Attachment B

City of Oakland
Energy and Climate Action Plan

Appendix
Draft – December 1, 2010

This document contains supporting information related to the draft Energy and Climate Action Plan for Oakland, California.

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Updates and Additional Information: www.sustainableoakland.com

Developing the Oakland Energy and Climate Action Plan

Oakland has a long legacy of leadership on reducing energy use and greenhouse gas (GHG) emissions. Through the Oakland Energy and Climate Action Plan (ECAP), the City is developing a comprehensive, prioritized plan of action to enable Oakland to achieve aggressive and important GHG emissions reduction targets.

Development of the ECAP began in fall 2008 with the first of several public workshops held to gather community ideas on potential climate targets, actions, and the process to be used for developing the ECAP. Approximately 200 people attended these workshops, representing a variety of interests, including local nonprofit and advocacy organizations, government agencies, utilities, interest groups, private companies, and individual citizens.

The first two workshops (held in December 2008 and January 2009) provided an overview of the planned ECAP development process, gathered initial input on potential ways of reducing GHG emissions, and discussed issues to consider in the process of developing the ECAP. With assistance from ICLEI – Local Governments for Sustainability and CirclePoint, Inc., City of Oakland (City) staff used input gathered at the workshops to identify and evaluate potential greenhouse gas (GHG) emissions reduction targets, and strategies for hitting those targets.

The next two workshops (held in April 2009) were used to gather input on target setting and GHG reduction actions to evaluate for potential inclusion in the ECAP. Input from these workshops also helped to inform the ECAP development process and the evaluative criteria used in considering actions for inclusion in the ECAP. Information from all four of these workshops, along with other project information, has been posted to the City's website at www.sustainableoakland.com. Additional public input was also gathered through this website, and at other meetings.

On July 7, 2009, the Oakland City Council directed staff to develop the draft ECAP using a preliminary planning target equivalent to achieving a 36% reduction from 2005 GHG emissions by 2020, and annual benchmarks for meeting the target. The target-setting staff report and accompanying City Council resolution are available on the City's website.

From summer 2009 through spring 2010, the City continued to identify and analyze potential GHG reduction actions through which the City could position Oakland to achieve a 36% reduction in GHG emissions. Ideas for GHG reduction actions were gathered from public input, existing City policy documents, adopted climate action plans from other jurisdictions, and various other sources (e.g., Oil Independent Oakland Action Plan, The 21st Century Energy Greenprint for the East Bay). The evaluative criteria outlined in Table 1 were used to inspire ideas for GHG reduction opportunities and to evaluate potential actions to help guide future planning and budgeting discussions. These nine evaluative criteria capture the range of issues expressed by the community at the first four public workshops held between December 2008 and April 2009. Based on this analysis, Staff developed recommendations for a prioritized set of GHG reduction actions best suited to helping the City advance Oakland's GHG reduction efforts and achieve the identified target.

Following a special City Council workshop on energy and climate action issues, the first Draft Energy and Climate Action Plan was released on April 22nd, 2010 (Earth Day). Two more public workshops were held in

May 2010 to provide an overview of the draft ECAP and gather community input. Public comments were also accepted for several weeks via the City's website. Local organizations helped to spread the word about the draft ECAP and to generate public review and comment.

From summer 2010 through fall 2010, City staff proceeded to consider public input received about opportunities to improve the draft ECAP. A revised draft ECAP, accompanied by this appendix, was then developed for consideration of the Oakland City Council.

Table 1. Evaluative Criteria for Considering Potential Energy and Climate Actions

Evaluative Criteria	Issues to Consider
GHG Reduction Potential	• Magnitude of GHG reductions • Measurability of reductions
Implementation Cost and Access to Funding	• Cost to City budget • Cost to other stakeholders • Access to funding
Financial Rate of Return	• Return on investment to City and/or stakeholders implementing the action • Protection from future costs
GHG Reduction Cost Effectiveness	• Relative cost/benefit assessment in terms of estimated GHG reductions
Economic Development Potential	• Job creation potential • Business development and retention potential • Workforce development potential • Cost savings to community • Education benefits for community
Creation of Significant Social Equity Benefits	• Benefits to disadvantaged residents in the form of jobs, cost savings, and other opportunities • Reduction of pollution in heavily impacted neighborhoods • Equity in protection from impacts of climate change
Feasibility & Speed of Implementation	• Degree of City control to implement the action • Level of staff effort required • Resources required • Degree of stakeholder support • Amount of time needed to complete implementation • Time period during which implementation can begin
Leveraging Partnerships	• Leverage partnerships with community stakeholders • Leverage partnerships on a regional, state or national level • Facilitate replication in other communities
Longevity of Benefits	• Persistence of benefits over time • Opportunity to support future additional benefits

Community input was critical to the development of the ECAP. This input was received directly from hundreds of community members and dozens of local organizations engaged with thousands of additional community members. The Oakland community helped to shape the process, GHG reduction targets, tone and structure of the ECAP, and many of the proposed GHG reduction actions.

Development of the Energy and Climate Action Plan was made possible by funds allocated by the Oakland City Council from the Williams Energy Settlement; an energy and climate planning grant from the Bay Area Air Quality Management District; and many hours of City staff time leveraged throughout the development process.

Oakland's 2005 Energy Use and Greenhouse Gas Emissions

Challenges Associated with Quantifying Oakland's GHG Emissions

Many local governments throughout the country have developed GHG emission inventories for the purpose of understanding GHG emissions associated with their operations and the communities they represent, revealing emissions reduction opportunities and tracking performance toward emissions reduction goals. However, no official protocol has been developed and imposed on local governments to guide quantification of GHG emissions associated with geographically defined communities.

While widespread agreement exists that emissions associated with building energy use and transportation fuel should be counted, methodologies for how this accounting is done vary widely from one community to another. Furthermore, methodologies differ even more widely regarding GHG accounting associated with solid waste decomposition and recycling, regional ports located within or outside the community (e.g., airports, seaports), non-road vehicle traffic (e.g., airplanes, trains, ships), pass-through highway vehicle travel, upstream and downstream lifecycle emissions associated with activity occurring in the community, and other sources. Data for many of these sources can be difficult to obtain and more difficult to correlate to a particular geographic community, yet all can be significant sources of GHG emissions. Debate also exists as to whether community-scale GHG accounting should seek to include all GHG sources within each community or focus instead on areas of most policy relevance to the local government performing the assessment, establishing reduction targets and developing plans.

It is reasonable to assume that GHG inventory methodologies will continue to evolve in the coming years, driven by changes in data availability, scientific understanding, and the application of GHG inventories. For example, ICLEI – Local Governments for Sustainability is currently developing a voluntary protocol to guide local governments in estimating GHG emissions associated with their geographically defined communities. This project began in fall 2010 and is slated for completion in summer 2011.

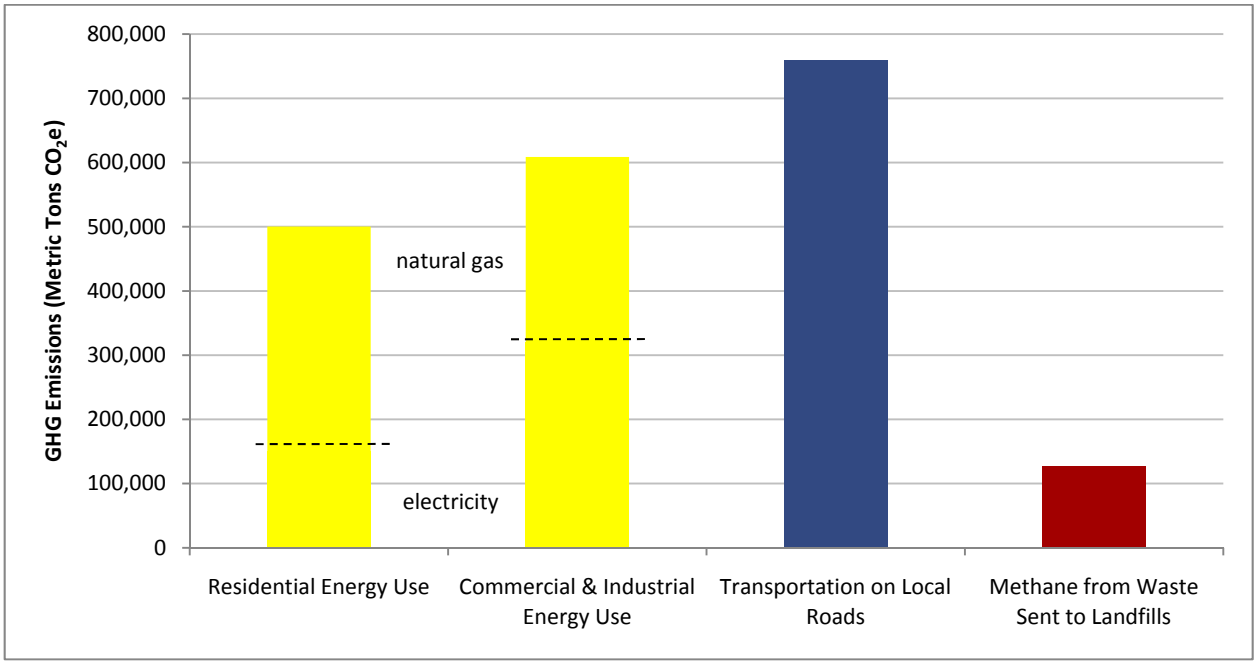
As GHG inventory methodologies evolve, Oakland's baseline 2005 and other inventories may be adjusted to comply with improved methodologies. It will be important to maintain an ability to compare GHG emissions over time in a meaningful and appropriate method to allow for informative tracking of progress in reducing GHG emissions. For this reason, GHG reduction targets are defined in terms of percentages of a baseline, rather than absolute tons of GHG emissions, to best maintain relevance.

Oakland's 2005 GHG Emissions

City Action Focus Areas

To date, the City has focused its GHG reporting on emission sources that the City has a relatively high degree of influence over and the ability to measure over time. These sources (transportation on local roads; electricity and natural gas consumption in residential, commercial and industrial buildings; and landfilled solid waste) are the primary focus of the draft ECAP. The draft ECAP is designed to highlight energy and GHG reduction actions that enable Oakland to achieve its GHG reduction targets for these sources. Figure 1 provides a summary of 2005 GHG emissions associated with these focus area sources. Additional detail on these sources is provided in Tables 2 – 5 below.

Figure 1. Oakland's 2005 GHG Emissions from Focus Area Sources



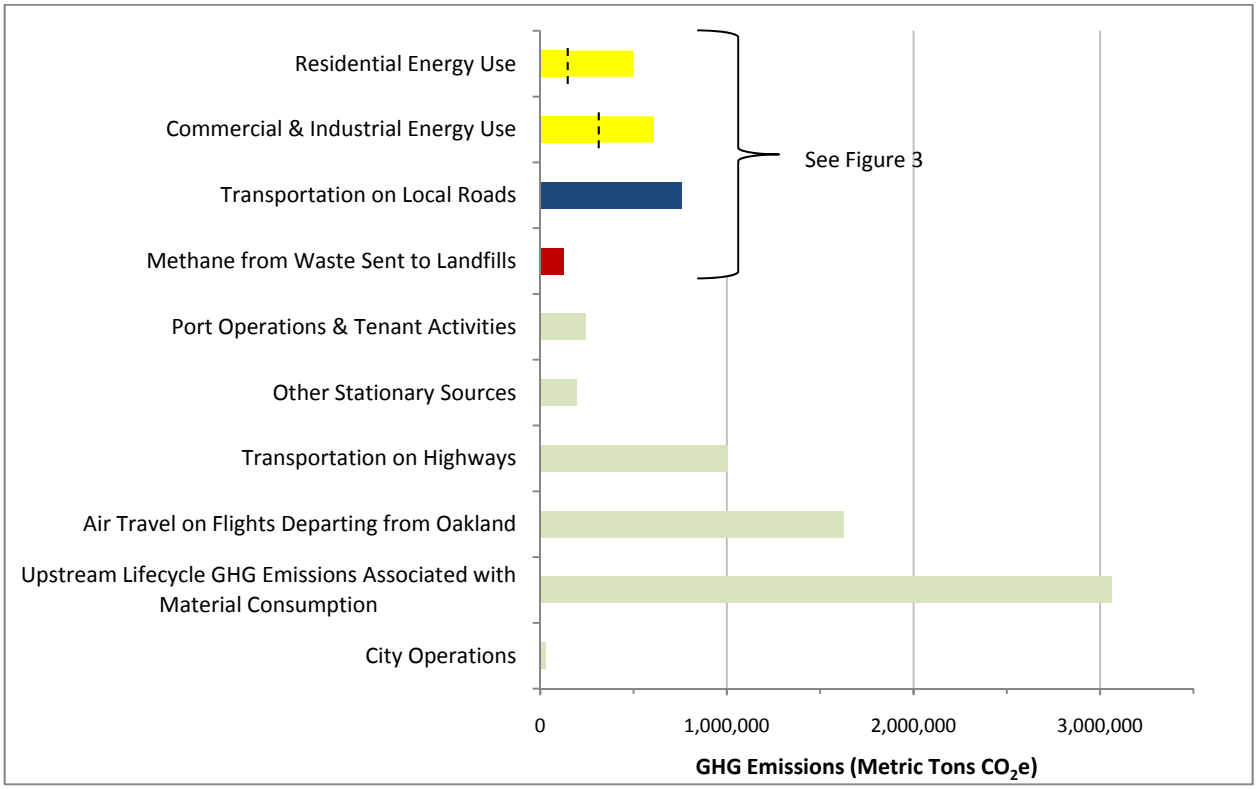
Recognizing All Relevant GHG Emission Sources

Beyond the ECAP focus areas, there are a number of significant GHG emission sources that, while City influence might be relatively limited, can be reduced through local and regional community action (e.g., passenger air travel associated with the Oakland International Airport, pass-through travel on local highways, lifecycle impacts of material consumption choices of residents and businesses).

This more comprehensive set of GHG emission sources associated with Oakland is identified in Tables 2 – 5 and summarized in Figure 2 below. Estimates of GHG emissions associated with each source are included where possible. The draft ECAP includes actions aimed at reducing GHG emissions outside of the City's primary focus areas identified above. The City will continue to report on all of these GHG emission sources, to the extent feasible, in future progress reports and updates to the ECAP.

Information provided in Tables 2 – 5 is intended to summarize all relevant sources to the extent possible and to enable the City and other interested community stakeholders to report on and consider GHG emissions associated with Oakland in a variety of manners. For example, local organizations may wish to help educate community members about the importance of reducing lifecycle GHG emissions by changing material consumption choices. Data from the tables below enable comparison of emission sources associated with Oakland, and can be used to highlight the magnitude of impacts associated with material consumption, as well as other activities such as air travel.

Figure 2. 2005 GHG Emissions Associated with Oakland from Select Quantified Sources



Appropriate Reporting of Citywide GHG Emissions

When summarizing GHG emissions associated with Oakland in 2005 or for any other unit of time, a summary of the reporting method used should always be provided. This summary should include transparency regarding which GHG emission sources are included in the analysis, along with available detail on assumptions and data inputs used. This information will help to ensure that reported GHG emissions are analyzed appropriately and interpreted in the manner intended.

Note that overlap may exist amongst some of the data contained in Tables 2 – 5 below. For example, it would be inappropriate to add GHG emissions associated with "transportation on local roads" to GHG emissions associated with "trips of origin and/or destination in Oakland", as significant overlap exists between these two data sets. Both are presented below as each may offer unique value to GHG reporting efforts. Care should be taken whenever reporting on GHG emissions to avoid under-reporting, over-reporting, or double-counting of Oakland's emissions.

Data Tables for GHG Emission Sources Associated with Oakland

GHG emissions associated with Oakland in 2005 are summarized in Tables 2 – 5 below. The following information is provided for each GHG emissions source:

- **GHG Emissions Source** – Brief description of the GHG emissions source
- **Notes** – Additional description or context regarding each GHG emissions source
- **2005 Estimated GHG Emissions (metric tons CO_2e)** – Quantity of GHG emissions associated with this source in 2005 expressed in metric tons of carbon dioxide equivalence (CO_2e)
- **2005 Data Primary Input Factors** – Primary input factors used to estimate GHG emissions, if available
- **2020 GHG Reduction Goal** – Emissions reduction target to be achieved relative to 2005 by 2020
- **Within Geographic Boundary?** – Do the emissions associated with this source occur primarily within the geographic boundary of Oakland? (yes/no)
- **Relative Degree of City Influence** – What is the City government's degree of influence over this emissions source relative to other sources documented in these tables? (high/medium/low)
- **Measurable?** – Are emissions or primary inputs associated with this source: currently measured; modeled based on assumptions; or not available?
- **ECAP Focus Area?** – For the purposes of identifying GHG sources of relatively high City influence, is it the intent of the ECAP to focus attention on this source and include a full set of actions needed to achieve the GHG reduction goal for this source? (yes/no) These sources may also be identified as pertinent to the City's development of a Qualified Greenhouse Gas Reduction Strategy to be used for tiering environmental analysis of future projects under the California Environmental Quality Act.
- **Data Provider(s)** – What agency provides data needed to estimate GHG emissions associated with this source and monitor progress toward emission reduction goals?

Table 2a. Oakland GHG Emissions by Source – Transportation Related Emissions

GHG Emissions Source	Vehicle Miles Traveled Within Geographic Boundary Method				Trip-Based Method	Bay Area Rapid Transit (BART) Operations
	Transportation on Local Roads	Transportation on Highways			VMT Associated with Trips of Origin and/or Destination in Oakland	
		Total Transportation on Highways	Pass-Through Transportation on Highways	Oakland Trips Transportation on Highways		
Notes	Includes all miles driven on local roads within city boundaries, regardless of trip origin or destination	Includes all miles driven on highways within city boundaries, regardless of trip origin or destination	Subset of total highway transportation miles associated with trips for which neither trip origin nor destination occur in the city	Subset of total highway transportation miles associated with trips for which trip origin and/or destination occur in the city	Provides more insight into effects of local planning and policy decisions, but data not yet available at city-scale. Methodology: count full VMT from intra-city trips, half VMT from trips with either origin or destination in Oakland, no VMT from pass-through trips.	GHG emissions from BART assumed to be zero due to BART direct access contract for carbon neutral electricity
2005 Estimated GHG Emissions (metric tons CO_2e)	759,884	1,006,911	Not Available	Not Available	Not Available	0
2005 Data Primary Input Factors	1.4 billion VMT	1.8 billion VMT	Not Available	Not Available	Not Available	Not Available
Within Geographic Boundary?	Yes	Yes	Yes	Yes	Partially	No
Relative Degree of City Influence	high	medium	low	medium	high	Low
Measurable?	Measured and Modeled	Measured and Modeled	Not Available	Not Available	Not Available	Measured
ECAP Focus Area?	Yes	No	No	No	No	No
Data Provider(s)	MTC	CalTrans	Not Available	Not Available	MTC considering potential of establishing models to generate estimates of trips associated with individual communities	BART

Notes:

- On-road movement of passenger vehicles, freight, transit, and other vehicles is included in the estimates provided in Table 2a. This data is not available by vehicle type/use.
- GHG emissions associated with BART are not included because a) consumption data is not currently available, and b) it is believed that BART was operating on a direct access contract supplying carbon neutral electricity in 2005.

