 requires ARB to (1) implement regulations that achieve the maximum technologically feasible and cost-effective reduction of GHG emissions, (2) identify and adopt regulations for discrete early-action measures, and (3) prepare and approve a Scoping

Plan, to be updated at least once every five years, to achieve the maximum technologically feasible and cost-effective reduction of GHG emissions. Due to a variety of factors, most importantly being the great recession that started in 2008, California will achieve the goals of AB 32 in advance of the 2020 deadline.

SB 32 (Pavley), Chapter 249, Statutes of 2016, requires ARB to ensure that statewide GHG emissions are reduced to at least 40 percent below the 1990 level by December 31, 2030. This goal helps keep California on target to achieve the level of reductions scientists say is necessary to meet the goals of the Paris Agreement, which calls for limiting global warming to well below 2 degrees Celsius and pursuing efforts to limit it to 1.5 degrees Celsius.

AB 398 (E. Garcia), Chapter 135, Statutes of 2017, extends the authority of ARB to implement a cap-and-trade program. AB 398 specifies a variety of requirements on the post-2020 cap-and-trade program; most notable are: (1) requiring the banking of allowances from the current cap-and-trade program into the post-2020 program, (2) specifying industry assistance factors for the post-2020 program, and (3) the adoption of a price ceiling in the program, at which point an unlimited number of allowances must be made available for purchase.

The Scoping Plan. AB 32 creates a comprehensive, multi-year program to reduce GHG emissions in California. AB 32 requires ARB to develop a Scoping Plan that describes the approach California will take to reduce GHGs to achieve the goal of reducing emissions to 1990 levels by 2020. The Scoping Plan was first approved by ARB in 2008 and must be updated every five years. In 2016, SB 32 codified a 2030 GHG emissions reduction target of 40 percent below 1990 levels. With SB 32, the Legislature passed companion legislation AB 197 (E. Garcia), Chapter 250, Statutes of 2016, which provides additional direction for developing the Scoping Plan. ARB completed the second update to the Scoping Plan to reflect the 2030 target in January 2017.

The Scoping Plan lays out California's overall climate policy portfolio as follows:

- Double building efficiency
- Increase renewable power
- More clean, renewable fuels
- Cleaner zero or near-zero emission cars, trucks, and buses
- Walkable/bikeable communities with transit
- Cleaner freight and goods movement
- Slash potential "super-pollutants" from dairies, landfills, and refrigerants
- Cap emissions from transportation, industry, natural gas, and electricity
- Invest in communities to reduce emissions

The Scoping Plan notes that a balanced mix of strategies can provide the state with a great level of certainty in meeting the target at a low cost while also improving public health, investing in disadvantaged and low-income communities, protecting consumers, and supporting economic growth, jobs, and energy diversity.

Major GHG Emissions Policies. California has established seven major policies to meet statewide GHG limits, as follows:

- ***Cap-and-Trade.*** The Cap-and-Trade regulation establishes a "cap" on overall emissions from large emitters by issuing a limited number of permits (also known as allowances). Allowances can be bought and sold (traded), which creates a market price for allowances and an incentive for lowest cost reductions. *(More details below.)*

- ***Short-Lived Climate Pollutants (SLCPs).*** Regulations and incentives are intended to reduce certain types of emissions from dairies, landfills, and refrigeration equipment. Climate pollutants including methane, tropospheric ozone, hydrofluorocarbons (HFCs), and soot (black carbon), are relatively short-lived (anywhere from a few days to a few decades), but when measured in terms of how they heat the atmosphere (global warming potential, or GWP), can be tens, hundreds, or even thousands of times greater than that of carbon dioxide.

  Because SLCPs remain in the atmosphere for a relatively short period, but have a much higher GWP than carbon dioxide, efforts aimed at reducing their emissions in their near term would result in more immediate climate, air quality, and public health benefits, rather than a strategy focused solely on carbon dioxide. According to ARB's website, "while the climate impacts of CO2 reductions take decades or more to materialize, cutting emissions of SLCPs can immediately slow global warming and reduce the impacts of climate change." Recent research estimates that SLCPs are responsible for about 40 percent of global warming to date and that actions to reduce SLCP emissions could cut the amount of warming that would occur over the next few decades by half.

- ***Renewable Portfolio Standard (RPS).*** RPS regulations require utilities to provide a certain percentage of electricity from qualifying renewable sources, such as wind and solar. Most recently, SB 100 (de León), Chapter 312, Statutes of 2018) accelerated the RPS to require utilities generate 44 percent of their energy from renewable energy sources by December 31, 2024, 52 percent by December 31, 2027, and 60 percent by December 31, 2030. SB 100 also states that it is California policy that 100 percent of energy in the state be RPS-eligible or zero-carbon by December 31, 2045.

