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# California's Global Warming Solutions Act of 2006

## A Background Paper for Labor Unions



August 2008

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# TABLE OF CONTENTS

Executive Summary	5
Introduction	11
Main Policy and Regulatory Options	17
Potential Employment Impacts of AB 32	43
How Organized Labor is Responding to Climate Change Legislation	58
Conclusion and Recommendations: Toward an Equitable Transition	65
References	74
Appendix	77

## TABLES AND CHARTS

Graph 1: California greenhouse gas emissions (2002-2004 average)	12
Graph 2: Magnitude of the challenge	18
Table 1: Recommended greenhouse gas reduction measures	20
Table 2: Sector responsibilities under cap-and-trade program (MMTCO <sub>2e</sub> in 2020)	25
Table 3: Predicted impact of AB 32 on employment	46
Table 4: Employment levels in heavy-emitting industries	50
Graph 3: Median wages for workers in heavy-emitting industries	51
Graph 4: Median wages for non-professional workers in heavy-emitting industries	52
Graph 5: Union density in private sector firms	53
Graph 6: Union density in private firms for heavy-emitting industries	54
Table A1: AB 32 Draft Scoping Plan recommendations, early actions, and other measures under consideration, by sector	78





## EXECUTIVE SUMMARY

This background paper analyzes AB 32, the Global Warming Solutions Act of 2006, a landmark law which aims to dramatically reduce California’s greenhouse gas (GHG) emissions. The paper focuses on AB 32’s potential impact on California jobs and workers, and highlights ways that California labor unions can influence the implementation process to promote both lower emissions and good jobs.

Under AB 32, the California Air Resources Board (ARB) is responsible for designing and implementing a GHG emissions reduction plan, known as the “scoping plan.” Further, the law mandates that ARB seek input from stakeholders as it develops this plan. There is a small period of time during which labor unions can respond to the draft scoping plan, which was released in June and will be finalized and voted on by ARB in November. Labor unions can respond to the draft scoping plan with public comments at ARB hearings, and through discussions with ARB staff and board members, as well as with elected officials. Even after the scoping plan is finalized, many of the detailed policies and regulations will be developed over the next several years, providing ongoing opportunities for organized labor’s concerns to be heard. Organized labor’s participation in these debates can play an important role in shaping how AB 32 ultimately affects working families in California.



# Main Findings

## AB 32 DRAFT SCOPING PLAN

This background paper describes the measures proposed in the draft scoping plan for reaching the AB 32 GHG emissions reduction goals. These include numerous single-sector regulations and a cap-and-trade program, which is a market mechanism covering multiple sectors of the economy. Some of the measures can be directly implemented by ARB; others require cooperation from other state or federal agencies, or voter approval.

The sectors that will be most heavily impacted by regulations are energy (which includes electricity, renewable energy, and energy efficiency in commercial and residential buildings); industry (including cement plants, oil and gas refineries, glass and other manufacturing industries); and transportation. The construction sector will also be affected by many of the measures. One of the most significant proposed measures for a single sector is an increase in the renewables portfolio standard (RPS)—the portion of electricity that must be sourced from renewable energy—to 33 percent by 2020.

The draft scoping plan recommends a cap-and-trade program, to be designed and administered in coordination with the Western Climate Initiative, a regional climate change initiative of the Western states in the U.S. and Canada. The proposed cap-and-trade program in California covers electricity, transportation fuels, natural gas, and large industrial sources, which together comprise 85 percent of the state's total GHG emissions. The emissions reductions from the cap-and-trade program would supplement direct regulation in the covered sectors. ARB currently plans that about 20 percent of the total reductions in emissions will be achieved via the cap-and-trade program.

The cap-and-trade program proposal puts an economic value on carbon by capping total emissions and allowing private entities to buy and sell allowances. If the state auctions the allowances—the permits that allow businesses to emit a certain quantity of carbon into the atmosphere—the cap-and-trade program has the potential to generate tens of billions of dollars of revenue for the green transition, depending on the price that buyers bid. At a conservative estimate of \$10 per metric ton of carbon, the public revenue generated by a 100 percent auction under the draft scoping plan's broadest cap-and-trade program would be more than \$3.5 billion per year.

## IMPACT ON CALIFORNIA JOBS

This report analyzes three types of job impacts, for which there is preliminary data. Further research on job impacts should be carried out by ARB and independent researchers.

### OVERALL JOB GROWTH AND LOSS

First, the available macroeconomic forecast, which traces the job growth and job loss throughout the economy resulting from the implementation of AB 32, shows very small changes in the overall

number of jobs, with a small positive impact on total employment. Most of the scenarios show no job loss in any of the industry categories, although in some industries employment does not grow as much as it would have without AB 32 regulation, while in others it grows marginally faster. The only industry that shows any job loss between 2006 and 2020 is the electrical appliances industry, which is predicted to lose 300 jobs, or less than one percent of jobs in the sector. About 41,000 additional jobs in construction are forecasted due to the draft scoping plan measures, but this is a very small change in percentage terms.

## CHANGES IN THE HEAVY-EMITTING INDUSTRIES

The second job impact analysis documents the jobs in the heavy-emitting industries subject to new ARB regulations and/or a cap-and-trade program. These include a wide range of manufacturing industries, fuel extraction and energy generation, and waste and water services. These industries account for over three million jobs, about 20 percent of California's jobs in 2006. In addition to being affected by changes in the number of jobs, as discussed above, these are the sectors where changes in workers' skill requirements and the need for retraining are likely to be concentrated.

These sectors also are sectors with a high concentration of well-paying blue-collar union jobs. Union density in these sectors is 15.6 percent. While only a portion (how much cannot be determined at this time) of the jobs in the heavy-emitting industries will require retraining, the sheer number of jobs in this group will mean that these traditional blue-collar jobs will account for most of the job transformation as California lowers its carbon emissions. In addition, climate change policies affecting these industries can favor certain firms—those that are able to respond to the changes in their regulatory and competitive environment—and put other firms at a disadvantage.

## NEW GREEN JOBS

The third job impact analysis summarizes other studies of jobs associated with new green businesses. The most comprehensive California-wide study estimates that there are currently about 3,000 green businesses in the state, accounting for about 44,000 jobs (*Clean Technology and the Green Economy*, 2008). Green businesses, defined as products and services that reduce environmental impact or improve natural resource use, are concentrated in energy generation and energy efficiency services. By North American Industry Classification System (NAICS) sectors, the study finds that 36 percent of California's green businesses are in professional, scientific, and technical services; 19 percent are in construction; and 15 percent are in manufacturing. These green businesses and jobs are likely to expand rapidly: estimates of the investment needed to meet just the RPS for electricity are approximately \$100 billion.

## HOW ORGANIZED LABOR IS RESPONDING

The California Labor Federation and the California State Building and Construction Trades Council (SBCTC) have been closely monitoring AB 32. The Labor Federation and SBCTC have developed a coordinated message for labor leaders and activists wishing to participate in the AB 32 process.

Organized labor's position is one of support for the goals of AB 32 as well as for policies that address workers' contributions and needs during the economic transition. Specifically, organized labor supports investment in worker transition assistance for displaced workers; investment in workforce training that builds on existing union apprenticeship and other infrastructure; and other measures to assure the creation of good, middle-class jobs with career paths.

Union officials are following other climate-change-related policies in addition to AB 32, such as AB 118, the California Alternative and Renewable Fuel, Vehicle Technology, Clean Air, and Carbon Reduction Act of 2007, and green jobs legislation like State Senator Pro Tem Darrell Steinberg's Green Jobs/Career Tech Education Bond, SB 1672.

The California Labor Federation has also joined with other labor federations in the Western U.S. and Canada to engage in the Western Climate Initiative (WCI).

## RECOMMENDATIONS

Organized labor's traditional arenas for promoting workers' rights and welfare—policy advocacy, organizing, and collective bargaining—provide a tool kit that can be used to reduce emissions and help create and maintain good jobs.

### ► Engagement in the Policy Process

Solutions to the global warming crisis will come primarily from changes in public policy and industry regulation; organized labor can get a seat at the table and influence this process now. Unions can get involved with the AB 32 implementation process and the design of the Western Climate Initiative cap-and-trade program as well as other climate change and green jobs legislation.

Organized labor is more likely to succeed when unions speak in a unified voice. In addition, collaboration with environmental, environmental justice, and social justice groups, with which organized labor has many common interests, can increase political effectiveness.

### ► AB 32 Climate Change Policy Recommendations

Overall, this report supports ARB's policy recommendations but urges ARB to take action to protect workers and improve job quality. This can be accomplished through a variety of public investment strategies as well as by creating specific safeguards on cap and trade, if it is adopted in California. Public investment can be funded in part or wholly from cap-and-trade revenues.

#### *Cap-and-Trade Recommendations*

- ◆ *Cap and auction:* The state should have a goal of auctioning 100 percent of the carbon allowances, rather than distributing them at no cost to emitters. This goal should be reached after a short adjustment period in which some key enterprises, like municipal utilities, receive waivers if they invest directly in permanent emissions reductions. While the draft

scoping plan does not contradict this goal, the Western Climate Initiative’s most recent design proposal includes no specific recommendation for a minimum percentage of allowances to be auctioned.

- ◆ *Scope*: The cap-and-trade program should cover a broad set of heavy-emitting industries.
- ◆ *Leakage*: ARB should adopt “consumption-based accounting” to assure that jobs don’t leave California. Putting a cap or levy on the *consumption* of carbon instead of on its *production* avoids the problem of leakage—the movement of jobs (and carbon emissions) to states and countries with less stringent GHG emissions standards than California’s.
- ◆ *System design to prevent “hot spots”*: Emissions trading that results in further concentration of emissions in disadvantaged communities should not be permitted.
- ◆ *Offsets*: Regulated businesses should not be allowed to “offset” their own emissions reductions by investing in an emissions reduction project outside the capped sectors except in highly restrictive circumstances. Offsets should be limited to a small portion of covered entities’ compliance obligations, and should meet job quality standards and environmental justice criteria to ensure the maximum co-benefits to the people of California. Offsets must be verifiable and enforceable by a state agency.

## ► Public Investment Recommendations

- ◆ *Worker transition assistance*: Public investment is needed for transitional support and retraining for workers whose jobs may be lost, using the principals of trade adjustment assistance, and similar to the language that the AFL-CIO was able to insert in proposed national cap-and-trade legislation. Current forecasts predict no significant job loss, but protections should be in place, and are likely to be low cost because of the small number of workers who may be affected.
- ◆ *Workforce development*: Investment is needed in workforce development initiatives that will complement the most successful of the state’s already-established workforce development programs. Many of these are union apprenticeship programs and other high-road labor-management training partnerships. Such programs provide a tremendous asset for the green transition, particularly because of the key role of construction occupations in new green building, energy efficiency building retrofits, solar energy installation, and construction of renewable energy plants.
- ◆ *Consumer assistance*: Investment in mass transit, residential efficiency retrofits, urban infill, and other strategies can lower households’ energy use and vehicle miles traveled, while promoting good jobs. Much of the emissions in California come from passenger vehicles and residential buildings, requiring changes in consumer behavior that are particularly difficult for low- and moderate-income consumers to make. Public investment in these areas can play an important part in cost-effective emissions reductions, while producing good jobs and protecting low-income consumers from escalating energy costs.

## ► Industry and Community Partnership Recommendations

Whether transforming existing jobs or creating new high quality jobs in the greening economy, unions will need to be deeply engaged with their employers and/or with other stakeholders in their industries. In addition to influencing policy, union training programs should adopt curricula for the needed new skills sets and promote union apprenticeship programs as a way to assist businesses to adopt new green technologies. Unions should also encourage their employers to seek growth opportunities in the changing business environment.

Partnerships with community and environmental groups can provide the momentum to lead to changes in industries that both reduce emissions *and* improve jobs. Successful labor-community-environmental partnerships are profiled in this report.

“AB 32 can be a win for the environment and a win for working people. But the win-win is not going to be created by wishful thinking; it’s going to be created by intentional policies ... We have the opportunity to help shape this major restructuring of our economy in a way that promotes California businesses, creates good jobs for a skilled and stable workforce, AND reduces our carbon footprint. Our planet and its people depend on it.”

—Art Pulaski  
Executive Secretary-Treasurer  
California Labor Federation

AB 32 will help slow global warming and at the same time generate enormous opportunities for California and for labor unions. California’s initiative in GHG reduction has the potential to create a green economic engine by fostering leading-edge technologies, processes, and products that can be exported to the rest of the world. Organized labor can play a vital role in this process, by advocating a just and equitable model for GHG reduction, by positioning union workers and employers to play a leading role in the new green economy, and by training the next generation of workers.

## INTRODUCTION

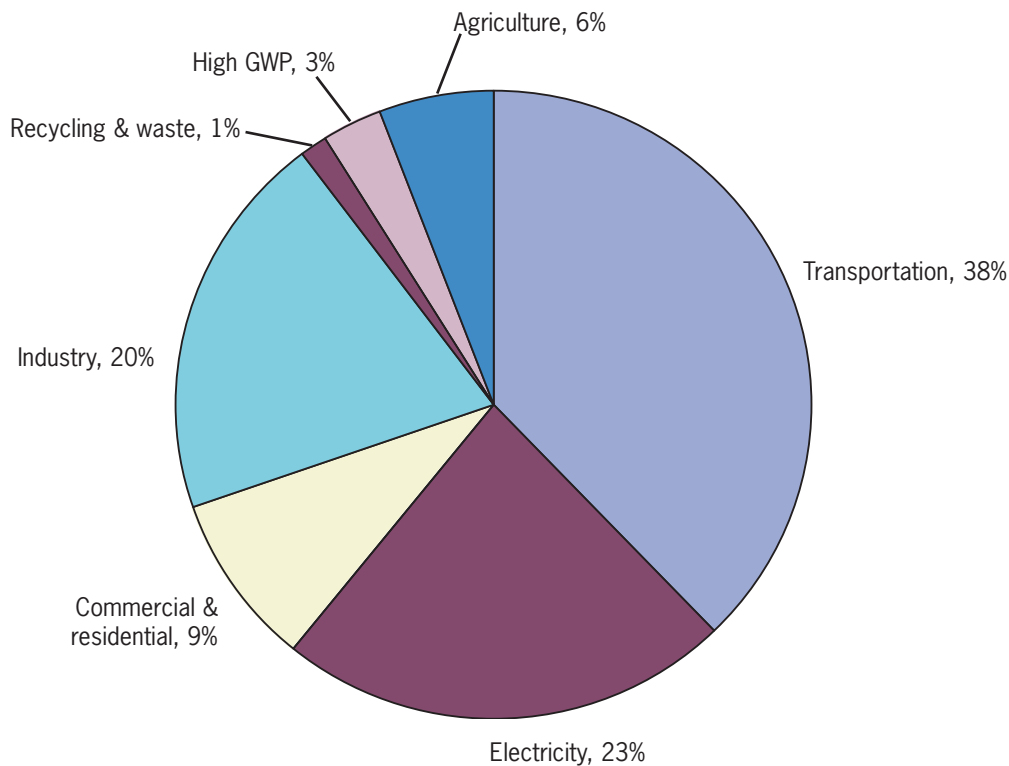
In 2012, the State of California will begin implementing a landmark piece of legislation which aims to dramatically reduce California's global warming emissions. AB 32, the Global Warming Solutions Act of 2006, will reduce California greenhouse gas emissions (GHGs) to 1990 levels by 2020 and to 80 percent below 1990 levels by 2050. The evidence is now clear that global warming already poses a threat to our planet. If we do not act immediately, the climate-change related droughts, wildfires, floods, and other environmental problems that are already beginning to disrupt our economy and hurt workers, their families and their communities, are likely to worsen.

California unions and workers want to know what AB 32 will mean for them. There has been much excitement in the news media and amongst politicians about the potential for creating "green jobs" in new and emerging industries. There has been less discussion and little research—by either the California Air Resources Board (ARB) or independent researchers—of the impact of AB 32 on jobs in existing industries. Jobs throughout the economy, not just in new industries, will require new skills as businesses change production processes to reduce their carbon footprint. Affected industries will include construction, energy generation, cement manufacturing, oil refining, steel production, ventilation and air conditioning, and many more. Many of the jobs in these industries are well-paying union jobs with good benefits.

The opportunities presented by the Global Warming Solutions Act are many: an opportunity for labor unions to work with other stakeholders to develop a new array of well-paying jobs with good benefits; a chance for unions to take leadership in providing a skilled and stable workforce for the green economy; and an opening at the ground level of the green economy to make quality jobs accessible to low-income communities. AB 32 will induce billions of dollars in private and public investment in energy efficiency retrofits, new building construction, and renewable energy generation. It

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**Graph 1**  
**California greenhouse gas emissions (2002-2004 average)**



Source: California Air Resources Board, AB 32 Draft Scoping Plan

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will present growth opportunities in traditional unionized sectors and new organizing opportunities in green industries like solar and wind energy. Union training programs are well positioned to help high-road employers gain a competitive advantage as they adapt to the new green economy that is being promoted by AB 32. If a cap-and-auction system or carbon fee is adopted under AB 32, those measures could create a revenue source of at least several billion dollars annually that could be spent on economic and workforce development to help the green transition.

The challenges are also daunting. This is clearly a case in which the devil is in the details. Depending on how AB 32 is implemented, the new regulations could mean trading in old union jobs that pay well for new non-union jobs of lesser quality; it could result in job loss if businesses leave for “less green pastures;” it could direct public funding to low-quality training programs that undermine union apprenticeships; and it could result in higher energy costs that disproportionately affect working and low-income people.



The purpose of this briefing paper is to inform organized labor and its allies about the Global Warming Solutions Act, draw attention to organized labor's interests in the key policy choices still to be made, present what we know so far about its impact on jobs and workers in California, and highlight the opportunities for promoting good jobs and benefits for working families.

AB 32 set goals for emissions reductions and charged ARB with designing and implementing a plan to reach those goals. ARB released its draft implementation plan, called the "draft scoping plan," in June of 2008 and the final implementation plan will be voted on in November. The period of time before the November vote is a critical window during which labor unions and other interested groups can have an influence on the way AB 32 is implemented. Further refinements of major regulations will still be needed after this vote, affording other opportunities for organized labor's engagement in the next several years.

California has the opportunity to help shape this major restructuring of our economy in a way reduces our carbon footprint AND creates good jobs with access to training and career opportunities. This will require engagement by labor unions and their allies in AB 32 implementation policy, in workforce development partnerships, in helping union employers take advantage of new markets, and in new strategic organizing campaigns.

## The Expected Impacts of Climate Change

AB 32 is among hundreds of pieces of legislation around the world that local, state, and national governments have passed in an effort to slow global warming and prevent its most harmful effects. One hundred and seventy eight nations and other parties have signed the Kyoto Protocol, and even though the United States did not sign the treaty, 852 U.S. cities—including large California cities such as Los Angeles, San Francisco, and San Diego—have signed the U.S. Conference of Mayors Climate Protection Agreement, whose goal is to meet or beat the Kyoto Protocol targets.

Governments at the local, state, and national levels are taking action on climate change because the result of inaction is expected to intensify in coming years, leading to what Nobel Peace Prize winner Al Gore calls a "threat to the survival of our civilization." According to the United Nations Intergovernmental Panel on Climate Change, the international scientific body that shared the Nobel Peace Prize with Gore, climate change is "unequivocal" and is already causing glaciers to melt, sea levels to rise, heat waves to become more frequent, and tropical cyclones to become more intense.

Current and future impacts of climate change include damage to crops; droughts; wildfires; extreme climate events; increased risk of food and water shortages; increased risk of death, injuries, and water- and food-borne diseases; disruption of coastal settlements, commerce, transport and societies due to flooding; and potential for population migration, among others.

All of these impacts will also have economic consequences. The Stern Review on the Economics of Climate Change, a comprehensive analysis of the economics of climate change carried out by former



World Bank Chief Economist Sir Nicholas Stern, argues that the economic costs and risks of not taking any action against climate change will be equivalent to losing at least five percent of global GDP each year, “now and forever.” In contrast, the Stern Review estimates that the costs of taking action to reduce greenhouse gas emissions to avoid the worst impacts of climate change can be limited to around one percent of global GDP each year.

At this point, there is no way that labor unions can turn back the clock on climate mitigation measures—nor is it in organized labor’s interest to oppose those acting to slow global warming. Labor union members will not only benefit indirectly from climate mitigation measures—if the measures succeed in preventing some of the worst impacts of global warming—but they will also directly benefit—for example, in terms of health and safety improvements for workers who will no longer be subject to hazardous emissions fumes. Organized labor had little involvement in the design and passage of AB 32, but still has the opportunity to influence its outcomes. Although the natural tendency for each union is to focus its involvement on specific measures that affect its current employers, the more organized labor can speak with one voice, find common ground with other stakeholders, and join the effort to create climate solutions, the more influence it will have.