Table 2b. Oakland GHG Emissions by Source – Port and Other Transportation Related Emissions

Emissions Source	**Port Operations & Tenant Activities**	**Air Travel Originating at Oakland International Airport**	**Air Travel Serving Oakland Residents**	**Marine Vessel Travel Associated with Port of Oakland**	**Truck Freight Travel Associated with Port of Oakland**	**Train Travel Associated With Oakland**	**Other Off-Road Vehicle Activity**
Notes	Includes emissions associated with Port-owned vehicles and equipment, harbor craft, cargo handling equipment, berthed vessels, and trucks and trains operating within Port property. Does not include movement of vehicles outside of Oakland.	Includes all fuel consumed by planes on flights departing from Oakland International Airport. Data from 2007.	Includes only Oakland resident portion of trips to/from Oakland International Airport, plus portion of impacts from connecting flights elsewhere	Movement of marine vessels outside of port	Movement of freight trucks outside of port and outside of Oakland	Movement of trains outside of port	Other off-road vehicle activity
2005 Estimated GHG Emissions (metric tons CO_2e)	235,000	1,627,688	Not Available	Not Available	Not Available	Not Available	Not Available
2005 Data Primary Input Factors	Estimated by City based on data in Port of Oakland Maritime Air Quality Improvement Plan and 2007 Criteria Pollutant and Greenhouse Gas Emissions Inventories, as well as studies from other ports	169,698,222 gallons of jet fuel 469,058 gallons of AvGas*	Not Available	Not Available	Not Available	Not Available	Not Available
Within Geographic Boundary?	Yes	No	No	No	No	No	Yes
Relative Degree of City Influence	Low	Low	Low	Low	Low	Low	Low
Measurable?	Measured and Modeled	Measured	Not Available	Not Available	Not Available	Not Available	Not Available
ECAP Focus Area?	No	No	No	No	No	No	No
Data Provider(s)	Port of Oakland; studies from other ports	Port of Oakland	Not Available	Not Available	Not Available	Not Available	Not Available

* This figure was updated on November 30, 2010 to correct a typographical error contained in the version of this document that was posted on the City website on November 24, 2010 and provided to the City Planning Commission for its December 1, 2010 meeting

Table 3. Oakland GHG Emissions by Source – Building Energy Use Related Emissions

GHG Emissions Source	**Natural Gas Residential**	**Natural Gas Commercial /Industrial**	**Electricity Residential**	**Electricity Commercial /Industrial**	**Stationary Sources**	**Water Related Energy Use Serving Oakland Customers**	**Port of Oakland Building Energy Use and Stationary Sources**
Notes	Natural gas consumed by accounts in Oakland	Natural gas consumed by accounts in Oakland	Electricity consumed by accounts in Oakland	Electricity consumed by accounts in Oakland	Stationary sources permitted by the Bay Area Air Quality Management District such as stationary diesel motors	Includes energy use associated with delivery and treatment of water by EBMUD serving Oakland accounts. Total EBMUD facility energy use occurring in Oakland already included in Commercial/ Industrial data	Includes emissions associated with building energy consumption, and other stationary sources. Does not include movement of vehicles outside of Oakland.
2005 Estimated GHG Emissions (metric tons CO_2e)	350,162	288,514	150,077	320,151	195,238	Not Available	31,662
2005 Data Primary Input Factors	65 million therms	54 million therms	671 million kWh	1.4 billion kWh	Not Available	Not Available	Not Available
Within Geographic Boundary?	Yes	Yes	No	No	Yes	Partially	Yes
Relative Degree of City Influence	High	High	High	High	Low	Low	Low
Measurable?	Locally measured	Locally measured	Locally measured	Locally measured	Locally measured	Locally measured	Measured and Modeled
ECAP Focus Area?	Yes	Yes	Yes	Yes	No	No	No
Data Provider(s)	PG&E	PG&E	PG&E	PG&E	BAAQMD	EBMUD	Port of Oakland; BAAQMD; estimates based on studies at other ports

Notes:

- GHG emissions associated with direct access electricity consumption have not been included as data is not currently available. Depending on the fuel source consumed, direct access electricity consumption can result in significantly more GHG emissions than the current PG&E average grid electricity. Data on the number and size of direct access accounts in Oakland is not currently available to the City.
- Electricity consumed by facilities located in Oakland to deliver and treat water and wastewater is assumed to be included in macro-level Commercial/Industrial Electricity estimates. These facilities serve customers both in and outside of Oakland.
- Other decentralized GHG emission sources, including decentralized fuel use in applications not permitted through the Bay Area Air Quality Management District and fugitive emissions associated with refrigerants and solvents are not included due to lack of data availability.

Table 4. Oakland GHG Emissions by Source – Material Consumption and Waste Related Emissions

GHG Emissions Source	**Landfilled Solid Waste**	**Upstream Lifecycle Impact of Material and Food Consumption**	**CO_2e Emissions Derived from Biogenic Methane Liberated During Wastewater Treatment Located in Oakland**	**Methane from Wastewater Treatment Serving Oakland Customers**
Notes	Estimated using EPA WARM model	Estimated using Carnegie Mellon University EIO-LCA model, national Consumer Expenditure Survey data, and Oakland household income data available through U.S. Census	Estimate of CO2 generated at EBMUD wastewater treatment facility after liberated biogenic methane is either used to produce electricity or flared	Includes only the portion of wastewater treatment methane associated with Oakland customers
2005 Estimated GHG Emissions (metric tons CO_2e)	126,361	3,065,110	757620	Not Available
2005 Data Primary Input Factors	416,827 tons of waste*	# of households by income bracket; national average household expenditures by material category; upstream GHG impacts by material category	Not Available	Not Available
Within Geographic Boundary?	No	No	Yes	Yes
Relative Degree of City Influence	high	Low	Low	Low
Measurable?	Locally measured	Modeled	Unknown	Unknown
ECAP Focus Area?	Yes	No	No	No
Data Provider(s)	CalRecycle	Carnegie Mellon University, national Consumer Expenditure Survey, U.S. Census	EBMUD	EBMUD

Notes:

- Oakland sent 416,827 tons of waste to landfill in 2005, plus 201,625 tons of alternative daily cover (ADC). Source: Oakland 2005 GHG Inventory developed by ICLEI – Local Governments for Sustainability; Updated Nov 2008
- GHG impacts associated with agricultural products (e.g., fertilizers) consumed in Oakland are not included due to lack of data availability.

Table 5. Oakland GHG Emissions by Source – City Government Operations Related Emissions

Emissions Source	**Vehicle Fleet Fuel Consumption**	**Employee Commute Travel**	**Employee Business Travel**	**Facilities and Operations Natural Gas Consumption**	**Facilities and Operations Electricity Consumption**	**Facilities and Operations Water Consumption**	**Landfilled Solid Waste**
Notes	City fleet fuel consumption		Includes employees driving their own vehicles. Would also include other forms of business travel (e.g., air travel) if available	City facilities energy consumption	City facilities energy consumption	Impacts of City operations water consumption	Solid waste collected from City facilities and sent to landfill
2005 Estimated GHG Emissions (metric tons CO_2e)	10,585	Not Available	78	3,786	12,099	Not Available	3,374
2005 Data Primary Input Factors	751,537 gallons gasoline; 280,539 gallons diesel; 95,317 therms of natural gas	Not Available	~8,031 gallons gasoline from reimbursed mileage; Additional business travel data not available	706,367 therms	52,211,408 kWh	Not Available	12,727 tons
Within Geographic Boundary?	Yes	Partially	Partially	Yes	Yes	Yes	No
Relative Degree of City Influence	High	High	High	High	High	High	High
Measurable?	Measured	Not Available	Not Available	Measured	Measured	Measured	
ECAP Focus Area?	Yes	No	No	Yes	Yes	No	Yes
Data Provider(s)	BART	City employees	City	PG&E	PG&E	EBMUD	Not Available

Oakland's GHG Reduction Target

Overview of Oakland's GHG Reduction Target

In July 2009, the Oakland City Council approved a preliminary planning GHG emissions reduction target for the year 2020 at 36% below 2005 levels, on a path toward reducing GHG emissions by more than 80% below 2005 levels by 2050.

This planning target was developed based on recent publications of the Intergovernmental Panel on Climate Change (IPCC), widely recognized as the world's leading body of climate scientists. According to a recent IPCC report[i], achieving this level of GHG reductions throughout the industrial world will help to achieve a level of climate stabilization that would avoid the worst future climate impact scenarios.[ii]

Oakland has an opportunity to demonstrate leadership by striving to achieve this level of GHG emissions reductions, reinforcing our commitment to local climate action.

Identifying an Oakland Preliminary Planning Target for GHG Reduction

A clear scientific near-consensus has emerged regarding the dangers of escalating concentrations of greenhouse gases in the Earth's atmosphere and the significant role that anthropogenic (human caused) sources of GHG emissions are playing in increasing those concentrations. Tremendous collective action will be necessary in the near term on a global scale to reduce GHG emissions to levels that avoid the worst impacts.

Projected local impacts of climate change include rising Bay and delta waters, decreased potable water supply, increased fire danger, added stress on infrastructure, pricing and quality of life impacts, ecological impacts, and other impacts. The State Climate Action Team has predicted that sea levels may rise between 12 and 36 inches by the end of this century.[iii] According to the Bay Conservation and Development Commission, low-elevation portions of Oakland, including the airport, could be vulnerable to a 16-inch rise in sea level.[iv]

Current Scientific Perspective on Needed GHG Reduction Goals

Significant reductions in global anthropocentric GHG emissions are projected to be necessary to reverse present trends and restore a stabilized atmospheric GHG concentration level similar to that of recent history. According to climate scientist James Hansen, "If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted, paleoclimate evidence and ongoing climate change suggest that CO_2 will need to be reduced from its current 385 ppm to at most 350 ppm, but likely less than that."[v] Achieving an atmospheric GHG concentration of 350 ppm CO_2 would roughly correlate to a concentration of approximately 450 ppm in total CO_2-equivalent (CO_2e) terms, a metric often used to express the total equivalent warming potential of CO_2 and other relatively minor but also significant greenhouse gases in the atmosphere.[vi]

According to the latest report of the Intergovernmental Panel on Climate Change (IPCC), a body of the world's most authoritative climate scientists, achieving even an atmospheric GHG concentration of 450 ppm CO_2e will yield some negative climate impacts, including some deglaciation, species extinction, and changes in frequency and severity of flooding, droughts, fires and other impacts. However, this target is frequently framed in the

literature near the best-case scenario end of the future range of projections, requiring highly aggressive GHG reductions.[vii]

The IPCC's Fourth Assessment Report (FAR) suggests that industrialized countries would need to reduce GHG emissions to levels 25-40% below 1990 levels by 2020 and 80-95% below 1990 levels by 2050 to achieve a stabilized atmospheric GHG concentration of 450 ppm CO_2-equivalent (CO_2e).

Applying Current Global Climate Science in the Context of Oakland

Data are unavailable regarding Oakland's 1990 GHG emissions, but a 2005 GHG inventory was developed for Oakland. Using Oakland's existing 2005 GHG emissions inventory as a baseline will allow progress to be measured and demonstrated going forward.

Based on information provided by the California Air Resources Board, achieving a statewide GHG reduction of 25% below 1990 levels would correlate to a statewide reduction target of approximately 36% below 2005 GHG levels. Achieving statewide reductions of 80% below 1990 levels would be roughly equivalent to an 83% reduction relative to 2005 levels.

Faced with a lack of data for 1990, Staff are assuming similar GHG emissions growth has occurred in Oakland to the State average during the time period from 1990 to 2005. Thus for Oakland to meet the IPCC-suggested GHG reduction targets for industrialized countries, Oakland's GHG emissions would need to be reduced by at least 36% below 2005 levels by 2020, and 83% below 2005 levels by 2050.

State Perspective on Role of Local Governments in Reducing GHG Emissions

Below is an excerpt from the California Air Resources Board (CARB) adopted Climate Change Scoping Plan describing CARB's perspective on the role of local governments in reducing GHG emissions in California.[viii]

> The Role of Local Government: Essential Partners
>
> Local governments are essential partners in achieving California's goals to reduce greenhouse gas emissions. They have broad influence and, in some cases, exclusive authority over activities that contribute to significant direct and indirect greenhouse gas emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Many of the proposed measures to reduce greenhouse gas emissions rely on local government actions.
>
> Over 120 California cities have already signed on to the U.S. Conference of Mayors Climate Protection Agreement. In addition, over 30 California cities and counties have committed to developing and implementing Climate Action Plans. Many local governments and related organizations have already begun educating Californians on the benefits of energy efficiency measures, public transportation, solar homes, and recycling. These communities have not only demonstrated courageous leadership in taking initiative to reduce greenhouse gas emissions, they are also reaping important co-benefits, including local economic benefits, more sustainable communities, and improved quality of life.
>
> Land use planning and urban growth decisions are also areas where successful implementation of the Scoping Plan relies on local government. Local governments have primary authority to plan, zone, approve, and permit how and where land is developed to accommodate population growth and the changing needs of their jurisdictions. Decisions on how land is used will have large impacts on the greenhouse gas emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas sectors.

To provide local governments guidance on how to inventory and report greenhouse gas emissions from government buildings, facilities, vehicles, wastewater and potable water treatment facilities, landfill and composting facilities, and other government operations, ARB recently adopted the Local Government Operations Protocol. ARB encourages local governments to use this protocol to track their progress in achieving reductions from municipal operations. ARB is also developing an additional protocol for community emissions. This protocol will go beyond just municipal operations and include emissions from the community as a whole, including residential and commercial activity. These local protocols will play a key role in ensuring that strategies that are developed and implemented at the local level, like urban forestry and greening projects, water and energy efficiency projects, and others, can be appropriately quantified and credited toward California's efforts to reduce greenhouse gas emissions.

In addition to tracking emissions using these protocols, ARB encourages local governments to adopt a reduction goal for municipal operations emissions and move toward establishing similar goals for community emissions that parallel the State commitment to reduce greenhouse gas emissions by approximately 15 percent from current levels by 2020. To consolidate climate action resources and aid local governments in their emission reduction efforts, the ARB is developing various tools and guidance for use by local governments, including the next generation of best practices, case studies, a calculator to help calculate local greenhouse gas emissions, and other decision support tools.

The recent passage of SB 375 (Steinberg, Chapter 728, Statutes of 2008) creates a process whereby local governments and other stakeholders work together within their region to achieve reduction of greenhouse gas emissions through integrated development patterns, improved transportation planning, and other transportation measures and policies. The implementation of regional transportation-related greenhouse gas emissions targets and SB 375 are discussed in more detail in Section C.

Considering GHG Reduction Targets in the Context of Recent State Policy Action

Recent climate policies adopted at the State level in California (e.g., AB 32, SB 375) aim to reduce statewide GHG emissions to 1990 levels by 2020.[ix] This correlates to a reduction of approximately 15% below current levels by 2020. Executive Order S-3-05 issued by Governor Schwarzenegger calls for statewide GHG reductions of 80% below 1990 levels by 2050.[x]

As recently documented in the Climate Change Proposed Scoping Plan adopted by the California Air Resources Board (CARB) in December 2008, a variety of State-driven strategies are being developed and implemented to help achieve these statewide goals. Additional and complementary local actions will be needed to help reach these goals and make additional progress. Table 8 summarizes these State-driven strategies outlined in the CARB Scoping Plan.

Table 8. Recommended Greenhouse Gas Reduction Measures from CARB Climate Change Scoping Plan[xi]

Recommended Reduction Measures
California Light-Duty Vehicle Greenhouse Gas Standards • Implement Pavley standards • Develop Pavley II light-duty vehicle standards
Energy Efficiency • Building/appliance efficiency, new programs, etc. • Increase CHP generation by 30,000 GWh • Solar Water Heating (AB 1470 goal)
Renewables Portfolio Standard (33% by 2020)
Low Carbon Fuel Standard
Regional Transportation-Related GHG Targets
Vehicle Efficiency Measures
Goods Movement • Ship Electrification at Ports • System-Wide Efficiency Improvements
Million Solar Roofs
Medium/Heavy Duty Vehicles • Heavy-Duty Vehicle Greenhouse Gas Emission Reduction (Aerodynamic Efficiency) • Medium- and Heavy-Duty Vehicle Hybridization
High Speed Rail
Industrial Measures (for sources covered under cap-and-trade program) • Refinery Measures • Energy Efficiency & Co-Benefits Audits
Additional Reductions Necessary to Achieve the Cap
High Global Warming Potential Gas Measures
Sustainable Forests
Industrial Measures (for sources not covered under cap and trade program) • Oil and Gas Extraction and Transmission
Recycling and Waste (landfill methane capture)
Other Recommended Measures
State Government Operations
Local Government Operations
Green Buildings
Recycling and Waste (other measures)
Water Sector Measures
Methane Capture at Large Dairies

While some of these strategies may not affect Oakland significantly, most will have some impact in Oakland and should be considered when developing local GHG reduction targets and plans for meeting those targets.

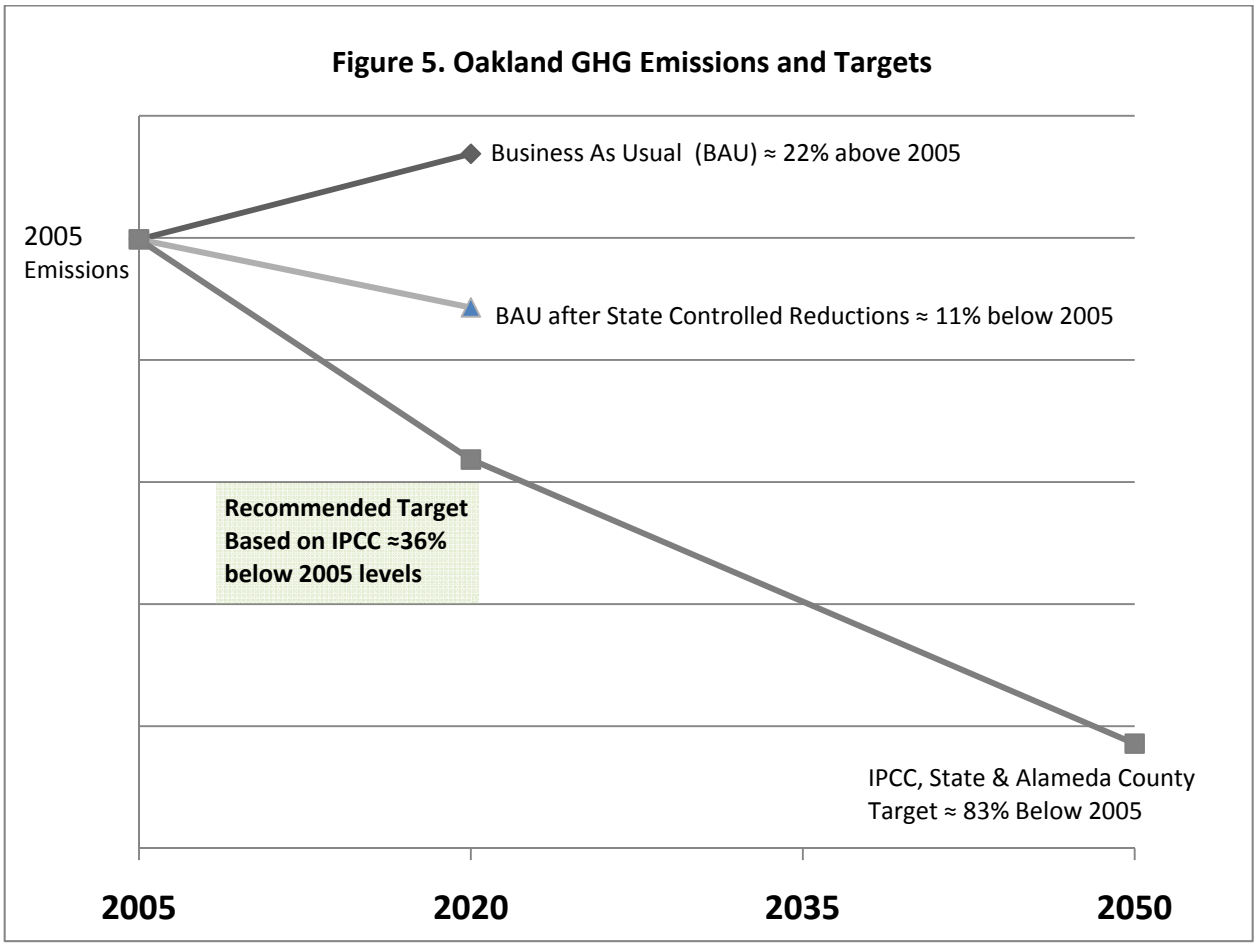
Some of these State-driven strategies will affect future GHG emissions in Oakland irrespective of additional local action. For example, strategies such as requiring the sale of low carbon fuels and more fuel efficient vehicles on a statewide basis may create GHG reductions in Oakland without relying on local government implementation. Projections of future GHG emissions in Oakland are based on the assumed implementation of these State-driven strategies.