- ***Energy Efficiency.*** Energy efficiency regulations and financial incentives encourage more efficient energy use in commercial buildings, homes, and manufacturing facilities. In addition to the RPS, SB 350 (de León and Leno), Chapter 547, Statutes of 2015, established new energy efficiency goals for the state by (1) requiring the California Energy Commission to establish annual targets for statewide energy efficiency savings and demand reductions that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by January 1, 2030, (2) requiring the Public Utilities Commission to establish efficiency targets for electrical and gas corporations consistent with this goal, and (3) requiring local publicly-owned electric utilities to establish annual targets for energy efficiency savings and demand reductions consistent with this goal. ARB claimed, in the last update to the Scoping Plan, that energy efficiency would be responsible for 10 percent of the GHG emissions reductions necessary to achieve the SB 32 target.

- ***Low Carbon Fuel Standard (LCFS).*** LCFS regulation requires transportation fuel suppliers to reduce the amount of GHGs per unit of fuel used in California. LCFS is also known as carbon intensity of fuels.

- ***Vehicle-Related Programs.*** Vehicle-related programs consist of regulations and incentives to encourage more efficient light- and heavy-duty vehicles, as well as promote certain types of technologies such as electric vehicles. Vehicle-related programs include the following:

    - *Enhanced Fleet Modernization Program and Clean Cars 4 All.* EFMP is designed to encourage low-income drivers to retire their older, high-emitting vehicles and replace them with newer, cleaner, more fuel-efficient vehicles. CC4A is a complementary incentive program and augments the EFMP base program by adding up to an additional $5,000 in incentives for the subset of participants living in or near a disadvantaged community census tract and who choose an advanced technology replacement vehicle (e.g., hybrid, plug-in hybrid, and battery electric vehicles).

    - *Clean Vehicle Rebate Project (CVRP).* In order to promote the production and use of zero-emission vehicles. CVRP enables the purchaser or lessee of an eligible vehicle to receive a rebate of up to $5,000. CVRP was initially designed to achieve 1.5 million zero emission vehicles on the road by 2025.

    - *Zero Emission Vehicle (ZEV) Regulation.* The ZEV regulation requires large volume and intermediate volume vehicle manufacturers that sell cars in the state to produce ZEVs (e.g., battery electric and fuel cell vehicles), clean plug-in hybrids, clean hybrids and clean gasoline vehicles with near-zero tail pipe emissions. The ZEV regulation requires that 15 percent of new car sales be ZEVs by 2025.

- ***Vehicle Miles Traveled (VMT).*** VMT planning strategies and financial incentives are intended to reduce the amount of light-duty vehicle use through such things as increased transit and changes to land use.

According to the Legislative Analyst's Office (LAO), the electricity sector has been the primary driver of GHG emission reductions over the last decade. Annual emissions from the electricity sector have declined by about 40 million metric tons (40 percent) over this period. Reductions have mostly been due to a change in the mix of resources used to generate electricity – primarily large increases in renewables (solar and wind) and, to a lesser extent, reductions in the amount of coal.

Cap-and-Trade was designed as a "backstop" to other climate change policies in the march to the AB 32 goal, with the bulk of GHG emission reductions coming from other measures. It was designed to account for about 15 percent of the state's emission reductions, and experts say that it will likely end up accounting for less. Although the other measures, a broad suite of sector-specific regulations, are often called "complimentary," they have been the main drivers of GHG emissions reductions in California.

CLIMATE CHANGE IMPACTS

Climate Change Projected to Have Significant Effects on the Environment. According to the LAO, scientists are conclusive that some degree of climate change already is inevitable. The changing climate will have several consequential effects on California over the coming decades. Indeed, such impacts have already begun. In recent years, the state experienced a severe drought, multiple serious wildfires, and periods of record-breaking heat, all of which scientists suggest likely are harbingers of future

conditions. In addition to these more episodic events, science has shown that the changing climate will result in a gradual and permanent rise in global sea levels. In the coming years, the state will need to broaden its focus from efforts to mitigate the effects of climate change to also undertake initiatives centered on how communities can adapt to the approaching impacts.

Climate change could have a myriad of consequential effects in California, including the following:

- ***Sea-Level Rise (SLR).*** According to the LAO, California could experience as much as seven feet of SLR by 2100. Given the significant natural resources, public infrastructure, housing, and commerce located along California's 840 miles of coastline, the certainty of rising seas poses a serious and costly threat. Recent estimates project that compared to 2000, sea levels along the California coast south of Mendocino will rise between 1.5 inches and one foot by 2030 and between five inches and two feet by 2050. These changes would impact both human and natural resources along the coast, increasing the risk of inundation of buildings and infrastructure, salt-water intrusion into groundwater basins, and beach erosion.