## AB 32 in the Context of the Green Economy

Although AB 32 is the most important piece of climate mitigation legislation in California, it is only one among many state policies designed to reduce greenhouse gas emissions. These policies include the Low Carbon Fuel Standard (Executive Order S-01-07), the Million Solar Roofs Program and California’s Clean Car Regulations (AB1493), among others.

There are also a number of climate change mitigation proposals in various stages of development. State Senator Darrell Steinberg’s SB 1672 is a bond measure that will be placed on the ballot in 2010. If approved, it would authorize \$2.25 billion in state bonds for infrastructure investments for green career technical education for educational institutions, including high schools, community colleges, state-certified apprenticeship programs, and other public and private training institutions, all with a focus on benefits for disadvantaged communities. Another bond measure is being proposed by State Treasurer Bill Lockyer, which would invest \$5 million in improving the energy efficiency of state-owned buildings. And Assembly Speaker Emeritus Fabian Núñez is sponsoring AB 3018, the California Green Collar Jobs Act of 2008, which would establish a Green Collar Jobs Council.

These policies are also part of a larger “green” shift in the economy in California. As climate mitigation policies are passed in cities and localities throughout California—and the country—and consumer demand for green products like solar panels and energy efficiency appliances increases, new businesses and new jobs are being created to meet that demand. California is the largest recipient of venture capital for clean technologies, attracting more than \$1.7 billion in 2007. Everyone is talking about green jobs—from advocates for poor communities, who hope these jobs will create a

# The Evolving Definition of “Green Jobs”

**What is a “green job”? The term is still evolving and is being debated at universities, think tanks, workforce development institutions, and government agencies in the United States and throughout the world.**

Some define a green job simply in terms of whether the activity or service produced has a positive impact on the environment. For example, the California Employment Development Department’s Labor Market Information Division has a working group on green jobs that has tentatively defined “green” as any activity or service that performs at least one of the following: generating renewable energy, recycling existing materials, manufacturing or installing energy efficiency products, education and awareness, or natural and sustainable product manufacturing. Similarly, a global green jobs report by the Worldwatch Institute and Cornell University Global Labor Institute (*Green Jobs: Towards Sustainable Work in a Low-Carbon World*, 2007) defines green jobs as positions “aimed at alleviating the myriad environmental threats faced by humanity. Specifically, but not exclusively, this includes jobs that help to protect and restore ecosystems and biodiversity, reduce energy, materials, and water consumption through high efficiency and avoidance strategies, de-carbonize the economy, and minimize or altogether avoid generation of all forms of waste and pollution.”

Others are including the idea of economic sustainability in their definition of green jobs. They contend that a green job cannot represent the idea of environmental sustainability if it doesn’t create a sustainable environment for the worker doing the actual work. By this definition, a green job should pay a living wage, include benefits and provide avenues for career advancement. An example of the use of this definition of green jobs is found in *Greener Pathways: Jobs and Workforce Development in the Clean Energy Economy*, a new report by the Center on Wisconsin Strategy, Workforce Alliance, and Apollo

Alliance. These groups define green jobs as “family-supporting jobs that contribute significantly to preserving or enhancing environmental quality.”

The *Greener Pathways* report also points out an important dimension of green jobs that labor unions should note: these jobs include not only the easily identifiable new green jobs like solar panel installers and biofuel technicians, but they also include traditional jobs in occupations like construction and manufacturing that have been transformed to serve greener purposes. With this understanding, green jobs would include the construction worker who installs efficient water systems and the machinist who punches parts for wind turbines.

The idea that green jobs should inherently be good jobs has naturally led to the use of the term “green-collar job.” This term is usually used to refer to a manual labor job in a green business (*Green Collar Jobs*, 2007), but it also often meant to invoke well-paying and skilled blue-collar jobs that do not have high educational barriers.

For the purposes of this background paper on AB 32, a green job is defined as any job that reduces or eliminates negative human impacts on the environment and improves the productive and responsible use of natural resources. It includes both new green jobs—jobs that did not exist before and are tied to the development of new clean technologies—and transformed jobs—jobs that existed before but require new skills as processes are implemented that are less harmful to the environment. The report also encourages labor unions and others to advocate that green jobs should be good jobs that provide living wages, benefits, career paths, and a voice at work.

pathway out of poverty for people from disadvantaged communities, to Democratic presidential candidate Barack Obama, who is promoting green jobs programs as a way to simultaneously lift the U.S. out of its current economic downturn, reduce energy dependence, and slow global warming.

The definition of a “green job” is still evolving (see “The Evolving Definition of Green Jobs,” page 15), but for the purposes of this report, a green job is defined as any job that reduces or eliminates negative human impacts on the environment and improves the productive and responsible use of natural resources. It includes both new green jobs—jobs that did not exist before and are the result of the development of new clean technologies—and transformed jobs—jobs that existed before but require new skills as processes that are less harmful to the environment are adopted.

## The Organization of this Report

This report is designed as a background paper on AB 32 for organized labor and its allies. It seeks to document and analyze issues that are important to labor unions and their members in AB 32 implementation.

The first section documents the measures that are being proposed to meet the AB 32 GHG emissions reduction goals. It explains the multi-sector measures such as the cap-and-trade program, as well as the numerous regulations proposed for individual sectors. The second section analyzes AB 32’s potential impact on employment. It evaluates the data on jobs within industries that are heavy emitters of GHGs; presents the job growth and job loss forecasts of a macroeconomic analysis of AB 32; and summarizes what we know about jobs in the new green technology industries. The third section discusses labor union involvement in AB 32 implementation and other union initiatives related to climate change mitigation and green jobs. The final section presents our conclusions and recommendations for labor unions as they become more deeply involved in climate change mitigation and green jobs initiatives.

AB 32 presents labor unions with an opportunity to work for California policies that will have a huge impact on their members and the general public. Responses to the draft scoping plan are critical and needed before November 2008, when ARB votes on the final implementation plan. Further refinements of major regulations will still be needed after this vote, affording other opportunities for organized labor’s engagement in the next several years. Organized labor’s participation in policy debates and implementation can play an important role in shaping the outcomes for working families, assuring that the new jobs will be good jobs, and that workers and low-income people are protected during the green transition.

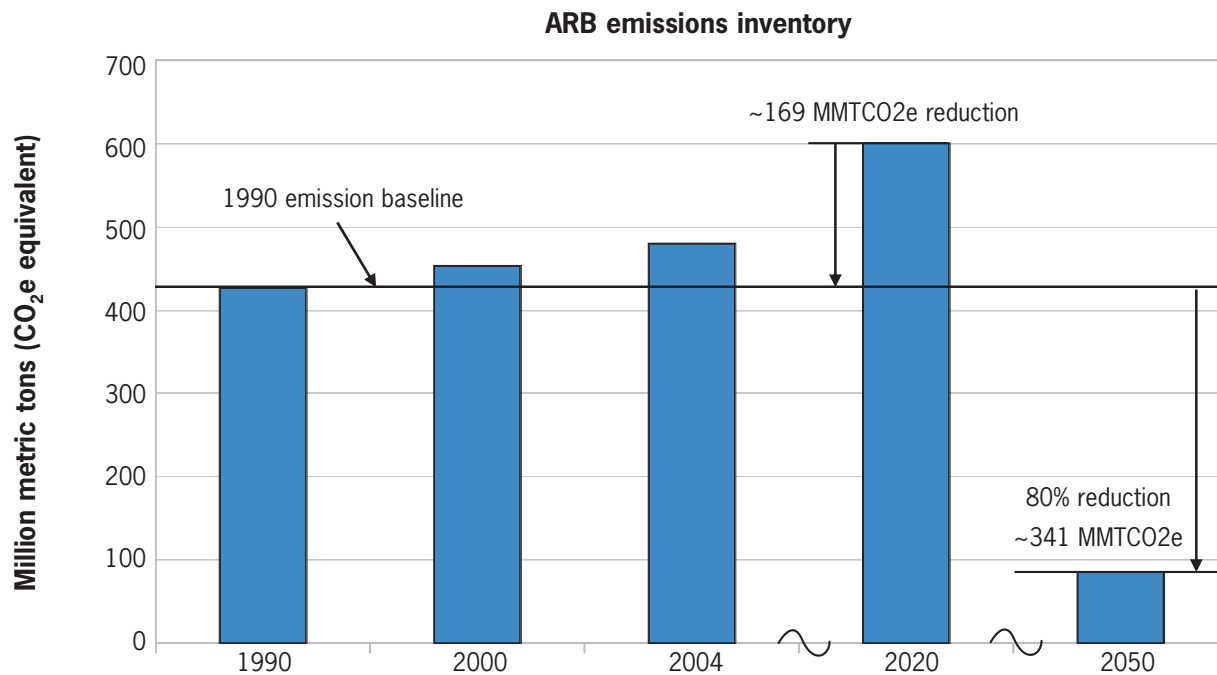
# MAIN POLICY AND REGULATORY OPTIONS

## Agency in Charge and Timeline

AB 32 sets specific goals to reduce California's greenhouse gas (GHG) emissions to 1990 levels by 2020 (a reduction of about 30 percent or 169 million metric tons CO<sub>2</sub> equivalent (MMTCO<sub>2</sub>e)) and to 80 percent below 1990 levels by 2050, as shown in Graph 2, below (page 18). AB 32 mandates that the emissions goals must be met using the most cost effective interventions while also maximizing other societal benefits, including reductions in other air pollutants, diversification of energy sources, and benefits to the economy, environment, and public health.

On June 26, 2008, the California Air Resources Board (ARB), the government agency charged with determining how the AB 32 goals will be reached, released its "draft scoping plan," which proposes specific measures for reaching AB 32's GHG reduction goals for 2020. The plan aims to reduce emissions through a variety of strategies, including sector-specific regulations, market mechanisms, voluntary measures, fees, incentives, and other policies and programs. It was developed in collaboration with various state agencies that have specific regulatory power over some of the AB 32 emissions reductions measures, including the California Environmental Protection Agency, California Energy Commission, and California Public Utilities Commission. In addition, AB 32 requires a public input process, and many stakeholder groups, including labor unions, provided input at ARB workshops and meetings, through participation in AB 32 committees such as the Environmental Justice Advisory Committee and Economic and Technology Advancement Advisory Committee, and through other channels.

**Graph 2**  
**Magnitude of the challenge**



Source: California Air Resources Board, AB 32 Draft Scoping Plan

ARB will hold a series of statewide workshops in July and August 2008 to get public comment on its draft scoping plan. The agency will also accept formal written comments through its website. Based on the comments, ARB staff will revise the draft plan and release a final staff recommendation in October 2008. The Air Resources Board members will vote on the final plan in November, and it will actually go into effect in 2012.

Clearly, there is only a small window of time during which labor unions and other stakeholders can influence the final AB 32 implementation plan. However, many of the detailed regulations will be developed over the next several years. In addition, if ARB approves a cap-and-trade program, there will be a planning period, with opportunities for public input, in coordination with the Western Climate Initiative. Involvement from the California legislature is also likely, particularly with regards to expenditures from any revenue-generating measures included in the final scoping plan (such as from a cap-and-trade program if the allowances are auctioned rather than given away). While the scoping plan is a key policy document into which input from labor is critical, there will be ongoing opportunities for labor's concerns to be heard as the AB 32 implementation process goes forward.

## AB 32 IMPLEMENTATION TIMELINE

2008	Mandatory reporting of GHG emissions begins and 1990 baseline is determined
June 26, 2008	Draft scoping plan released
July & August 2008	Statewide workshops held on the draft scoping plan; supplemental economic and environmental impact analyses released
October 2008	ARB staff release their recommended final scoping plan
November 2008	ARB hearing to adopt final scoping plan
2009	ARB publishes scoping plan
2010	ARB adopts enforceable early action regulations
2011	GHG reduction measures adopted
2012	GHG reduction measures operative

## DRAFT SCOPING PLAN

ARB's draft scoping plan proposes numerous sector-specific regulations. In addition, it proposes a market mechanism—a cap-and-trade program—that will cover multiple sectors of the economy and will be developed in collaboration with other Western states of the U.S. and Canada through the Western Climate Initiative (see Table 1 on page 20).

The sectors that will be most heavily impacted by regulations are energy (which under ARB's categorization includes electricity, renewable energy, and energy efficiency in commercial and residential buildings); industry (under which ARB includes cement and glass plants, oil and gas refineries, and other manufacturing industries); and transportation. The construction sector will be affected by many of the measures that are listed under other sectors, such as energy efficiency measures targeting residential and commercial construction, renewable energy measures like the Million Solar Roofs program, and construction associated with measures to clean up high-emitting industries. ARB is also asking the California state government, local governments, and regional decision-making bodies to adopt GHG reduction targets and measures through land-use planning for denser development, public transit, building codes, and other measures under their jurisdictions.

ARB is evaluating each measure for its environmental and economic impact; as of the date of this publication, however, the evaluation reports have not been released. These reports are expected to be published sometime this summer. Regarding AB 32's economic impact, ARB's draft scoping plan

**Table 1****Recommended greenhouse gas reduction measures**

<b>Recommended Reduction Strategies</b>	<b>Sector</b>	<b>2020 Reductions (MMTCO<sub>2</sub>e)</b>
The Role of State Government <ul style="list-style-type: none"> <li>Reduce carbon footprint</li> <li>Set an example</li> </ul>		1–2
California Cap-and-Trade Program Linked to WCI: Emissions cap of 365 MMTCO <sub>2</sub> e covering electricity, transportation, residential/commercial and industrial sources by 2020. Shaded reductions contribute to achieving the cap.		
California Light-Duty Vehicle GHG Standards <ul style="list-style-type: none"> <li>Implement Pavley standards</li> <li>Develop Pavley II light-duty vehicle standards</li> </ul>	Transportation	31.7
Energy Efficiency <ul style="list-style-type: none"> <li>Building and appliance energy efficiency and conservation <ul style="list-style-type: none"> <li>32,000 GWh reduced electricity demand</li> <li>800 million therms reduced gas use</li> </ul> </li> <li>Increase Combined Heat and Power (CHP) electricity production by 30,000 GWh</li> <li>Solar Water Heating (AB 1470 goal)</li> </ul>	Electricity & Commercial and Residential	26.4
Renewables Portfolio Standard (33% by 2020)	Electricity	21.2
Low Carbon Fuel Standard	Transportation	16.5
High Global Warming Potential Gas Measures	High GWP	16.2
Sustainable Forests	Forests	5
Water Sector Measures	Water	4.8
Vehicle Efficiency Measures	Transportation	4.8
Goods Movement <ul style="list-style-type: none"> <li>Ship Electrification at Ports</li> <li>System-Wide Efficiency Improvements</li> </ul>	Transportation	3.7
Heavy/Medium Duty Vehicles <ul style="list-style-type: none"> <li>Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)</li> <li>Medium- and Heavy-Duty Vehicle Hybridization</li> <li>Heavy-Duty Engine Efficiency</li> </ul>	Transportation	2.5
Million Solar Roofs (Existing Program Target)	Electricity	2.1
Local Government Actions and Regional GHG Targets	Land Use & Local Government	2
High Speed Rail	Transportation	1
Landfill Methane Control	Recycling & Waste	1
Methane Capture at Large Dairies	Agriculture	1
Energy Efficiency and Co-Benefits Audits for Large Industrial Sources	Industrial	TBA
Additional Emissions Reduction from Capped Sectors		35.2
	<b>Total Reductions</b>	<b>169</b>

Source: California Air Resources Board, AB 32 Draft Scoping Plan

asserts that “the overall savings from improved efficiency and developing alternatives to petroleum will, on the whole, outweigh the costs.” These issues are discussed in detail in the economic impact section of this report (see pages 43 to 57).

In this section, the draft scoping plan is described in detail and is organized as follows:

The multi-sector measures under consideration are described in the first section. They include the recommended cap-and-trade program, and an alternative carbon fee policy that could be substituted for cap and trade if ARB so votes. Next, the proposals affecting specific sectors are described, so that readers interested in a specific sector can find the relevant information easily. For each sector, the report describes the core measures recommended by ARB staff, additional measures that are under consideration by ARB staff but have not been included as recommendations, and “early actions.” Early actions are measures that can be implemented before 2012, when the rest of AB 32 goes into effect. “Discrete early actions” are very specific regulations that will be implemented beginning on January 1, 2010.<sup>1</sup>

## Multi-Sector Measures

### CAP AND TRADE

At the beginning of the planning process for AB 32 implementation, ARB considered two possible market mechanisms to reduce GHG emissions in California: a cap-and-trade program and a fee on carbon. Although ARB has not discarded the possibility of a carbon fee (see page 27 below), the draft scoping plan recommends cap and trade as the preferred market mechanism.

Cap-and-trade policies are a main component of regional and national emissions reductions initiatives that will eventually affect California. This policy momentum adds weight to the preference for cap and trade in California because in the future, state, regional, and national policies will need to be consistent with each other. Cap and trade is the main policy initiative in the Western Climate Initiative (WCI), and the AB 32 draft scoping plan recommends tight coordination with that planning and implementation process. Cap and trade was also the cornerstone of the national Lieberman-Warner Climate Security Act, which will be revived in coming years, and which will cover the whole nation. The East Coast Regional Greenhouse Gas Initiative also has committed to implementing a cap-and-trade program, and other regional bodies are expected to follow suit. A cap-and-trade system is currently the main mechanism being used in the European Union (E.U.) to meet the carbon emissions reduction targets of the Kyoto Protocol.

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<sup>1</sup> Nine discrete early actions have been recommended by ARB staff, and several of them have already been approved by ARB. There are an additional 35 early actions that have been approved by ARB. Both types of early actions are listed on pages 40 to 42.



Under cap and trade, the government places a “cap” or limit on carbon emissions from covered sectors in a specified geographic region. Unlike regulations, which require firms to meet specified emissions levels on a firm-by-firm basis, this market mechanism allows the buying and selling of carbon allowances—allowances that give a firm the right to emit carbon into the atmosphere—by the private sector. Companies that emit GHGs beyond the allowances that they “own” must buy more allowances. Companies that emit less than their allowances are rewarded by being able to sell (and profit from) their allowances. A cap-and-trade program allows the government to place a monetary value on the right to emit GHGs, resulting in a market price determined by demand from allowance purchasers for the quantity of allowances that are distributed. If demand for emissions allowances grows, through the entrance of new firms whose processes emit GHGs, the price of allowances will rise since the cap can only change through policy.

The logic behind cap and trade is that it will give the private sector flexibility and an incentive to find the least costly way to reduce emissions, thus lowering the overall costs to society created by climate mitigation policies. A cap-and-trade program can also be a source of revenues if the government auctions emissions allowances rather than giving them to emitting businesses at no cost.

## ✓ KEY ISSUES FOR ORGANIZED LABOR

The cap-and-trade program is a controversial one for many stakeholders, including labor. A segment of both the organized labor and environmental communities oppose cap and trade in any form. The reasons include doubts that a market free of fraud, speculation, and windfall profits for companies can be created; concerns that a cap-and-trade program will allow businesses to buy their way out of abating, particularly in low-income neighborhoods with high levels of co-pollutants; and general distrust of market solutions.

If, as is likely, a cap-and-trade system is in fact adopted in the final scoping plan, there are a number of extremely important options for how it is implemented. Of particular interest to unions and workers are 1) how *allowances*—the permits that allow businesses to emit a quantity of carbon—are distributed; 2) to what extent *offsets*—emissions reduction projects outside the capped sector that can replace emissions reductions within the capped sector—are allowed; and 3) how *leakage*—the movement of production (and emissions and jobs) to locations with less stringent emissions standards—is avoided.

## CAP AND TRADE OR CAP AND AUCTION?

Within a cap-and-trade policy, one of the most important decisions to be made is whether the government gives carbon allowances away *for free* to firms already emitting GHGs, whether it auctions the allowances *for a fee* to the highest bidder, or whether it uses some mix of the two approaches. The more allowances that are auctioned, the more revenues will be generated for the state. A cap-and-trade system in which allowances are auctioned is sometimes called a cap-and-auction system.

The auction proceeds would be public revenues. The size of this yearly revenue stream for California will depend on the annual quantity of allowances in the cap and on the price that buyers bid. A 100 percent auction in California would yield yearly revenues of more than \$3.5 billion with very conservative assumptions about the price that allowances will command.

How such revenues should be spent would be a significant public decision. Thus far, discussion of possible uses of revenue from a cap-and-auction program has focused on funding the transition to a green economy through investment in energy efficiency and renewable energy development; retraining of workers whose jobs are changing or will be lost; investment in grades 7 to 14 vocational and career technical education for future job growth; energy assistance to low-income families; and return of funds to utilities or other key enterprises that have committed to invest in permanent emissions reductions.

The European Union experience on cap and trade highlights the dangers of a free allowance system. During the first phase of its program to implement the Kyoto Protocol, the E.U. implemented a cap-and-trade system that gave away allowances for free to current emitters rather than auctioning them. This has led to windfall profits for some of the major carbon emitters without resulting in significant carbon reductions. The E.U. has changed its policy and starting in 2013 power companies will have to buy their emissions allowances through an auction.