Other State-driven strategies identify goals for creating GHG reductions that can be translated to Oakland, but which will only be met if supported by new local action. For example, achieving statewide and regional goals related to reducing the number of vehicle miles traveled on local roads will require planning, policy and programmatic action at the local government level. To avoid any double-counting of GHG reductions,

achievement of these goals is not assumed in business-as-usual projections of future GHG emissions in Oakland, as potential actions under consideration in the development of the ECAP will be needed to achieve these goals.

For the purpose of quantifying GHG reductions associated with a preliminary planning target, Oakland's business-as-usual 2020 GHG projections have been adjusted based on these factors. These projections are also based on projected increases in population and economic activity provided by the Association of Bay Area Governments and vehicle miles traveled provided by the California Energy Commission.

Figure 5. Oakland GHG Emissions and Targets



Under business-as-usual conditions without implementation of the strategies outlined in the CARB Climate Change Scoping Plan, GHG emissions in Oakland were projected to increase by approximately 22% above 2005 levels by 2020. Assuming implementation of State-driven strategies as described above, Oakland's GHG emissions in 2020 are projected to be approximately 11% below 2005 levels in the absence of additional local action.

Review of GHG Reduction Targets Established by Other Jurisdictions

Other jurisdictions within and outside of California have adopted a wide range of community-scale GHG reduction targets. These targets reference a variety of baseline years and target years, influenced by the date

at which each target was adopted, local data availability, and other factors. These variables make direct comparison of adopted GHG reduction targets difficult. Below is a summary of selected GHG reduction targets adopted by other institutions.

Table 9. Example GHG Reduction Targets Established by Other Jurisdictions

Jurisdiction	Community-Scale GHG Reduction Target
State	
California Assembly Bill 32	1990 levels by 2020[xii]
Executive Order S-3-05	80% below 1990 levels by 2050[xiii]
California Air Resources Board	Encourages local governments to adopt GHG reduction targets of 15% below current levels by 2020[xiv]
California Cities	
Berkeley	80% below 2000 levels by 2050, on a path to reduce GHG emissions by ~25% from 2005 levels by 2020
Chula Vista	20% below 1990 levels by 2010
Hayward	12% below 2005 levels by 2020, 83% below 2005 level by 2050
Los Angeles	35% below 1990 levels by 2030
Palo Alto	5% below 2005 levels by 2012 and 15% below 2005 levels by 2020
San Diego	15% below 1990 levels by 2010
Bay-Area Counties	
Alameda County	80% below ~2007 levels by 2050
Marin County	15% below 2000 levels by 2020
San Francisco	20% below 1990 levels by 2012
Sonoma County & Cities	25% below 1990 levels by 2015 (all nine cities in Sonoma County have adopted targets at least as aggressive)
National, International	
Denmark	21% below 1990 levels by 2012
European Union	20% below 1990 levels by 2020
Germany	21% below 1990 levels by 2012
Luxembourg	28% below 1990 levels by 2010
Sweden	25% below 1990 levels by 2020
United Kingdom	20% below 1990 levels by 2010
Kyoto Protocol (and U.S. Mayors' Climate Protection Agreement)	7% below 1990 levels by 2012

Applying Oakland's GHG Reduction Target

Identification of Sub-Targets

There are many ways to report and evaluate community-scale GHG emissions data. In the absence of a standard protocol for community-scale GHG emissions accounting and reporting, it is currently up to each community to identify its preferred method.

It is recommended that each community apply its GHG reduction target to each category of GHG emission sources separately (e.g., transportation on local roads, building energy use). This method will help to avoid potential problems associated with double-counting of GHG reductions by multiple communities and increase the likelihood that collective action is producing the expected results.

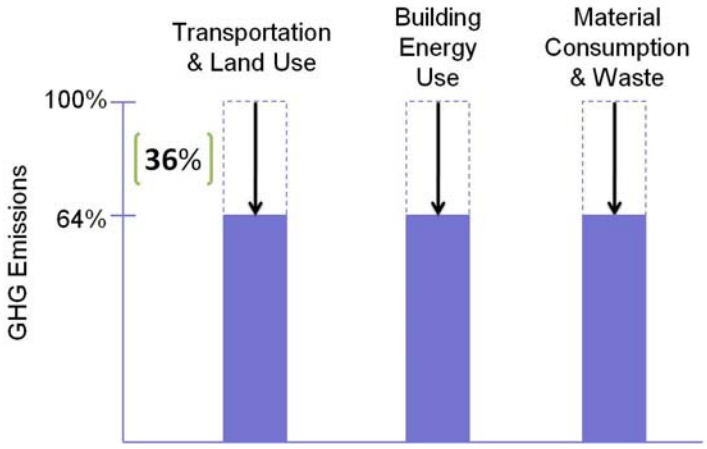


Figure 6. Applying the 36% GHG Reduction Goal in Each Emissions Source Category

Staff recommends that Oakland's target of reducing GHG emissions by 36% from 2005 levels by 2020 be separately applied to each GHG emission source category. GHG emissions reduction progress will be reported with respect to each emissions source category and sub-category (as illustrated in Tables 2 – 5) as data and resources allow. Progress will be analyzed on both an absolute basis and per capita basis to enable future reflection on GHG reduction process, irrespective of population migration patterns.

Consideration of Regional Context

As regional and statewide action on climate protection grows, Oakland may be asked to adjust future growth plans to accommodate more or less residential, commercial, or industrial development than is currently planned. In some cases, increasing development in Oakland near comparatively transit-rich infrastructure may help the region to achieve bigger overall success toward energy and climate goals. Future updates to the ECAP will require reflection on regional plans and consideration of refinements to Oakland's targets, planned actions and reporting metrics to ensure that Oakland is able to meet its own goals, contribute effectively to regional GHG reduction progress and track its contribution toward mitigating this global problem.

Considering Actions Reducing GHG Emissions Outside of Oakland

Some policies and actions that could be undertaken by the Oakland City government might result in significant GHG reductions in other geographic communities, or in the future, in ways that are difficult to represent in a traditional inventory of Oakland citywide GHG emissions. For example:

- Fostering population movement to dense, transit-served urban centers like Oakland may lead to big overall statewide reductions in vehicle miles traveled and associated GHG emissions (while possibly increasing vehicle use and GHG emissions within Oakland).
- Fostering decreased consumption of material resources can help to conserve fossil fuel energy used for production and transportation of goods outside of Oakland.

- Fostering decreased generation of waste sent to landfill may lead to reductions in landfill methane in another geographic location where Oakland's waste is sent.

In many cases these 'lifecycle' benefits occur elsewhere in time and/or space and can be difficult to quantify accurately. In situations where the GHG reduction benefits from these kinds of actions can be estimated at a sufficient level of accuracy, they will be reported as part of the story of Oakland's progress in fostering GHG emissions reductions.

Revisiting Climate Targets and Plans

It is reasonable to assume that climate science will continue to evolve in the coming years and revisions to the target and actions recommended in this report may be appropriate. The draft ECAP outlines a process by which the City will periodically revisit GHG reduction targets to consider ongoing scientific, policy and technological developments, as well as progress toward the goal.

Achieving Oakland's 36% GHG Reduction Target

Oakland's Citywide Target: 36% Reduction in All GHG Emission Source Areas

Achieving Oakland's 36% GHG reduction target across all sources of GHG emissions will require significant action in many areas by all members of the Oakland community. In some areas (e.g., local land use planning, building codes), the City has significant opportunities to influence GHG emission sources and foster GHG reductions. In others areas (e.g., air travel and material consumption choices by residents), achieving Oakland's GHG reduction target will rely most heavily on the choices of individuals and additional leadership from local and regional partners. The City calls upon the greater Oakland community to embrace a 36% GHG reduction target for each GHG emission source area, and to take personal action toward that target wherever feasible.

Applying Oakland's Target to ECAP Focus Action Areas

The purpose of the draft ECAP is to identify and prioritize actions through which the City of Oakland can foster reductions in energy consumption and GHG emissions and position Oakland to achieve a 36% reduction in GHG emissions from 2005 levels.

Actions included in the ECAP are primarily designed to enable Oakland to achieve its 36% citywide GHG reduction target with respect to those GHG emission sources that the City has a relatively high degree of influence over and for which measurable data can be collected over time. These sources (transportation on local roads; electricity and natural gas consumption in residential, commercial and industrial buildings; and landfilled solid waste) are the primary focus of actions in the draft ECAP. The City will measure and report on progress for each of these focus area emissions sources at a greater level of detail than for other areas. This chapter provides information on how actions identified in the ECAP will quantifiably help Oakland to achieve its 36% GHG emissions reduction goal in each of the ECAP focus action areas.

Achieving a 36% GHG Reduction – Transportation on Local Roads

The City of Oakland has a number of significant opportunities to influence fuel consumption and GHG emissions associated with transportation on local roads. As described in the draft ECAP, these include land use planning decisions, parking requirements associated with new development, parking pricing and management strategies, development of alternative transportation infrastructure such as bicycle lanes and transit connections, and support for the use of transit, pedestrian and bicycling travel choices.

The ECAP contains a number of proposed actions through which the City can enable Oakland to reduce citywide GHG emissions associated with transportation on local roads by 36% from 2005 levels. These actions will also help to significantly reduce GHG emissions on Oakland's highways, though additional actions will need to be implemented on a regional scale to reduce emissions associated with the many trips that pass through Oakland on local. The City appreciates the emphasis that SB 375 has placed on reducing GHG emissions from transportation on a regional level, and looks forward to partnering with regional agencies and other local governments to enact land use and transportation planning supporting these changes.

2005 Energy Use and GHG Emissions Associated with Transportation on Local Roads

Table 10 provides a summary of key energy and GHG data associated with transportation on local roads in 2005.

Table 10. Fuel Use and GHG Emissions Associated with Transportation on Local Roads in 2005

	Gasoline	Diesel	Subtotal
Vehicle Type	Passenger vehicles	Heavy trucks	
Annual VMT	1,273,207,834	98,783,366	1,371,991,200
Annual Gallons of Fuel	66,660,096	15,434,901	82,094,997
Avg MPG	19.1	6.4	n/a
Fuel CO2e/gallon	0.009038	0.010197	n/a
GHGs in Metric Tons (CO_2e)	602,496	157,387	759,883

Reading the Tables Below

In each of the tables below, the following color scheme is used to illustrate which factors are assumed to be directly affected by the assumptions considered, and which other factors are indirectly affected as a consequence.

Directly Affected Factors
Indirectly Affected Factors

2020 Business As Usual Forecast – GHG Emissions Associated with Transportation on Local Roads

Fuel consumption and GHG emissions associated with transportation on local roads in 2020 were projected using assumptions based on statewide average growth projections.[xv] The forecast assumes a 1.543% average annual growth rate statewide in vehicle miles traveled. The City will consider opportunities to update this forecast with more region- or ideally Oakland-specific projections in the future.

As illustrated, GHG emissions associated with transportation on local roads are projected to grow by 26% between 2005 and 2020 under business as usual conditions.

Table 11. Fuel Use and GHG Emissions Associated with Transportation on Local Roads in 2020 Under Business As Usual Forecast Assumptions

	Gasoline	Diesel	Subtotal
Vehicle Type	Passenger vehicles	Heavy trucks	
Annual VMT	1,601,950,726	124,289,280	1,726,240,007
Annual Gallons of Fuel	83,871,766	19,420,200	103,291,966
Avg MPG	19.1	6.4	n/a
Fuel CO2e/gallon	0.009038	0.010197	n/a
GHGs in Metric Tons (CO_2e)	758,061	198,024	956,085
Cumulative GHG Emissions from Local Roads Transportation Relative to 2005 Levels			+ 26 %

State Actions Anticipated to Affect 2020 Forecast

Numerous State-driven actions associated with California's AB 32 climate policy are planned for implementation between 2005 and 2020. Several of these State-driven actions are projected to help reduce GHG emissions associated with the transportation sector. Below are summaries of each significant anticipated State-driven action, including quantified projections of impacts on Oakland's GHG emissions associated with transportation on local roads.

State Scoping Plan Strategy 1: Pavley 1 and 2

This policy is expected to reduce GHG emissions from passenger vehicles, based on a fleetwide average, through technological efficiency improvements to vehicles and other actions. The Pavley standards (Pavley I) regulate passenger vehicle GHG emissions starting with the 2009 model year and continuing through 2016. The second phase of the Pavley regulations (Pavley II) is expected to affect model year vehicles from 2016 through 2020. This calculation assumes that Pavley I and II will only affect light duty vehicles. Assuming fleetwide fuel efficiency will increase from an average of 19.1 miles per gallon (current EMFAC data) to 28.5 miles per gallon based on trends observed in a recent study by the Metropolitan Transportation Commission (MTC).

Table 12. Fuel Use and GHG Emissions Associated with Transportation on Local Roads in 2020 Adjusted for State Actions – Adding State Scoping Plan Strategy 1 (Pavley 1 & 2 Fuel Efficiency Standards)

	Gasoline	Diesel	Subtotal
Vehicle Type	Passenger vehicles	Heavy trucks	
Annual VMT	1,601,950,726	124,289,280	1,726,240,007
Annual Gallons of Fuel	56,208,797	19,420,200	75,628,997
Avg MPG	28.5	6.4	n/a
Fuel CO2e/gallon	0.009038	0.010197	n/a
GHGs in Metric Tons (CO_2e)	508,034	198,024	706,058
Cumulative GHG Emissions from Local Roads Transportation Relative to 2005 Levels			- 7 %

State Scoping Plan Strategy 2: Tire Inflation Program

This measure would increase vehicle fuel efficiency by requiring properly inflated automobile tires to reduce rolling resistance. A proposed Tire Pressure Measure would require all automotive service centers and test-only smog check service centers in California to perform mandatory tire pressure inspections on vehicles being serviced at the facility and further requires that the tires be inflated to the manufacturer recommended levels. Increasing fuel efficiency reduces GHG emission by consuming less fuel. This calculation assumes that 51% of the light-duty fleet will be affected by this by 2020, and that fuel efficiency for those vehicles will be increased by 0.7%, increasing overall fleet wide fuel efficiency to 28.6 miles per gallon.

Table 13. Fuel Use and GHG Emissions Associated with Transportation on Local Roads in 2020 Adjusted for State Actions – Adding State Scoping Plan Strategy 2 (Tire Inflation Program)

	Gasoline	Diesel	Subtotal
Vehicle Type	Passenger vehicles	Heavy trucks	
Annual VMT	1,601,950,726	124,289,280	1,726,240,007
Annual Gallons of Fuel	56,008,846	19,420,200	75,429,046
Avg MPG	28.60	6.4	n/a
Fuel CO2e/gallon	0.009038	0.010197	n/a
GHGs in Metric Tons (CO_2e)	506,226	198,024	704,251
Cumulative GHG Emissions from Local Roads Transportation Relative to 2005 Levels			- 7 %

State Scoping Plan Strategy 3: Tire Tread Standard

This measure would increase vehicle efficiency by creating an energy efficiency standard for automobile tires to reduce rolling resistance. A reduction in GHG emissions would result from reduced fuel use. This calculation assumes that reducing the rolling resistance of tires by 10% results in a 2% increase in fuel efficiency, and that 15% of the passenger vehicle fleet would be affected by 2020, increasing fleet wide average fuel efficiency to 28.69 miles per gallon.

Table 14. Fuel Use and GHG Emissions Associated with Transportation on Local Roads in 2020 Adjusted for State Actions – Adding State Scoping Plan Strategy 3 (Tire Tread Standard)

	Gasoline	Diesel	Subtotal
Vehicle Type	Passenger vehicles	Heavy trucks	
Annual VMT	1,601,950,726	124,289,280	1,726,240,007
Annual Gallons of Fuel	55,841,322	19,420,200	75,261,522
Avg MPG	28.69	6.4	n/a
Fuel CO2e/gallon	0.009038	0.010197	n/a
GHGs in Metric Tons (CO_2e)	504,712	198,024	702,737
Cumulative GHG Emissions from Local Roads Transportation Relative to 2005 Levels			- 8 %

State Scoping Plan Strategy 4: Low Friction Engine Oil

This measure would increase vehicle efficiency by mandating the use of engine oils that meet certain low friction specifications. The American Petroleum Institute has established "energy conserving designation" for certain oils. These specifications would be used as a starting point for the mandated oils under this measure. This calculation assumes that 85% of the light-duty passenger vehicle fleet would be affected by 2020, and that these vehicles would experience a 2% average fuel efficiency would increase, resulting in a new fleet wide average fuel efficiency of 29.18 miles per gallon.

Table 15. Fuel Use and GHG Emissions Associated with Transportation on Local Roads in 2020 Adjusted for State Actions – Adding State Scoping Plan Strategy 4 (Low Friction Engine Oil)

	Gasoline	Diesel	Subtotal
Vehicle Type	Passenger vehicles	Heavy trucks	
Annual VMT	1,601,950,726	124,289,280	1,726,240,007
Annual Gallons of Fuel	54,907,888	19,420,200	74,328,088
Avg MPG	29.18	6.4	n/a
Fuel CO2e/gallon	0.009038	0.010197	n/a
GHGs in Metric Tons (CO_2e)	496,276	198,024	694,300
Cumulative GHG Emissions from Local Roads Transportation Relative to 2005 Levels			- 9 %

State Scoping Plan Strategy 5: Solar reflective Automotive Paint and Window Glazing

This measure would increase vehicle efficiency by reducing the engine load for cooling the passenger compartment with air conditioning. The use of solar reflective automotive paints and window glazing reduces heating of the automobile passenger compartment from the sun. This results in both less frequent air conditioning use by drivers and smaller air conditioners specified by manufacturers for new vehicles. This calculation assumes that 43% of light-duty passenger vehicles would be affected by 2020, and that these vehicles would experience a 1.7% average fuel efficiency increase, resulting in a fleet wide fuel efficiency of 29.4 miles per gallon.

Table 16. Fuel Use and GHG Emissions Associated with Transportation on Local Roads in 2020 Adjusted for State Actions – Adding State Scoping Plan Strategy 5 (Solar Reflective Paint & Glazing)

	Gasoline	Diesel	Subtotal
Vehicle Type	Passenger vehicles	Heavy trucks	
Annual VMT	1,601,950,726	124,289,280	1,726,240,007
Annual Gallons of Fuel	54,509,424	19,420,200	73,929,624
Avg MPG	29.4	6.4	n/a
Fuel CO2e/gallon	0.009038	0.010197	n/a
GHGs in Metric Tons (CO_2e)	492,674	198,024	690,699
Cumulative GHG Emissions from Local Roads Transportation Relative to 2005 Levels			- 9 %

State Scoping Plan Strategy 6: Low Carbon Fuel Standard

This measure would reduce GHG emissions by requiring a 10% reduction in carbon intensity of transportation fuels sold in California by the year 2020. The low carbon fuel standard regulation is under development and the reduction pathways are being analyzed.

Table 17. Fuel Use and GHG Emissions Associated with Transportation on Local Roads in 2020 Adjusted for State Actions – Adding State Scoping Plan Strategy 6 (Low Carbon Fuel Standard)

	Gasoline	Diesel	Subtotal
Vehicle Type	Passenger vehicles	Heavy trucks	
Annual VMT	1,601,950,726	124,289,280	1,726,240,007
Annual Gallons of Fuel	54,509,424	19,420,200	73,929,624
Avg MPG	29.4	6.4	n/a
Fuel CO2e/gallon	0.008134	0.009177	n/a
GHGs in Metric Tons (CO_2e)	443,407	178,222	621,629
Cumulative GHG Emissions from Local Roads Transportation Relative to 2005 Levels			- 18 %

Impact of Proposed ECAP Actions

Actions proposed in the draft ECAP have been designed to help Oakland advance beyond the results above and achieve a 36% total reduction in GHG emissions associated with transportation on local roads. These actions result in the following sub-targets, which together enable Oakland to achieve the 36% reduction:

- Reduce vehicle miles traveled on local roads by 20%
- Increase fuel efficiency by 2% over statewide average
- Decrease City fleet GHG emissions by 36%

Additional information on how the proposed actions included in the draft ECAP are projected to achieve each of these sub-targets is provided below.