  Most responsibility for SLR preparation lies with local governments, however the state has a vested interest in ensuring the coast is prepared. Waiting too long to initiate adaption efforts likely will make responding effectively more difficult and costly. According to the LAO, key coastal adaptation challenges for local governments include the following:

  - Funding constraints hinder both planning and adaptation projects.
  - Limited local government capacity restricts their ability to take action.
  - Adaptation activities are constrained by a lack of key information.
  - Lack of forums for shared planning and decision-making impede cross-jurisdictional collaboration.
  - Responding to SLR is not yet a priority for many local residents or elected officials.
  - Protracted process for attaining project permits delays adaption progress.

- ***Flooding.*** Climate models predict less frequent, but more intense storm patterns, which would increase inland flooding risk. Floods cause significant risk to human life, as well as damage roads, buildings, and other infrastructure.

- ***Temperature Increases.*** Extreme heat events are projected to worsen through the state. By midcentury, for example, the Central Valley is projected to experience high heat events that are two weeks longer. Changing temperatures could affect human health, agricultural production, and natural habitats.

- ***Drought.*** Warmer temperatures would contribute to more frequent and intense droughts by leading to more precipitation falling as rain rather than snow, faster melting of winter snowpack, greater rates of evaporation, and drier soils. These conditions decrease the amount of spring snowmelt runoff upon which the state historically has depended for its annual water supply, as well as increases the demand for irrigation water in both agricultural and urban settings.

- ***Wildfires.*** Climate change is expected to make forests more susceptible to extreme wildfires. One study, for example, predicts that by 2100, the frequency of extreme wildfires burning over

approximately 25,000 acres would increase by nearly 50 percent, and that the average area burned statewide would increase by 77 percent.

- ***Warming Oceans.*** Evidence indicates that climate change is degrading the state's marine environment. In recent years, California's coastal environment has experienced a historic marine heat wave, record harmful algal bloom, fishery closures, and a significant loss of northern kelp forests.

The environmental effects would vary by region and could affect communities differently. Some effects include reduced public health from high heat events; reduced water supply, water quality, and agricultural production from droughts; increased energy costs from increased average temperatures; and increased risks to public safety and infrastructure from flooding and wildfires.

Fiscal Effects of Climate Change. According to the LAO, emerging research findings suggest economic costs on the order of tens of billions of dollars for California by the end of the century associated with certain climate impacts, particularly increased human mortality, reduced agricultural production, and higher energy expenditures. Another recent analysis estimates that there is $150 billion of property value at risk of damage just from modest sea-level rise projected to occur by 2100.

Future costs to state or local governments include the following:

- *Disaster Response and Recovery.* State and local governments incur costs to respond to major disasters such as wildfires and floods. To the extent that climate change increases the risk of such events, there could be large one-time costs.
- *Annual Operating Expenses.* Government agencies might devote a greater share of their budget resources to prevention and response activities, such as to combat wildfires, maintain flood protection infrastructure, and supply clean drinking water.
- *Infrastructure Modifications and Replacement.* State and local governments have billions of dollars of infrastructure that could be damaged by climate change-induced events, such as wildfires, flooding, and sea-level rise. This infrastructure includes roads and highways, water treatment facilities, schools, and other public buildings. Choices include "hardening" infrastructure to prevent or reduce damage when events occur, making infrastructure more resilient to accommodate changing conditions, and relocating facilities to lower-risk sites.

CLIMATE CHANGE ADAPTATION AND RESILIENCY

Reducing Vulnerability to Climate Change. All sectors in California – including residents, businesses, agricultural producers, and state and local governments – have the potential to be adversely impacted by the effects of climate change. According to the California Natural Resources Agency's Fourth Climate Assessment, if we continue on our business as usual path, the cost of climate change to the state will reach $113 billion annually by 2050. Investing in climate prevention and adaptation measures now could save the state billions of dollars in future damages.

According to the LAO, planning for these impacts is key to long-term resiliency by developing strategies to minimize the worst potential impacts. Developing and implementing effective risk reduction measures is a multistep process that includes assessment of risks and costs, development of adaptation plans, selection of specific projects and policies, implementation, and ongoing monitoring. Because the number

of steps and their potential complexity, it often will take years to develop and implement mitigation measures. For this reason, developing an effective response requires early planning – before the worst climate change impacts are felt. The LAO states the key steps in adaptation planning and implementation are as follows:

1. *Conduct Vulnerability Assessment.* Develop understanding of how climate change might effect different jurisdictions. Model various climate change scenarios and assess the potential exposure and impacts to key assets (such as infrastructure, property, and natural resources) and services (such as drinking water and emergency response).

2. *Develop Adaptation Plan.* Based on assessed vulnerabilities, determine specific strategies that can be undertaken to reduce the amount of risk and damage that will be experienced. Identify overall approach and priorities, policies, potential projects, and timelines.

3. *Develop Detailed Project Plans and Policies.* Develop specific implementation plans for adaptation projects including engineering design, environmental permitting, costs, funding sources, deadlines, and anticipated performance measures. Research and draft new policies and solicit public feedback.

4. *Implement Adaptation Projects and Policies.* Construct projects. Adopt and enforce policies.