Those labor unions and environmental groups that support cap and trade generally do so only if allowances are fully auctioned, although some groups support a short transition period with some free allowances for specific companies. In particular, for publicly-owned utilities that have a historical reliance on coal but have a credible strategy to transition to renewables (such as the Los Angeles Department of Water and Power), purchasing allowances might jeopardize their transition strategy. In general, advocates see auctioning as a way to avoid windfall profits to firms, and see the proceeds from an auction as a means to fund the variety of investments needed to make the transition to a green economy effective and equitable.

The main industry lobby group working on AB 32 in California, the AB 32 Implementation Group, opposes auctioning the emissions allowances, asserting that the fee will put California companies at a disadvantage when competing with out-of-state companies that do not have to pay for emissions allowances.

## OFFSETS

Another consideration in fashioning a policy to cap emissions is the extent to which “offsets” should be allowed. Offsets allow a company to invest in an emissions reduction project outside the capped sectors—such as a reforestation project that can capture carbon—instead of reducing emissions itself. One of the main policy choices is whether offsets should be limited to the geographical area of the cap-and-trade program (for example, should companies be allowed to invest in a biofuel company in Brazil as part of a cap-and-trade program seeking to reduce emissions in California?).

Allowing companies to purchase offsets in developing countries can spur the use of new, low-carbon technologies in the developing world and reduce carbon emissions worldwide. On the other hand, such offsets will not contribute to permanent emissions reductions or the development of clean energy technology in California.

Another challenge in implementing effective offset programs is ensuring that offset projects are verifiable, enforceable, and would not have been carried out anyway. Here too, the European Union experience is instructive. The E.U. allows offsets approved through the Kyoto Protocol's clean development mechanism (CDM), a worldwide carbon offset market, which is run by the United Nations. NGOs monitoring the system contend that almost three-quarters of the CDM "offset" projects were already completed at the time of their approval, meaning the projects would have been carried out anyway. Additionally, the NGOs say that billions of dollars in offset funds are going to chemical, coal, and oil corporations as well as the developers of destructive dams—rather than to projects that would promote renewables and energy efficiency (*Bad Deal for the Planet*, 2008).

It is extremely difficult to ensure that offset projects are legitimate, will be effective, and are additional—meaning that they would not have been carried out anyway. For these reasons, many environmental groups and labor unions recommend that offsets be strictly regulated and only be allowed to meet a small portion of a company's compliance obligation.

## LEAKAGE

Leakage refers to a situation in which jobs and carbon emissions leave California if California businesses relocate to other states—or countries—that have less stringent GHG emissions regulations. If the WCI sets emissions standards for the Western states and Canadian provinces that are as stringent as California's, leakage is less of a risk. In order to ensure that leakage does not occur, ARB can adopt "consumption-based accounting" in its cap-and-trade program, which would mean that out-of-state businesses whose products are *consumed* in California would need to obtain carbon emissions allowances just as in-state-businesses whose products are *produced* in California do. This issue is discussed in more detail below, in the section on ARB's proposed measures for the industry sector, because it is primarily of concern to industries that face strong interstate and global competition, like the cement industry.

## ⌘ WHAT IS ARB PROPOSING?

The draft scoping plan proposes the implementation of a cap-and-trade program in California that would cover electricity, transportation fuels, natural gas, and large industrial sources. The emissions reductions from the cap-and-trade program would supplement direct regulation in the covered sectors. ARB currently plans that about 20 percent of the total reductions in emissions will be achieved via the cap-and-trade program, accounting for a reduction of 35 MMTCO<sub>2e</sub>, compared to 112 MMTCO<sub>2e</sub> from direct regulation, out of a total reduction of 169 MMTCO<sub>2e</sub>.

**Table 2**

**Sector responsibilities under cap-and-trade program (MMTCO<sub>2</sub>e in 2020)**

Sector	Projected 2020 business-as-usual emissions		Projected 2020 emissions after implementation of other recommended measures		Preliminary 2020 emissions limit under cap-and-trade program
	by sector	total	by sector	total	
Transportation	225	512	163	400	365
Electricity	139		94		
Commercial & Residential	47		42		
Industry	101		101		

Source: California Air Resources Board, AB 32 Draft Scoping Plan

The draft scoping plan estimates that the sectors covered under the proposed cap-and-trade program produce 85 percent of California’s total GHG emissions, as shown in Table 2. The preliminary estimates for the 2020 emissions limit under the cap-and-trade program would be 365 MMTCO<sub>2</sub>e. This is the quantity of allowances that the government has the choice to sell or distribute at no cost to the private sector.

The draft scoping plan does not make detailed recommendations on some of the key policy choices within a cap-and-trade program, such as the distribution of the allowances and the specific rules for offsets.

**⌘ Distribution of allowances**

The scoping plan says that “the distribution of allowances would quickly transition from a system in which the State provides some free allowances, to a system in which a majority of allowances are auctioned in the trading market.” No specific amounts are given.

Assuming that the final scoping plan has a cap-and-trade program covering 365 MMTCO<sub>2</sub>e, many billions of dollars would be generated if allowances are fully auctioned. If the price of carbon is \$10 per metric ton—a conservative assumption—we estimate that the annual revenues generated from a 100 percent auction would equal \$3.65 billion per year.

The draft scoping plan does list a number of uses for revenue that might be generated either by a cap-and-trade system or by a carbon fee (see page 27 for a discussion of the carbon fee). The list of possible uses includes the following:

- ◆ Reducing costs of emission reductions or achieving additional emission reductions (funding energy efficiency and renewable resource development)
- ◆ Achieving environmental co-benefits (for public health benefit)
- ◆ Incentives to local government for well-designed land-use planning and infrastructure projects
- ◆ Consumer rebates (for using renewable resources or increasing energy efficiency)
- ◆ Direct refund to consumers
- ◆ Climate change adaptation program—help the state adapt to the impacts of climate change
- ◆ Subsidies to reduce cost impacts to covered industries
- ◆ RD&D funding—research, development, and deployment of green technologies
- ◆ Worker transition assistance—“worker training programs” for displaced workers
- ◆ Administration of AB 32
- ◆ Direct emissions reductions—by purchasing emissions allowance for the purpose of retiring them and thereby lowering emissions

## ⌘ Offsets

The draft scoping plan says that ARB is considering the use of compliance offsets under the cap-and-trade system, as long as the emissions reductions from the offset projects are real, additional, verifiable, enforceable, and permanent. The plan doesn't say what percentage of a company's compliance obligations could be met with offsets, though it does include an example in which it mentions a potential limit of ten percent. It also does not say whether the offsets would need to be limited to California or to the Western Climate Initiative region, and asserts that there could be benefits from offsets outside the region.

## ⌘ Western Climate Initiative

For further details about the cap-and-trade program, the draft scoping plan refers to the cap-and-trade program that is being designed under the Western Climate Initiative (WCI). The WCI is a regional project that includes participation by California, Arizona, New Mexico, Oregon, Washington, Utah, Montana, British Columbia, Manitoba, and Quebec. Its goal is to reduce regional GHG emissions 15 percent from 2005 by 2020. In May and July 2008, the WCI released draft design recommendations for its cap-and-trade program. The final program design framework will be released in September 2008.

Regarding the key issues of allowance distribution and offsets, the WCI draft design recommendations are somewhat more specific than the AB 32 draft scoping plan. In the May version of the draft design recommendations, the WCI recommended the partners auction a minimum of 25 to 75 percent of their allowances, but in the July version no minimum percentage figure was given. According to the May version of the WCI draft recommendations, in comments submitted to the WCI, a number of commentators, especially NGOs, called for 100 percent auctioning, while others, like utility companies, called for limiting auctions to a very small percentage (five percent or less) of allowances. It appears that the advocates for limiting auctions are gaining influence.

On the topic of offsets, the WCI recommends allowing the use of offsets but limiting them to not more than ten percent of an individual facility's compliance obligation. Regarding location, it says offset projects located throughout Canada, the U.S., and Mexico should be included.

## CARBON FEE

The draft scoping plan does not recommend a carbon fee but does present it for consideration by the Board.

### KEY ISSUES FOR ORGANIZED LABOR

Most of the risks and potential benefits that are at issue in a cap-and-trade program are also applicable to a carbon fee. Both are market mechanisms that allow firms to buy permits to emit, internalizing the cost of emissions into firms' decision-making. Like the cap-and-trade program, carbon fees allow the possibility that companies can pay instead of reducing their GHG emissions. Also like the cap-and-trade program, carbon fees could generate substantial public revenues. Some labor unions prefer a carbon fee to a cap-and-trade program, because a fee is a commonly used and straightforward market mechanism that would be more difficult to manipulate than cap and trade.

### What is a carbon fee?

Under a carbon fee approach, businesses would have to pay a fee for every ton of greenhouse gases they emit. The fees are generally levied on the producers or importers of energy; energy cost increases are then transmitted to all downstream purchasers of energy-using products and services. Carbon fees would force businesses and consumers to internalize the environmental costs of carbon emissions, raising the costs of production. These costs would then be passed on to consumers, lower profits, induce innovation that saves on energy usage, or some combination of the above.

The main difference between a carbon fee approach and a cap-and-trade approach is that under cap and trade, the government determines the cap—that is, the quantity of carbon that can be emitted. Given this limit on the quantity of carbon emissions, the market will determine the price as users buy allowances, bidding them up until the price equals the cost of reducing emissions. Under a carbon fee approach, the government determines the price—that is, the amount of money it will charge for

each ton of GHGs that is emitted. In this case, the market determines how much carbon will be emitted, as users pay for the cost of each ton emitted, and will choose to do so whenever the cost of reducing emissions exceeds the fee. In theory, both of these market mechanisms result in similar outcomes. However, cap and trade creates price uncertainty, while carbon fees create uncertainty about the total quantity of GHGs that will be emitted. These differences may lead to different outcomes.

Advocates of a carbon fee argue that it is better than a cap-and-trade system for the following reasons:

- ◆ A carbon fee will lend predictability to energy prices, whereas under a cap-and-trade system, there could be price volatility because the price of carbon allowances is being determined by market trading.
- ◆ A carbon fee is a more tested approach that can be implemented more quickly and inexpensively, because existing fee collection mechanisms can be used to collect the fee on energy sellers, whereas under cap and trade a complex new system will have to be created and this could take months or even years.
- ◆ A carbon fee approach is more transparent because it is easier to understand and more familiar to people than a cap-and-trade approach.
- ◆ It will be harder to manipulate or “game” the system under a carbon fee approach than it would be under a cap-and-trade system.

Those who do not support a carbon fee list the following arguments to support their position:

- ◆ It will be difficult to guarantee the necessary emissions cuts required by AB 32 with a carbon fee, because no one knows the quantity of emissions reductions that will result from a given fee level. If the fee per ton is too low, businesses and households will choose to pay the fee and continue emitting more carbon than the reduction goals set out in AB 32. It will be difficult to determine the correct level at which to set the fee, because no one knows what fee will actually create the tipping point that leads to changes in behavior. For example, as gasoline prices have increased, it has been difficult to predict at what price per gallon drivers would begin to reduce their vehicle miles traveled.
- ◆ Revenues from a carbon fee would be restricted in their possible uses. Under a cap-and-trade system, if GHG allowances are auctioned, proceeds can legally go towards almost any use. Under a carbon fee approach, in order to be considered a fee and not a tax, the funds raised by the fee would have to be spent on activities specifically related to AB 32. The interpretation of what qualifies as an appropriate use of carbon fees is sure to be a bone of political contention. The benefit of a carbon fee over a carbon tax, at least in California, is that a fee can be approved by a simple majority of state legislators, while a tax needs the support of two-thirds of the legislators.



## ⌘ WHAT IS ARB PROPOSING?

In addition to implementing a small carbon fee that would be used to cover the costs of administering AB 32, the draft scoping plan includes a discussion of a carbon fee that would cover transportation fuels, natural gas processing plants, natural gas pipelines, emissions from coal imports, high-emitting industrial sources like cement and nitric acid production facilities and suppliers of high-GWP gases, and California-bound electricity generated by power plants outside the state.<sup>2</sup> ARB staff present the carbon fee as a measure that is still under evaluation; however, the staff recommends the cap-and-trade program over a carbon fee.

To create an incentive for significant GHG reductions, ARB staff estimate that the fees would need to be set between \$10 and \$50 per metric ton of CO<sub>2</sub>e. As stated above, such a fee could generate billions of dollars per year in revenue. See the cap-and-trade section, above, for ARB's suggested uses for any revenue generated by a cap-and-trade program or a carbon fee.

## Sector-Specific Measures

The sectors that will be most significantly impacted by proposed measures are energy (which includes electricity, renewable energy, and energy efficiency in commercial and residential buildings); industry (including cement and glass plants, oil and gas refineries, and other manufacturing industries); and transportation. Those are the sectors described in detail in this paper, but ARB also proposes measures that target high global warming potential greenhouse gases (such as SF<sub>6</sub>), recycling and waste, the water sector, and agriculture and forestry. All the measures being proposed in the AB 32 draft scoping plan are listed in Table A1 in the appendix (pages 78 to 82).

The construction and building trades stand to benefit from many of the proposed GHG emission reduction measures, because these measures will require major investments in public, commercial, and residential new building construction and building retrofits, construction of renewable energy generation plants, and energy efficiency measures in other industries. This report follows ARB's categorization and does not separate out construction as a sector. Discussion of the impact on the construction industry is instead included in the following description of the proposed measures for the energy, transportation, and industry sectors.

## ENERGY

This sector includes renewable energy sources for electricity generation and energy efficiency. In addition to new regulations, electricity will also be included in the proposed cap-and-trade program. The draft scoping plan proposes an enormous commitment to switching from fossil fuels to

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<sup>2</sup> Carbon fees are levied at the source of energy generation or distribution, whereas cap and trade are levied on energy users.



renewable energy sources to produce electricity for the state. The 33 percent renewables portfolio standard (RPS) for California utilities will be the highest in the nation and is estimated to require \$100 billion of new investment.

## ✓ KEY ISSUES FOR ORGANIZED LABOR

Renewable energy generation and the plethora of energy efficiency regulations and incentives will be the largest job generators of the green transition. The construction and building trades especially stand to benefit from many of the proposed energy sector measures. Some of the jobs that will be created because of renewable energy and energy efficiency measures are in segments of the construction industry with high union density, such as public buildings, public infrastructure, and utilities construction. Project labor agreements, quality training standards, best value contracting rules, and prevailing wages could be applied to the new investments induced by AB 32 to ensure high job quality in these areas. These tools will be more easily applied when public funding is involved, however success is not assured, as was evidenced in the political struggle over the Million Solar Roofs program, which is included as one of the AB 32 measures.

There is also an opportunity to expand union density in commercial and residential construction. To do this, unions will need to leverage their highly skilled workforces and apprenticeship infrastructure to ensure quality installation of HVAC systems, water conservation technology, and a series of other green construction practices. This will require that the apprenticeship programs stay ahead of the

curve in curricula development and graduate sufficient numbers of apprentices so that union contractors can successfully bid for work. It will also require that unions educate union contractors about the benefits of entering the fields of green building and renewable energy. Licenses issued to green contractors and workers will need to require the high level of training that union training programs provide.

In addition to the opportunities highlighted above for the building and construction trades, unions may have new organizing opportunities in renewable energy generation. Right now most of the jobs are located in non-union “independent energy providers.” Whether or not these will become quality jobs will depend on public policy and successful union organization, because it will undoubtedly be more challenging to organize for high-quality jobs in the decentralized renewable energy sector than it has been in the more centralized fossil fuel power plants.

“AB 32 and other legislation that will follow could be the fuse that ignites California’s next construction boom.

But it will happen only if our joint union/employer apprenticeship programs and California’s public school system can continue to produce a new generation of construction workers that are trained in the increasingly complex technologies of the future.”

—**Bob Balgenorth**  
**President**

**State Building and Construction  
Trades Council of California**

## ⌘ WHAT IS ARB PROPOSING?

### ⌘ Renewables Portfolio Standard

This measure will increase California's RPS to 33 percent by 2020. The RPS requires that California utilities generate a certain amount of electricity from renewable resources. Renewable resources include wind, solar, geothermal, small hydroelectric, biomass, and biogas.

### ⌘ Building and appliance energy efficiency and conservation (32,000 GWh reduced electricity demand; 800 million therms reduced gas use)

This measure would enhance existing programs by increasing incentives and implementing more stringent building codes and appliance efficiency standards. The goal of the measure is to reduce statewide energy demand by 32,000 gigawatt hours and 800 million therms from business-as-usual projections for 2020. The draft scoping plan discusses "green buildings" in this section, even though green building measures cut across multiple sectors including energy, water, waste, and transportation. ARB encourages the state to develop green building measures for new construction and existing buildings.

### ⌘ Solar Water Heating (AB 1470 goal)

The Solar Hot Water and Efficiency Act of 2007 directs the California Public Utilities Commission to establish a statewide incentive program to encourage the installation of solar water heating systems. According to ARB, this program could save as much as 26 million therms of natural gas per year.

### ⌘ Million Solar Roofs

California has a goal under the existing Million Solar Roofs program to install 3,000 megawatts of new, solar-electric systems by 2017. It requires publicly-owned utilities to adopt, implement, and finance a solar incentive program. It also encourages energy efficiency, because building owners have to meet certain efficiency requirements in order to obtain the incentives.

#### *Other measures under evaluation:*

These measures are not recommended in the draft scoping plan but are still being considered for inclusion in the final scoping plan:

### ⌘ Measures to expand the Million Solar Roofs Program and/or the Residential Solar Hot Water Heater Installation Program

### ⌘ Energy efficiency targets even higher than those being recommended above

### ⌘ Coal Emission Reduction Standard

This approach could require electric service providers to divest or otherwise mitigate portions of existing investments in coal-based energy generation.

# INDUSTRY

This sector is a broad umbrella that includes refineries, oil and gas production, cement production, semiconductor manufacturing, automobile manufacturing, food processors, and other manufacturing plants. In addition to being targeted by some specific regulations for which there little detail, these will also be included in the proposed cap-and-trade program.

## KEY ISSUES FOR ORGANIZED LABOR

Many high-energy using and heavy-emitting industries are in this category, which means that they will be subject to new regulations and higher energy costs. These sectors are most likely to experience threats to competitiveness due to higher costs, and possible job loss. In addition, as industries green their production processes, jobs will be transformed and workers will need to acquire new skills. As will be addressed in the section on economic impacts (pages 43 to 57), jobs in this category are disproportionately well-paying blue-collar, union jobs.

Oil and gas refineries and cement factories may face the highest transition costs. These industries merit close monitoring to assess the possibility of job loss and the need for protections for workers. However, new technologies may be found to reduce emissions more cost-effectively, and job loss may be mitigated by retirements rather than lay-offs. Additionally, retrofitting these facilities will likely create at least short-term construction jobs. Moreover, since cement is a fundamental component of most construction projects, demand for cement will be created by other capital investments in renewables, industrial retrofitting, and green construction, likely offsetting market loss due to higher production costs. The cement industry is highly unionized and cement workers' unions, such as the United Steelworkers, are actively seeking solutions to meet the AB 32 emissions targets while also protecting workers.

A key issue for industry is the effect of AB 32 on the competitiveness of California businesses compared to out-of-state businesses. Organized labor has an interest in ensuring that the state regulates out-of-state businesses that sell to consumers within California so that they do not gain a competitive advantage, which could lead to "leakage" as discussed above. In a cap-and-trade or carbon fee program, this can be done through "consumption-based accounting" where fees levied or allowances purchased must be based on where the product is consumed, not just produced.

A key opportunity for labor unions in this area is the chance to rebuild manufacturing in California. As solar energy and energy efficiency businesses begin to flourish in the state, the green components needed by those businesses could potentially be manufactured here. One policy that could move this possibility forward is a domestic content preference for green companies competing for state funds.

## ⌘ WHAT IS ARB PROPOSING?

### ⌘ Energy efficiency and co-benefits audits for large industrial sources

This measure would apply to major industrial facilities with more than .5 MMTCO<sub>2</sub> per year of GHG emissions—power plants, refineries, cement plants, and other sources. It requires each facility to conduct an audit of the energy efficiency of individual sources within the facility to determine the potential to reduce GHGs, criteria air pollutants, and toxic air contaminants. ARB can then use the audit results to determine if certain emissions sources within a facility can make cost-effective GHG reductions that also provide reductions of toxic pollutants that are harmful to the public health.

#### *Other measures under evaluation:*

These measures are not recommended in the draft scoping plan but are still being considered for inclusion in the final scoping plan:

### ⌘ Cement: Measures to reduce emissions during the cement production process

These approaches would include consideration of cement produced in state as well as imported cement.