Objective 1. Reduce Vehicle Miles Traveled by 20% from 2005 Levels on Local Roads

Anticipated State actions are focused on increasing the fuel efficiency of vehicles sold in California and reducing the GHG impact of transportation fuels sold across the state. To reach Oakland's GHG reduction goals, the number of vehicle miles traveled (VMT) on our roads, the third major determinant of GHG emissions associated with transportation, must also be addressed.

Recently adopted State policies encourage progress in reducing VMT as well. Adopted Senate Bill 375 requires that a regional plan be developed demonstrating how the Bay Area will achieve reductions in vehicle miles traveled and associated GHG emissions. However, these reductions in VMT will only be achieved through a combination of planning efforts, local policies and programs, and infrastructure investments on the part of local governments. Thus for the purposes of the draft ECAP it is assumed that progress toward reducing VMT on local roads will only happen through local action.

It is estimated that taking local action to reduce VMT on local roads by 20% will play a key role in achieving Oakland's 36% GHG reduction target.

Table 18. Fuel Use and GHG Emissions Associated with Transportation on Local Roads in 2020 Adjusted for State Actions and Local Actions – Adding 20% Reduction in Vehicle Miles Traveled

	Gasoline	Diesel	Subtotal
Vehicle Type	Passenger vehicles	Heavy trucks	
Annual VMT	1,281,560,581	99,431,424	1,380,992,006
Annual Gallons of Fuel	43,607,539	15,536,160	59,143,699
Avg MPG	29.4	6.4	n/a
Fuel CO2e/gallon	0.008134	0.009177	n/a
GHGs in Metric Tons (CO_2e)	354,725	142,578	497,303
Cumulative GHG Emissions from Local Roads Transportation Relative to 2005 Levels			- 34 %

Table 19 summarizes how proposed actions in the draft ECAP are projected to support the achievement of a 20% reduction in driving on local roads in Oakland. Assumptions used to project VMT reduction goals for each set of actions below are generally drawn from "Quantifying Greenhouse Gas Mitigation Measures" published in August 2010 by the California Air Pollution Control Officers Association, the "California Environmental Quality Act – Air Quality Guidelines" published in June 2010 by the Bay Area Air Quality Management District, and other sources.

Table 19. Reducing Vehicle Miles Traveled on Local Roads by 20% Through Proposed Actions in Draft ECAP

Proposed Action or Group of Actions	Notes	Estimated % Reduction Goal in Vehicle Miles Traveled on Local Roads
Advance Infill, Mixed-Use and Transit-Oriented Development	A number of actions would advance infill, mixed-use, dense, transit-oriented development, with an emphasis on development around priority, transit-oriented areas with the potential to significantly reduce the number of future vehicle miles traveled. Many of these are foundational facilitative actions needed to enable VMT reductions from other actions as well. Requiring transportation demand management (TDM) performance criteria and strategies of all new major development projects is estimated to reduce future vehicle miles traveled by 2%. Other actions, such as developing a public transit master plan for Oakland and optimizing street design to encourage modes such as transit, bicycling and walking are estimated to further reduce VMT. Assuming that these actions would generate a reduction in VMT on local roads of approximately 3%. The following actions may contribute to this goal: • TLU 1 Participate in Quarterly SB 375 Discussions • TLU 2 Develop a Comprehensive Oakland Transportation Plan	3%

Proposed Action or Group of Actions	Notes	Estimated % Reduction Goal in Vehicle Miles Traveled on Local Roads
Advance Infill, Mixed-Use and Transit-Oriented Development (continued)	• TLU 3 Integrate Land Use and Transportation Planning in Every Project • TLU 6 Identify and Adopt Priority Development Areas • TLU 7 Create a Transportation Impact Fee • TLU 8 Require Transit-Oriented Development Performance for New Development • TLU 9 Encourage New Housing at Range of Price Levels • TLU 10 Develop a Comprehensive Infrastructure Plan • TLU 11 Promote Vibrant, Safe and Attractive Transit-Oriented Dense Development • TLU 12 Engage Lenders on Infill Development Strategy • TLU 15 Update Environmental Impact Evaluation Process • TLU 17 Optimize Street Design for Transit, Bicycling and Walking • TLU 26 Enforce Transportation Demand Management Measures in New Development • TLU 42 Make Planning Decisions With Consideration of Port GHG Impacts	
Transit System Improvements	Several actions will help to reduce VMT by encouraging drivers to switch from personal automobile travel to increased use of public transit. When operating at capacity, public transit can create significant net fuel efficiency benefits. Improving transit interconnections, frequency, hours of service, and real-time information signage (e.g., NextBus) is estimated to increase bus ridership by at least 5% and yield a net 1% reduction in vehicle miles traveled. Implementing bus rapid transit along a major transportation corridor through Oakland is estimated to reduce vehicle miles traveled by 2.4%. Additional community outreach efforts would encourage residents and employees to take advantage of improve transit system and further reduce VMT. The following actions may contribute to this goal: • TLU 13 Launch and Develop a Funding Plan for the Downtown Shuttle • TLU 14 Advance Bus Rapid Transit in Oakland • TLU 19 Expand and Enhance Transit Service, Interconnections, Vehicles, and Facilities • TLU 20 Enhance Transit Service on Major Corridors • CE-1 Expand Outreach on Energy and Climate Issues • CE-2 Partner with Local Organizations to Expand Outreach • CE-3 Develop a Community Climate Action Guide • CE-4 Support Local Climate Action Workshops • CE-5 Create Community Listservs on Climate Related Topics • CE-6 Promote Climate-Related Events • CE-7 Create a Community Climate Challenge	4%
Parking Pricing and Management Strategies	Several actions relate to adjustments in parking pricing and management strategies, including limiting parking supply, on-street market pricing, and use of residential parking permits. The combination of these strategies is projected to reduce driving by 5%. Unbundling the cost of parking from building space rental costs on a citywide basis is estimated to reduce vehicle miles traveled by 3%. Imposing parking maximums on new development is estimated to reduce vehicle miles traveled on local roads by approximately 1%. As the City engages in an update to its parking policies within the next three years, these strategies will be considered to foster a reduction in VMT while meeting the needs of residents and businesses.	7.5%

Proposed Action or Group of Actions	Notes	Estimated % Reduction Goal in Vehicle Miles Traveled on Local Roads
Parking Pricing and Management Strategies (continued)	The following actions may contribute to this goal: • TLU 28 Develop Regulations Allowing Alternatives to Installing Parking • TLU 29 Develop a Dynamic Parking Pricing Strategy • TLU 30 Impose Parking Maximums on New Development • TLU 31 Facilitate Unbundling of Parking Costs from Renting Building Space • TLU 32 Review Opportunities to Expand Residential Permit Parking	
Advance the Use of Alternative Modes of Travel, Alternative Fuels, & Fuel-Efficient Vehicles	Several actions would advance the use of alternative modes of travel and help to reduce total vehicles miles traveled. Expanding car share service by promoting car share options and expanding the number of car share locations in Oakland is estimated to increase car share program participation and reduce net vehicle miles traveled by 1.6%. Completing the implementation of bicycle paths outlined in the City's adopted Bicycle Master Plan is anticipated to further increase biking in the community and reduce vehicle miles traveled by 0.4%. Optimizing trip planning in City operations will also reduce VMT. Other community outreach efforts would generate additional mode shifts and reductions in VMT. The following actions may contribute to this goal: • TLU 16 Accelerate Completion of Bicycle and Pedestrian Networks • TLU 17 Optimize Street Design for Transit, Bicycling and Walking • TLU 25 Explore Strategies for Increasing Local Car Share Capacity • TLU 57 Expand Staff Training on Fuel Efficient Vehicle Operation • CE-1 Expand Outreach on Energy and Climate Issues • CE-2 Partner with Local Organizations to Expand Outreach • CE-3 Develop a Community Climate Action Guide • CE-4 Support Local Climate Action Workshops • CE-5 Create Community Listservs on Climate Related Topics • CE-6 Promote Climate-Related Events • CE-7 Create a Community Climate Challenge	3%
Encourage Reductions in Commute Trips and Other Trips	Several actions would encourage GHG reductions associated with commute trips of Oakland residents and employees. Expanding existing Safe Routes to School and guaranteed ride home programs is estimated to result in a 0.7% VMT reduction. Expanding offerings to City staff and encouraging large private developers to do the same to foster the use of alternative employee commute modes is estimated to reduce vehicle miles traveled by 0.5%. Other outreach efforts, requiring TDM components in major new developments, discontinuing the practice of providing free parking to some City staff and enabling more employees to work flex schedules or to telecommute would help to generate additional VMT reductions. The following actions may contribute to this goal: • TLU 18 Support Alternative Transportation Strategies by Private Employers • TLU 21 Provide Outreach on Alternative Transportation Options • TLU 26 Enforce Transportation Demand Management Measures in New Development • TLU 52 Provide Subsidized Transit Passes and Commuter Allowances • TLU 53 Discontinue Providing Parking to City Employees • TLU 54 Enable Flexible Work Schedules and Encouraging Telecommuting	2%

Proposed Action or Group of Actions	Notes	Estimated % Reduction Goal in Vehicle Miles Traveled on Local Roads
Traffic Signal Synchronization	Traffic signal synchronization can reduce vehicle idling time and create significant GHG benefits. However, it may also encourage vehicle travel by reducing trip times. This calculation assumes that traffic signal synchronization at 40 key intersections is projected to decrease GHG emissions associated with vehicle miles traveled by 0.5%.	0.5%
Total Reduction in VMT from the Above City Actions		20%

Objective 2. Improve Citywide Average Vehicle Fuel Efficiency by 2%

While actions that reduce VMT are projected to account for the majority of progress toward Oakland's transportation GHG reduction target, the City will also seek to further improve the fuel efficiency of vehicles operating on local roads. As stated earlier, recent State policies are expected to significantly improve vehicle fuel efficiency by 2020. By promoting fuel-efficient and alternative fuel vehicles, the City will seek to foster even higher levels of fleet wide fuel efficiency among vehicles operating on local roads.

Several actions would advance the use of alternative fueled vehicles and fuel-efficient vehicles. Facilitating public adoption of electric vehicles by planning for and developing local EV infrastructure is estimated to improve fuel efficiency equivalence by at least 0.7%. Encouraging taxi fleets and other large vehicle fleets to shift to fuel-efficient vehicles is estimated to improve fuel efficiency by 1%. Replacing older, inefficient vehicles in the City's fleet is estimated to improve fleet wide fuel efficiency by 0.1%. Other community outreach efforts would generated additional shifts to more fuel efficient vehicles. This calculation assumes that these actions would further improve average fleet wide fuel efficiency of all vehicles on local roads by approximately 2%.

The following actions may contribute to this goal:

- TLU 33 Engage in Electric Vehicle Infrastructure Planning
- TLU 34 Promote Use of Fuel-Efficient Vehicles and Low Carbon Fuels
- TLU 35 Encourage Low-Carbon Fuels Production
- TLU 36 Establish GHG Performance Criteria for Large Vehicle Fleets
- TLU 51 Replace Inefficient City Vehicles
- TLU 56 Perform Preventive Maintenance of City Fleet
- TLU 57 Expand Staff Training on Fuel Efficient Vehicle Operation
- TLU 58 Expand Capacity to Support Electric and Alternative Fuel Vehicles
- CE-2 Partner with Local Organizations to Expand Outreach
- CE-3 Develop a Community Climate Action Guide
- CE-4 Support Local Climate Action Workshops
- CE-7 Create a Community Climate Challenge

Table 20. Fuel Use and GHG Emissions Associated with Transportation on Local Roads in 2020 Adjusted for State Actions and Local Actions – Adding Achievement of 2% Average Increase in Vehicle Fuel Efficiency

	Gasoline	Diesel	Subtotal
Vehicle Type	Passenger vehicles	Heavy trucks	
Annual VMT	1,281,560,581	99,431,424	1,380,992,006
Annual Gallons of Fuel	42,752,489	15,231,529	57,984,019
Avg MPG	30.0	6.5	n/a
Fuel CO2e/gallon	0.008134	0.009177	n/a
GHGs in Metric Tons (CO_2e)	347,770	139,782	487,552
Cumulative GHG Emissions from Local Roads Transportation Relative to 2005 Levels			- 35 %

Objective 3. Reduce City Fleet GHG Emissions by 36 %

The City is also committed to achieving the 36% GHG reduction target within its own operations. Several proposed actions will enable the City to reduce the amount of fuel consumed and associated GHG emissions from City fleet operations. This calculation assumes that the City will reduce the equivalent of approximately 400,000 gallons of fuel use annually through use of more fuel efficient vehicles, optimization of trip planning, and conversions to more fuel efficient alternative fuel vehicles such as electric vehicles.

The following actions may contribute to this goal:

- TLU 51 Replace Inefficient City Vehicles
- TLU 56 Perform Preventive Maintenance of City Fleet
- TLU 57 Expand Staff Training on Fuel Efficient Vehicle Operation
- TLU 58 Expand Capacity to Support Electric and Alternative Fuel Vehicles

Table 21. Fuel Use and GHG Emissions Associated with Transportation on Local Roads in 2020 Adjusted for State Actions and Local Actions – Adding Achievement of Average X MPG Vehicle Fuel Efficiency

	Gasoline	Diesel	Subtotal
Vehicle Type	Passenger vehicles	Heavy trucks	
Annual VMT	1,281,560,581	99,431,424	1,380,992,006
Annual Gallons of Fuel	42,552,489	15,031,529	57,584,018
Avg MPG	30.0	6.5	n/a
Fuel CO2e/gallon	0.008134	0.009177	n/a
GHGs in Metric Tons (CO_2e)	346,143	137,947	484,090
Cumulative GHG Emissions from Local Roads Transportation Relative to 2005 Levels			- 36 %

Summary of Achieving a 36% GHG Reduction Associated with Transportation on Local Roads

Table 22. Summary of Achieving a 36% GHG Reduction Associated with Transportation on Local Roads

	Gasoline	Diesel	Subtotal
Vehicle Type	Passenger vehicles	Heavy trucks	
2005 GHGs in Metric Tons (CO_2e)	602,496	157,387	759,883
2020 GHGs in Metric Tons (CO_2e) Adjusted for BAU Forecast	758,061	198,024	956,085
2020 GHGs in Metric Tons (CO_2e) Adjusted for Anticipated State Actions	443,407	178,222	621,629
2020 GHGs in Metric Tons (CO_2e) Adjusted for Proposed ECAP Actions	346,143	137,947	484,090
Estimated GHG Reduction Below 2005 Baseline by 2020 Based on Proposed ECAP Actions			**36%**

Achieving a 36% GHG Reduction – Building Energy Use

2005 Energy Use and GHG Emissions Associated with Building Energy Use

Baseline energy use and associated GHG emissions from the year 2005 are summarized below.

Table 23. 2005 Building Energy Use Baseline

	Residential		Commercial & Industrial		Total		
	electricity	natural gas	electricity	natural gas	electricity	natural gas	total
Electricity Consumed (kWh)	671,311,906	-	1,432,075,418	-	2,103,387,324	-	-
Natural Gas Consumed (Therms)	-	65,470,470	-	53,944,169	-	119,414,639	-
CO_2e /kWh	0.0002236	-	0.0002236	-	-	-	-
CO_2e /therm	-	0.005290	-	0.005290	-	-	-
GHGs in Metric Tonnes CO_2e	150,105	346,339	320,212	285,365	470,317	631,703	1,102,021

2020 Business As Usual Forecast – GHG Emissions Associated with Building Energy Use

Energy use and associated GHG emissions were forecasted to grow between 2005 and 2020 under business as usual conditions. Residential energy consumption is forecasted to grow as a function of predicted population growth. Commercial and industrial energy consumption is assumed to grow as a function of predicted jobs growth. Projections are based on data from the Association of Bay Area Government's 2009 Projections.[xvi]

- 2005 Oakland Population: 410,600
- 2020 Oakland Population: 470,900
- 2005 Oakland Jobs: 202,570
- 2020 Oakland Jobs: 229,720

Table 24. 2020 Business As Usual Forecast

	Residential		Commercial & Industrial		Total		
	electricity	natural gas	electricity	natural gas	electricity	natural gas	total
Electricity Consumed (kWh)	769,899,602	-	1,624,013,255	-	2,393,912,857	-	-
Natural Gas Consumed (Therms)	-	75,085,349	-	61,174,184	-	136,259,533	-
CO_2e /kWh	0.0002236	-	0.0002236	-	-	-	-
CO_2e /therm	-	0.005290	-	0.005290	-	-	-
GHGs in Metric Tonnes CO_2e	172,150	397,201	363,129	323,611	535,279	720,813	1,256,092
Cumulative Total Building Energy Use GHG Emissions Relative to 2005 Levels							+ 14%

State Actions Anticipated to Affect 2020 Forecast

Numerous State-driven actions associated with California's AB 32 climate policy are planned for implementation between 2005 and 2020. Several of these State-driven actions are projected to help reduce GHG emissions associated with building energy use. Below are summaries of each significant anticipated State-driven action, including quantified projections of impacts on Oakland's GHG emissions associated with building energy use.

Building and Appliance Standards

New statewide building and appliance standards enforced by the State are anticipated to require higher levels of energy efficiency performance in building construction and appliances. Anticipated impacts of these standards are illustrated in Table 25.

Table 25. 2020 Adjusted Forecast Including Anticipated State Actions – Building and Appliance Standards

	Residential		Commercial & Industrial		Total		
	electricity	natural gas	electricity	natural gas	electricity	natural gas	total
Electricity Consumed (kWh)	741,359,086	-	1,563,810,370	-	2,305,169,456	-	-
Natural Gas Consumed (Therms)	-	72,738,257	-	59,261,941	-	132,000,198	-
CO_2e /kWh	0.0002236	-	0.0002236	-	-	-	-
CO_2e /therm	-	0.005290	-	0.005290	-	-	-
GHGs in Metric Tonnes CO_2e	165,768	384,785	349,668	313,496	515,436	698,281	1,213,717
Cumulative Total Building Energy Use GHG Emissions Relative to 2005 Levels							+ 10%

Renewable Portfolio Standard for Electricity

Changes to California's Renewable Portfolio Standard (RPS) now require utilities to provide 33% of electricity supplied to the grid from qualifying renewable energy sources by 2020. Projected impacts shown in Table 26 assume that electricity production shifting to clean renewable energy sources will displace production from natural gas. Resulting electricity production would be approximately 79% GHG emissions free (ignoring unknown upstream GHG impacts associated with power production from nuclear and renewable energy sources).

Table 26. 2020 Adjusted Forecast Including Anticipated State Actions – 33% Renewable Portfolio Standard

	Residential		Commercial & Industrial		Total		
	electricity	natural gas	electricity	natural gas	electricity	natural gas	total
Electricity Consumed (kWh)	741,359,086	-	1,563,810,370	-	2,305,169,456	-	-
Natural Gas Consumed (Therms)	-	72,738,257	-	59,261,941	-	132,000,198	-
CO_2e /kWh	0.00011401	-	0.00011401	-	-	-	-
CO_2e /therm	-	0.005290	-	0.005290	-	-	-
GHGs in Metric Tonnes CO_2e	84,520	384,785	178,285	313,496	262,805	698,281	961,086
Cumulative Total Building Energy Use GHG Emissions Relative to 2005 Levels							- 13%

Impact of Proposed ECAP Actions

Actions proposed in the draft ECAP have been designed to help Oakland advance beyond the State-driven results above to achieve a 36% total reduction in GHG emissions associated with building energy use. These actions result in the following sub-targets, which together enable Oakland to achieve the 36% reduction:

- Oakland Shines Program Targeting Downtown with Energy Efficiency and Conservation Programs
- Energy Programs Targeting 400 Largest Commercial Energy Users
- Energy Efficiency Improvements in Other Commercial Properties
- Residential Energy Efficiency Initiatives
- Energy Efficiency in New Construction
- Renewable Energy Generation (electricity and heat) in Excess of RPS and State Action
- Combined Heat and Power
- Energy Efficient Product Purchasing
- Persistent Energy Conservation

Additional information on how the proposed actions included in the draft ECAP are projected to achieve each of these sub-targets is provided below.