5. *Monitor and Evaluate Effectiveness of Projects and Policies.* Conduct multiyear monitoring to assess how well projects and policies are meeting anticipated objectives as conditions change and whether modifications may be necessary to maintain or improve outcomes.

California agencies have completed several reports in recent years designed to identify climate change risks and provide guidance to state and local governments on how to do adaptation planning. Examples include:

- "Paying It Forward: The Path Toward Climate-Safe Infrastructure in California," (California Natural Resources Agency [CNRA], 2018) provides information on how to incorporate climate change projections into the state's infrastructure design, planning, and implementation.

- "California's Fourth Climate Change Assessment," (Office of Planning and Research [OPR], California Energy Commission, and CNRA, 2018) provides scientific assessments of climate-related vulnerabilities.

- "Planning and Investing for a Resilient California: A Guidebook for State Agencies," (OPR, 2018) is a guidance document on steps of climate change planning for state agencies.

- "Safeguarding California Plan: 2018 Update," (CNRA, 2018) is a catalogue of ongoing actions and recommendations to protect infrastructure, communities, services, and the natural environment from climate change.

- "Climate Adaptation Planning Guide: Planning for Adaptive Communities," (California Emergency Management Agency, CNRA, 2012) provides guidance for local governments and regional collaboratives to address the consequences of climate change.

These documents generally focus broadly on statewide climate change risks and planning strategies.

Integrated Climate Adaptation and Resilience Program (ICARP). SB 246 (Wieckowski), Chapter 606, Statutes of 2015, directed the Office of Planning and Research to form ICARP, which is designed to develop a cohesive and coordinated response to the impacts of climate change across the state. Through its activities, ICARP will develop holistic strategies to coordinate climate activities at the state, regional and local levels, while advancing social equity. ICARP has two components: the State Adaptation Clearinghouse and the Technical Advisory Council (TAC). The State Adaptation Clearinghouse is a centralized source of information and resources to assist decisionmakers at the state, regional, and local levels when planning for and implementing climate adaptation projects to promote resiliency across California. TAC brings together local government, practitioners, scientists, and community leaders to help coordinate activities that better prepare California for the impacts of a changing climate. TAC supports the Governor's Office of Planning and Research in its goal to facilitate coordination among state, regional, and local adaptation and resiliency efforts, with a focus on opportunities to support local implementation actions that improve the quality of life for present and future generations.

CLIMATE CHANGE FUNDING MECHANISMS

CAP-AND-TRADE PROGRAM

A Market-Based Approach to Reducing GHG Emissions. Cap-and-Trade is a market-based approach to reducing emissions. The Cap-and-Trade regulation places a "cap" on aggregate GHG emissions from large GHG emitters, such as large industrial facilities, electricity generators and importers, and transportation fuel suppliers. Capped sources of emissions are responsible for roughly 80 percent of the state's GHG emissions. Sources included under the cap are termed "covered entities." To implement the Cap-and-Trade program, ARB issues carbon allowances equal to the cap, and each allowance is essentially a permit to emit one ton of carbon dioxide equivalent. Entities can also "trade" (buy and sell on the open market) the allowances in order to obtain enough to cover their total emissions. 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 and may be "banked" (i.e., allowing current allowances to be used for future compliance). 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). Some fraction of allowances are allocated freely to covered entities, a small portion are set aside as part of an allowance-containment reserve (a cost-containment mechanism that releases additional allowances into the market to slow price increases), and the rest are auctioned off quarterly.

Summary of California-Quebec Joint Auction Settlement Prices and Results

Auction Name	Total Current Auction Allowances Offered	Total Current Auction Allowances Sold	Current Auction Settlement Price	Total Advance Auction Allowances Offered	Total Advance Auction Allowances Sold	Advance Auction Settlement Price
Nov 2019 Joint Auction (JA) #21	67,435,661	67,435,661	$17.00	9,038,000	9,038,000	$16.80
Aug 2019 JA #20	66,289,515	66,289,515	$17.16	9,038,000	9,038,000	$16.85
May 2019 JA #19	66,321,122	66,321,122	$17.45	9,038,000	9,038,000	$17.40
Feb 2019 JA #18	80,847,404	80,847,404	$15.73	9,038,000	5,983,000	$15.62
Nov 2018 JA #17	78,825,717	78,825,717	$15.31	9,401,500	9,401,500	$15.33
Aug 2018 JA #16	79,421,265	79,421,265	$15.05	9,401,500	9,401,500	$14.90
May 2018 JA #15	90,587,738	90,587,738	$14.65	12,427,950	6,057,000	$14.53
Feb 2018 JA #14	90,215,920	98,215,920	$14.61	12,427,950	8,576,000	$14.53

Source: ARB. Last updated November 2019. Allowances offered are sold in metric tons. Current Auction Settlement Price means the allowance price that resulted from the sale of allowances in the Current Auction per metric ton. Advance Auction Settlement Price means the same for future vintages allowances offered in the Advance Auction. All prices are shown in the table above are in US dollars.