### ⌘ Refineries/Oil and Gas Production: Possible measures include capturing methane emissions during extraction, reducing methane leaks during transmission, improving the efficiency of refineries, and capturing methane at refineries

### ⌘ Boiler and engine efficiency

Measures to increase efficiency in other industries that use industrial boilers or on-site internal combustion power sources, and for off-road equipment like forklifts and bulldozers.

### ⌘ Glass plants: Using recycled materials or improving the energy efficiency of the glass manufacturing process

## LAND USE AND LOCAL GOVERNMENT

ARB is encouraging local governments to set GHG emissions reduction goals. Local governments have jurisdiction over many areas that could produce GHG emissions, including land use, building codes standards, public transportation, and water use. Much of the emissions in California come from passenger vehicles and residential buildings, requiring changes in consumer behavior that are particularly difficult for low- and moderate-income consumers to make. Land use, zoning, building codes, and other local policies are key to helping consumers drive fewer miles and live in more energy efficient homes.

## ✓ KEY ISSUES FOR ORGANIZED LABOR

Labor unions should consider getting involved in the development of their city or town’s climate action plan. This would allow them to promote measures that would create high-quality jobs, such as energy efficiency and public transit measures. High-density development is also a measure that would be beneficial both for the environment and for creating a climate that is favorable toward union workers. Local public investment in these areas can spur cost-effective emissions reductions that help households lower energy use while creating good jobs.

There are many opportunities for local green job growth, depending on what local measures are adopted—from local infrastructure projects to municipal waste projects to operations and maintenance work on already-energy-efficient buildings. It is also possible that these local measures will grow the local public sector workforce, because city workers will be needed to develop, administer, and monitor climate action programming.

## ⌘ WHAT IS ARB PROPOSING?

### ⌘ Local government actions and regional GHG targets

This set of measures encourages local governments and regional decision-making bodies to set quantifiable emission reduction targets for their jurisdictions. ARB encourages local governments to develop climate action plans, set 2020 targets to reduce GHG emissions, and incorporate GHG reduction measures and regional blueprint plans into their general plans. Areas in which local governments could take action are community energy use, community waste and recycling practices, water use in municipal operations, increase of the use of low-carbon travel, and the siting and design of new residential and commercial developments. ARB does not have jurisdiction in regulating these activities, and thus is dependent on the actions of local and regional governmental bodies.

Regarding regional targets, ARB encourages increased emphasis on urban infill development: more mixed use communities, improved mobility options, and better designed suburban environments. ARB will work with regional and local governments to develop regional GHG emissions reduction targets.

## PUBLIC SECTOR

ARB is asking the State of California to set an example by reducing its GHG emissions by a minimum of 30 percent. Measures to accomplish this could impact the construction sector and state workers. Since much of the emissions from government activities arise from energy consumption in buildings, investment in efficiency retrofits—perhaps financed by revenues from a cap-and-trade program or carbon fee—are likely to be a main strategy for lowering emissions by state government.

## ✓ KEY ISSUES FOR ORGANIZED LABOR

Although the public sector is not separated out by ARB in its draft scoping plan, public sector unions will want to take note of ARB's recommendations to the State of California as they pertain to California public employees. Additionally, as is mentioned in the land use and local government section of this report (page 33 above), additional climate mitigation measures may end up growing the state public workforce because workers will be needed to administer and monitor the measures. If there is a major investment in efficiency retrofits in state buildings, this is likely to provide jobs for building and construction trades workers.

## ⌘ WHAT IS ARB PROPOSING?

### ⌘ ARB asks the California state government to reduce its emissions by a minimum of 30 percent by 2020. Possible measures include:

- ◆ Using the most advanced, cost-effective environmental performance requirements in the design, construction, and operation of state facilities.
- ◆ Prioritizing low-carbon investments in the state's pension fund investments.
- ◆ Allowing state workers to telecommute and use alternative work schedules, and siting facilities to encourage jobs/housing balance.
- ◆ Increasing the number of fuel-efficient vehicles in the state fleet.
- ◆ Expanding renewable energy use and divesting from coal power plants.

## TRANSPORTATION

This sector includes measures targeting cars, trucks, transportation fuels, ports, goods movement, and public transit.

## ✓ KEY ISSUES FOR ORGANIZED LABOR

There are several measures that impact port workers and workers in the freight industry that labor unions should take note of: the SmartWay Truck Efficiency measure, the Green Ports measure, and some of the other vehicle- and engine-efficiency measures. Although some shipping and freight companies are arguing that the transportation measures are too costly for them to implement, there is also a cost to maintaining the status quo, under which workers and nearby communities may be exposed to harmful emissions that pose significant health risks.

A high-speed rail measure is also being proposed, which could create high-quality construction jobs and permanent transit jobs if approved by California voters. Additional public transit measures that are not included in the draft scoping plan could also be recommended to ARB.

Finally, the proposed low carbon fuel standard creates the possibility that additional ethanol plants will be built in California agricultural areas that are experiencing high unemployment. Although there is currently some controversy surrounding ethanol and its relationship to increasing food prices, there is also experimentation underway to develop ethanol made from agricultural inputs other than corn, such as switchgrass.

## ⌘ WHAT IS ARB PROPOSING?

### ⌘ California Light-Duty Vehicle GHG standards

This measure refers to AB 1493, which was signed into law in 2002. AB 1493 aims to reduce GHG emissions from California passenger vehicles by about 22 percent by 2012 and about 30 percent by 2016. AB 1493 has yet to go into effect because it is being challenged in the courts by various automakers and because the U.S. Environmental Protection Agency has refused to give California a waiver to implement the bill. ARB is acknowledging that the implementation of AB 1493 will lead to GHG reductions that can contribute to the AB 32 goals. ARB is also proposing to initiate the next phase of these standards, which could reduce vehicle emissions by 40 percent from 2017 to 2020 or 2022.

### ⌘ Low Carbon Fuel Standard (discrete early action)

The Low Carbon Fuel Standard was approved by ARB in June 2007. It calls for a ten percent reduction in the carbon content of California's transportation fuels by 2020. Possible low carbon fuel strategies include high blend ethanol for use in Flex Fuel Vehicles, switching to ethanol made from cellulosic materials, electricity (which could be used in pure electric vehicles or in plug-in hybrid vehicles), hydrogen (used in a fuel cell vehicles), biodiesel made from algae, and others. There will also be a market mechanism that allows firms to trade carbon credits so that providers of fuels that exceed the performance standard will be able to generate carbon credits and either bank them for future use or sell them to other fuel providers.

### ⌘ SmartWay Truck Efficiency (discrete early action)

This discrete early action measure is based on the U.S. Environmental Protection Agency's SmartWay SM Program and aims to improve the efficiency of heavy-duty tractors and trailers operating in California. The strategy involves requiring existing trucks/trailers to be retrofitted with the best available technologies that reduce GHG emissions. The technologies used by the federal SmartWay Transport program include truck stop electrification, direct-fired bunk heaters, auxiliary power units to eliminate or reduce idling, single-wide tires that improve fuel economy by saving weight and reducing rolling resistance, advanced trailer and van aerodynamics, and others. The impacted industries include the freight industry, trailer manufacturers, truck manufacturers, tire manufacturers, businesses that own trailers to haul their freight in and out of California, and cab and trailer aerodynamic device manufacturers.



### ⌘ **Green Ports (discrete early action)**

This measure, approved by ARB in December 2007, will reduce emissions from diesel auxiliary engines on container ships, passenger ships, and refrigerated cargo ships while at-berth at California ports. The regulation requires operators of vessels meeting specified criteria to turn off their auxiliary engines for most of their stay in port. ARB anticipates that such vessels would then receive their electrical power from the shore, or use an alternative but equally effective means of emission reductions. In addition to reducing GHG emissions, this measure is expected to benefit the health of communities located near California ports. The impacted sectors will be the ports and the shipping industry.

### ⌘ **Restrictions on High GWP Refrigerants (discrete early action)**

This measure, approved by ARB in June 2007, aims to reduce the hydrofluorocarbon emissions that are released when individuals use HFC-134a cans during do-it-yourself motor vehicle air conditioning servicing.

### ⌘ **Tire Inflation Program (discrete early action)**

This measure involves ensuring that vehicle tire pressure is maintained to manufacturer specifications.

### ⌘ **High Speed Rail**

This measure envisions a High Speed Rail system between Northern and Southern California. It depends on voter approval and may be placed on the ballot as early as November 2008.

### ⌘ **Other transportation measures include vehicle efficiency measures, medium- and heavy-duty vehicle hybridization measures and heavy-duty engine efficiency**

#### *Other measures under evaluation:*

These measures are not recommended in the draft scoping plan but are still being considered for inclusion in the final scoping plan:

### ⌘ **Feebates**

Combines a rebate program for low-emitting vehicles and a fee program for high-emitting vehicles.

### ⌘ **Congestion pricing**

Vehicles are charged a toll for traveling during peak hours on congested routes.



### ⌘ **Pay-as-you-drive insurance**

Premiums are broken down into a per-mile charge, so drivers have the opportunity to lower their insurance costs by driving less.

### ⌘ **Indirect source rules for new development**

Rules to consider indirect emissions associated with residential and commercial development. For example, low-density development located far from employment centers has a high level of indirect GHG emissions.

### ⌘ **Large scale public education and other programs to reduce vehicle travel**

## **OTHER SECTORS— AGRICULTURE, FORESTS, HIGH GLOBAL WARMING POTENTIAL GASES, RECYCLING AND WASTE, WATER**

ARB also proposes measures that target agriculture, forests, high global warming potential greenhouse gases (such as SF6), recycling and waste, and the water sector. Those measures are listed below.

### ⌘ **WHAT IS ARB PROPOSING?**

#### ⌘ **Agriculture: Methane capture at large dairies**

A voluntary program that encourages the capture of methane through the use of manure digester systems at large dairies.

#### ⌘ **Forests: Sustainable forests**

This measure would preserve forests, which naturally take in and store carbon, and encourage the use of forest biomass for sustainable energy generation. Measures include sustainable management practices, including reducing the risk of catastrophic wildfires, and the avoidance or mitigation of land-use changes that reduce carbon storage.

#### ⌘ **High Global Warming Potential Gas Measures**

There are a number of measures targeting High Global Warming Potential (GWP) greenhouse gases. According to ARB, these gases are very common and are used in many different applications such as refrigerants, air conditioning and fire suppression systems, and the production of insulating foam. They are released primarily through leaking refrigeration systems and during the disposal process. The proposed measures target High GWP gases being released from mobile sources, stationary sources, consumer products, semiconductor manufacturing, and elsewhere.

# How Can Your Union Get Involved?

## AB 32, THE GLOBAL WARMING SOLUTIONS ACT OF 2006

- ◆ <http://www.arb.ca.gov/cc/cc.htm>
- ◆ **Attend and make comments at AB 32 draft scoping plan hearings** in San Jose on August 8th and San Diego on August 15th
- ◆ **Attend Environmental Justice Advisory Committee and Economic and Technology Advancement Advisory Committee (ETAAC) meetings.** See [http://www.arb.ca.gov/app/calendar/cc\\_cur\\_evnt.php](http://www.arb.ca.gov/app/calendar/cc_cur_evnt.php) for dates of advisory committee meetings and other upcoming meetings.
- ◆ **Submit written comments on AB 32.** Comments on the draft scoping plan are requested by August 1st but they will be accepted until Oct. 2, 2008. Comments on the draft scoping plan appendices are requested by August 11th. <http://www.arb.ca.gov/cc/scopingplan/spcomment.htm>
- ◆ **Join ARB's email list to be informed when the final scoping plan is published:** [http://www.arb.ca.gov/lispub/listserv\\_grp.php?listtype=CO](http://www.arb.ca.gov/lispub/listserv_grp.php?listtype=CO)
- ◆ **Join sector-specific working groups.** For more information, contact Peter Cooper or Jay Hansen, listed below.

## WESTERN CLIMATE INITIATIVE (WCI)

- ◆ <http://www.westernclimateinitiative.org>
- ◆ **Attend upcoming WCI meetings.** Join the WCI email list to be informed of upcoming meetings: [http://www.westernclimateinitiative.org/Mailing\\_List.cfm](http://www.westernclimateinitiative.org/Mailing_List.cfm)
- ◆ **Submit written comments about the WCI draft recommendations:** [http://www.westernclimateinitiative.org/Send\\_Public\\_Input.cfm](http://www.westernclimateinitiative.org/Send_Public_Input.cfm)

## OTHER CALIFORNIA GREEN JOBS AND CLIMATE CHANGE LEGISLATION

- ◆ Get involved with other green jobs and climate legislation such as SB 1672, the **Renewable Energy, Climate Change, Career Technical Education, and Clean Technology Job Creation Bond Act of 2010**; and AB 3018, the **California Green Collar Jobs Act of 2008**.
- ◆ For more information, contact Peter Cooper and Jay Hansen, listed below.

## LOCAL GREEN JOBS AND CLIMATE CHANGE INITIATIVES

- ◆ **Get involved with the development of local and regional climate action plans in your area.** This is an opportunity to create good, green jobs at the local level.
- ◆ **Collaborate with your local Apollo Alliance** (<http://www.apolloalliance.org>) or with another local coalition of labor, environmental, and environmental justice groups.

## CALIFORNIA ORGANIZED LABOR GREEN JOBS AND CLIMATE CHANGE CONTACT PEOPLE

- ◆ **Peter Cooper**, Senior Program Manager, California Labor Federation Workforce and Economic Development Program, [pcooper@calaborfed.org](mailto:pcooper@calaborfed.org), (916) 444-3676 x13
- ◆ **Jay Hansen**, Legislative Director, State Building and Construction Trades Council of California, [jay@sbctc.org](mailto:jay@sbctc.org), (916) 443-3302

## UC BERKELEY CENTER FOR LABOR RESEARCH AND EDUCATION CONTACT PEOPLE

- ◆ **Cheryl Brown**, Labor Specialist, [cherylbrown@berkeley.edu](mailto:cherylbrown@berkeley.edu), (510) 642-1851
- ◆ **Andrea Buffa**, Communications Specialist, [andreabuffa@berkeley.edu](mailto:andreabuffa@berkeley.edu), (510) 642-6371
- ◆ **Carol Zabin**, Senior Labor Policy Specialist, [zabin@berkeley.edu](mailto:zabin@berkeley.edu), (510) 642-9176

## ⌘ **Recycling and Waste: Landfill methane control (discrete early action)**

The landfill methane capture strategy was approved by ARB in June 2007. It will reduce methane emissions from landfills by requiring gas collection and control systems on currently uncontrolled municipal solid waste landfills. This measure will impact all new and existing California landfills, but most landfills in California already have controls, so the measure is not expected to have a large economic impact.

## ⌘ **Water: Water efficiency and recycling measures**

ARB proposes that the state of California establish a public goods charge for funding investments in water efficiency, to be collected on water bills and used to fund end-use water efficiency improvements, system-wide efficiency projects, and water recycling.

# EARLY ACTION MEASURES

Nine discrete early action measures are included in the draft scoping plan and are listed above. By sector, they are:

## DISCRETE EARLY ACTION MEASURES

### High GWP

- ◆ PFC Reduction from Semiconductor Manufacturing
- ◆ SF6 Reductions in the Non-Electric Sector
- ◆ Reduction of High GWP GHGs in Consumer Products

### RECYCLING AND WASTE

- ◆ Landfill methane control

### TRANSPORTATION

- ◆ Low Carbon Fuel Standard
- ◆ SmartWay Truck Efficiency
- ◆ Green Ports
- ◆ Restrictions on High GWP Refrigerants
- ◆ Tire Inflation Program

ARB also plans to implement numerous other early actions, which are listed here by sector:

## OTHER EARLY ACTION MEASURES

### AGRICULTURE

- ◆ Manure management (methane digester protocol)
- ◆ Collaborative research on GHG reductions from nitrogen land application
- ◆ Electrification of stationary agricultural engines

### ENERGY

- ◆ Electricity: Reduction of SF6 in electricity generation
- ◆ Energy Efficiency: Cool communities program

### FORESTS

- ◆ Forestry protocol adoption

### HIGH GWP GASES

- ◆ Specifications for commercial refrigeration
- ◆ High GWP refrigerant tracking, reporting, and recovery program
- ◆ Foam recovery/destruction program

### INDUSTRY

#### Cement

- ◆ Blended cements
- ◆ Energy efficiency of California cement facilities

#### Fuels

- ◆ Above ground storage tanks
- ◆ Gasoline dispenser hose replacement
- ◆ Portable outboard marine tanks

#### Oil and Gas

- ◆ Reduction of venting/leaks from oil and gas systems

## TRANSPORTATION

- ◆ Diesel—off-road equipment<sup>3</sup> (non-agricultural)
- ◆ Diesel—port trucks
- ◆ Diesel—vessel main engine fuel specifications
- ◆ Diesel—commercial harbor craft
- ◆ Standards for off-cycle driving conditions
- ◆ Diesel—privately owned on-road trucks
- ◆ Anti-idling enforcement
- ◆ Cool automobile paints
- ◆ Ban of HFC release from MVAC service/dismantling
- ◆ Diesel—off-road equipment (agricultural)
- ◆ Add AC leak tightness test and repair to Smog Check
- ◆ Requirement of low-GWP GHGs for new MVACs
- ◆ Hybridization of medium- and heavy-duty diesel vehicles
- ◆ Strengthen light-duty vehicle standards
- ◆ Truck stop electrification with incentives for truckers
- ◆ Diesel—vessel speed reductions
- ◆ Transportation refrigeration—electric standby

In sum, the AB 32 draft implementation plan includes proposed measures that will impact a large portion of the California economy. It presents many opportunities, including the potential for job growth in the construction industry and a large stream of potential revenue if a cap-and-auction program or carbon fee is approved. Realizing the potential from these opportunities will require that unions be proactive in shaping AB 32 implementation policy, leading training partnerships, and pursuing organizing and collective bargaining campaigns.

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<sup>3</sup> Off-road equipment here refers to construction equipment like cranes and bulldozers.

## POTENTIAL EMPLOYMENT IMPACTS OF AB 32

This section presents preliminary analyses of the potential job impacts of the AB 32 draft scoping plan measures. Further research on job impacts is needed and should be carried out by ARB and independent researchers. The section begins by presenting preliminary results on the net economic impact of AB 32 draft scoping plan measures from one of the macroeconomic models commissioned by ARB. In addition, it presents three types of job impacts in specific sectors: 1) the estimated job growth and potential job loss for each sector, using forecasts from one of the macroeconomic models commissioned by ARB, 2) an analysis of jobs in the heavy GHG-emitting sectors that will face new regulations and be covered by the cap-and-trade program, and where changes in worker skills set requirements are likely to be concentrated, and 3) a summary of the studies on jobs resulting from new green technology businesses. Important insights for unions, other advocates, and policy makers emerge from each of these views of the labor market.

### Overall Economic Impact Forecasts

To assess the overall impact of AB 32 on the California economy, ARB is using two main macroeconomic models, the E-DRAM and the BEAR models, combined with an energy use model, the Energy 2020 model.<sup>4</sup> While these models are imperfect, they provide the best available forecasts of the economic impact of the AB 32 draft scoping plan. ARB is required by law to evaluate the economic impact of each of its proposed measures, but this detailed evaluation has not yet been released.

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<sup>4</sup> See <http://www.arb.ca.gov/cc/scopingplan/economics-sp/models/models.htm> for an explanation of ARB's economic models.

Preliminary overall and sector impacts from one of the models, the BEAR model, are available. They show that the California economy can absorb the costs of lowering GHG emissions to the AB 32 goals without reducing employment. In fact, the preliminary BEAR results show modest overall job creation.

There are several reasons for these very optimistic predictions of the economic effects of California's climate solutions bill. Estimates of the total direct cost of emissions reductions are only a small percentage of the total annual gross state product. This is a small overall cost that can be absorbed over time, given that California's productivity has risen by an average of 2.6 percent per year since 1995. When higher energy costs are incorporated into firms' and households' decision-making, they economize on energy-intensive goods and services and invent new ways to lower emissions. In addition, many experts agree—and the models assume—that there are enormous energy savings to be achieved by energy efficiency measures, which, even at current prices, can pay for themselves over the medium run. Retrofitting existing buildings for energy efficiency is a key example of this—many investments go undone not because they do not bring a return, but rather because households and businesses do not have easy access to sound information about which measures are cost-effective, because they have cash flow constraints, or because they have no way to reap the benefits of their investment if they sell their buildings. When the price of energy rises or the government acts to reduce the barriers to these investments, firms and consumers change their behavior, producing net savings over time. These net savings will then be spent on other goods and services and will generate economic growth, not only in the construction sector and other sectors where energy savings investments will be made, but also throughout the whole economy.