Oakland Shines Program Targeting Downtown with Energy Efficiency and Conservation Programs

The Oakland Shines program plans to offer energy efficiency and conservation services to 80% of the several thousand businesses located in a 120-block area of Downtown Oakland. The program implementation team, comprised of Quantum Energy Services and Technologies (QuEST), Community Energy Services, and the City of Oakland, in coordination with PG&E, will conduct comprehensive outreach and provide significant rebates for improvements to Class B buildings to help owners reduce energy use and costs, and make their buildings more attractive to tenants. Oakland Shines is funded by a $4.8 million ARRA grant and is expected to save 8,300,000

kWh of electricity and 138,000 therms of natural gas annually by helping participants to reduce energy consumption by 20% through efficiency, pre-and post-project utility cost tracking, and conservation.

The following actions may contribute toward this goal:

- Maximize participation in the Oakland Shines program targeted at downtown businesses, combining turnkey design and installation programs with large incentives and energy cost tracking and benchmarking services
  - BE-10 Oakland Shines downtown outreach and incentives
  - BE-12 Offer technical assistance to energy intensive businesses
  - BE-14 Strategic analysis and planning
  - BE-15 Track consumption and cost over time
  - BE-17 Kilowatt crackdown community challenge
- Continue delivering aggressive, cost-effective, proven energy and water efficiency improvement measures to businesses throughout Oakland
  - BE-9 Promote benefits of efficiency and offer guidance
  - BE-31 Large water user conservation and efficiency monitoring with EBMUD
  - BE-35 Use water-efficiency fixtures

Table 27. 2020 Building Energy Use and Associated GHG Emissions Adjusted for State Actions and Local Actions – Oakland Shines Program Targeting Downtown Commercial Sector

	Residential		Commercial & Industrial		Total		
	electricity	natural gas	electricity	natural gas	electricity	natural gas	total
Electricity Consumed (kWh)	741,359,086	-	1,555,445,664	-	2,296,804,750	-	-
Natural Gas Consumed (Therms)	-	72,738,257	-	59,123,416	-	131,861,673	-
CO_2e /kWh	0.00011401	-	0.00011401	-	-	-	-
CO_2e /therm	-	0.005290	-	0.005290	-	-	-
GHGs in Metric Tonnes CO_2e	84,520	384,785	177,331	312,763	261,851	697,548	959,399
Cumulative Total Building Energy Use GHG Emissions Relative to 2005 Levels							- 13%

Energy Programs Targeting 400 Largest Commercial Energy Users

It is estimated that 86% of commercial building electricity and 93% of commercial natural gas consumption is associated with energy used by building infrastructure, heating, cooling refrigerators, hot water, lighting and cooking. These elements are addressed by building codes and energy retrofit programs, which are the emphasis of this section of the analysis. The other 14% of electricity is used for computers and equipment that are not covered by green building ordinances, energy codes and major programs. The remaining 7% of natural gas is used for processes and miscellaneous activities. This calculation assumes that 100% of the largest 400 electricity users reduce their building energy (that is energy that is governed by building codes and green building ordinances and often the focus of energy retrofit programs) by an average of 20%.

The following actions may contribute toward this goal:

- Maximize participation in the Oakland Shines program targeted at downtown businesses, combining turnkey design and installation programs with large incentives and energy cost tracking and benchmarking services
  - BE-12 Offer technical assistance to energy intensive businesses

  - BE-14 Strategic analysis and planning
  - BE-15 Track consumption and cost over time
  - BE-17 Kilowatt crackdown community challenge
- Leverage green building and time of sale ordinances to require cost-effective energy efficiency improvements when properties are in transition
  - BE-3 Renovation in green building ordinance
  - BE-13 Time of lease or sale ordinance
- Continue delivering aggressive, cost-effective, proven energy and water efficiency improvement measures to businesses throughout Oakland
  - BE-6 Pursue funding for new energy consumption reduction programs
  - BE-9 Promote benefits of efficiency and offer guidance
  - BE-29 Large water user conservation and efficiency monitoring with EBMUD
  - BE-34 Use water-efficiency fixtures

Table 28. 2020 Building Energy Use and Associated GHG Emissions Adjusted for State Actions and Local Actions – Adding Energy Assistance to Largest Energy Users

	Residential		Commercial & Industrial		Total		
	electricity	natural gas	electricity	natural gas	Electricity	natural gas	total
Electricity Consumed (kWh)	741,359,086	-	1,377,879,523	-	2,119,238,609	-	-
Natural Gas Consumed (Therms)	-	72,738,257	-	54,153,095	-	126,891,352	-
CO_2e /kWh	0.00011401	-	0.00011401	-	-	-	-
CO_2e /therm	-	0.005290	-	0.005290	-	-	-
GHGs in Metric Tonnes CO_2e	84,520	384,785	157,087	286,470	241,607	671,255	912,863
Cumulative Total Building Energy Use GHG Emissions Relative to 2005 Levels							- 17%

Energy Efficiency Improvements in Other Commercial Properties

It is estimated that 86% of commercial building electricity and 93% of commercial natural gas consumption is associated with energy used by building infrastructure, heating, cooling refrigerators, hot water, lighting and cooking. These elements are addressed by building codes and energy retrofit programs, which are the emphasis of this section of the analysis. The other 14% of electricity and 7% of natural are used for computers and equipment that are not covered by green building ordinances, energy codes and major programs. This calculation assumes that 30% of commercial sector properties that are not among the largest 400 electricity users reduce their building energy use (that is energy that is governed by building codes and green building ordinances, or is the focus of an energy retrofitting program) by an average of 20%.

The following actions may contribute toward this goal:

- Maximize participation in the Oakland Shines program targeted at downtown businesses, combining turnkey design and installation programs with large incentives and energy cost tracking and benchmarking services
  - BE-10 Oakland Shines downtown outreach and incentives
  - BE-14 Strategic analysis and planning
  - BE-15 Track consumption and cost over time
  - BE-17 Kilowatt crackdown community challenge

- Leverage green building and time of sale ordinances to require cost-effective energy efficiency improvements when properties are in transition
  - BE-3 Renovation in green building ordinance
  - BE-13 Time of lease or sale ordinance
- Continue delivering aggressive, cost-effective, proven energy and water efficiency improvement measures to businesses throughout Oakland
  - BE-6 Pursue funding for new energy consumption reduction programs
  - BE-8 Promote upgrades for historic buildings
  - BE-9 Promote benefits of efficiency and offer guidance
  - BE-11 Encourage participation in East Bay Energy Watch
  - BE-16 Expand technical assistance in small commercial programs
  - BE-29 Water efficient landscaping
  - BE-31 Large water user conservation and efficiency monitoring with EBMUD
  - BE-35 Use water-efficiency fixtures

Promote innovative financing techniques to support the implementation of cost effective upgrades
  - BE-4 Property tax assisted financing
  - BE-5 On-bill financing

Table 29. 2020 Building Energy Use and Associated GHG Emissions Adjusted for State Actions and Local Actions – Adding Energy Efficiency Improvements in Other Commercial Properties

	Residential		Commercial & Industrial		Total		
	electricity	natural gas	electricity	natural gas	electricity	natural gas	total
Electricity Consumed (kWh)	741,359,086	-	1,357,856,331	-	2,099,215,416	-	-
Natural Gas Consumed (Therms)	-	72,738,257	-	52,716,281	-	125,454,538	-
CO_2e /kWh	0.00011401	-	0.00011401	-	-	-	-
CO_2e /therm	-	0.005290	-	0.005290	-	-	-
GHGs in Metric Tonnes CO_2e	84,520	384,785	154,805	278,869	239,324	663,655	902,979
Cumulative Total Building Energy Use GHG Emissions Relative to 2005 Levels							- 18%

Residential Energy Efficiency Initiatives

This calculation assumes that 30% of all households will achieve an average 10% reduction in building-related electricity and natural gas consumption by implementing home energy upgrades in areas such as refrigerators, duct sealing, hot water insulation, programmable thermostats, envelope sealing, lighting with compact fluorescent lamps, heating systems, wall insulation and windows, where cost-effective. Building-related energy accounts for approximately 60% of electricity and 90% of natural gas use.

The following actions may contribute toward this goal:

- Promote efficient use of energy and water
  - BE-6 Pursue funding for new energy use reduction programs
  - BE-8 Promote upgrades for historic buildings
  - BE-9 Promote benefits of efficiency and offer guidance
  - BE-18 Energy Upgrade California
  - BE-20 Weatherization for low-to-moderate income households
  - BE-21 Promote improvements in rental housing

  - BE-24 Do-it-yourself tools at tool lending library
  - BE-29 Water efficient landscaping
  - BE-32 Collect water in cisterns
  - BE-35 Use water-efficiency fixtures
- Leverage green building and time of sale ordinances to require cost-effective energy efficiency improvements when properties are in transition
  - BE-3 Include renovation in green building ordinance
  - BE-22 Residential time of lease or sale ordinance
- Encourage the use of on-site renewable energy sources
  - BE-25 Community solar program
- Promote innovative financing techniques to support the implementation of cost effective upgrades
  - BE-4 Property tax assisted financing
  - BE-5 On-bill financing
  - BE-19 Promote investment in multi-family affordable housing

Table 30. 2020 Building Energy Use and Associated GHG Emissions Adjusted for State Actions and Local Actions – Adding Residential Energy Efficiency Initiatives

	Residential		Commercial & Industrial		Total		
	electricity	natural gas	electricity	natural gas	electricity	natural gas	total
Electricity Consumed (kWh)	727,996,924	-	1,357,856,331	-	2,085,853,255	-	-
Natural Gas Consumed (Therms)	-	70,774,324	-	52,716,281	-	123,490,605	-
CO_2e /kWh	0.00011401	-	0.00011401	-	-	-	-
CO_2e /therm	-	0.005290	-	0.005290	-	-	-
GHGs in Metric Tonnes CO_2e	82,996	374,396	154,805	278,869	237,801	653,265	891,066
Cumulative Total Building Energy Use GHG Emissions Relative to 2005 Levels							- 19%

Energy Efficiency in New Construction

This calculation assumes that 100% of residential and commercial new construction projects in Oakland will be built with infrastructure that is 10% more energy efficient than required by the State Energy Code. It is estimated that 60% of electricity and 90% of natural gas consumption in residential buildings are associated with the building infrastructure. It is also estimated that 84% of commercial building electricity and 93% of natural gas consumption are associated with energy used by building infrastructure, heating, cooling refrigerators, hot water, lighting and cooking. These elements are addressed by building codes, which are the emphasis of this section of the analysis. The remaining energy consumption is used for equipment that is not covered by green building ordinances and energy codes.

The following actions may contribute toward this goal:

- Adopt the proposed Green Building Ordinance to include cost-effective energy efficiency construction for new buildings and renovations
  - BE-1 Green Building Ordinance for new construction and renovation
  - BE-3 Include renovation in green building ordinance
- Include water efficiency measures in new construction projects
  - BE-29 Water efficient landscaping
  - BE-32 Collect water in cisterns

  - BE-35 Use water-efficiency fixtures
- Continue delivering aggressive, cost-effective, proven energy and water efficiency improvement measures to businesses throughout Oakland
  - BE-14 Strategic analysis and planning
- Promote innovative financing techniques to support the inclusion of all cost-effective efficiency and conservation measures in new construction projects
  - BE-4 Property tax assisted financing
  - BE-5 On-bill financing
- Encourage the use of on-site renewable energy sources
  - BE-25 Community solar program

Table 31. 2020 Building Energy Use and Associated GHG Emissions Adjusted for State Actions and Local Actions – Adding Energy Efficiency in New Construction

	Residential		Commercial & Industrial		Total		
	electricity	natural gas	electricity	natural gas	electricity	natural gas	total
Electricity Consumed (kWh)	724,048,186	-	1,346,901,521	-	2,070,949,707	-	-
Natural Gas Consumed (Therms)	-	70,197,431	-	52,268,461	-	122,465,892	-
CO_2e /kWh	0.00011401	-	0.00011401	-	-	-	-
CO_2e /therm	-	0.005290	-	0.005290	-	-	-
GHGs in Metric Tonnes CO_2e	82,546	371,344	153,556	276,500	239,102	647,845	883,947
Cumulative Total Building Energy Use GHG Emissions Relative to 2005 Levels							- 20%

Renewable Energy Generation in Excess of RPS and State Action

This calculation assumes that 3% of post-efficiency electricity and natural gas energy for residential and commercial use is generated from clean renewable energy sources.

The following actions may contribute toward this goal:

- Identify, promote and finance solar and other renewable energy projects throughout the residential and commercial sectors
  - BE-4 Property tax assisted financing
  - BE-25 Community solar program
  - BE-28 Study local solar, wind, wave, combined heat and power and anaerobic digestion opportunities
- Alternative methods for increasing renewable energy production
  - BE-26 Negotiate with PG&E for green power
  - BE-27 Explore Community Choice Aggregation

Table 32. 2020 Building Energy Use and Associated GHG Emissions Adjusted for State Actions and Local Actions – Adding Renewable Energy Generation in Excess of RPS and State Action

	Residential		Commercial & Industrial		Total		
	electricity	natural gas	electricity	natural gas	electricity	natural gas	total
Electricity Consumed (kWh)	702,326,740	-	1,306,494,475	-	2,008,821,216	-	-
Natural Gas Consumed (Therms)	-	68,617,989	-	51,123,605	-	119,741,594	-
CO_2e /kWh	0.00011401	-	0.00011401	-	-	-	-
CO_2e /therm	-	0.005290	-	0.005290	-	-	-
GHGs in Metric Tonnes CO_2e	80,070	362,989	148,949	270,444	229,019	633,433	862,452
Cumulative Total Building Energy Use GHG Emissions Relative to 2005 Levels							- 22%

Combined Heat and Power

Combined heat and power fits into Oakland's efforts to strategically place energy production where it can achieve the biggest benefit. This calculation assumes that Oakland has discretion about whether to build combined heat and power projects. The State estimates that combined heat and power will reduce electricity consumption by 13.5%. Although GHG emissions from combustion of natural gas use would increase, the net effect would be to reduce GHG emissions because combined heat and power makes good use of waste heat to create a net GHG emissions benefit.

The following actions may contribute toward this goal:

- Develop combined heat and power projects city-wide on a strategic basis to support City objectives
  - BE-14 strategic analysis and planning
  - BE-26 Study local solar, wind, wave, combined heat and power and anaerobic digestion opportunities
  - BE-27 Explore Community Choice Aggregation
- Maximize effectiveness of renewable power by striving to minimize consumption
  - BE-9 Promote benefits of efficiency and offer guidance
- Promote innovative financing techniques to support the implementation of Combined Heat and Power
  - BE-4 Property tax assisted financing

Table 33. 2020 Building Energy Use and Associated GHG Emissions Adjusted for State Actions and Local Actions – Adding Combined Heat and Power

	Residential		Commercial & Industrial		Total		
	electricity	natural gas	electricity	natural gas	electricity	natural gas	total
Electricity Consumed (kWh)	607,234,254	-	1,129,599,871	-	1,736,834,123	-	-
Natural Gas Consumed (Therms)	-	69,694,999	-	53,127,099	-	122,822,098	-
CO_2e /kWh	0.00011401	-	0.00011401	-	-	-	-
CO_2e /therm	-	0.005290	-	0.005290	-	-	-
GHGs in Metric Tonnes CO_2e	69,229	368,687	128,782	281,042	198,011	649,729	847,740
Cumulative Total Building Energy Use GHG Emissions Relative to 2005 Levels							- 23%

Energy Efficient Product Purchasing

This calculation assumes that 100% of Oakland residents and businesses will reduce energy consumption associated with their non-infrastructure (e.g., energy using products such as televisions, stereos, cell phone chargers) by 10% through more energy efficient product purchasing decisions.

The following actions may contribute toward this goal:

- Encourage energy efficient choices when making purchasing decisions
  - BE-9 Promote benefits of efficiency and offer guidance

Table 34. 2020 Building Energy Use and Associated GHG Emissions Adjusted for State Actions and Local Actions – Adding Energy Efficient Product Purchasing

	Residential		Commercial & Industrial		Total		
	electricity	natural gas	electricity	natural gas	electricity	natural gas	total
Electricity Consumed (kWh)	582,993,203	-	1,113,353,162	-	1,696,346,364	-	-
Natural Gas Consumed (Therms)	-	68,998,049	-	52,750,373	-	121,748,422	-
CO_2e /kWh	0.00011401	-	0.00011401	-	-	-	-
CO_2e /therm	-	0.005290	-	0.005290	-	-	-
GHGs in Metric Tonnes CO_2e	66,465	365,000	126,930	279,049	193,395	644,049	837,444
Cumulative Total Building Energy Use GHG Emissions Relative to 2005 Levels							- 24%

Persistent Energy Conservation

This calculation assumes that all Oakland residents and businesses practice persistent energy conservation that reduces energy consumption by 16% below that achieved through other State and local actions. Achieving this goal will require significant change in energy use behaviors of all members of the Oakland community.

The following actions may contribute toward this goal:

- Encourage energy efficient choices when making purchasing decisions
  - BE-7 Promote energy conservation
  - BE-17 Commercial building energy challenge
  - BE-29 Water efficient landscaping
  - BE-35 Use water-efficiency fixtures
  - CE-2 Promote local climate action
  - CE-3 Produce community climate action guide
  - CE-7 Community climate challenge
  - CE-16 Develop multi-media library of local model action

Table 35. 2020 Building Energy Use and Associated GHG Emissions Adjusted for State Actions and Local Actions – Adding Persistent Energy Conservation

	Residential		Commercial & Industrial		Total		
	electricity	natural gas	electricity	natural gas	electricity	natural gas	total
Electricity Consumed (kWh)	489,714,290	-	935,216,656	-	1,424,930,946	-	-
Natural Gas Consumed (Therms)	-	57,958,361	-	44,310,314	-	102,268,675	-
CO_2e /kWh	0.00011401	-	0.00011401	-	-	-	-
CO_2e /therm	-	0.005290	-	0.005290	-	-	-
GHGs in Metric Tonnes CO_2e	55,831	306,600	106,621	234,402	162,452	541,001	703,453
Cumulative Total Building Energy Use GHG Emissions Relative to 2005 Levels							- 36%

Table 36. Summary of Plan for Achieving a 36% GHG Reduction Target for Building Energy Use

	Residential			Commercial & Industrial			Total		
	electricity	natural gas	subtotal	electricity	natural gas	subtotal	electricity	natural gas	total
2005 Baseline GHG Emissions (Metric Tonnes CO_2e)	150,105	346,339	496,444	320,212	285,365	605,577	470,317	631,703	1,102,021
2020 Business as Usual Forecast (Metric Tonnes CO_2e)	172,150	397,201	569,351	363,129	323,611	686,741	535,279	720,813	1,256,092
2020 Forecast Adjusted for State Actions (Metric Tonnes CO_2e)	84,520	384,785	469,305	178,285	313,496	491,780	262,805	698,281	961,086
% Reduction from 2005 Baseline	44%	-11%	5%	44%	-10%	19%	44%	-11%	13%
2020 Planned Including Local Actions (Metric Tonnes CO_2e)	55,831	306,600	362,431	106,621	234,402	341,023	162,452	541,001	703,453
% Reduction from 2005 Baseline	63%	11%	27%	67%	18%	44%	65%	14%	**36%**

Achieving a 36% GHG Reduction – Material Consumption & Waste

From a lifecycle perspective, GHG impacts associated with the manufacture, transport, use and disposal of material goods and food represent a major source of GHG emissions. While many of these emissions do not occur within Oakland's geographic boundaries, material consumption and disposal decisions made by each member of the Oakland community are a major factor driving their creation. By virtue of its role in administering solid waste collection and management programs in Oakland, the City has the ability to influence the manner in which solid waste is collected, managed and disposed.