Greenhouse Gas Reduction Fund (GGRF). Cap-and-Trade auction proceeds are deposited into GGRF. GGRF revenue to date is as follows:

GGRF Revenue to Date

Auction Quarter or Fiscal Year	Proceeds of Auction to GGRF
Q4 2019 (November)	$739,265,162.01
Q3 2019 (August)	$729,162,758.22
FY 2018-19	$3,207,445,517.33
FY 2017-18	$2,913,174.716.32
FY 2016-17	$891,915,202.45
FY 2015-16	$1,829,134,502.71
FY 2014-15	$1,490,776,416.79
FY 2013-14	$477,140,441.20
FY 2012-13	$257,264,031.64
TOTAL	**$12,535,278,748.67**

Source: ARB. Last updated December 2019.

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. Statutes require a state agency, prior to expending any money appropriated to it by the Legislature from GGRF, 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 GHG emissions reductions; 4) How the agency considered other objectives of that act; and, 5) How the agency will document expenditure results.

GGRF: Over 60 Percent of Annual Revenue to Certain Programs and Approximately 40 Percent Discretionary. Over the last several years, the Legislature has committed to ongoing or multiyear funding for a variety of programs, including:

- ***"Off-the-Top" Allocations to Backfill Certain Revenue Losses.*** AB 398 and subsequent legislation allocates GGRF to backfill state revenue losses from (1) expanding a manufacturing sales tax exemption and (2) suspending a fire prevention fee that was previously imposed on landowners in State Responsibility Areas (SRA fee). Under current law, both of these backfill allocations are subtracted—or taken off the top—from annual auction revenue before calculating the continuous appropriations discussed below. These allocations are roughly $100 million annually.

- ***Continuous Appropriations.*** Several programs are automatically allocated 60 percent of the remaining annual revenue. State law continuously appropriates annual revenue (minus the backfills taken off the top) as follows: (1) 25 percent for the state's high-speed rail project, (2) 20 percent for affordable housing and sustainable communities grants (with at least half of this amount for affordable housing), (3) 10 percent for intercity rail capital projects, and (4) 5 percent for low carbon transit operations.

- ***Safe Drinking Water Program.*** Last year, the budget included $100 million GGRF to the Safe and Affordable Drinking Water Fund as established by SB 200 (Monning), Chapter 120, Statues of 2019, which provides funding for local water systems to ensure an adequate and affordable supply of safe drinking water. Trailer bill language dedicated five percent of GGRF annual appropriation (with a cap of $130 million), which begins in 2020-21 and sunsets 2030, for safe drinking water and provides a General Fund backstop for the Safe Drinking Water Fund should the five percent of GGRF fall below $130 million beginning in 2023-24.

The remaining revenues — sometimes referred to as "discretionary"— are allocated through the annual budget process, and funds generally support activities intended to facilitate GHG reductions. Historically, some of these expenditures have been allocated on a one-time basis, while other programs have been allocated funding on a multiyear basis.

The following table shows the Cap-and-Trade discretionary spending plan that was approved in the 2019 Budget Act:

2019-20 GGRF Discretionary Spending Plan

Investment Category	Program	Department	Amount *(in millions)*
Air Toxic and Criteria Air Pollutants	AB 617 - Community Air Protection	ARB	245
	AB 617 State and Local Implementation Costs	ARB	20
	Technical Assitance to Community Groups	ARB	10
Low Carbon Transportation	Clean Vehicle Rebate Project	ARB	238
	Clean Trucks, Buses & Off-Road Freight Equipment	ARB	182
	Enhanced Fleet Modernization Program, School Buses & Transportation Equity Projects	ARB	65
Healthy Forests	Healthy & Resilient Forests (SB 901)	CalFire	165
	Prescribed Fires & Fuel Reduction (SB 901)	CalFire	35
	Wildland-Urban Interface (WUI) and Other Fire Prevention Activities	CalFire	10
	Urban Forestry	CalFire	10
Climate Smart Agriculture	Agricultural Diesel Engine Replacement & Upgrades	ARB	65
	Healthy Soils	Food & Agriculture	28
	Methane Reduction	Food & Agriculture	34
Short-Lived Climate Pollutants	Waste Diversion/Recycling Infrastructure	CalRecycle	25
	HFC Refrigerants	ARB	1
Climate Mitigation & Resilience	Coastal Resilience/Adaptation	Various	3
	Transformative Climate Communities	Strategic Growth Council	60
	Urban Greening	Natural Resources Agency	30
	Energy Corps	Conservation Corps	6
	Low-Income Weatherization	Community Services and Development	10
Climate & Clean Energy Research and technical assistance to disadvantaged communities	Climate and Energy Research	Strategic Growth Council	5
	A study on the Transition to a Carbon-Neutral Economy Study and a study on identifying top strategies to reduce emissions from the transportation sector.	CalEPA	3
	Technical Assistance to Disadvantaged Communities	Strategic Growth Council	2
Workforce Training	Apprenticeships for a Green Economy	Workforce Development Board	35
Safe Drinking Water	Safe Drinking Water	State Water Resources Control Board	100
		TOTAL	**$1,387**