Several cautionary points must be made, however. First, the models used to make these assessments are built on many assumptions that in the end may turn out to be inaccurate. They assume quick responses to price signals and full employment of resources, including labor. As a consequence, the models do not fully capture the dislocations that can occur in specific industries and firms and that may result in job loss for some. Moreover, while overall income may not fall, given current patterns of inequality, it is likely that low-income people will be less able to change their energy use and will therefore experience these changes in the form of reduced disposable income. It should also be noted that even with a very low cost transition to lower GHG emissions, it may be that the efforts in California and elsewhere will not be enough to stop global warming, which will necessitate a variety of major new public investments to help the state adapt to higher ocean waters, droughts, flooding, wildfires, and other environmental problems that disrupt economic activity.

While the models may not forecast the future completely accurately, they do represent the best forecasts we have. Overall, they suggest that our economy is strong enough to absorb the costs of climate solutions policy and that there is ample room to pick “low hanging fruit”—low-cost ways to lower GHG emissions—without hurting the economy.



## Job Growth and Potential Job Loss

This section examines the forecasts of changes in employment in specific sectors that derive from the BEAR<sup>5</sup> model (the E-DRAM model analysis was scheduled for release in July but has been delayed). These forecasts are the best available estimation of job changes that will result from the specific regulations proposed as part of the implementation of AB 32, however, they are by no means infallible.

Employment changes occur not just in the sectors that are directly affected by AB 32, but also in related industries that supply inputs or purchase goods and services from the regulated sectors. In addition, employment change is affected by changing demand patterns, as consumers increase demand for goods that are less energy-intensive.

The preliminary BEAR model forecasts changes in employment under five policy scenarios with various combinations of the draft scoping plan proposed measures. For simplicity, this report presents only one scenario, which comprises the draft scoping plan's sector-specific core measures combined with the proposed cap-and-trade program.

Table 3 (pages 46 and 47) shows employment changes by industry under this scenario. The table shows employment in each sector in 2006, and the projected change in employment with and without the AB 32 draft scoping plan core measures, including cap and trade. Comparing 2006 to 2020 with AB 32 measures, there is no job loss in any sector, with the exception of a job loss of 300 jobs, or less than one percent, in the electrical appliances industry. There are also some sectors that grow more slowly than they would have otherwise, such as oil and gas extraction and refining and food processing, but they do not show absolute job loss over the period 2006 to 2020.

Overall, the job changes from the preliminary forecasts are minor. About 41,000 additional jobs in construction are forecasted due to AB 32, but this is a very small change in percentage terms. Other sectors forecasted to gain employment are natural gas distribution and ground transportation and delivery. Illustrating how the model transmits the measures throughout the economy, certain service sectors like education show marginally higher growth under the policy measures, while others such as medical services and financial services grow, but at a slower rate under AB 32 than they would with no policy implementation.

In sum, these preliminary forecasts show negligible dislocations due to AB 32 implementation. These forecasts are preliminary and depend on assumptions that may prove to be unrealistic. Also, this does not mean that individual businesses will survive, since in any industry some firms will more easily adjust to the regulations and new market conditions than others. It does point to the huge growth opportunities in selected industries, particularly non-residential construction. The construction apprenticeship infrastructure is an extremely valuable asset that unions can use to leverage this

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<sup>5</sup> David Roland-Holst generously provided these preliminary forecasts from his still-to-be published analysis of the economic impact of the draft scoping plan measures.

**Table 3**  
**Predicted impact of AB 32 on employment**

<b>Industrial Sector</b>	<b>2006</b>	<b>No policy, 2020</b>	<b>With AB 32 policy scenario, 2020</b>	<b>Total job change due to AB 32</b>	<b>Percent job change due to AB 32</b>	<b>Union density*</b>
Agriculture, fisheries, non-cattle livestock	397,700	538,900	536,700	-2,200	-0.4%	6%
Cattle production	6,100	8,100	8,100	0	-0.7%	4%
Dairy production	29,400	42,300	42,300	0	0.1%	3%
Forestry, mining, quarrying	2,400	3,800	3,800	0	0.1%	18%
Oil & gas extraction	5,900	7,400	6,200	-1,200	-16.3%	7%
Mining	13,900	16,700	16,500	-200	-1.0%	
Generation & distribution of electricity	33,900	34,800	35,600	800	2.4%	40%
Natural gas distribution	33,700	31,800	38,500	6,700	21.0%	52%
Water, sewage, steam	33,800	44,000	43,100	-900	-2.0%	48%
Residential construction	683,700	1,048,600	1,064,700	16,100	1.5%	16%
Non-residential construction	390,400	530,800	552,500	21,700	4.1%	16%
Construction of utilities, roads, etc.	124,300	169,400	172,200	2,800	1.7%	16%
Food processing	201,000	221,200	215,900	-5,300	-2.4%	20%
Textiles & apparel	121,900	142,700	142,400	-300	-0.2%	2%
Wood, pulp, & paper	38,800	59,300	59,400	100	0.1%	8%
Printing & publishing	97,600	128,400	128,400	0	0.0%	10%
Oil & gas refineries	14,600	19,500	15,800	-3,700	-18.7%	39%
Chemicals	96,400	135,900	134,200	-1,700	-1.2%	6%
Pharmaceuticals	27,700	33,900	33,600	-300	-0.8%	3%
Cement	22,300	31,100	31,700	600	2.0%	19%
Metal manufacture & fabrication	167,700	276,800	274,800	-2,000	-0.7%	10%
Aluminum production	6,600	10,500	10,400	-100	-0.9%	7%
General machinery	71,600	85,200	85,100	-100	-0.2%	5%
Air conditioner, refrigerator, manufacturing	4,700	6,300	6,600	300	5.2%	
Semiconductors	331,400	499,100	508,400	9,300	1.9%	2%
Electrical appliances	32,300	32,200	31,900	-300	-0.9%	9%
Automobiles and light truck manufacturing	2,700	2,500	2,500	0	2.9%	
Other vehicle manufacturing	43,500	55,900	56,500	600	1.1%	10%
Airplane & aerospace manufacturing	66,900	96,000	96,900	900	1.0%	17%

*Table 3 continued on next page*

Table 3 (continued)

## Predicted impact of AB 32 on employment

Industrial Sector	2006	No policy, 2020	With AB 32 policy scenario, 2020	Total job change due to AB 32	Percent job change due to AB 32	Union density*
Other Industry	199,500	281,600	281,300	-300	-0.1%	4%
Wholesale trade	770,100	1,112,500	1,123,500	11,000	1.0%	7%
Retail vehicle sales and service	235,300	326,900	334,400	7,500	2.3%	4%
Air transport services	45,700	62,200	62,400	200	0.4%	54%
Ground transportation & delivery	144,100	233,500	248,700	15,200	6.5%	24%
Water transport	2,900	3,700	3,700	0	-0.1%	17%
Trucking	153,400	214,500	213,600	-900	-0.4%	10%
Public transit	31,900	44,500	44,700	200	0.5%	54%
Retail appliances	93,100	137,300	137,500	200	0.2%	2%
General retail services	1,611,200	1,974,100	1,986,500	12,400	0.6%	11%
Information and communication services	545,100	721,600	734,900	13,300	1.8%	19%
Financial services	1,136,500	1,434,800	1,419,600	-15,200	-1.1%	3%
Other professional services	1,344,100	1,737,600	1,749,300	11,700	0.7%	2%
Business services	1,587,800	2,118,900	2,135,000	16,100	0.8%	15%
Waste services	37,500	55,400	54,900	-500	-0.8%	31%
Landfill	4,900	7,200	7,000	-200	-2.0%	
Educational services	1,187,000	1,535,500	1,610,300	74,800	4.9%	49%
Medical services	1,665,500	1,934,600	1,913,500	-21,100	-1.1%	19%
Recreation and cultural activity	388,900	524,000	537,200	13,200	2.5%	12%
Hotel and restaurant services	1,364,200	1,840,400	1,848,300	7,900	0.4%	5%
Other private services	910,500	1,274,000	1,293,900	19,900	1.6%	5%
			<b>net change</b>	<b>207,700</b>	<b>.09%</b>	

\* Union density for entire sector, including the self-employed, from the Current Population Survey 2000-2008. Data not available for some small sectors.

Sources: 2006 employment from the Quarterly Census of Employment and Wages; 2020 employment obtained using projected growth rates from David Roland-Holst, based on preliminary results of the BEAR model.

opportunity and help their contractors expand their businesses. This will require graduating enough apprentices to fill the demand for skilled workers and scaling up union apprenticeship programs to accomplish this.

## Job Characteristics of Heavy-Emitting Industries

The California ARB has identified the industrial sectors that are heavy emitters of GHGs. These industries will be subject to new emissions standards, with the exception of agriculture, which will largely be unaffected by mandatory regulations in this round of proposed measures. As detailed in the main policy and regulatory options section of this report (pages 17 to 42), the draft scoping plan proposes major new regulations on energy, construction, and transportation. In addition, it proposes a cap-and-trade program to cover these sectors as well as other manufacturing sectors. It also proposes energy audits and mandatory investments in cost-effective energy efficiency measures for major industrial facilities that emit more than 0.5 MMTCO<sub>2e</sub> of GHGs per year. Further regulations on manufacturing are expected both in the final scoping plan and over the next several years.

This section presents the job and worker characteristics in these heavy-emitting sectors using the Current Population Survey and the Quarterly Census of Employment and Wages. The analysis demonstrates that unions have a particular stake in the impact of AB 32 implementation, because jobs in the affected sectors are largely well-paying, blue-collar jobs. The sectors also have much higher than average union density. The high-emitting industries are the industries where changes in skills set requirements—necessitating worker retraining—are likely to be concentrated. In addition, within these sectors, businesses that adapt quickly to the new regulatory environment and new market opportunities will be positioned to grow; those that do not may decline. Unions can help their employers succeed in this new environment by providing a workforce with up-to-date skills. They can also help grow unionized business by shaping policy and public investment in a way that rewards quality and a skilled workforce.

A specific example serves to illustrate this point.<sup>6</sup> ARB is cognizant that residential air conditioning systems are a source of heavy GHG emissions (even though these are already regulated by the California Energy Commission and the CPUC). A significant portion of the carbon emissions in this sector was found to be due to faulty installation of air-conditioning units, which can diminish efficiency by as much as 50 percent, with typical efficiency deficits of 30 percent.<sup>7</sup> HVAC residential contractors are now about 90 percent non-union, and workers in non-union companies mostly do not go through rigorous training. In contrast, union sheet metal workers go through comprehensive apprenticeship programs and learn proper installation both through classroom instruction and significant on-the-job training. Thus far, regulations set by the California Energy Commission that

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<sup>6</sup> This example was provided by Erik Emblem, Sheet Metal Workers International Association.

<sup>7</sup> See CEC and CPUC, <http://californiaenergyefficiency.com/docs/hvac/nov28meeting/Training%20subcommgroup3%2011-14.doc>

require energy-efficient HVAC equipment to be installed when upgrading air-conditioning systems (many of which have been coupled with incentives from the CPUC) have not been linked to requirements that installation be carried out by skilled workers. As ARB considers the next phase of regulations in this sector, the sheet metal workers and their contractors are planning to advocate for policies that favor the use of skilled workers who can properly install the new more energy-efficient units. Ideas include requiring consumer rebates to be tied to inspection of proper installation and/or only be available to consumers who show proof of building permits. Both of these policies favor higher quality contractors with skilled workforces. This example shows the importance of unions' engagement in the development of very specific regulations and policies affecting their employers and industries.

Table 4 (page 50) shows employment levels in the 24 industry categories identified by ARB as heavy emitters. These industries account for over three million jobs, about 20 percent of all California jobs.

As shown on Table 4, construction, agriculture, electronics manufacturing, and warehousing and transport services account for the largest number of jobs in heavy-emitting sectors. These will all be affected by the draft scoping plan mandatory regulations or the cap-and-trade program, with the exception of agriculture, which at this time faces only relatively minor, voluntary measures. For the following analysis of job and worker characteristics we exclude agriculture, except for dairy, which does face new regulations.

Jobs in heavy-emitting industries affected by AB 32 are largely high-wage, heavily unionized, blue-collar jobs. Nearly 60 percent of the workers in heavy-emitting industries hold blue-collar or service jobs, compared to only 38 percent for all workers in California, and nearly one-third of the blue-collar and service workers are employed in heavy-emitting industries. Graph 3 (page 51) shows that on average, jobs in heavy-emitting industries (excluding agriculture) pay \$19.52 per hour compared to a California average of \$17.58. When wages of all jobs except professional and managerial occupations are compared, the wage differential between heavy-emitting industries and other private-sector industries<sup>8</sup> is even more significant, as shown in Graph 4 (page 52). Wages average \$16.49 for these “working-class” occupations in heavy-emitting industries, compared to \$13.93 in working-class occupations for all California industries.

<sup>8</sup> For the discussion of union density in the heavy-emitting sectors, this report compares unionization rates within the private sector only, and excludes the public sector. This is the relevant comparison, because the heavy-emitting industries are primarily private-sector industries.

“I don’t believe that the question before us is IF the labor movement has a role to play; I believe the question before us is WHAT ROLE do we play ... It is our duty as labor leaders to take a strong stand and carve out the role we will play in solving what may become the most critical issue of our time.”

—Gerry Hudson  
Executive Vice President  
SEIU

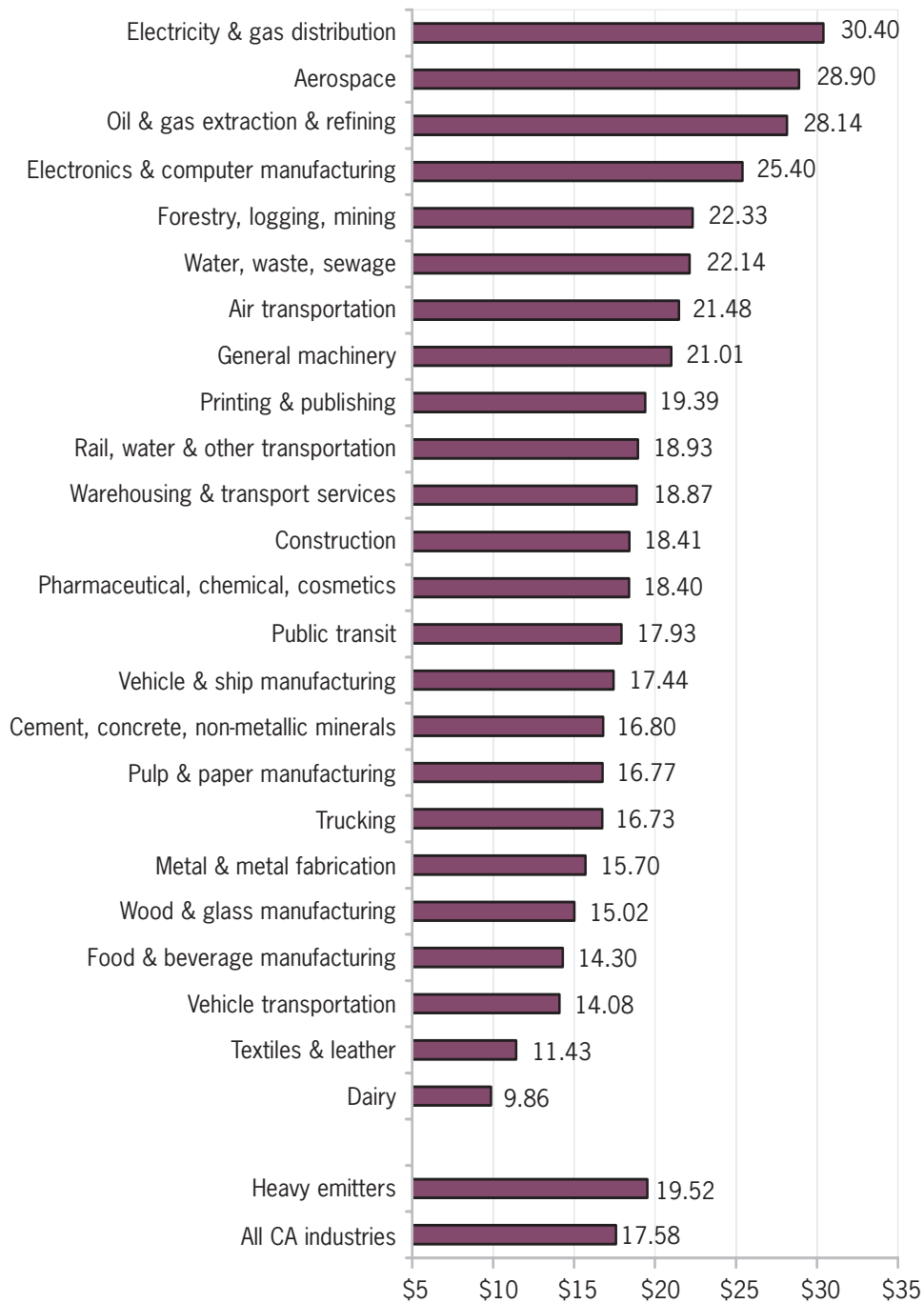
**Table 4**  
**Employment levels in heavy-emitting industries**

<b>Heavy-emitting industries</b>	<b>CA jobs</b>	
Construction—residential	690,000	
Agriculture, livestock, fisheries	400,000	
Construction—non-residential	390,000	
Electronics & computer manufacturing	370,000	
Warehousing & transport services	350,000	
Food & beverage manufacturing	200,000	
Metal & metal fabrication	170,000	
Trucking	150,000	
Pharmaceutical, chemical, cosmetics	120,000	
Construction—infrastructure & utilities	100,000	
Printing & publishing	80,000	
Water, waste, sewage	80,000	
General machinery	70,000	
Electricity & gas distribution	70,000	
Aerospace	70,000	
Wood & glass manufacturing	50,000	
Vehicle & ship manufacturing	50,000	
Air transportation	50,000	
Textiles & leather manufacturing	40,000	
Dairy production	30,000	
Cement, concrete, non-metallic minerals	30,000	
Vehicle transportation	30,000	
Public transit	30,000	
Pulp & paper manufacturing	30,000	
Oil & gas extraction & refining	20,000	
Forestry, logging, mining	20,000	
Rail, water & other transportation	20,000	
Refrigeration & air conditioning	10,000	
		<b>% of CA jobs</b>
<b>Heavy emitters w/o agriculture, livestock, fisheries</b>	<b>3,290,000</b>	<b>19%</b>
<b>Heavy emitters with agriculture, livestock, fisheries</b>	<b>3,690,000</b>	<b>21%</b>
<b>All CA jobs</b>	<b>17,400,000</b>	<b>100%</b>

Source: 2006 Quarterly Census of Employment & Wages, CPS

**Graph 3**

**Median wages for workers in heavy-emitting industries**

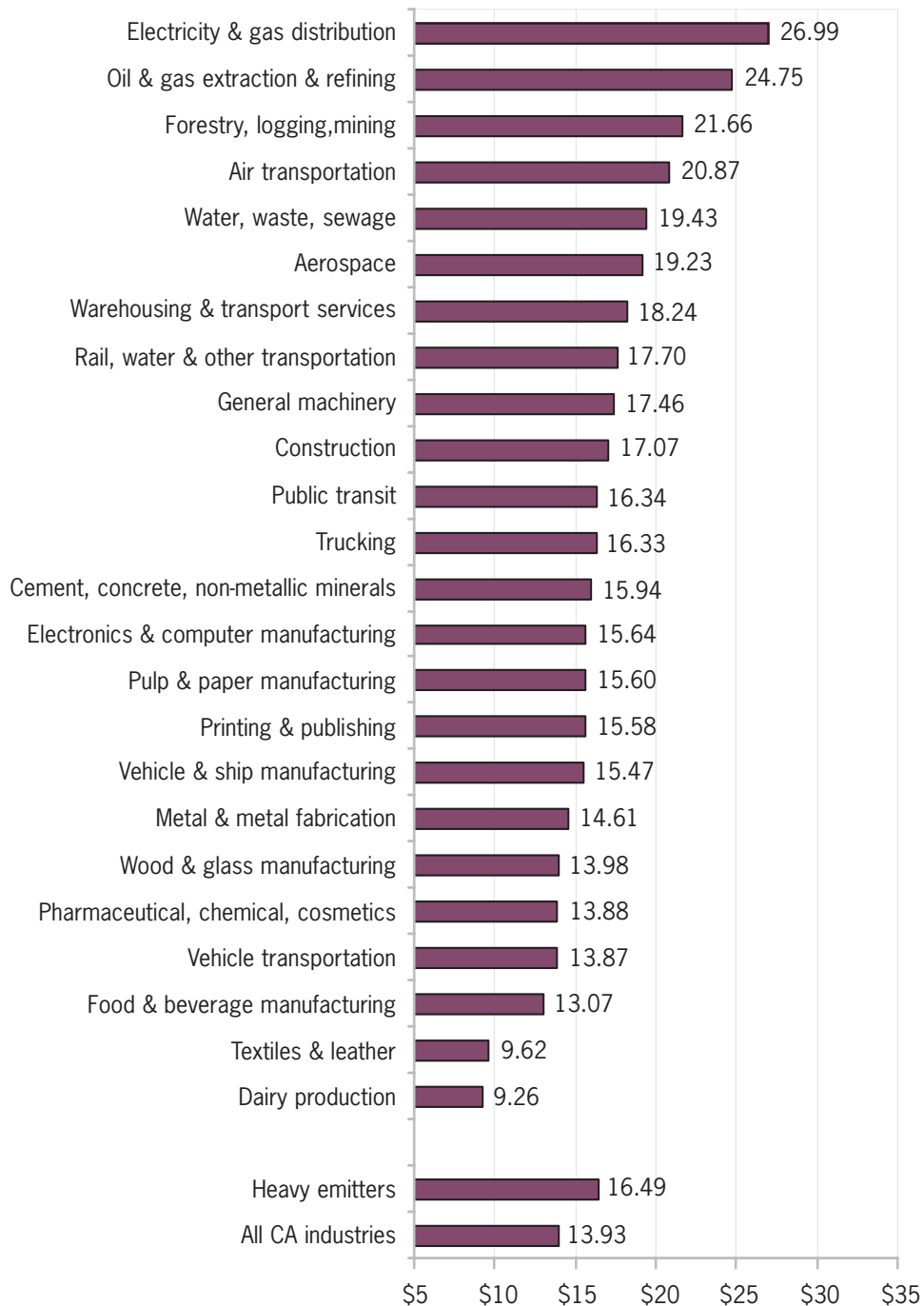


Source: Current Population Survey 2000-2008, wages as of May 2008



Graph 4

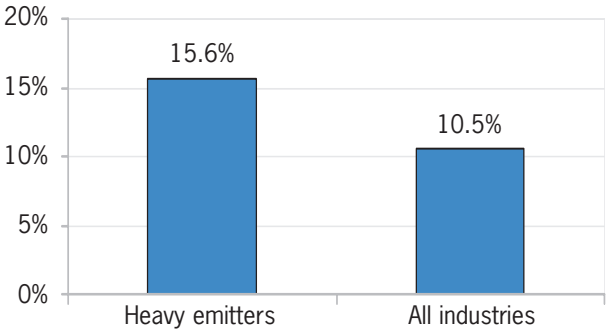
## Median wages for non-professional workers in heavy-emitting industries



Source: Current Population Survey 2000-2008, wages as of May 2008

Union density in heavy-emitting industries is almost 50 percent higher than union density in the private sector in California overall. Graph 5 shows that 15.6 percent of workers are unionized in the heavy-emitting industries, compared to 10.5 percent for all California private sector workers.