The Oakland City Council adopted a Zero Waste goal in 2006, calling for a 90% reduction in waste sent to landfill by 2020. The draft ECAP recognizes the importance of achieving this Zero Waste Goal, which would reduce landfill methane emissions associated with solid waste sent from Oakland to nearby landfills by far more than 36%. Given the difficulty associated with achieving this goal, it is not recommended that GHG reduction targets be lessened in other areas, despite the potential for progress beyond a 36% GHG reduction with respect to this source. Rather, achieving Oakland's Zero Waste Goal by 2020 would enable Oakland to meet anticipated longer term goals (on the order of 80% reduction by 2050) sooner.

This calculation assumes that solid waste sent to landfill from Oakland for purposes other than as alternative daily cover would be reduced by 90% from 2005 levels by 2020.

Table 37. GHG Emissions Associated with Solid Waste Sent to Landfill from Oakland Activity in 2005

Quantity of Non-ADC Solid Waste Sent to Landfill (tons)	416,827*
Estimated GHG Emissions (metric tons CO_2e)	126,361

*In 2005, 416,827 tons of solid waste was disposed in landfill from Oakland, along with an additional 201,625 tons of alternative daily cover (ADC). Oakland's adopted Zero Waste goal applies to non-ADC solid waste.

Table 38. GHG Emissions Associated with Solid Waste Sent to Landfill from Oakland Activity in 2020 Based on City's Adopted Zero Waste Goal

Quantity of Non-ADC Solid Waste Sent to Landfill (tons)	40,000
Estimated GHG Emissions (metric tons CO_2e)	13,306
Reduction in Total Building Energy Use GHG Emissions from 2005 Levels	89%

Existing Oakland Energy and GHG Reduction Policies and Programs

The City of Oakland has a long legacy of action on energy and climate issues. Below are examples of existing City policies supportive of energy and GHG emission reduction activities in Oakland.

General Plan Land Use and Transportation Element (LUTE)

Policy	Description
Policy I/C2.2	**Reusing Abandoned Buildings** The reuse of abandoned industrial buildings by non-traditional activities should be encouraged where the uses are consistent with, and will assist in the attainment of, the goals and objectives of all elements of the Plan.
Policy T1.6	**Designating Truck Routes** An adequate system of roads connecting port terminals, warehouses, freeways and regional arterials, and other important destinations should be designated. This system shall rely upon arterial streets away from residential neighborhoods.
Policy T1.8	**Rerouting and Enforcing Truck Routes** The City shall make efforts to re-route truck traffic away from neighborhoods, wherever possible, and enforce truck route controls.
Policy T2.1	**Encouraging Transit-Oriented Development** Transit-oriented development should be encouraged at existing or proposed transit nodes, defined by the convergence of two or more modes of public transit such as BART, bus, shuttle service, light rail or electric trolley, ferry, and inter-city or commuter rail.
Policy T2.2	**Guiding Transit-Oriented Development** Transit-oriented developments should be pedestrian oriented, encourage night and day time use, provide the neighborhood with needed goods and services, contain a mix of land uses, and be designed to be compatible with the character of surrounding neighborhoods.
Policy T2.3	**Promoting Neighborhood Services** Promote neighborhood serving commercial development within one-quarter to one-half mile from established transit routes and nodes.
Policy T2.5	**Linking Transportation and Activities** Link transportation facilities and infrastructure improvements to recreational uses, job centers, commercial nodes, and social services, (i.e. hospitals, parks, and community centers).
Policy T3.3	**Allowing Congestion Downtown** For intersections within Downtown and for those that provide direct access to Downtown locations, the City should accept a lower level of service and a higher level of traffic congestion than is accepted in other parts of Oakland. The desired pedestrian-oriented nature of Downtown activity and the positive effect of traffic congestion in promoting the use of transit of other methods of travel should be recognized.
Policy T3.5	**Including Bikeways and Pedestrian Walks** The City should include bikeways and pedestrian walks in the planning of new, reconstructed, or realized streets, wherever possible.

Policy	Description
Policy T3.6	**Encouraging Transit** The City should encourage and promote use of public transit in Oakland by expediting the movement of and access to transit vehicles on designated "transit streets" as shown on the Transportation Plan.
Policy T3.7	**Resolving Transportation Conflicts** The City, in constructing and maintaining its transportation infrastructure, should resolve any conflicts between public transit and single occupant vehicles in favor of the transportation mode that has the potential to provide the greatest mobility and access for people, rather than vehicles, giving due consideration to the environmental, public safety, economic development, health, and social equity impacts. [Note: This is the City's 'Transit-First Policy.']
Objective T4	**Increase use of alternatives modes of transportation**
Policy T4.1	**Incorporating Design Features for Alternative Travel** The City will require new development, rebuilding, or retrofit to incorporate design features in their projects that encourage use of alternative modes of transportation such as transit, bicycling, and walking.
Policy T4.2	**Creating Transportation Incentives** Through cooperation with other agencies, the City should create incentives to encourage travelers to use alternative transportation options.
Policy T4.3	**Reducing Transit Waiting Times** The City should encourage transit operators to reduce waiting times for users by coordinating schedules and maintaining intervals of fifteen (15) minutes or less between buses during peak daytime periods.
Policy T4.4	**Developing Light Rail or Electric Trolley** The City supports the development of light rail or trolley bus along Regional Transit Streets in high travel demand on corridors.
Policy T4.5	**Preparing a Bicycle and Pedestrian Master Plan** The City should prepare, adopt, and implement a Bicycle and Pedestrian Master Plan as part of the Transportation Element of this General Plan.
Policy T4.6	**Making Transportation Accessible for Everyone** Alternative modes of transportation should be accessible for all of Oakland's population, including the elderly, disabled, and disadvantaged.
Policy T4.7	**Reusing Abandoned Rail Lines** Where rail lines (including siding and spurs) are to be abandoned, first consideration should be given to acquiring the line for transportation and recreational uses, such as bikeways, footpaths, or public transit.
Policy T4.8	**Accommodating Multiple Types of Travel on the Bay Bridge** The City should encourage the design and engineering for the new Bay Bridge to accommodate multiple means of access and travel by automobiles, trucks, transit, bicycles, pedestrians, and future mass transit.

Policy	Description
Policy T4.10	**Converting Underused Travel Lanes** Take advantage of existing transportation infrastructure and capacity that is underutilized. For example, where possible and desirable, convert underused travel lanes to bicycle or pedestrian paths or amenities.
Policy D3.1	**Promoting Pedestrians** Pedestrian-friendly commercial areas should be promoted.
Policy D3.2	**Reusing Vacant or Underutilized Buildings** Existing vacant or underutilized buildings should be reused. Repair and rehabilitation, particularly of historic or architecturally significant structures, should be strongly encouraged. However, where reuse is not economically feasible, demolition and other measures should be considered.
Policy D10.6	**Creating Infill Housing** Infill housing that respects surrounding development and the streetscape should be encouraged in the downtown to strengthen or create distinct districts.
Policy D11.1	**Promoting Mixed-Use Development** Mixed use developments should be encouraged in the downtown for such purposes as to promote its diverse character, provide for needed goods and services, support local art and culture, and give incentive to reuse existing vacant or underutilized structures.
Policy D13.1	**Coordinating Transportation Options** A variety of transportation modes to and within all downtown districts should be coordinated to safely and efficiently move people and goods. Affordability and convenience are primary considerations.
Policy N1.2	**Placing Public Transit Stops** The majority of commercial development should be accessible by public transit. Public transit stops should be placed at strategic locations in Neighborhood Activity Centers and Transit-Oriented Districts to promote browsing and shopping by transit users.
Policy N3.2	**Encouraging Infill Development** In order to facilitate the construction of needed housing types, infill development that is consistent with the General Plan should take place throughout the City of Oakland.
Policy N8.1	**Developing Transit Village** "Transit Village" areas should consist of attached multi-story development on properties near or adjacent to BART stations or other well-used or high-volume transit facilities, such as light rail, train, ferry stations, or multiple-bus transfer locations. While residential units should be encouraged as part of any transit village, other uses may be included where they will not negatively affect the residential living environment.

Open Space Conservation and Recreation (OSCAR) Element

Policy	Description
Action OS-1.2.6	**Management of Airport Wetlands** Encourage the Port of Oakland to retain wetlands within Oakland International Airport as Resource conservation Areas, where compatible with the FAA.

Policy	Description
Policy OS-2.3	**Community Gardening** Maintain and support a viable community gardening program to foster an appreciation of local ecology, instill a sense of stewardship and community, and provide a multi-ethnic, multi-generational activity open to all.
Policy OS-5.2	**Joint Use of Right-of-Way** Promote the development of linear parks or trails within utility or transportation corridors, including transmission line rights-of-way, abandoned railroad rights-of-way, and areas under the elevated BART tracks.
Policy OS-5.4	**Maintenance of Mid-Block Paths** Maintain a network of mid-block paths and stairsteps in Oakland to enhance neighborhood character and provide pedestrian "short-cuts" through developed areas.
Objective OS-12	**Street Trees** To green Oakland's residential neighborhoods and commercial areas with street trees.
Policy OS-12.2	**Street Tree Maintenance** Maintain street trees to promote their natural forms, eliminate hazardous conditions, provide adequate vertical clearance over streets and sidewalks, and abate pest and disease problems.
Policy CO-1.2	**Soil Contamination Hazards** Minimize hazards associated with soil contamination through the appropriate storage and disposal of toxic substances, monitoring of dredging activities and clean-up of contaminated sites. In this regard, require soil testing for development of any site (or dedication of any parkland or community garden) where contamination is suspected due to prior activities on the site.
Objective CO-4	**Water Supply** To maintain a water supply sufficient to meet local needs while maintaining the need to develop new water supply facilities.
Policy CO-4.1	**Water Conservation** Emphasize water conservation and recycling strategies in efforts to meet future demand.
Policy CO-4.2	**Drought-Tolerant Landscaping** Require the use of drought-tolerant plants to the greatest extent possible and encourage the use of irrigation systems which minimize water consumption.
Action CO-4.2.1	**Adoption of a Water Efficient Landscape Ordinance** Adopt a revised version of the Water Efficient Landscaping Ordinance.
Policy CO-4.3	**Use of Reclaimed Water** Study the feasibility of amending the Oakland Municipal Code to require the use of reclaimed wastewater for irrigation on development exceeding a certain threshold, or to require that new irrigation systems be designed so that they can be switched over to reclaimed water when it becomes economically feasible.
Policy CO-4.4	**Water Conscious Development Process** Encourage regional development patterns which make environmentally sound use of water resources.

Policy	Description
Policy CO-7.4	**Tree Removal** Discourage the removal of large trees on already developed sites unless removal is required for biological, public safety, or public works reasons.
Action CO-7.6.1	**Long-Term Tree Replacement Plan and Firestorm Reforestation** Develop a long-term plan for maintaining and replacing Oakland's aging trees and reforesting the 1991 firestorm area.
Objective CO-10	**Vegetation Management** To manage vegetation so that the risk of catastrophic wildfire is minimized.
Objective CO-12	**Air Resources** To improve air quality in Oakland and surrounding Bay Region.
Policy CO-12.1	**Land Use Patterns Which Promote Air Quality** Promote land use patterns and densities which help improve regional air quality conditions by: (a) minimizing dependence on single passenger autos; (b) promoting projects which minimize quick auto starts and stops, such as live-work development, mixed use development, and office development with ground floor retail space; (c) separating land uses which are sensitive to pollution from the sources of air pollution; and (d) supporting telecommuting, flexible work hours, and behavioral changes which reduce the percentage of people in Oakland who must drive to work on a daily basis.
Policy CO-12.2	**Coordinated Transportation Systems** Maintain a coordinated bus, rail, and ferry transit system which provides efficient service to major destinations and promotes alternatives to the single passenger auto.
Policy CO-12.3	**Transportation Systems Management** Expand existing transportation systems management and transportation demand management strategies which reduce congestion, vehicle idling, and travel in single passenger autos.
Policy CO-12.4	**Design of Development to Minimize Air Quality Impacts** Require that development projects be designed in a manner which reduces potential adverse air quality impacts. This may include: (a) the use of vegetation and landscaping to absorb carbon monoxide and to buffer sensitive receptors; (b) the use of low-polluting energy sources and energy conservation measures; and (c) designs which encourage transit use and facilitate bicycle and pedestrian travel.
Policy CO-12.7	**Regional Air Quality Planning** Coordinate local air quality planning efforts with other agencies, including adjoining cities and counties, and the public agencies responsible for monitoring and improving air quality. Cooperate with regional agencies such as the Bay Area Air Quality Management District (BAAQMD), the Metropolitan Transportation Commission (MTC), the Association of Bay Area Governments (ABAG), and the Alameda County Congestion Management Agency in developing and implementing regional air quality strategies. Continue to work with BAAQMD and the California Air Resources Board in enforcing the provisions of the State and Federal Clean Air Acts, including the monitoring of air pollutants on a regular and on-going basis.
Objective 13	**Energy Resources** To manage Oakland's energy resources as efficiently as possible, reduce consumption of non-renewable resources, and develop energy resources which reduce dependency on fossil fuels.

Policy	Description
Policy CO-13.1	**Reliable Energy Network** Promote a reliable local energy network which meets future needs and long-term economic development objectives at the lowest practical cost.
Policy CO-13.2	**Energy Efficiency** Support public information campaigns, energy audits, the use of energy-saving appliances and vehicles, and other efforts which help Oakland residents, businesses, and City operations become more energy efficient.
Policy CO-13.3	**Construction Methods and Materials** Encourage the use of energy-efficient construction and building materials. Encourage site plans for new development which maximize energy efficiency.
Policy CO-13.4	**Alternative Energy Sources** Accommodate the development and use of alternative energy resources, including solar energy and technologies which convert waste or industrial byproducts to energy, provided that such activities are compatible with surrounding land uses and regional air and water quality requirements.
Policy REC-8.7	**Transit-Dependent Populations** Improve access to parks and recreational services for adults without access to automobiles.

Housing Element

Policy	Description
Policy 1.3	**Appropriate Locations and Densities for Housing** Consistent with the General Plan Land Use and Transportation Element adopted in 1998, review and revise the residential development regulations with the intent of encouraging and sustaining a diverse mix of housing types and densities throughout the City for all income levels.
Action 1.3.2	**Mixed Use Development** Consistent with the General Plan Urban Residential land use classification, update the Planning Code and Development Control Map to rezone designated commercial areas along San Pablo Avenue, Telegraph Avenue, MacArthur Boulevard, Foothill Boulevard and International Boulevard to higher density residential uses or to urban residential mixed use zoning districts to allow mixed use developments that include a combination of retail, office, and residential uses in the same project or on the same site. See Action 7.5.1.
Policy 1.6	**Adaptive Reuse** Encourage the re-use of industrial and commercial buildings for joint living quarters and working spaces.
Policy 7.1	**Sustainable Residential Development Programs** Develop and promote programs to foster the incorporation of sustainable design principles, energy efficiency and Smart Growth principles into residential developments. Offer education and technical assistance regarding sustainable development to project applicants.
Policy 7.2	**Minimize Energy Consumption** Encourage the incorporation of energy conservation design features in existing and future residential development beyond minimum standards required by State building code.

Policy	Description
Policy 7.3	**Foster Low-Carbon Emission and Development** Continue to direct development toward existing communities and encourage infill development at densities that are higher than—but compatible with-- the surrounding communities. Encourage development in close proximity to transit, and with a mix of land uses in the same zoning district, or on the same site, so as to reduce the number and frequency of trips made by automobile.
Policy 7.4	**Minimize Environmental Impacts from New Housing** Work with developers to encourage construction of new housing that, where feasible, reduces the footprint of the building and landscaping, preserves green spaces, and supports ecological systems.

Historic Preservation Element

Policy	Description
Objective 1	**Identifying Properties Potentially Warranting Preservation** To adopt an objective, consistent, well-documented, and widely-accepted method for identifying which properties warrant, or may warrant preservation effort and for determining the relative importance of each of these properties so that preservation efforts may be appropriately gauged.
Objective 2	**Preservation Incentives and Regulations** To develop a system of preservation incentives and regulations for specifically designated significant older properties.
Objective 3	**Historic Preservation and Ongoing City Activities** To establish administrative procedures and criteria to promote preservation of significant older properties as a routine part of City-sponsored or assisted projects, programs, and regulatory activities.
Policy 3.5	**Historic Preservation and Discretionary Permit Approvals** For any project involving complete demolition of Heritage Properties or Potential Designated Historic Properties requiring discretionary City permits, the City will make the finding that: (1) the design quality of the proposed project is at least equal to that of the original structure and is compatible with the character of the neighborhood; or (2) the public benefits of the proposed project outweigh the benefit of retaining the original structure; or (3) the existing design is undistinguished and does not warrant retention and the proposed design is compatible with the character of the neighborhood.
Policy 3.6	**Historic Preservation and City-Sponsored or Assisted Projects** To the extent consistent with other Oakland General Plan provisions, City-sponsored or assisted projects involving an existing or Potential Designated Historic Property, except small-scale projects, will: (a) be selected and designed to avoid or minimize adverse effects on these properties and to promote their preservation and enhancement; (b) incorporate preservation efforts based in part on the importance of each property; and (c) be considered to have no adverse effects on the these properties if they conform with the Secretary of the Interior's Standards for the Treatment of Historic Properties. The City will encourage applicants for City-assisted projects to submit proposals consistent with this policy.
Policy 3.7	**Property Relocation Rather than Demolition as Part of Discretionary Projects** As a condition of approval for all discretionary projects involving demolition of existing or Potential Designated Historic Properties, the City will normally require that reasonable efforts be made to relocate the properties to an acceptable site.

Safety Element

Policy	Description
Policy PS-1	Maintain and enhance the city's capacity to prepare for, mitigate, respond to and recover from disasters and emergencies.
Policy FI-3	Prioritize the reduction of the wildfire hazard, with an emphasis on prevention.
Policy HM-2	Reduce the public's exposure to toxic air contaminants through appropriate land use and transportation strategies.
Policy FL-1	Enforce and update local ordinances, and comply with regional orders, that would reduce the risk of storm-induced flooding.
Policy FL-2	Continue or strengthen city programs that seek to minimize the storm-induced flooding hazard.
Policy FL-3	Seek the cooperation and assistance of other government agencies in managing the risk of storm-induced flooding.
Action FL-4.3	Inform shoreline-property owners of the possible long-term economic threat posed by rising sea levels.
Action FL-4.4	Stay informed of emerging scientific information on the subject of rising sea levels, especially on actions that local jurisdictions can take to prevent or mitigate this hazard.

Bicycle Master Plan

Policy	Description
Policy 1A	**Bikeway Network** Develop and improve Oakland's bikeways network.
Policy 1B	**Routine Accommodations** Address bicycle safety and access in the design and maintenance of all streets.
Policy 1C	**Safe Routes to Transit** Improve bicycle access to transit, bicycle parking at transit facilities, and bicycle access on transit vehicles.
Policy 1D	**Parking and Support Facilities** Promote secure and conveniently located bicycle parking at destinations throughout Oakland.
Policy 2A	**Education** Work with public agencies and the private sector to improve bicycle education, enforcement, and promotional programs.
Policy 2B	**Enforcement** Prioritize the enforcement of traffic laws that protect bicyclists.
Policy 3A	**Resources** Seek the necessary staff and funding to implement the Bicycle Master Plan.
Policy 3B	**Project Development** Prioritize and design bicycle projects in cooperation with key stakeholders.
Policy 3C	**Public Review** Prior to the implementation of bikeway projects, affected residents, merchants, and property owners shall be notified of the project's costs and benefits.