GENERAL OBLIGATION BONDS

Recent Natural Resources Related Bonds. According to the LAO, since 2000, voters have approved about $31 billion in general obligation bonds in statewide elections to pay for different types of natural resources and environmental protection-related projects. Two most recent such bonds were (1) Proposition 1 in 2014, which provided $7.5 billion primarily for water supply infrastructure, water quality improvements, and habitat restoration activities; and (2) Proposition 68 in 2018, which provided $4.1 billion primarily for state and local parks and habitat conservation and restoration activities.

Almost 90 percent of Proposition 1 has been appropriated, with most of that committed to specific projects. Over half of Proposition 68 funds have been appropriated in the first two fiscal years since its passage.

Natural Resources General Obligation Bonds Approved by Voters Since 2000
(Dollars in Millions)

Proposition	Date	Primary Purposes	Amount[a]
12	March 2000	Parks and habitat protection	$2,100
13	March 2000	Water supply and flood protection	1,884
40	March 2002	Habitat protection, water quality, and parks	2,597
50	November 2002	Coastal protection, Delta, water supply and quality	3,345
1E	November 2006	Flood protection	3,990
84	November 2006	Water quality, habitat protection, flood protection, and parks	5,266
1	November 2014	Water supply, habitat protection, and water quality	7,465
68	June 2018	Habitat protection, parks, and flood protection	4,100
Total			**$30,747**

[a] Reflects amounts authorized by voters as adjusted by Proposition 1 and Proposition 68.

State Indebtedness. According to the LAO, the state has about $82 billion of General fund-supported bonds on which it is making annual principal and interest payments. In addition, the voters and the Legislature have approved about $42 billion of General Fund-supported bonds that have not yet been sold. Most of these bonds are expected to be sold in the coming years as additional projects need funding.

As of March 2019, the LAO estimated that the state is paying about $6 billion annually from the General Fund to repay bonds (including roughly $1 billion for natural resources-related debt service). Consequently, the state's debt service ratio – the portion of the state's annual General Fund revenues spent on bond debt – is under five percent.

As a general principle, the LAO states that general obligation bonds should be used for the construction and acquisition of capital improvements as well as associated planning costs. Directing bond funds to long-term capital improvements ensures that bond spending provides benefits over many years so that future taxpayers do not bear the cost of projects that do not benefit them.

The Costs of Bond Financing. After selling bonds, the state makes annual payments over the following few decades until the bonds are paid off. The state pays more for a project funded by bonds than if the state does not borrow money for the project because of the interest costs. The amount of additional cost depends primarily on the interest rate and the time period over which the bonds have to be repaid. In the

past, the LAO has estimated that the cost of using bonds after adjusting for inflation is about $1.30 for each $1 borrowed.

CALIFORIA INFRASTRUCTURE AND ECONOMIC DEVELOPMENT BANK (IBank)

IBank. IBank was created in 1994 to finance public infrastructure and private development that promote a healthy climate for jobs, contribute to a strong economy and improve the quality of life in communities. IBank operates pursuant to the Bergeson-Peace Infrastructure and Economic Development Bank Act and is located within the Governor's Office of Business and Economic Development. A five-member Board of Directors govern IBank. IBank has broad authority to issue tax-exempt and taxable revenue bonds, provide financing to public agencies, provide credit enhancements, acquire or lease facilities, and leverage state and federal funds. IBank programs include the following:

- ***Infrastructure State Revolving Fund (ISRF) Loans.*** IBank has financed more than $720 million in low-cost ISRF loans to state and local government entities for infrastructure and economic expansion projects since 1999.
- ***Bond Financings.*** IBank has issued more than $39 billion of tax-exempt and taxable conduit bonds for public agencies, nonprofits, manufacturing companies, and exempt facilities since 1995.
- ***ISRF Bonds.*** Since 2002, IBank has issued more than $480 million of ISRF bonds to provide the revenue source for direct, low-cost financing to public agencies for infrastructure and economic expansion projects.
- ***California Lending for Energy and Environmental Needs (CLEEN) Center Loans.*** IBank has financed nearly $7 million in direct loans under its CLEEN Center, which was established in 2014.
- ***Green Bonds.*** IBank has issued nearly $1.4 billion Green Bonds since 2016. The bond proceeds provide financial assistance to local agencies such as the State Water Resources Control Board Clean Water and Clean Drinking Water State Revolving Fund Programs.
- ***Safe Drinking Water State Revolving Fund (SDWSRF).*** IBank has provided nearly $89 million in short-term loans to the California Drinking Water Program since 2013. These financings are matching funds that allowed the SDWSRF to receive approximately $445 million in federal capitalization grants. The SDWSRF finances drinking water infrastructure improvements for communities.
- ***Small Business Loan Guarantee Program.*** IBank has supported more than 20,000 loans amounting to more than $3 billion for entrepreneurs through its various credit enhancement programs, with more than $1.8 billion in loan guarantees since the early 2000's.
- ***Jump Start Loan Program.*** IBank has made $295,000 in microloans to 33 low-wealth entrepreneurs in low-wealth communities and provided 965 hours of Technical Assistance to 324 small businesses in these communities.