**Graph 5**  
**Union density in private sector firms**



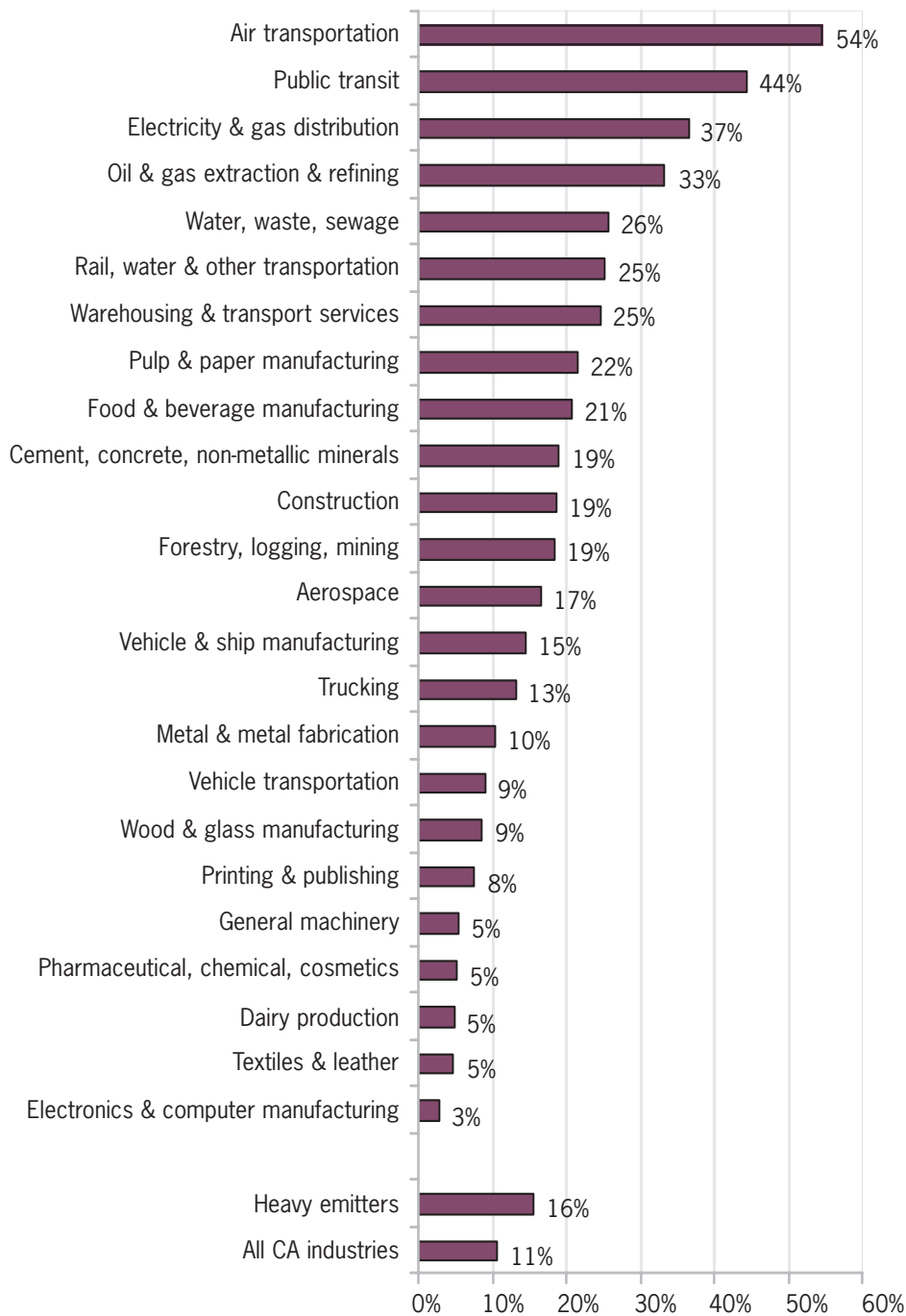
Source: Current Population Survey 2000-2008.

Graph 6 (page 54) illustrates the union density for specific heavy-emitting industries. Higher union density in the heavy-emitting industries is concentrated in utilities; construction; transportation; oil and gas refining and extraction; cement; and water, waste, and sewage.

In summary, the heavy-emitting industries that will be subject to new emissions limits under AB 32 are in key manufacturing, construction, and energy industries in which well-paying blue-collar jobs are concentrated. These industries have high union density compared to the private sector as a whole. If unions are able to build on this base of union density and play a significant role in retooling industries to reduce emissions, they have a chance to gain market share, grow union jobs, and build a high-wage green economy. In addition, creating new manufacturing jobs may be possible if renewable energy plants and their component parts manufacturing are encouraged to locate in the state. California has the opportunity to be a national headquarters of the new energy economy, fueled by the state’s research and engineering infrastructure, strong apprenticeship infrastructure, and the emerging consensus among stakeholders, including organized labor, for the need for strong state action to promote the green transition.

This analysis also reveals that more industry specific and occupational research is greatly needed. The available data on jobs in the heavy-emitting industries do not bring to light the kinds of

**Graph 6**  
**Union density in private firms for heavy-emitting industries**



Source: Current Population Survey 2000-2008, wages as of May 2008

re-skilling that may be necessary as these industries lower their emissions. For example, switching to cleaner trucks may not change truck driver jobs but will certainly require new skills in truck manufacturing and truck repair and maintenance. Detailed occupational analyses that provide a comprehensive picture of changing skills set requirements will be necessary to guide the state, unions, and training and educational institutions so that California workers can help create a strong green economy.

## Green Technology Job Growth

The third job impact analysis summarizes what we know about jobs resulting from green technology businesses, using the narrow definition of green jobs in firms that sell a product or service that has a positive impact on the environment.<sup>9</sup> Though the growth of green jobs, narrowly defined, has received a large amount of attention from policy makers and the media, it represents a tiny fraction of the overall jobs that are affected by climate change policy, at least in the short run.

The jobs we focus on here are in the industries and businesses that are growing in response to new market opportunities associated not just with AB 32, but with consumer preference changes and other market opportunities. Emerging green businesses and green jobs are related to AB 32, because particular measures that are implemented to meet the AB 32 GHG reduction goals may spur the growth of certain green businesses and green jobs. For example, ARB proposes increasing the renewables portfolio standard to 33 percent, a policy that would likely spur the creation of more businesses and jobs in renewable energy generation like solar energy. ARB is also proposing new energy efficiency standards for residential and commercial construction, which will likely lead to the creation of new “green” construction jobs.

Many analysts of green jobs focus only on these sectors, which, as we will see, account for far fewer jobs than the larger set of industries that will change as a result of AB 32 regulations and policies. These jobs are clearly growing in California—and around the world. Venture capital is increasingly directed toward investments in clean tech companies. According to the Cleantech Group, LLC, “clean tech” venture capital investments in California reached more than \$1.7 billion in 2007.

There is evidence that clean energy production, including solar, wind, and biomass, is more labor-intensive than the fossil fuel-based energy sector per unit of energy delivered (*Putting Renewables to Work: How Many Jobs Can the Clean Energy Industry Generate?* 2004). Another study by the Center on Wisconsin Strategy, Workforce Alliance, and Apollo Alliance (*Greener Pathways: Jobs and Workforce Development in the Clean Energy Economy*, 2008) estimates that eight to eleven direct jobs are created per \$1 million invested in retrofitting buildings for energy efficiency. The policies that are adopted by ARB to meet the AB 32 implementation goals could end up creating many new jobs in the emerging green economy.

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<sup>9</sup> There is of course some overlap between the jobs discussed here and those in the previous section, but since green jobs have not been assigned an industry code, this is inevitable.

The most comprehensive study to date that quantifies how many green jobs currently exist in California and in which industries those jobs are located is *Clean Technology and the Green Economy: Growing Products, Services, Businesses and Jobs in California's Value Network*, which was published by the California Economic Strategy Panel in March 2008. In the study, the authors identify and compile a list of green businesses in California by using green business association documents, the National Establishment Time Series (NETS) database, and other resources. They then match these businesses with other information on the industries they are in and derive an estimate of the number of jobs these green tech businesses account for, and where they are located. The study defines a green business as one that lowers performance costs, reduces or eliminates negative ecological impact, and improves the productive and responsible use of natural resources. It looks not only at green “products” but also at the products’ associated chains of suppliers, distributors, and service providers.

The study finds that there are 43,746 jobs in 3,085 green businesses in CA. The study identifies the following green industry segments: energy generation, energy efficiency, transportation, green building, energy storage, environmental consulting, water and wastewater, finance/investment, environmental remediation, air and environment, business services, research and alliances, agriculture, recycling and waste, materials, and manufacturing/industrial. By green industry segment, it finds that California’s green businesses are primarily in energy generation and energy efficiency.

The energy generation sector accounts for 43 percent of California’s green businesses. Energy generation includes businesses with primary activities in manufacturing, design, installation, system management, and consulting, as well as various business services and associations focused on energy generation or specific forms such as solar or wind. Within the energy generation sector, solar energy generation comprises 64 percent of the businesses and 53 percent of employment.

The energy efficiency sector makes up 31 percent of green business in California. Within the energy efficiency sector, 40 percent of businesses are in energy conservation consulting. The bulk of employment within the energy efficiency sector is in the manufacturing, design, and sales of low-wattage or zero-wattage lighting products.

The study also looks at how California’s green businesses and jobs are distributed across industry sectors according to the North American Industry Classification System (NAICS). It finds that 36 percent of California’s green businesses are in professional, scientific and technical services; 19 percent are in construction; and 15 percent are in manufacturing.

By region, the majority of green businesses and green jobs are found in the San Francisco Bay Area and Southern California regions. Green building and green finance/investment businesses are more numerous in the Bay Area region. Energy efficiency and energy storage are more numerous in the Southern California region. Transportation is equally distributed across the two regions with some activity also taking place in the Southern Border region.

A number of regional or industry specific studies tell similar stories. A study of Los Angeles by the Economic Roundtable (*Jobs in L.A.'s Green Technology Sector*, 2006) found that the most common industry classifications for green technology jobs were professional, scientific and tech services; construction, including solar power; and manufacturing. A study of Berkeley, California (in the Bay Area region) (*Green Collar Jobs: An Analysis of the Capacity of Green Businesses to Provide High Quality Jobs for Men and Women with Barriers to Employment*, 2007) identified specific positions for which green businesses expressed a need, including skilled carpenters and finishers, certified solar electric installers, and journeyman electricians, and concluded that many of the jobs could be accessible to individuals with barriers to employment. The Centers of Excellence, which are part of California's community college system, have also carried out a number of green jobs studies, looking at the solar industry in California (*California's Solar Industry Workforce, Preview of Key Findings*, 2008), green construction in L.A. County (*Green Construction*, 2007), and energy efficiency occupations in the San Francisco Bay Area (*Energy Efficiency Occupations At A Glance*, 2007). All of these studies found that job growth is expected in these industries.

In the final analysis, AB 32 will, over time, significantly impact jobs in California. It will create opportunities for job growth in the construction trades, including in retrofitting and building new buildings, in building the infrastructure for renewable energy, and in efficiency improvements in manufacturing. Job loss will be small or may not occur, and dislocations can be managed with targeted assistance programs. Much further research is needed to determine the specific industries and businesses where energy efficiency measures will change jobs significantly, resulting in the need for private and public investment in re-training and new skill development. The workforce and economic changes that will come with AB 32 create tremendous opportunities for organized labor and its allies to shape the green transition so that it benefits working families.

# HOW ORGANIZED LABOR IS RESPONDING TO CLIMATE CHANGE LEGISLATION

## Background

The position of U.S. unions on climate change issues has both varied widely and evolved significantly. Until this year, the AFL-CIO opposed of the Kyoto Protocol, one of the most important international agreements to address climate change, and the United Auto Workers worked to defeat legislation aimed at reducing automobile GHG emissions. On the other hand, unions like the United Steelworkers have long been active in promoting environmental improvements, playing a key role as early as 1970 in the passage of the Clean Air Act, and more recently in global warming mitigation policy.

Today, U.S. unions are starting to voice their support for policies to reduce global warming. Factors leading to the shift include increasing concern about climate change amongst the general public, concern about worker health and safety, and the influence of such groups as the Apollo Alliance, which is a coalition of labor unions, environmentalists, community groups, and businesses that advocates for clean energy policies that would both address the climate crisis and expand opportunities for U.S. businesses and workers. Another key reason for the shift in U.S. labor's position is the increasing attention to green jobs. If climate change legislation can create new jobs, then there is a very clear and obvious reason why labor unions should be part of the debate.

The AFL-CIO reversed its position on the Kyoto Protocol after 20 U.S. labor leaders and staff from a diversity of unions attended the 2007 United Nations Climate Change Conference in Bali. The



delegation, which was organized by the Cornell University Global Labor Institute, included representatives from the United Mineworkers of America, International Union of Electrical Workers-CWA, United Steelworkers of America, International Brotherhood of Boilermakers, Transport Workers Union of America, Service Employees International Union, AFL-CIO Industrial Union Council, and Oregon AFL-CIO, among others.

The new AFL-CIO position echoes the position of the International Trade Union Confederation. The Confederation emphasizes a commitment to address climate change while calling for a “just transition” to ensure that the urgent measures which must be taken are implemented in a way that is fair to workers, especially those in the regions of the planet expected to be hardest hit by global warming.

In March 2008, the Blue-Green Alliance, a coalition spearheaded by the Steelworkers and the Sierra Club, held a conference called Good Jobs, Green Jobs that was attended by some 1,000 people and addressed by AFL-CIO Secretary-Treasurer Richard Trumka; Marrienne McMullen, an assistant to SEIU President Andy Stern; and other national labor leaders.

The AFL-CIO also actively engaged in the national Lieberman-Warner climate change bill, which is expected to be revived when a new national administration is in place in 2009. Though the AFL-CIO did not take a stand on cap and trade, because of disagreement among the affiliates, it did contribute legislative language on worker retraining and worker adjustment assistance that was incorporated into the bill.

All of these developments illustrate a now broadly shared view that opportunities to address environmental crises like climate change can also present opportunities to fulfill organized labor’s core mission of promoting workers’ rights and improving working conditions.

## Labor Engagement in California

In California, both the California Labor Federation and the State Building and Construction Trades Council (SBCTC) have been closely monitoring AB 32 in its implementation phase. The potential for very high job growth in construction has spurred the SBCTC to participate in state committees to shape various pieces of the AB 32 draft scoping plan, as well as to support other climate change and green jobs legislation like State Senator Pro Tem Darrell Steinberg’s Green Jobs/Career Tech Education Bond, SB 1672.

The California Labor Federation’s Workforce and Economic Development Program (WED) in particular has been focusing on AB 32 because of the important role that worker training and re-training needs to play in the green transition. As early as 2006, WED included green jobs and climate change workshops as part of its annual Building Workforce Partnerships conference. In fall 2007, just after ARB published its list of “early actions,” WED identified unions that might be impacted to encourage

## California Labor Unions Take on Climate Change and Green Jobs

Some California labor unions have been leading the way in creating new training programs, campaigns, and coalitions to address climate change and green jobs in their industries and communities. “We already know that working people are disproportionately affected by environmental degradation and the negative impacts of global warming,” says SEIU Executive Vice President Gerry Hudson. “It is our duty as labor leaders to take a strong stand and carve out the role we will play in solving what may become the most critical issue of our time.”

Here are just a few examples of different types of projects labor unions are initiating:

### ► **Solar Installation Training Program**

Solar energy is one of the fastest growing areas of the new green economy in California. Southern California’s International Brotherhood of Electrical Workers (IBEW) Local 11 is a leader in training electricians in the art of installing and maintaining solar panels. Local 11 has trained 2,000 licensed electricians in California so far, and its training program is being used by the IBEW International as a model for other locals across the U.S. The courses are funded by the Los Angeles County Chapter of the National Electrical Contractors Association (NECA) and IBEW Local 11 through the Southern California IBEW-NECA Labor-Management Cooperation Committee. They also receive California state government training funds. In its weekend training program, Local 11 trains journey level electricians in the national electrical code relevant to solar, requirements for proper solar installation, sizing solar panel systems, and getting maximum photovoltaic output from the panels. Local 11’s Kim Craft, a journeymen-licensed electrician with 30 years experience and a trainer at the Commerce, CA facility, estimates that the demand for the solar workforce alone could quadruple by 2009 as California building owners learn about the photovoltaic potential of their buildings. For more information about the training program, go to <http://www.yoursolarsolution.org>

### ► **Green Contract Language and Worker Involvement at the Worksite**

SEIU International has developed green contract language that it is encouraging locals to bring to the bargaining table. It encourages provisions to address issues like green clean-

ing products for janitors, harmful hospital toxins, alternative transportation, daytime cleaning, recycling, and environmental labor-management committees. SEIU Local 1000, California’s largest state employee union, plans to bring many of these provisions to its negotiations, including creating two labor-management committees on the environment. One committee would address the consumption and acquisition of non-recycled materials; the other committee would work on reducing greenhouse gas emissions from the workplace, in line with AB 32. For details on SEIU’s green contract provisions, go to:

[http://www.seiu.org/about/green\\_contract\\_provisions/index.cfm](http://www.seiu.org/about/green_contract_provisions/index.cfm)

### ► **Clean and Safe Ports Campaign**

AB 32 includes a “green ports” measure designed to reduce emissions from California ports while also benefiting the health of nearby communities. A coalition of labor unions, environmental organizations, and community groups already has a head start on this plan. The Coalition for Clean and Safe Ports is promoting a campaign to address the fumes from “dirty” diesel gas trucks that pollute port communities and endanger their public health. To fix the system, the campaign recommends that trucking companies buy cleaner trucks and directly hire the truck drivers as full-time employees. Currently the drivers work as independent contractors and are paid by the load rather than the hour, leading to long idling periods that release GHGs. The coalition is led by Change to Win and the International Brotherhood of Teamsters, and also includes such groups as the Natural Resources Defense Council, East Bay Alliance for a Sustainable Economy, and the Los Angeles Alliance for a New Economy (LAANE). It had a major victory in Los Angeles in

March when the Port of L.A. approved a strong and sustainable diesel emissions-reduction plan. The plan would make the trucking industry—not the underpaid port drivers—permanently responsible for turnover to a clean-technology fleet, and the truck companies would have to act as employers to assume full responsibility for low-emission cargo vehicles. In Oakland, the campaign convinced the Port of Oakland to pledge an 85 percent pollution reduction in West Oakland. For more information, see <http://www.cleanandsafeports.org> and <http://www.oakland.cleanandsafeports.org>

### ► **Pathways Out of Poverty and into Green Union Jobs**

Many community groups in California are excited about the idea that green jobs can create pathways out of poverty for low-income people, people of color, and other people with barriers to employment. These groups have begun to create job training programs they hope will place people from disadvantaged communities into green jobs. One group that stands out in this area is the Los Angeles Apollo Alliance, led by the grassroots organization SCOPE (Strategic Concepts in Organizing and Policy Education), which developed the Green Career Ladder Training Program for retrofitting City of Los Angeles buildings. SCOPE has long-standing relationships with labor unions in L.A. and has made sure they are key partners in a coalition that also includes community groups, environmentalists, and businesses. SEIU Local 721, IBEW Local 11, and PIPE (Piping Industry Progress and Education Trust Fund, which is affiliated with the United Association of Plumbers and Pipefitters) are on the L.A. Apollo Alliance planning committee. There are two things that are unique about L.A. Apollo Alliance's green jobs program. The first is that it started out with a strategy to create demand for green jobs through its campaign to pass an ordinance to retrofit Los Angeles city buildings for water and energy efficiency. The other unique aspect of the training program is its deliberate coordination and partnership with existing union apprenticeship training programs and community college programs to take advantage of this existing infrastructure. The goal is to get trainees into apprenticeship programs or full-time city jobs. For more information about the L.A. Apollo Alliance and other similar green jobs programs, see the new report *Green Collar Jobs for America's Cities*, <http://www.apolloalliance.org/downloads/greencollarjobs.pdf>

### ► **Labor-Management Partnership in Renewable Energy**

Laborers Local 783 of San Bernardino has developed a labor-management partnership with Ameron, a company that is now entering the realm of clean energy generation. Ameron, which started out as a pipe contractor in the 1950s, is now manufacturing windmill towers at its facility in Fontana. Members of Local 783 who work there are now doing what many people would consider “green jobs.” Local 783 is collaborating with Ameron and other contractors on an apprenticeship program, and also on a jointly managed trust that works to market the trust's signatory contractors. These labor-management partnerships existed before part of Ameron's operations went green but are now being adapted to the new green economy. For example, the apprenticeship program curriculum can incorporate skills needed for new green jobs, and the joint trust is keeping track of proposed wind tower projects by monitoring federal, state, and local government databases. That way, Local 783 and its contractor partners can submit proposals and compete for the jobs that will be created to build, install, and maintain wind towers coming down the line. Situations like this one will become more and more common as traditional companies green their operations and/or add new green projects to their existing ventures. Labor-management partnerships and apprenticeship programs that can adapt quickly to the green transition will be of enormous benefit to union companies and workers.

their involvement in ARB's public input process. Meetings with union representatives in cement and goods transports sectors were also convened. The Apollo Alliance and the Blue-Green Alliance participated in some of these convenings.