Pedestrian Master Plan

Policy	Description
Policy 1.1	**Crossing Safety** Improve pedestrian crossings in areas of high pedestrian activity where safety is an issue.
Policy 1.2	**Traffic Signals** Use traffic signals and their associated features to improve pedestrian safety at dangerous intersections.
Policy 1.3	**Sidewalk Safety** Strive to maintain a complete sidewalk network free of broken or missing sidewalks or curb ramps.
Policy 2.1	**Route Network** Create and maintain a pedestrian route network that provides direct connections between activity centers.
Policy 2.2	**Safe Routes to School** Develop projects and programs to improve pedestrian safety around schools.
Policy 2.3	**Safe Routes to Transit** Implement pedestrian improvements along major AC Transit lines and at BART stations to strengthen connections to transit.
Policy 3.2.	**Land Use** Promote land uses and site designs that make walking convenient and enjoyable**.**
Policy 4.1	**Education** Promote safe and courteous walking and driving and the benefits of walking through targeted outreach programs.
Policy 4.2	**Enforcement** Prioritize the enforcement of traffic laws that protect the lives of pedestrians.

Estuary Policy Plan

Policy	Description
Objective C-2	Establish a continuous waterfront parkway; a safe promenade for pedestrians, bicycles, and slow-moving automobiles.
Objective C-5	Promote transit service to and along the waterfront.
Objective C-6	Improve pedestrian and bicycle circulation.
Policy JL-6	Encourage the preservation and adaptive reuse of existing buildings in a new Waterfront Warehouse District. Use of buildings and new infill development should include joint living and working quarters, residential, light industrial, warehousing & distribution, wholesaling, offices and other uses which preserve and respect the District's unique character.
Policy JL-14	Provide for increased transit service to the Jack London District.
Policy JL-15	Enhance bicycle circulation through the Jack London District.
Policy OAK-6	Explore the future potential for a new BART station and major parking facility on BART property at Fifth Avenue and East Eighth Street.

Policy	Description
Policy OAK-9	Improve the Embarcadero east of Oak Street as a multimodal landscaped parkway with bicycle, pedestrian and vehicular facilities.
Policy OAK-10	Create a network of pedestrian-friendly streets that opens up views and access to the water.
Policy SAF-9	Provide a continuous Embarcadero parkway from Ninth Avenue to Damon Slough.

Other Existing City Policies Supporting GHG Reductions

- Sustainable Development Resolution (No. #74678 C.M.S., 1998)

  Authorizes the City of Oakland to adopt the "City of Oakland Sustainable Community Development Initiative"

- Climate Protection Resolution (No. #72809 C.M.S., 1998)

  Authorizes the City of Oakland to join the Cities for Climate Protection campaign; and to apply to the International Council for Local Environmental Initiatives (ICLEI) and accept the amount of $13,000 for the "Get Around Town" Transportation alternatives marketing project

- Construction and Demolition Recycling Ordinance (No. #12253 C.M.S., 2002)

  Authorizes the City of Oakland to divert a minimum of 50% of Construction and Demolition debris from landfills; process and return the materials in to the economic mainstream thereby conserving natural resources; and stimulating markets for recycled and salvaged materials.

- Recycled Content Procurement and Source Reduction Policy (No. #70814 C.M.S., 1994)

  Adopts the Source Reduction and Recycling Procurement Policy.

- Recycling Space Allocation Ordinance (No. #11807 C.M.S., 1995)

  Amends the Oakland planning code to include provisions which allow for adequate space for the collection and storage of recyclable materials.

- Green Fleet Resolution (No. #77842 C.M.S., 2003)

  Establishes "Green Fleet" policies and procedures to reduce greenhouse gas emissions and improve air quality in the City of Oakland, and to increase the energy efficiency of the city's fleet.

- Waste Reduction and Recycling Act (Measure D, 1989)

  Measure D establishes the Alameda County Source Reduction and Recycling Board. It was approved by the voters of Alameda County in November, 1990 by a margin of 63%. The requirements and prohibitions contained within the Alameda County Waste Reduction and Recycling Initiative apply to the County of Alameda, as an entity, and to unincorporated areas within the county.

- Waste Reduction Resolution (No. #77500 C.M.S., 2002)

  Establishes a goal of 75% reduction of waste going to landfills by 2010 for the City of Oakland in alliance with the countywide 75% waste reduction goal.

- Chicago Climate Exchange Resolution (No. #79135 C.M.S., 2005), Agenda Report and Supplemental Report

  Authorizes the Oakland City Administrator to establish membership in the Chicago Climate Exchange (a market for reducing and trading greenhouse gas emissions) for the City of Oakland, and to expend the funds necessary to initiate and maintain such membership and the cost of trading emissions.

- Urban Environmental Accords Resolution (No. #79808 C.M.S., 2006)

  Acknowledges the Urban Environmental Accords signed by Mayor Jerry Brown on January 5, 2005 on the occasion of United Nations World Environment Day and declares Oakland A Green City and proclaiming April, 2006 as Earth month in recognition of the 36th anniversary of Earth Day and the several community events to celebrate Oakland as a sustainable city.

- Civic Green Building Ordinance (No. #12658 C.M.S., 2005), Agenda Report and Supplemental Report

  Establishes green building (e.g. sustainable site development, water savings, energy efficiency materials selection and indoor environmental quality) requirements for certain City projects

- Food Policy Plan Resolution (No. #79680 C.M.S., 2006) and Agenda Report

  Authorizes the Mayor's Office of Sustainability to develop an Oakland food policy and plan for 30% local area food production, by undertaking an initial food systems assessment study, conducted by a research team from the University of California at Berkeley.

- Zero Waste Resolution (No. #79774 C.M.S., 2006) and Agenda Report

  Adopts a zero waste goal by 2020 for the City of Oakland and directing the Public Works Agency, in concert with the Mayor's Office, to develop a zero waste strategic plan to achieve the city's zero waste goal.

- Green Building Guidelines Resolutions (No. #79871 C.M.S., 2006) and Agenda Report

  Provides, as official City reference documents, The Alameda County Residential Green Building Guidelines, the U.S. Green Building Council's LEED Rating Systems and Bay-Friendly Landscape Guidelines, and recommending their use in the City of Oakland.

- Green Food Service Ware (No. #12747 C.M.S., 2006), Agenda Report and Supplemental Report

  Prohibits the use of polystyrene foam disposable food service ware and require, when cost neutral, the use of biodegradable or compostable disposable food service ware by food vendors and city facilities.

- Williams Resolution Resolution (No. #80659 C.M.S., 2007)

  Allocates $3,519,409.74 from Williams Energy Corporation and Reliant Energy Corporation settlement for energy efficiency projects for activities that promote alternative energy production or improved energy efficiency.

- Food Policy Council Resolution and Agenda Report

  Authorizes the City Administrator to allocate $50,000 from the Williams Energy Settlement within the City Facilities Energy Conservation Fund (4450) to Provide Startup Funding for the Establishment of a Food Policy Council for Oakland.

- Environmentally Preferable Purchasing Policy (2007)

  Requires City purchasers to consider environmental attributes along with traditional purchasing factors such as performance, safety, price and local availability, when making purchasing decisions.

- Zero Waste Strategic Plan Resolution (No. #80286 C.M.S., 2006), and Agenda Report

  Adopts a Zero Waste Strategic Plan to provide a framework of policies and initiatives to guide the planning and decision-making process to achieve Oakland's Zero Waste Goal.

- Extended Producer Responsibility Resolution (No. #80390 C.M.S., 2007) and Agenda Report

  Authorizes the City to pursue and support statewide and local legislative and other initiatives to hold producers responsible for product waste.

- Housing and Business Mix Zoning (No. #12772 C.M.S., 2006)

  Amends Title 17 of the Oakland Planning Code to include the Central Business District zoning regulations.

- Mills Act Pilot Program (No. #12784 C.M.S., 2007)
  The Mills Act Program is a preservation incentive that allows reductions of property tax assessments for historic properties if the owner signs an agreement with the local government to preserve and maintain the historic characteristics of the property.

- Industrial Zoning (No. #12875 C.M.S., 2008)

  Amends Title 17 of the Oakland Planning Code to include the industrial zoning regulations.

- Bike Parking Ordinance (July, 2008)

  Amends Title 17 of the Oakland Planning Code to include bicycle parking for certain development projects.

- Central Business District Zoning (No. #12955 C.M.S., 2009)
  Amends Title 17 of the Oakland Planning Code to include the Central Business District zoning regulations.
- Bay Friendly Landscaping Ordinance (June, 2009)
  Amends Title 15 of the Oakland Municipal Code to require City projects to meet minimum landscaping standards.
- Green Building Ordinance for Private Development Projects (October, 2010)
  Requires certain private development construction projects to meet minimum green building standards.

Standard Conditions of Approval

Listed below are applicable and adopted City of Oakland Conditions of Approval & Uniformly Applied Development Standards imposed as Standard Conditions of Approval related to policies in the Draft Energy and Climate Action Plan.

1. Required Landscape Plan for New Construction and Certain Additions to Residential Facilities of over 500 sq. ft.
2. Landscape Requirements for Street Frontages.
3. Assurance of Landscaping Completion.
4. Landscape Requirements for Downslope Lots.
5. Landscape Maintenance.
6. Parking and Transportation Demand Management for Projects over 50 units or 50,000 sq. ft. of non-residential space
7. Dust Control
8. Construction Emissions
9. Waste Reduction and Recycling
10. Asbestos Removal in Structures
11. Asbestos Removal in Soil
12. Tree Removal Permit on creekside and non-creekside properties
13. Tree Replacement Plantings
14. Tree Protection During Construction
15. Vegetation Management Plan for fire safety on creekside and non-creekside properties
16. Fire Safety during construction
17. Creek Protection Plan
18. Regulatory Permits and Authorizations for creek protection
19. Creek Monitoring
20. Creek Landscaping Plan
21. Creek Dewatering and Aquatic Life
22. Creek Dewatering and Diversion
23. Regulatory Permits and Authorizations for all projects within a flood plain
24. Structures within a Floodplain for all projects within a flood plain
25. Stormwater and Sewer capacity for new projects
26. Traffic Fairshare for Projects Located in Southeast Oakland
27. Indoor Air Quality for new residential uses and sensitive receptors
28. Air Pollution Buffering for Private Open Space for new residential uses and sensitive receptors

CEQA Review of Future Development Projects

This section explains the relationship between the ECAP and the review of future development projects under the California Environmental Quality Act (CEQA). In accordance with the State CEQA Guidelines and the Bay Area Air Quality Management District (Air District) CEQA Guidelines, the City may determine that future proposed development projects would result in a less-than-significant GHG impact under CEQA if the projects are consistent with a "qualified GHG Reduction Strategy" that meets certain requirements under the State CEQA Guidelines and the Air District CEQA Guidelines. The ECAP provides the framework for Oakland's qualified GHG Reduction Strategy. As demonstrated below, the ECAP, along with other City adopted plans and policies, provide the basis for tiering GHG impact analysis of future projects so that future projects would result in less-than-significant GHG impacts under CEQA if the future projects comply with the ECAP and other City requirements.

Environmental impacts associated with GHG emissions are now recognized under CEQA. According to the State CEQA Guidelines §15183.5 (Tiering and Streamlining the Analysis of Greenhouse Gas Emissions):[xvii]

> *"(a) Lead agencies may analyze and mitigate the significant effects of greenhouse gas emissions at a programmatic level, such as in a general plan, a long range development plan, or a separate plan to reduce greenhouse gas emissions. Later project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review. Project-specific environmental documents may rely on an EIR containing a programmatic analysis of greenhouse gas emissions as provided in section 15152 (tiering), 15167 (staged EIRs) 15168 (program EIRs), 15175-15179.5 (Master EIRs), 15182 (EIRs Prepared for Specific Plans), and 15183 (EIRs Prepared for General Plans, Community Plans, or Zoning).*
>
> *(b) Plans for the Reduction of Greenhouse Gas Emissions. Public agencies may choose to analyze and mitigate significant greenhouse gas emissions in a plan for the reduction of greenhouse gas emissions or similar document. A plan to reduce greenhouse gas emissions may be used in a cumulative impacts analysis as set forth below. Pursuant to sections 15064(h)(3) and 15130(d), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances.*
>
> *(1) Plan Elements. A plan for the reduction of greenhouse gas emissions should:*
>
> - *A. Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;*
> - *B. Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;*
> - *C. Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;*
> - *D. Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;*
> - *E. Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels;*
> - *F. Be adopted in a public process following environmental review."*
>
> *(2) Use with Later Activities. A plan for the reduction of greenhouse gas emissions, once adopted following certification of an EIR or adoption of an environmental document, may be used in the cumulative impacts analysis of later projects. An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project. If there is substantial evidence that the effects of a particular project may be cumulatively considerable*

notwithstanding the project's compliance with the specified requirements in the plan for the reduction of greenhouse gas emissions, an EIR must be prepared for the project.

The Air District has further clarified the above Guidelines by developing specific criteria for the development of a qualified GHG Reduction Strategy that would comply with these requirements. According to the Air District 's June 2010 CEQA Guidelines:

"If a project is located in a community with an adopted qualified GHG Reduction Strategy…, the project may be considered less than significant if it is consistent with the GHG Reduction Strategy. A project must demonstrate its consistency by identifying and implementing all applicable feasible measures and policies from the GHG Reduction Strategy into the project."[xviii]

The ECAP contains the following elements specified in the Air District's CEQA Guidelines to serve as a qualified GHG Reduction Strategy.[xix] Meeting these criteria should enable the ECAP, upon environmental review, formal adoption, and implementation to relieve future Oakland development projects of conducting additional project-specific GHG analysis as part of their CEQA review:

Air District CEQA Guidelines Requirement for a Qualified GHG Reduction Strategy	**ECAP Consistency with Requirement**
Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area. Include projections for forecast year 2020.	The ECAP includes a baseline GHG inventory for Oakland's citywide direct GHG emissions from the year 2005. The ECAP also includes a forecast of 2020 citywide GHG emissions under business-as-usual assumptions. Results of these analyses are shown in Chapter 4 of this document.
A GHG Reduction Strategy must establish a target that is adopted by legislation that meets or exceeds one of the following options, all based on AB 32 goals: • Reduce emissions to 1990 level by 2020 • Reduce emissions 15 percent below baseline (2008 or earlier) emission level by 2020 • Meet the plan efficiency threshold of 6.6 MT CO2e/service population/year	The ECAP includes a goal of reducing citywide GHG emissions by 36% below 2005 levels by 2020. This goal is expected to be adopted in the context of adoption of the ECAP. This goal exceeds the minimum requirements outlined by the Air District in comparison with each of the options provided.
Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area.	The ECAP includes quantified estimates of the anticipated results of State-driven strategies included in the AB 32 Scoping Plan. State-driven strategies that do not require implementation action by the City are assumed to be part of an adjusted business-as-usual projection of 2020 emissions. Strategies that would require action by the City (e.g., land use planning to reduce vehicle miles traveled and associated fuel consumption), are included in the ECAP in relevant sections of Chapters 3 & 4.
Specify measures or a group of measures, including performance standards that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level. The GHG Reduction Strategy should include mandatory and enforceable measures that impact new development projects, such as mandatory energy efficiency standards, density requirements, etc. These measures may exist in codes or other policies and may be included in the Strategy by reference. The GHG Reduction Strategy should include quantification of expected GHG reductions from each	The ECAP contains more than 130 distinct GHG reduction actions recommended for implementation by 2020 that would, in concert with anticipated State actions, achieve Oakland's 2020 GHG reduction goal as outlined above. The draft ECAP includes quantification of projected GHG reduction benefits of recommended actions. Individual actions have been quantified where possible, and in many cases actions have been grouped for the purpose of quantifying projected benefits. Additional information on how recommended strategies and actions will help to reduce citywide GHG emissions to the 2020 GHG reduction target is provided in Chapter 4 of this Appendix.

Air District CEQA Guidelines Requirement for a Qualified GHG Reduction Strategy	ECAP Consistency with Requirement
identified measure or categories of measures (such as residential energy efficiency measures, bike/pedestrian measures, recycling measures, etc.), including disclosure of calculation methods and assumptions. Quantification should reflect annual GHG reductions and demonstrate how the GHG reduction target will be met. The Strategy should specify which measures apply to new development projects.	
To ensure that all new development projects are incorporating all applicable measures contained within the GHG Reduction Strategy, the Strategy should include an Implementation Plan containing the following: 1) Identification of which measures apply to different types of new development projects, discerning between voluntary and mandatory measures. 2) Mechanism for reviewing and determining if all applicable mandatory measures are being adequately applied to new development projects. 3) Identification of implementation steps and parties responsible for ensuring implementation of each action. 4) Schedule of implementation identifying near-term and longer-term implementation steps. 5) Procedures for monitoring and updating the GHG inventory and reduction measures every 3-5 years before 2020 and submitting annual implementation updates to the jurisdiction's governing body. 6) Annual review and reporting on the progress of implementation of individual measures, including assessment of how new development projects have been incorporating Strategy measures. Review should also include an assessment of the implementation of Scoping Plan measures in order to determine if adjustments to local Strategy must be made to account for any shortfalls in Scoping Plan implementation.	The ECAP includes a plan for monitoring implementation of actions contained in the plan, as well as evolving the plan over time. Each of the following are included: 1) The section below identifies which measures would be voluntary and which measures would be mandatory. 2) The City will report on the mechanism for reviewing and applying mandatory measures to new development projects. 3) Responsible parties are identified for all actions recommended for implementation in the next three years (2010-2013). 4) The ECAP outlines both a ten year plan for achieving Oakland's 2020 GHG reduction target (Chapter 4), as well as a Three Year Priority Plan for ensuring near term progress toward this goal (Chapter 3). A summary is provided in Chapter 3 of the anticipated implementation starts of all Priority Actions for which resources have been identified. Chapter 5 outlines how implementation will be coordinated and where additional funding will be sought to support implementation. 5) Chapter 5 outlines procedures for monitoring progress, reporting on and updating the ECAP. The City will update the ECAP every three years. Updates will include Oakland's citywide GHG inventory as well as priority actions for the next three year phase of implementation. City staff will provide annual implementation updates to the City Council. 6) The City will report on the status of actions and key performance metrics on an annual basis, as outlined in Chapter 5, and report on implementation of requirements for new development projects.
Adopt the GHG Reduction Strategy in a public process following environmental review. A GHG Reduction Strategy should undergo an environmental review which may include a negative declaration or EIR. If the GHG Reduction Strategy consists of a number of different elements, such as a general plan, a climate action plan and/or separate codes, ordinances and policies, each element that is applicable to new development projects would have to complete an environmental review in order to allow tiering for new development projects.	The Draft ECAP has undergone an extensive public process as outlined on pages 2-3 of the Appendix, in addition to duly noticed public hearings before the City Planning Commission, Public Works Committee of the City Council, and the City Council. Environmental review of the ECAP is planned to be completed prior to ECAP adoption.

The City believes that implementation of the ECAP, in combination with other existing City regulations that place specific GHG-reducing requirements on new development (e.g., Standard Conditions of Approval, the Bicycle Master Plan), would meet the requirements set forth in the State CEQA Guidelines and the Air District CEQA Guidelines above. Therefore, the City would be able to use this combination of plans and policies for the purpose of tiering GHG impact analysis of future projects to determine that future projects would result in a less-than-significant GHG impact under CEQA if the projects comply with the ECAP and other City requirements.