IBank has financed more than $40.5 billion of infrastructure and economic development projects over the years.

GOVERNOR'S PROPOSAL

The Governor proposes a $12.5 billion climate budget, which will be rolled out over five years, and includes GGRF, a proposed climate resilience bond, and a low-interest loan fund. The proposal is meant to be comprehensive and collaborative.

Climate Budget
(Dollars in Millions)

Funding Mechanism	2020-21 Total	5 Year Total
Climate Resilience Bond	-	$4,750
Cap and Trade Expenditure Plan	$965	$4,825
Climate Catalyst Fund	$250	$1,000
General Fund One-Time Investments	$169	$169
General Fund Ongoing Expenditures	$35	$315
Existing Bond and Special Fund Expenditures	$308	$1,424
Total	**$1,727**	**$12,483**

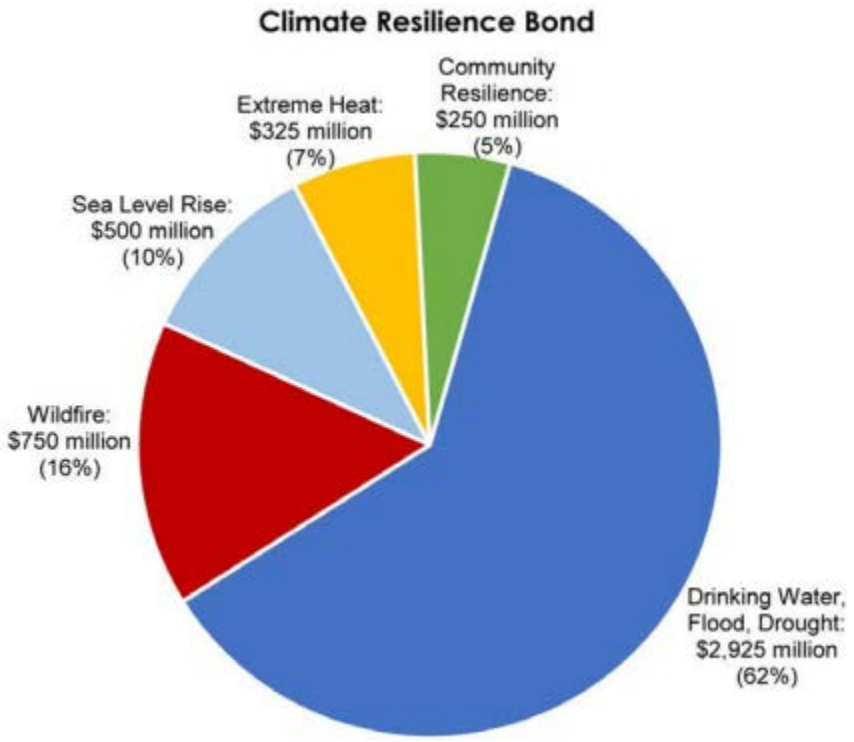
The Governor states that the climate budget is part of how the state would fund the California Green New Deal Act, introduced earlier this week by Assemblymember Bonta, which focuses on climate goals and issues of inequality.

Cap-and-Trade Expenditure Plan. The Governor proses a $965 million discretionary spending plan for GGRF.

2020-21 Cap and Trade Expenditure Plan
(Dollars in Millions)

Investment Category	Department	Program	Amount
Air Toxic and Criteria Air Pollutants	Air Resources Board	AB 617 - Community Air Protection and Local Programs to Reduce Air Pollution	$200
		AB 617 - Local Air District Implementation	$25
		AB 617 - Technical Assistance to Community Groups	$10
Low Carbon Transportation	Air Resources Board	Clean Vehicle Rebate Program	$125
		Clean Trucks, Buses and Off-Road Freight Equipment	$150
		Enhanced Fleet Modernization Program, School Buses and Transportation Equity Projects	$75
		Agricultural Diesel Engine Replacement and Upgrades	$50
Healthy Forests	CAL FIRE	Healthy and Resilient Forests	$165
		Forest Carbon Plan: Prescribed Fire and Fuel Reduction	$35
		2019 Fire Safety and Prevention Legislation	$8
Climate Smart Agriculture	Department of Food and Agriculture	Healthy Soils	$18
Short-Lived Climate Pollutants	CalRecycle	Waste Diversion	$15
	Department of Food and Agriculture	Methane Reduction	$20
Integrated Climate Action: Mitigation and Resilience	Coastal Commission and SF Bay Conservation and Development Commission	Coastal Resilience	$4
	California Conservation Corps	Energy Corps	$7
Research and Technical Assistance	Natural Resources Agency, California Energy Commission, Office of Planning and Research, and Strategic Growth Council	Climate Change Research, Technical Assistance, and Capacity Building	$25
Workforce Training	Workforce Development Board	Apprenticeships and Job Creation/Just Transition Strategies for a Carbon Neutral Economy	$33
		Total	**$965**