In April 2008, the California Labor Federation's Executive Committee adopted a set of climate action principles, reproduced in the appendix (pages 83 to 84). Since then, Labor Federation staff have organized educational and action plan meetings on AB 32. The Labor Federation and SBCTC created a coordinated message and talking points for labor leaders and activists wishing to participate in the AB 32 process. Reflecting the Labor Federation's principles, these key points include statements of organized labor's support for the AB 32 goals along with labor's belief that more attention should be paid to the crucial role California's workers must play in restructuring our economy to reduce the state's carbon footprint and to the impact these changes will have on them. The talking points also state that investments in the workforce through community colleges, workforce investment boards, and union apprenticeship programs should be scaled up; measures should be taken to prevent jobs leaving the state; and the creation of good, middle-class jobs should be favored as part of the scoping plan. In July 2008, the Labor Fed Executive Committee established a working group on climate change policy.

## **Advocating for Other Climate Change and Green Jobs Policies in California**

In addition to AB 32, lobbyists and other union officials in California are following a number of other policies related to the environment, energy, and green jobs. These include policies that address alternative fuels, transportation, emissions taxes, increasing energy and fuel costs facing households, and California's request to the federal Environmental Protection Agency for a waiver to implement AB 1493 and begin regulating automobile greenhouse gas emissions (see page 36 for more information).

The California Labor Federation was engaged in crafting AB 118, the Alternative and Renewable Fuel and Vehicle Technology Program, and now organized labor has a seat on the AB 118 advisory committee. The goal of AB 118 is to develop and deploy innovative technologies that transform California's fuel and vehicle types to help attain the state's climate mitigation goals. AB 118 provides \$120 million annually through a host of funding sources, including an increase in vehicle registration fees, to fund alternative fuel and vehicle research and development in universities and private firms; give grants or loans to help companies produce and distribute new fuels and vehicles that will cut greenhouse gases; provide subsidies to consumers to buy alternative fuel vehicles; and provide funding for workforce training programs.

The SBCTC, Labor Federation, and individual unions, in coalition with environmental groups like the Sierra Club and Environmental Defense Fund and social justice groups like the Ella Baker Center for Human Rights, are also joining together to advocate for SB 1672, the Green Jobs/Career Tech Education Bond. SB 1672, sponsored by State Senator Pro Tem Darrell Steinberg, would make \$2.25

billion in public bonds available to middle and high schools for infrastructure for career technical education (formerly known as vocational education). This bill is related to AB 32 because it addresses the need to retrain the existing workforce for jobs that will change or be created due to climate mitigation efforts. The coalition formed to work on SB 1672 strengthened the relationships between labor, environmental, and social justice groups at the state level.

Many unions are also involved in the development of AB 3018, the California Green Collar Jobs Act of 2008, which was introduced by Assembly Speaker Emeritus Fabian Núñez. AB 3018 would establish a Green Collar Jobs Council to develop programs, strategies, and resources to address the workforce needs of California's growing green economy and establish green jobs training programs. The Council would support regional initiatives and work with the state and local Workforce Investment Boards. By law, unions are entitled to at least 15 percent membership on local WIBs and there are currently nearly 100 local union leaders serving on boards.

There are still areas of disagreement within the California labor movement and between organized labor and its allies. Some of the most contentious areas center on whether or not the state should promote nuclear power, liquefied natural gas, and new coal technologies. As discussed elsewhere in this paper, there are divergent opinions about cap and trade, carbon fees, and carbon offsets. These issues must be addressed in more depth as labor unions continue to deepen their education and engagement on AB 32.

## **Organized Labor's Participation in Regional and National Climate Change Efforts**

The California Labor Federation has joined with other labor federations in the Western U.S. and Canada to participate in the Western Climate Initiative (WCI), a proposed regional cap-and-trade program (see page 26 for details). Actions have included attendance of California, Oregon, Utah, British Columbia, and Ontario labor representatives at WCI stakeholder meetings in Salt Lake City in May 2008 and San Diego in July 2008 for the purpose of advocating the incorporation of the concerns of working people into the design of the WCI. In June, the British Columbia Federation of Labour, and the Oregon AFL-CIO sent a joint letter to the WCI, expressing their positions on such issues as the auctioning of allowances and the use of offsets.

Now that ARB has proposed coordinating its cap-and-trade program planning process with that of the WCI, organized labor's participation in the development of the WCI cap-and-trade program is more important than ever.

## Sources for more information

### **AFL-CIO**

<http://www.aflcio.org>

### **APOLLO ALLIANCE**

<http://www.apolloalliance.org/resources.php>

### **BLUE-GREEN ALLIANCE**

<http://legacy.usw.org/uswa/program/content/3589.php>

### **CALIFORNIA STATE BUILDING AND CONSTRUCTION TRADES COUNCIL**

<http://www.sbctc.org>

### **CALIFORNIA LABOR FEDERATION WORKFORCE AND ECONOMIC DEVELOPMENT PROGRAM**

<http://www.wed-works.org>

### **CENTER ON WISCONSIN STRATEGY**

<http://www.cows.org/>

### **CORNELL UNIVERSITY GLOBAL LABOR INSTITUTE**

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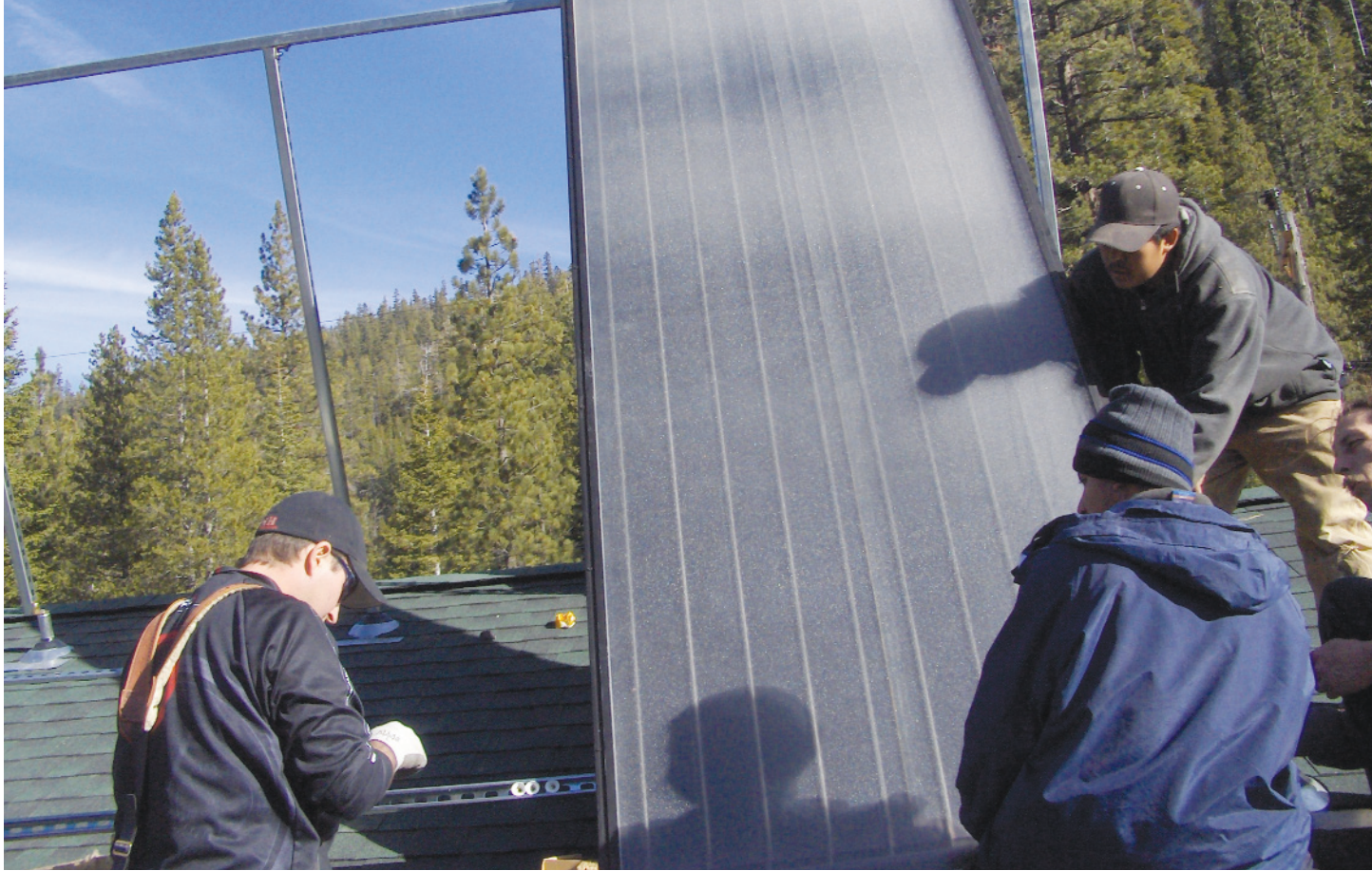
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## CONCLUSION AND RECOMMENDATIONS: TOWARD AN EQUITABLE TRANSITION

California, along with the rest of the country, is on the brink of a major economic transition as it confronts the real need for reducing GHG emissions. The specter of coastal flooding, ongoing drought, and increasingly uncontrollable wildfires in California has led to a consensus that the cost of the current path is much greater than the cost of reducing emissions. California also suffers from an economic structure characterized by the growth of low-wage jobs and inequality. The state's landmark global warming legislation, AB 32, will reshape not only the energy industry, but the whole California economy, offering an opportunity to redirect the state's future economic development. California's leadership in reducing GHG emissions positions the state to create a new engine of growth through reinvestment in California industries and promotion of exports to the rest of the country and the world.

Organized labor has an enormous stake in how AB 32 and other environmental policies are implemented. Labor's traditional arenas for protecting workers—policy advocacy, organizing, and collective bargaining—provide a tool kit that can be used to promote a just transition. In addition, organized labor's institutional infrastructure, particularly apprenticeship and other union-led job training programs, will be key to positioning unions to participate in—and lead—efforts to supply the skilled workforce needed for a green economy.



“We want a country and state that’s going to be here for our children. We want our children to know that they will not be suffering from respiratory problems in the future. We are the ones that stand up for social services programs and healthcare, and we’re going to continue to stand up for the environment.”

—Willie Pelote

**Assistant Director of Political Action  
AFSCME International**

If organized labor is proactive, it can assure that the new and transformed jobs in the green economy are good, safe, family-sustaining jobs; if labor is passive or seeks to protect the status quo, some of the key unions in the state could lose members and job quality could decline.

This report analyzes three types of job impacts that should be considered by unions as they formulate their strategies for influencing and participating in climate action efforts.

First, the available macroeconomic forecast, which traces the job growth and job loss throughout the economy as AB 32 is implemented, shows very small changes in the overall number of jobs as well as in the number of jobs in each sector. Most of the scenarios show no job loss in any of the industry categories, although in some industries employment does not grow as much as it would have without AB 32 regulation, while in others it grows marginally faster. The small size of any

job loss means that generous worker adjustment assistance, like the package that the AFL-CIO was able to insert in the Lieberman-Warner climate change bill (which is expected to be revived in 2009), is affordable and should be supported and promoted.

The preliminary forecast also shows that the highest job growth will occur in non-residential construction, highlighting the tremendous opportunities for the construction trades unions to grow as employment grows. It also calls attention to the importance of directing public and private investment into training that builds on and complements the union apprenticeship infrastructure, rather than undermines training standards.

This report’s second job impact analysis describes the jobs in the heavy-GHG-emitting industries, including the energy industries that will be subject to much stronger regulations and the manufacturing industries, both of which will be covered by the proposed cap-and-trade program. These industries account for over three million jobs, about 20 percent of California’s jobs in 2006. In addition to being affected by changes in the number of jobs, as discussed above, these are the sectors where changes in workers’ skills requirements and the need for retraining is likely to be concentrated. The heavy-emitting industries have high concentrations of well-paying blue-collar union jobs; union density in these industries is 15.6 percent. Certainly not all jobs in the heavy-emitting industries will be changed, but the sheer number of jobs in this sector means that, even if only a small percentage require retraining, most of the job transformation resulting from new climate legislation will be among traditional blue-collar union jobs. This again highlights the role of unions

in providing retraining and in shaping public and private investment to prioritize labor-management training partnerships.

The third job impact analysis summarizes other studies of jobs associated with new green businesses. The most comprehensive California-wide study estimates that there are currently about 3,000 green businesses in the state, accounting for about 44,000 jobs (*Clean Technology and the Green Economy*, 2008). The study finds that green businesses, defined as companies whose products and services reduce environmental impact or improve natural resource use, are concentrated in energy generation and energy efficiency services. By North American Industry Classification System (NAICS) sectors, it finds that 36 percent of California's green businesses are in professional, scientific, and technical services; 19 percent are in construction; and 15 percent are in manufacturing. These green businesses and jobs are likely to expand rapidly: estimates of the investment needed to meet just the renewables portfolio standard (RPS) for electricity are approximately \$100 billion.

In addition to these specific job impacts, union members in all sectors of the economy will also be affected by new climate change regulations as consumers and as community members. In particular, global warming and global mitigation costs will affect low- and moderate-income families more severely than people with higher incomes. Thus it is important for unions to take leadership in promoting a just and equitable transition to a green economy.

We summarize our recommendations for organized labor's climate action as follows: 1) policy engagement in AB 32 and other climate action policies, 2) specific policy recommendations for AB 32's scoping plan, and 3) recommendations for local union strategies in their industries. To support these efforts, we also recommend ongoing and more detailed research and analysis of the impact on California's workforce of AB 32, including a gap analysis to determine where there will be workforce skills shortages.

## Engagement in the Policy Process

Unions have the opportunity to get a seat at the climate solutions table now. The implementation of AB 32 provides a public process with opportunities for organized labor, like other stakeholders, to express its interests and influence outcomes. Public hearings on the draft scoping plan, discussions with ARB staff and board members, and work with legislators and the Governor are all arenas for participation. The environmental justice community gained a formal role in the AB 32 implementation process through the Environmental Justice Advisory Committee—and it may still be possible for labor unions to gain a formal role in the scoping plan process. In addition, though the policy recommendations are being formulated through ARB's administrative process, the California legislature is also likely to have a role in determining final policy outcomes. In particular, the allocation of public revenues generated by any fee, tax, or auction revenues will probably be determined by state elected officials.

In order to help shape these transitions labor unions can engage in the AB 32 implementation process, including through public comments at ARB hearings, participation in ARB committees like the Economic and Technology Advancement Advisory Committee or Environmental Justice Advisory Committee, attendance at meetings to discuss particular sectors being targeted by AB 32 measures, influence with elected officials, or all of the above.

Another extremely important venue for labor's engagement is the Western Climate Initiative, because California is committed to aligning AB 32 with the WCI. The WCI is currently proposing some measures that are less beneficial to working people than are the corresponding measures in ARB's draft scoping plan, particularly in the area of cap-and-trade auction amounts. As with ARB, the WCI also has a public process that labor can participate in by meeting with WCI administrators, attending stakeholder meetings, submitting formal comments, or influencing elected officials.

To the greatest extent possible, labor unions should work on these issues in collaboration with environmental, environmental justice, and social justice groups. In many areas, these groups have interests that are similar to organized labor's and would want to partner with labor unions to expand their influence. As is evidenced in the example of the Clean and Safe Ports campaign, such collaborations can lead to the development of compelling campaigns that can also win significant victories for workers and community members.

Organized labor's involvement in municipal and other local and regional climate mitigation activities and at the ballot box is also critical. Many of the draft scoping plan's critical proposed measures require approval and/or implementation by local bodies and other agencies. A key transportation measure, the high-speed rail proposal, requires voter approval.

## Policy Response to AB 32 Scoping Plan

This report supports ARB's overall policy recommendations but urges ARB to take action to protect workers and improve job quality as it makes more specific recommendations for the final scoping plan. ARB should analyze the impact of its proposed measures on jobs and workers, and put greater emphasis on both the key role California's workforce will play in this transition and on the new short- and longer-term needs that workers will face. It should emphasize public investment strategies to smooth the green transition, much of which can be funded in part or wholly from cap-and-trade revenues, if the cap-and-trade program is designed with the proper safeguards in place.

## CAP AND TRADE

The California ARB's draft scoping plan, released on June 26, 2008, details the specific policy recommendations for reducing GHG emissions to meet AB 32's goals. The draft scoping plan proposes a multi-industry cap-and-trade program, to be developed over the next several years in conjunction with the development of the Western Climate Initiative's cap-and-trade program. Many details of

how the cap-and-trade policy will be structured and implemented are not yet spelled out. The draft scoping plan proposes that about 20 percent of the emissions reductions come from the cap-and-trade program, and these reductions would be over and above the larger reductions expected from the proposed regulations that will also be imposed on each specific capped sector.

Currently, there is not consensus among California unions about whether to support a cap-and-trade program, a carbon fee, or only regulations with no market mechanisms as the means by which to achieve AB 32's GHG emissions reductions targets. Since there are pros and cons to each of these policies, this report makes no recommendation concerning which should be supported. However, if a cap-and-trade policy is adopted, it is recommended that the following safeguards be included to maximize the benefits to workers and their communities.

- ◆ *Cap and auction:* The state should have a goal of 100 percent auction of the carbon allowances, to be reached after a short adjustment period in which some key enterprises, like municipal utilities, receive waivers if they invest directly in permanent emissions reductions.
- ◆ *Scope:* The cap-and-trade system should cover a broad set of heavy-emitting industries and not be limited to the electricity sector. The broader the coverage of the policy, the greater the efficiency gains and the more the costs will be spread out, rather than concentrated among a few businesses.
- ◆ *Leakage:* The policy should adopt “consumption-based accounting” to assure that jobs don't leave California. Consumption-based accounting measures the emissions of products consumed in California, so out-of-state producers would have to play on the same playing field as in-state producers. This should also be used in industry specific regulations.
- ◆ *Enforcement:* Whistleblower protections need to be in place for workers involved in the carbon reduction verification process.
- ◆ *System design to prevent “hot spots”:* A cap-and-trade system can potentially result in “hot spots,” which occur when pollutants co-produced with GHGs are concentrated in specific low-income communities. Trading of carbon allowances can exacerbate this concentration if particular sites are expensive to abate, and companies can buy allowances instead of reducing their emissions.
- ◆ *Offsets:* Offsets should be limited to a small portion of covered entities' compliance obligations and should be allowed only for projects in California. Offset projects should meet job quality standards and environmental justice criteria to ensure the maximum co-benefits to the people of California. Offsets must be additional, verifiable, and enforceable by a state agency.

## **PUBLIC INVESTMENT**

The transition to a carbon-constrained economy will require both private and public investment. A cap-and-trade program can help defray many of the public investment expenses. Even a modest cap-and-trade program can generate several billion dollars annually in revenues that can help businesses, workers, and households change their practices. ARB should create a clear process to set priorities for the use of these new revenues. There is consensus that they should be used to develop and disseminate new technologies that lower carbon emissions and for investments in permanent emissions reductions by emitters. This report also recommends the following investments and investment strategies:

## **WORKFORCE DEVELOPMENT**

The transition to an economy that limits GHG emissions will require a significant restructuring of many of California's key industries as they adopt cleaner technologies. Retooling California's workforce training and education infrastructure is clearly important to assure an adequate supply of trained (and retrained) workers for new and restructuring industries. The analysis presented in this report shows that a large portion of job growth in the green economy will occur in mid-skilled occupations where vocational, community college, and work-based training programs are essential.

New investment in workforce development should build on and complement the existing workforce development system, particularly the union apprenticeship infrastructure, rather than substitute for it. This report recommends a dual-customer approach that develops industry-specific solutions—often known as the sector or high-road partnerships approach—built on what employers need in their workforce and what workers need to develop their skills into good jobs with career paths.

Many of the state's most successful workforce development programs are union apprenticeship programs or other high-road labor-management training partnerships. These represent a tremendous asset for the green transition, particularly because of the key role of construction occupations in new green building, energy efficiency building retrofits, solar energy installation, and construction of renewable energy plants. Apprenticeship programs and high school and community college vocational educational programs should be the focus of public investment in the green transition.

## **WORKER ADJUSTMENT ASSISTANCE**

Overall, job loss resulting from AB 32 is expected to be quite small in California, mostly because California's economy is less based on fossil fuels and dirty manufacturing than many other states. Job losses in oil and gas refining can be addressed by generous transition programs that will be affordable because of their small scale.

Just as the Trade Adjustment Assistance Program was set up to help workers whose jobs were eliminated by increased imports after trade agreements like NAFTA went into effect, so there should be a climate adjustment assistance program to support and provide retraining for displaced workers.

The AFL-CIO developed strong worker protection language for national cap-and-trade policy proposals that are expected to be revived under the new administration in 2009. This language included income and training supports for workers as well as bridges to retirement for workers near retirement. Similar language should be included in the AB 32 final scoping plan.

## **CONSUMER ASSISTANCE**

Investment in mass transit, residential efficiency retrofits, urban infill, and other strategies that can lower households' energy use and vehicle miles traveled, while promoting good jobs. Much of the emissions in California come from passenger vehicles and residential buildings, requiring changes in consumer behavior that are particularly difficult for low- and moderate-income consumers to make. Public investment in these areas can play an important part in cost-effective emissions reductions, while producing good jobs and protecting low-income people.

## **ATTACHING JOB AND TRAINING QUALITY STANDARDS TO PUBLIC INVESTMENT AND INCENTIVES**

Public investment in green infrastructure and green training should include standards for wages and benefits as well as for training programs. Unions have developed a set of policy tools to ensure that investments in public infrastructure are carried out by skilled workers and provide some floor for wage and benefit standards. These include prevailing wages, state-approved apprenticeship job training standards, project labor agreements, and best value contracting. They also include criteria for structuring public dollars so that they prioritize industry projects that include labor-management partnerships, as was part of the national Green Jobs Act language.

## **Recommendations for Local Union Strategies in their Industries**

Regulations on businesses within specific industries are very important in AB 32, accounting for a large portion of the emissions reductions in the draft scoping plan (though many of these have yet to be developed in full detail). These sector-specific regulations can present a series of opportunities for unions to shape the greening of their industries in ways that promote high-quality jobs. They can favor certain firms—those that are able to respond to the changes in their regulatory and competitive environment—and put other firms at a disadvantage. The union advantage under these circumstances is in providing a stable and skilled workforce that can implement new technologies to help employers reduce emissions and compete in the new green economy.

Because each sector is different, labor unions will need to analyze the regulations and other policies in each specific industry to look for levers that can help ensure the creation and maintenance of quality jobs. In energy generation this may mean engaging with new employers producing renewables; in port trucking it may mean making truckers employees instead of independent contractors; and in construction it may mean requirements to use state-approved apprenticeship job training



standards, project labor agreements, prevailing wages, and best value contracting. Other opportunities include engagement in local jurisdiction climate action plans, where promotion of public transit and urban infill can help the environment and promote quality jobs. In-fill development has been shown to have a much greater likelihood of producing high quality union jobs than suburban sprawl.

Growing high quality jobs also requires a deep engagement by unions with their employers and/or with other stakeholders in their industries as they are transformed. In addition to influencing policy, unions can build labor-management training partnerships that position unions as leaders in assist-

“Labor unions are learning from the experiences of our counterparts around the world. We know that efforts to deal with global warming present major opportunities to create good, family wage jobs—but only if labor is at the table to insist on wage and benefit standards.”

—**Barbara Byrd**  
**Secretary-Treasurer**  
**Oregon AFL-CIO**

ing businesses to successfully adopt new green technologies and institute energy efficiency measures. In some industries, like construction, joint apprenticeship programs can be leveraged to help union contractors grow market share. Apprenticeship programs that are integrating new green curricula to expand the skills of apprentice and journey level workers clearly are needed and are a huge asset in this environment. Public funding to complement the very large private funding in apprenticeships should be considered. Unions can also work with employers and community groups to launch new training initiatives, as there are clearly many new efforts by community groups that see green jobs as a big opportunity to create pathways out of poverty for disadvantaged groups. Both unions and community groups could benefit from these new initiatives.

AB 32’s most significant regulations and policies will have a major impact on the energy and transportation sectors as well as the construction industry. Enormous private and public investments will be required to meet the goals set out for these sectors. Estimates of the investment needed to meet the 33 percent RPS for electricity are approximately \$100 billion, much of which will occur in the state through construction of transmission infrastructure and actual location of renewable energy plants.

Estimates of the investment required to meet the building energy efficiency goals are not yet available, but are largely expected to pay for themselves and will accrue mostly to California, where the investments have to be physically located. The location of investments in transportation emissions is less likely to occur in California, since most vehicles Californians use are manufactured elsewhere, but if this region becomes a nexus of innovation in cleaner vehicles, the sector will grow as well. Additionally, if the final scoping plan emphasizes larger investments in public transit, this will also result in the creation of new transportation sector jobs.

Investment in these sectors will create jobs and provide both opportunities and challenges for labor unions. State and local government and other public institutions are already creating requirements for retrofitting their own infrastructure, and in California this will largely be done by union contractors. Skill standards, prevailing wage standards, and other policy tools commonly used by the building trades could be attached to public incentives and subsidies for retrofitting commercial and residential buildings for energy efficiency. However, the expected job growth in the renewable energy industry may be located within new, non-union firms. Maintaining union density will be vital to ensure that the new jobs are quality jobs.

AB 32 will help slow global warming and at the same time generate enormous opportunities for California and for unions. California's initiative in GHG reduction has the potential to create a green economic engine by fostering leading-edge technologies, processes, and products that can be exported to the rest of the world. Organized labor can play a vital role in this process, by advocating a just and equitable model for GHG reduction, by positioning union workers and employers to play a leading role in the new green economy, and by training the next generation of workers.



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# Appendix

Table A1

**AB 32 Draft Scoping Plan recommendations, early actions, and other measures under consideration, by sector**

Sector	Scoping Plan recommended sector measures (including discrete early action measures)	Additional early action measures	Other measures under evaluation
<p><b>Agriculture</b></p>	<p><b>Methane capture at large dairies.</b></p>	<p>Manure management (methane digester protocol). Collaborative research on GHG reductions from nitrogen land application. Electrification of stationary agricultural engines.</p>	
<p><b>Construction</b> (it is not separated out by ARB in the draft scoping plan but many measures in other sectors will create or transform construction jobs)</p>	<p>Also listed under the energy sector: <b>Building and appliance energy efficiency and conservation</b> (32,000 GWh reduced electricity demand; 800 million therms reduced gas use). <b>Increase Combined Heat and Power (CHP) electricity production by 30,000 GWh.</b> <b>Solar Water Heating</b> (AB 1470 goal). <b>Renewables Portfolio Standard</b> (33% by 2020). <b>Million Solar Roofs</b> (Existing Program Target). Also listed under the industry sector: <b>Energy efficiency and co-benefits audits for large industrial sources.</b></p>		
<p><b>Energy</b> (includes electricity, renewables and energy efficiency)  The <b>electricity sector</b> would be covered under the proposed cap-and-trade program.</p>	<p><b>Energy Efficiency:</b> Utility energy efficiency programs. Building and appliance standards. Additional efficiency and conservation. <b>Increase Combined Heat and Power (CHP) use by 32,000 GWh.</b> <b>Residential Solar Water Heater Installation</b> (AB 1470 goal). <b>Renewables Portfolio Standard</b> (33% by 2020). <b>Million Solar Roofs</b> (Existing Program Target).</p>	<p>Electricity: Reduction of SF6 in electricity generation. Energy efficiency: Cool communities program.</p>	<p>Measures to expand the Million Solar Roofs Program and/or the Residential Solar Hot Water Heater Installation Program. Energy efficiency targets that are even higher than those being recommended in the draft scoping plan. Coal Emission Reduction Standard.</p>

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Table A1 (continued)

**AB 32 Draft Scoping Plan recommendations, early actions, and other measures under consideration, by sector**

Sector	Scoping Plan recommended sector measures (including discrete early action measures)	Additional early action measures	Other measures under evaluation
<b>Fire Suppression</b>		Alternative suppressants in fire protection systems.	
<b>Forestry</b>	<b>Sustainable forests.</b>	Forestry protocol adoption.	
<b>High GWP</b> (refers to High Global Warming Potential Gases; these are found in the commercial sector and industry sector)	<p><b>PFC Reduction from Semiconductor Manufacturing</b> (discrete early action measure).</p> <p><b>SF6 Reductions in the Non-Electric Sector</b> (discrete early action measure).</p> <p><b>Reduction of High GWP GHGs in Consumer Products</b> (discrete early action measure).</p> <p><b>High GWP Reductions from Mobile Sources:</b></p> <ul style="list-style-type: none"> <li>• low GWP refrigerants for new motor vehicle air conditioning systems</li> <li>• air conditioner refrigerant leak test during vehicle smog check</li> <li>• refrigerant recovery from decommissioned refrigerated shipping containers</li> <li>• enforcement of federal ban on refrigerant release during servicing or dismantling of motor vehicle air conditioning systems</li> </ul> <p><b>High GWP Reductions from Stationary Sources:</b></p> <ul style="list-style-type: none"> <li>• high GWP recycling and deposit program</li> <li>• specifications for commercial and industrial refrigeration</li> <li>• foam recovery and destruction program</li> <li>• SF6 leak reduction and recycling in electrical applications</li> <li>• alternative suppressants in fire protection systems</li> <li>• residential refrigeration early retirement program</li> </ul>	<p>Specifications for commercial refrigeration.</p> <p>High GWP refrigerant tracking, reporting, and recovery program.</p> <p>Foam recovery/destruction program.</p>	

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Table A1 (continued)

**AB 32 Draft Scoping Plan recommendations, early actions, and other measures under consideration, by sector**

<b>Sector</b>	<b>Scoping Plan recommended sector measures (including discrete early action measures)</b>	<b>Additional early action measures</b>	<b>Other measures under evaluation</b>
<p><b>Industry</b> (includes refineries, oil and gas production, manufacturing, cement and glass plants, and other large industrial sources of GHG)</p> <p>The <b>natural gas sector, large industrial sources of GHG, and transportation fuels</b> would be covered under the proposed cap-and-trade program.</p>	<p><b>Energy efficiency and co-benefits audits for large industrial sources.</b></p>	<p>Cement: Blended cements. Cement: Energy efficiency of CA cement facilities. Fuels: Above ground storage tanks. Fuels: Gasoline dispenser hose replacement. Fuels: Portable outboard marine tanks. Oil and gas: Reduction of venting/leaks from oil and gas systems.</p>	<p>Cement: Carbon intensity standard for cement manufacturers. Carbon intensity standard for concrete batch plants. Waste reduction on concrete use. Refineries/Oil and Gas Production: Possible measures include capturing methane emissions during extraction, reducing methane leaks during transmission, improving the efficiency of refineries, and capturing methane at refineries. Boiler and engine efficiency: Measures to increase efficiency in other industries that use industrial boilers or on-site internal combustion power sources, and for off-road equipment like forklifts and bulldozers. Glass plants: using recycled materials or improving the energy efficiency of the glass manufacturing process.</p>
<p><b>Land Use and Local Government</b></p>	<p><b>Local government actions and regional GHG targets.</b> Areas for possible GHG reduction measures include community energy use, community waste and recycling practices, water use in municipal operations, increase of the use of low-carbon travel, and the siting and design of new residential and commercial developments.</p>		<p>Indirect source rules for new development. Public education and other programs to reduce vehicle travel.</p>

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Table A1 (continued)

**AB 32 Draft Scoping Plan recommendations, early actions, and other measures under consideration, by sector**

Sector	Scoping Plan recommended sector measures (including discrete early action measures)	Additional early action measures	Other measures under evaluation
Public Sector	<p>ARB asks the CA state government to reduce its emissions by a minimum of 30 percent by 2020.</p> <p><b>Possible measures include:</b></p> <ul style="list-style-type: none"> <li>• use the most advanced, cost-effective environmental performance requirements in the design, construction and operation of state facilities</li> <li>• prioritize low-carbon investments in its pension fund investments</li> <li>• allow state workers the ability to telecommute and use alternative work schedules, and site facilities to encourage jobs/housing balance</li> <li>• increase the number of fuel-efficient vehicles in the state fleet</li> <li>• expand renewable energy use and divest from coal power plants</li> </ul>		
Recycling & Waste	Landfill methane control (discrete early action).		
Transportation—see next page			
Water	<p>Water use efficiency.</p> <p>Water recycling.</p> <p>Water system energy efficiency.</p> <p>Reuse urban runoff.</p> <p>Increase renewable energy production</p> <p>Public goods charge for water.</p>		

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Table A1 (continued)

**AB 32 Draft Scoping Plan recommendations, early actions, and other measures under consideration, by sector**

Sector	Scoping Plan recommended sector measures (including discrete early action measures)	Additional early action measures	Other measures under evaluation
<p><b>Transportation</b></p>	<p><b>California light-duty vehicle GHG standards</b> (implement Pavley standards and develop Pavley II).  <b>Low Carbon Fuel Standard</b> (discrete early action measure).  <b>SmartWay Truck Efficiency</b> (discrete early action measure).  <b>Green Ports</b> (discrete early action measure).  <b>Reduction of High GWP Refrigerants from DIY MVAC Servicing</b> (discrete early action measure).  <b>Tire Inflation Program</b> (discrete early action measure).  <b>Other vehicle efficiency measures:</b>                      Low friction oil.                      Cool paints.  <b>Goods movement efficiency measures:</b>                      Port GHG targets.                      Vessel speed reduction.                      Other efficiency measures.  <b>Medium- and Heavy-Duty Vehicle Hybridization.</b>  <b>Heavy-Duty Engine Efficiency.</b>  <b>Regional Performance-Based VMT Targets and Local Government Action.</b>  <b>High-speed rail.</b></p>	<p>Diesel—off-road equipment (non-agricultural).                      Diesel—port trucks.                      Diesel—vessel main engine fuel specifications.                      Diesel—commercial harbor craft.                      Standards for off-cycle driving conditions.                      Diesel—privately owned on-road trucks.                      Anti-idling enforcement.                      Cool automobile paints.                      Ban of HFC release from MVAC service/dismantling.                      Diesel—off-road equipment (agricultural).                      Add AC leak tightness test and repair to Smog Check.                      Requirement of low-GWP GHGs for new MVACs.                      Hybridization of medium- and heavy-duty diesel vehicles.                      Strengthen light-duty vehicle standards.                      Truck stop electrification with incentives for truckers.                      Diesel—vessel speed reductions.                      Transportation refrigeration—electric standby.</p>	<p>Feebates.                      Congestion pricing.                      Pay-as-you-drive insurance.</p>

# California Labor Principles on Climate Change and Assembly Bill 32

(approved by the California Labor Federation Executive Committee in April 2008)

*Global Warming is an indisputable fact that will thoroughly change our economy, our labor markets, and many aspects of our daily lives. How labor responds will determine, in large part, whether these changes support our ability to organize new members and grow or whether our strength is undermined. Moreover, efforts currently underway to fight global warming, such as AB 32 which calls for a 25 percent reduction in greenhouse gas emissions by 2020, cannot succeed without an engaged Labor Movement.*

***Building Alliances and Regional Partnerships.*** Addressing global warming provides labor the opportunity to build new alliances and strengthen bonds with environmental, community, and business allies. Furthermore, in order to reach the target called for by AB 32 to mitigate global warming, we call upon employers to step up their efforts to reduce their own emissions and to partner with union representatives and community leaders in efforts to seriously address global warming.

***Sustainability.*** Climate stabilization can only be accomplished if economic and social life is structured around the notion of sustainable development and fair trade. For unions, sustainable development requires a commitment to decent working conditions, including a voice at work, the right to organize and to a safe work environment as well as access to prevailing and self-sufficient wages.

***Green Jobs Must be Union Jobs with a Future.*** The struggle against global warming is an opportunity to address unsustainable patterns of development, production, and consumption, and to create new and well paying “green” jobs throughout California in renewable energy, the construction trades, public transportation, sustainable farming, and much-needed manufacturing for California workers. It is not enough for a job to be with a clean tech or green employer for it to be truly green. Green jobs include any job that has been upgraded to address the environmental challenges facing the state or nation. A green job is one with good wages and benefits, an upward career pathway, and a voice on the job: in short, the protections only guaranteed by union membership.

***Just Transition.*** With the industrial transition that a green economy brings, workers in many traditional industries will experience major changes, including dislocation or other impacts. We support the concept of “just transition”—no worker should suffer economic hardship or insecurity as a result of the changes required to address climate crisis or other environmental challenges. Provisions shall be made for education, training, retraining, or as necessary, re-employment in comparably good jobs or bridges to retirement.

***Equity for Communities.*** People in the poorest communities of our state, who have shouldered much of the burden of our carbon-based economy in terms of poor air quality, health hazards, lower

wages, and longer commute times, must be among the first included in job-creation, programs, community development and pollution mitigation efforts.

***Worker Training and Coordination of Resources.*** Greening the economy will require a workforce with new skills. Policy-makers must support, enhance, and leverage union apprenticeship programs, labor-management training partnerships, career-technical education initiatives, community colleges, local workforce investment boards, and other education, training and worker supports to train new and incumbent workers and to build career pathways for the green economy.

***Global Warming is a Global Problem.*** Reducing greenhouse gas emissions will require action on many fronts. Industry, agriculture, transportation, electric generation and land use policies all must change. The regulatory system must ensure that these changes occur comprehensively and fairly. A carbon emissions fee should be levied on carbon emitted in the manufacture of any product sold, used, or imported for sale or use. Emission permits should be auctioned, and state government should administer the market with a majority of the proceeds used to benefit the public including substantial investment in workforce development. Domestic manufacturing and other industries must not be asked to compete against unfair foreign or out-of-state competitors that are able to circumvent California's regulatory scheme. Reducing our at-home global warming footprint when that reduction actually contributes to increased global GHG emissions in another part of the world is counterproductive.

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workforce and economic development  
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## UC Berkeley Center for Labor Research and Education

The Center for Labor Research and Education (Labor Center) is a public service project of the UC Berkeley Institute for Research on Labor and Employment that links academic resources with working people. Since 1964, the Labor Center has produced research, trainings and curricula that deepen understanding of employment conditions and develop diverse new generations of leaders.

## Workforce and Economic Development Program

Through its Workforce and Economic Development Program (WED), the California Labor Federation AFL-CIO is positioning labor as the catalyst in building strategic local and regional workforce investment alliances. No one union, organization, or public agency can alone address the economic challenges facing working families or the workforce needs of critical industries. WED serves as labor's resource in California for building effective workforce and economic development systems that create high wage jobs, economic opportunity, new partnerships, and stronger communities.