Climate Resilience Bond. The Governor proposes to put a $4.75 billion bond before voters in November 2020 to fund a variety of activities intended to help the state mitigate and prepare for the effects of climate change and reduce the risks from water, fire, extreme heat, and sea level rise. Once issued, the bond would generate annual debt service costs, which are included in the Governor's multiyear General Fund expenditures estimates.



The bond is intended to address risks especially in California's most vulnerable communities. About 80 percent of the bond addresses immediate risks, such as floods, drought, and wildfires. The remainder addresses long-term challenges, including sea level rise and extreme heat.

The following page provides a further breakdown of proposed allocations for the bond.

Climate Resilience Bond
(Dollars in Millions)

Investment Category	Department	Program	Amount
Drinking Water, Flood, Drought	Department of Water Resources / State Water Resources Control Board	Regional and Inter-regional Water Resilience	$1,000
	Department of Water Resources	Sustainable Groundwater Management	$395
	State Water Resources Control Board	Safe Drinking Water	$360
	Department of Water Resources	Flood - Urban/USACE Projects	$340
		Flood - Systemwide Multi-benefit	$270
	Natural Resources Agency	Salton Sea	$220
	California Department of Food and Agriculture	Environmental Farming Incentive Program	$200
	Department of Fish and Wildlife	Enhanced Stream Flows and Fish Passage	$140
		Subtotal	$2,925
Wildfire	Natural Resources Agency, CAL FIRE, and Office of Emergency Services	Hardening of Critical Community Infrastructure	$500
	CAL FIRE	Forest Health	$250
		Subtotal	$750
Sea Level Rise	Ocean Protection Council	Coastal Wetland Restoration	$320
		Nature-Based Solutions to Build Resilience	$130
		Demonstration Projects to Protect Critical Infrastructure	$50
		Subtotal	$500
Extreme Heat	Natural Resources Agency	Urban Greening and Forestry	$200
	Strategic Growth Council	Cool Surface Materials	$125
		Subtotal	$325
Community Resilience	Strategic Growth Council	Community Resilience Planning	$25
		Community Resiliency Centers	$225
		Subtotal	$250
		Total	**$4,750**

More than 60 percent of the bond focuses on reducing risk to water systems in communities, including funds for sustainable groundwater management, safe drinking water, flood control, the Salton Sea, farm incentives, and safe passage for fish in streams and rivers.

The bond allocates $500 million to harden infrastructure in high-fire-risk communities and $250 million for forest health projects, which is in addition to fuel reduction activities paid for by GGRF and the amount that utilities are required to contribute.

Climate Catalyst Revolving Loan Fund. The Governor proposes to establish a new loan program at the I-Bank. I-Bank provides financial assistance to local governmental entities by lending funds at below-market rates. The proposed Climate Catalyst Revolving Loan Fund will lend money to private organizations for projects determined to advance the state's environmental goals, along with other priorities – such as creating high-quality jobs. The climate-related projects will be selected based on criteria developed in consultation with the Strategic Growth Council and Labor and Workforce Development Agency. Eventually, the administration intends for the proposed lending program to be self-sustaining from fees and interest earnings.

The Governor proposes $1 billion General Fund ($250 million this budget year and $750 million in 2023-24). The fund will provide low-interest loans for climate-related projects that help the state meet its climate goals and create jobs. The projects will focus on reducing transportation emissions through ZEVs and infrastructure, climate smart agriculture, landowner loans for forest management, and recycling.

The Climate Catalyst Revolving Loan Fund will offer low-interest lending to small businesses and organizations that have green ideas but may not be established or connected enough to compete for venture capital funding. The funding of these projects could bring them far enough along for other investors to feel comfortable stepping in – help provide incentive for private money to flow into infrastructure and projects. The proposal could help bridge a gap in funding for climate innovations that have reached early levels of commercialization, but are not mature enough to attract venture capital. This fund could help fill the gap in enabling these projects to attract the kind of capital needed to get to scale and in a timeline that would actually benefit the fight against climate change, a bringing together of technology innovation and policy innovation.

Projects will be chosen on their ability to meet the state's environmental goals and the need to access low-cost borrowing. Applicants will also need to show how their projects will create high quality, good-paying jobs for the workers they hire.