Mandatory Requirements

The following would impose mandatory requirements on new development projects upon their respective future adoption called for by the ECAP:

Action Number	Action	Funded 3-Year Priority Action	Other 3-Year Priority Action	Other 10-Year Action
Goal Area: Transportation and Land Use				
TLU-7	Create a Transportation Impact Fee		✓	
TLU-8	Require Transit-Oriented Development Performance for New Development			✓
TLU-13	Launch and Develop a Funding Plan for the Downtown Shuttle	✓		
TLU-16	Accelerate Completion of Bicycle and Pedestrian Networks		✓	
TLU-17	Optimize Street Design for Transit, Bicycling and Walking			✓
TLU-26	Enforce Transportation Demand Management Measures in New Development			✓
TLU-30	Impose Parking Maximums on New Development			✓
TLU-31	Facilitate Unbundling of Parking Costs from Renting Building Space			✓
Goal Area: Building Energy Use				
BE-1	Adopt a Green Building Ordinance for Private Development	✓		
BE-29	Create an Oakland-specific Water Efficient Landscape Ordinance	✓		
Goal Area: Material Consumption and Waste				
MW-1	Restructure Solid Waste Management System	✓		
MW-4	Enforce Statewide and Countywide Bans on Certain Materials		✓	

Voluntary Actions

The following ECAP actions would encourage additional voluntary action by new development projects.

Action Number	Action	Funded 3-Year Priority Action	Other 3-Year Priority Action	Other 10-Year Action
Goal Area: Transportation and Land Use				
TLU-9	Encourage New Housing at Range of Price Levels			✓
TLU-11	Promote Vibrant, Safe and Attractive Transit-Oriented Dense Development			✓
TLU-13	Launch and Develop a Funding Plan for the Downtown Shuttle	✓		
TLU-16	Accelerate Completion of Bicycle and Pedestrian Networks		✓	
TLU-17	Optimize Street Design for Transit, Bicycling and Walking			✓
TLU-18	Support Alternative Transportation Strategies by Private Employers			✓
TLU-21	Provide Outreach on Alternative Transportation Options			✓
TLU-25	Explore Strategies for Increasing Local Car Share Capacity			✓
TLU-28	Develop Regulations Allowing Alternatives to Installing Parking		✓	
TLU-31	Facilitate Unbundling of Parking Costs from Renting Building Space			✓
TLU-33	Engage in Electric Vehicle Infrastructure Planning		✓	
TLU-34	Promote Use of Fuel-Efficient Vehicles and Low Carbon Fuels			✓
TLU-35	Encourage Low-Carbon Fuels Production			✓
TLU-36	Establish GHG Performance Criteria for Large Vehicle Fleets			✓
TLU-37	Call for Port of Oakland GHG Reduction Goals and Plans	✓		
TLU-38	Call for Climate Action by Port Tenants	✓		
Goal Area: Building Energy Use				
BE-7	Encourage All Community Members to Engage in Energy Conservation		✓	
BE-9	Promote Energy Efficiency to Property Owners and Tenants			✓
BE-11	Encourage Participation in Local Energy Efficiency Programs	✓		
BE-15	Promote Use of Building Energy Feedback Systems			✓
BE-16	Enhance Energy Retrofit Assistance for Small Commercial Properties			✓
BE-17	Launch a Commercial Building Energy Challenge Program			✓
BE-25	Launch a Community Solar Program		✓	
BE-30	Expand Promotion of Water Conservation and Efficiency			✓
BE-34	Promote Detailed Water Metering			✓
BE-35	Promote Indoor Water Efficiency			✓

Goal Area: Material Consumption and Waste				
MW-5	Conduct New Social Marketing Campaigns		✓	
MW-19	Evaluate Potential for Gardens on City-controlled Land			✓
MW-20	Encourage Gardens in Private Development			✓
MW-23	Provide Compost to Community Members			✓
MW-26	Consider Local Food in Selecting Vendors for City Events and Contracts			✓
Goal Area: Community Engagement				
CE-1	Provide Additional Information on Energy and Climate Issues Through Existing City Channels	✓		
CE-2	Expand Outreach on Energy and Climate Issues Through Partnerships with Local Organizations	✓		
CE-3	Develop a Community Climate Action Guide		✓	
CE-4	Support Local Climate Action Workshops		✓	
CE-8	Encourage Local Organizations to Integrate Climate Action into Operations			✓

Actions Reference Tables

The following tables provide a quick summary of all actions included in the draft Energy and Climate Action Plan. Actions are categorized based on the following criteria as identified in the draft ECAP:

- Actions identified to move forward with existing or anticipated resources during the next three years (2010-2013)
- Actions recommended for prioritization in the next three years for which new resources would be needed
- Other actions recommended for implementation by 2020

Action Number	Action	Funded 3-Year Priority Action	Other 3-Year Priority Action	Other 10-Year Action
Goal Area: Transportation and Land Use				
Strategy: Institutionalize a More Comprehensive Approach to Transportation and Land Use Planning				
TLU-1	Participate in Quarterly SB 375 Discussions	✓		
TLU-2	Develop a Comprehensive Oakland Transportation Plan		✓	
TLU-3	Integrate Land Use and Transportation Planning in Every Project		✓	
TLU-4	Augment Planning Commission Role in Transportation Planning			✓
TLU-5	Prioritize GHG Reductions in Zoning Updates			✓
Advance Infill, Mixed-Use and Transit-Oriented Development				
TLU-6	Identify and Adopt Priority Development Areas	✓		
TLU-7	Create a Transportation Impact Fee		✓	
TLU-8	Require Transit-Oriented Development Performance for New Development			✓
TLU-9	Encourage New Housing at Range of Price Levels			✓
TLU-10	Develop a Comprehensive Infrastructure Plan			✓
TLU-11	Promote Vibrant, Safe and Attractive Transit-Oriented Dense Development			✓
TLU-12	Engage Lenders on Infill Development Strategy			✓
Advance the Use of Low-Carbon Transportation Modes				
TLU-13	Launch and Develop a Funding Plan for the Downtown Shuttle	✓		
TLU-14	Advance Bus Rapid Transit in Oakland	✓		
TLU-15	Update Environmental Impact Evaluation Process		✓	
TLU-16	Accelerate Completion of Bicycle and Pedestrian Networks		✓	
TLU-17	Optimize Street Design for Transit, Bicycling and Walking			✓
TLU-18	Support Alternative Transportation Strategies by Private Employers			✓
TLU-19	Expand and Enhance Transit Service, Interconnections, Vehicles, and Facilities			✓
TLU-20	Enhance Transit Service on Major Corridors			✓

Action Number	Action	Funded 3-Year Priority Action	Other 3-Year Priority Action	Other 10-Year Action
TLU-21	Provide Outreach on Alternative Transportation Options			✓
TLU-22	Promote Transportation Options Information			✓
TLU-23	Promote Educational Outreach Efforts			✓
TLU-24	Encourage Bike Sharing Programs			✓
TLU-25	Explore Strategies for Increasing Local Car Share Capacity			✓
TLU-26	Enforce Transportation Demand Management Measures in New Development			✓
TLU-27	Reduce Barriers to Transit			✓
Refine Parking Policies to Encourage Low-Carbon Mobility				
TLU-28	Develop Regulations Allowing Alternatives to Installing Parking		✓	
TLU-29	Develop a Dynamic Parking Pricing Strategy		✓	
TLU-30	Impose Parking Maximums on New Development			✓
TLU-31	Facilitate Unbundling of Parking Costs from Renting Building Space			✓
TLU-32	Review Opportunities to Expand Residential Permit Parking			✓
Foster the Use of Low Carbon Vehicles and Fuels				
TLU-33	Engage in Electric Vehicle Infrastructure Planning		✓	
TLU-34	Promote Use of Fuel-Efficient Vehicles and Low Carbon Fuels			✓
TLU-35	Encourage Low-Carbon Fuels Production			✓
TLU-36	Establish GHG Performance Criteria for Large Vehicle Fleets			✓
Engage the Port of Oakland and Related Industry in Reducing GHG Emissions				
TLU-37	Call for Port of Oakland GHG Reduction Goals and Plans	✓		
TLU-38	Call for Climate Action by Port Tenants	✓		
TLU-39	Partner with the Port to Advance GHG Reductions			✓
TLU-40	Advocate With the Port for Tenant Performance Requirements			✓
TLU-41	Study Truck Re-routing Options			✓
TLU-42	Make Planning Decisions With Consideration of Port GHG Impacts			✓
TLU-43	Consider Opportunities to Require Port Climate Action via General Plan Update			✓
Grow Oakland's Urban Forest				
TLU-44	Develop an Urban Forest Master Plan		✓	
TLU-45	Conduct an Urban Tree Inventory			✓
TLU-46	Provide Preventative Tree Maintenance and Management			✓
TLU-47	Implement a Street Tree Planting Pilot Project			✓
TLU-48	Promote Proper Forest Management and Private Tree Planting			✓
TLU-49	Convene Community Tree Maintenance Workshops			✓

Action Number	Action	Funded 3-Year Priority Action	Other 3-Year Priority Action	Other 10-Year Action
TLU-50	Collaborate with Local Organizations on Urban Forestry			✓
Reduce Transportation Impacts of City Operations				
TLU-51	Replace Inefficient City Vehicles		✓	
TLU-52	Provide Subsidized Transit Passes and Commuter Allowances		✓	
TLU-53	Discontinue Providing Parking to City Employees		✓	
TLU-54	Enable Flexible Work Schedules and Encouraging Telecommuting			✓
TLU-55	Reduce the Size of the City's Vehicle Fleet			✓
TLU-56	Perform Preventive Maintenance to Optimize Fuel Efficiency			✓
TLU-57	Expand Staff Training on Fuel Efficient Vehicle Operations			✓
TLU-58	Expand Capacity to Support Electric and Alternative Fuel Vehicles			✓
TLU-59	Integrate fuel efficient specialized vehicles into City fleet			✓
Goal Area: Building Energy Use				
Optimize Energy Efficiency & Consumption in New Buildings				
BE-1	Adopt a Green Building Ordinance for Private Development	✓		
BE-2	Enforce Building Energy Codes			✓
Retrofit Oakland's Existing Building Stock to Reduce Energy Consumption – All Building Types				
BE-3	Adopt a Green Building Ordinance for Private Renovation Projects	✓		
BE-4	Offer Property-Based Energy Financing	✓		
BE-5	Engage Utilities to Offer On-Bill Financing Options		✓	
BE-6	Create New Residential and Commercial Energy Programs		✓	
BE-7	Encourage All Community Members to Engage in Energy Conservation		✓	
BE-8	Promote a Energy Upgrades for Historic Buildings			✓
BE-9	Promote Energy Efficiency to Property Owners and Tenants			✓
Retrofit Oakland's Existing Building Stock to Reduce Energy Consumption – Commercial/Industrial Buildings				
BE-10	Launch a Downtown Commercial Energy Retrofit Program	✓		
BE-11	Encourage Participation in Local Energy Efficiency Programs	✓		
BE-12	Target Energy Efficiency Outreach to Energy Intensive Businesses		✓	
BE-13	Require Energy-Related Improvements at Time of Lease or Sale			✓
BE-14	Develop New Tools to Advance Commercial Building Retrofits			✓
BE-15	Promote Use of Building Energy Feedback Systems			✓
BE-16	Enhance Energy Retrofit Assistance for Small Commercial Properties			✓
BE-17	Launch a Commercial Building Energy Challenge Program			✓

Action Number	Action	Funded 3-Year Priority Action	Other 3-Year Priority Action	Other 10-Year Action
Retrofit Oakland's Existing Building Stock to Reduce Energy Consumption – Residential Buildings				
BE-18	Launch a Residential Green Retrofit Program	✓		
BE-19	Conduct a Multi-Family Affordable Housing Retrofit Pilot	✓		
BE-20	Expand Weatherization Program Delivery	✓		
BE-21	Accelerate Energy Retrofits in Tenant-Occupied Properties		✓	
BE-22	Adopt a Residential Energy Improvement Time of Sale Ordinance		✓	
BE-23	Support Entry-Level Residential Energy Services Programs			✓
BE-24	Make Energy Related Tools Available at the Tool Lending Library			✓
Increase the Use of Clean Renewable Energy				
BE-25	Launch a Community Solar Program		✓	
BE-26	Encourage PG&E to Offer Green Power		✓	
BE-27	Continue to Monitor Community Choice Energy		✓	
BE-28	Study Local Renewable Energy Potential			✓
Promote Water Conservation and Efficiency				
BE-29	Create an Oakland-specific Water Efficient Landscape Ordinance	✓		
BE-30	Expand Promotion of Water Conservation and Efficiency			✓
BE-31	Support Partners in Promoting Water Conservation and Efficiency			✓
BE-32	Encourage Use of Rainwater Collection Systems			✓
BE-33	Refine Greywater Permit Process			✓
BE-34	Promote Detailed Water Metering			✓
BE-35	Promote Indoor Water Efficiency			✓
BE-36	Landscape Municipal Open Space with Water Efficient Vegetation			✓
BE-37	Require Water Efficiency in City Operations			✓
Optimize Energy Efficiency & Consumption in City Facilities				
BE-38	Implement Advanced Operating Procedures for City Facilities	✓		
BE-39	Improve Energy Performance of New City Facilities	✓		
BE-40	Retrofit City Facilities to Improve Energy Performance	✓		
BE-41	Explore Alternative Energy for City Facilities			✓
BE-42	Upgrade to Energy-Efficient Streetlights			✓
BE-43	Develop and provide training to City employees on targeted energy and climate issues.			✓

Action Number	Action	Funded 3-Year Priority Action	Other 3-Year Priority Action	Other 10-Year Action
Goal Area: Material Consumption and Waste				
Expand and Improve Waste Reduction, Reuse, Recycling, and Composting				
MW-1	Restructure Solid Waste Management System	✓		
MW-2	Refine Implementation of C&D Recycling Ordinance	✓		
MW-3	Require Waste Reduction at Community Events	✓		
MW-4	Enforce Statewide and Countywide Bans on Certain Materials		✓	
MW-5	Conduct New Social Marketing Campaigns		✓	
MW-6	Study Options for Deeper Waste Reduction Activities		✓	
MW-7	Identify and Retain Industrial Lands for Zero Waste Businesses			✓
MW-8	Adopt Zero Waste Practices in City Operations			✓
MW-9	Require Reporting on Environmentally Preferable Purchasing Policy			✓
MW-10	Require Waste Reduction Reporting from State-Recognized Institutions			✓
MW-11	Facilitate Recycling of Organics in Multi-Family Buildings			✓
MW-12	Promote Bay Friendly Landscaping Practices			✓
Encourage Sustainable Consumption				
MW-13	Support Expanded Producer Responsibility			✓
MW-14	Promote Local Green Businesses and Expand Green Business Program			✓
MW-15	Foster Reuse, Repair, Buy Local and Buy Recycled			✓
MW-16	Recruit Businesses Supporting Zero Waste Goals to Oakland			✓
Foster More Local Food Production				
MW-17	Update Zoning Regulations to Better Allow For and Regulate Urban Agriculture	✓		
MW-18	Evaluate the Potential of Creating Community Gardens on City-Controlled Public Land	✓		
MW-19	Evaluate Potential for Gardens on City-controlled Land			✓
MW-20	Encourage Gardens in Private Development			✓
MW-21	Promote Consideration of Land Available for Urban Agriculture			✓
MW-22	Promote Training on Urban Gardening and Composting			✓
MW-23	Provide Compost to Community Members			✓
MW-24	Include Preference for Local Food in Evaluating Applications for City Funds & Contracts			✓
MW-25	Encourage Development of Shared Commercial Kitchens			✓
Develop Markets for Local Food				
MW-26	Consider Local Food in Selecting Vendors for City Events and Contracts			✓
MW-27	Promote Food Impact Consideration in Green Business Certification			✓

Action Number	Action	Funded 3-Year Priority Action	Other 3-Year Priority Action	Other 10-Year Action
MW-28	Promote Local Food to Community Partners			✓
MW-29	Advance Economic Development Strategies Supporting Local Food Production			✓
MW-30	Review Permitting Requirements for Local Food Distribution Efforts			✓
Goal Area: Community Engagement				
Encourage Community Energy and Climate Action				
CE-1	Provide Additional Information on Energy and Climate Issues Through Existing City Channels	✓		
CE-2	Expand Outreach on Energy and Climate Issues Through Partnerships with Local Organizations	✓		
CE-3	Develop a Community Climate Action Guide		✓	
CE-4	Support Local Climate Action Workshops		✓	
CE-5	Create Community Listservs on Climate Related Topics			✓
CE-6	Promote Climate-Related Events			✓
CE-7	Create a Community Climate Challenge			✓
CE-8	Encourage Local Organizations to Integrate Climate Action into Operations			✓
CE-9	Engage Philanthropic Support for Model Projects			✓
Create New Opportunities for Community Engagement				
CE-10	Convene Community Climate Forums	✓		
CE-11	Establish Opportunities for Ongoing Community Climate Action Input			✓
CE-12	Encourage Community Input on Updates to City Plans and Policy Documents			✓
CE-13	Include Climate Content in Regular Community Surveys			✓
CE-14	Engage the Community in Developing a 2050 Vision for Oakland			✓
Track and Promote Community Action				
CE-15	Report on Energy and GHG Reduction Progress	✓		
CE-16	Develop an Oakland Climate Action Model Practices Campaign		✓	
CE-17	Expand Energy and Climate Reporting and Outreach Tools			✓
CE-18	Recognize Local Climate Leaders and Model Actions			✓
CE-19	Promote Green Community Events			✓
Develop the Local Green Workforce to Support Local Green Businesses				
CE-20	Support Local Green Jobs Programs	✓		
CE-21	Facilitate Hiring of Green Jobs Program Graduates			✓
CE-22	Develop a Community Green Jobs Electronic Bulletin Board			✓

Action Number	Action	Funded 3-Year Priority Action	Other 3-Year Priority Action	Other 10-Year Action
Adapting & Increasing Resilience to Climate Change				
Study Potential Local Climate Impacts				
AD-1	Participate in Regional Climate Adaptation Discussions	✓		
AD-2	Conduct a Study of Local Climate Impacts		✓	
Communicate Climate Impacts to the Community				
AD-3	Communicate Climate Impacts Information to the Community		✓	
Identify and Act on Opportunities to Improve Resilience				
AD-4	Identify and Act on Opportunities to Improve Resilience in City Plans and Policies		✓	
AD-5	Update Community Emergency Preparedness Plans and Capacity			✓
AD-6	Encourage Development of Regional Climate Adaptation Strategy			✓
AD-7	Develop a Climate Adaptation Plan			✓
AD-8	Require Reflective Surfaces to Reduce Urban Heat Island Effect			✓
AD-9	Develop Oakland's Urban Forest			✓
AD-10	Promote Indoor and Outdoor Water Conservation and Efficiency			✓
AD-11	Install Infrastructure to Reduce Flood Impacts			✓
AD-12	Encourage EBMUD to Deliver Recycled Water to Oakland			✓
AD-13	Consider Opportunities to Raise Funds for Adaptation			✓

Glossary

ABAG: Association of Bay Area Governments

AC Transit: The bus system for the East Bay

BAAQMD: Bay Area Air Quality Management District

BART: Bay Area Rapid Transit

BCDC: San Francisco Bay Conservation and Development Commission

BIG: Build It Green, a Oakland-based non-profit that provides green building assistance

BRT: Bus Rapid Transit

C&D: Construction and demolition debris

CCA: Community Choice Aggregation, a term used to describe an arrangement that enables a local government to supply electricity to customers within its borders and involves the local government in the purchase and sale of the energy commodity

CEC: California Energy Commission

CECO: Commercial Energy Conservation Ordinance

CH_4: Methane, a powerful greenhouse gas

CO_2e: Carbon dioxide equivalent units, converting all emissions to equivalent carbon dioxide units allows for the consideration of different greenhouse gases on comparable terms

CPUC: California Public Utilities Commission

CYES: California Youth Energy Services, a program that employs local youth to promote energy awareness

EPP: Environmentally Preferable Purchasing, a City policy designed to require purchase of products and services that minimize environmental and health impacts, toxics, pollution, and hazards to worker and community safety

GHG: Greenhouse Gas, the term used for gases that trap heat in the atmosphere. The principal greenhouse gases that enter the atmosphere as a result of human activity are carbon dioxide, methane, and nitrous oxide

GPR: GreenPoint Rated, a green building standard used in California for new residential projects

ICLEI: ICLEI – Local Governments for Sustainability, an international membership association of local governments focused on addressing the climate challenge

kW: A kilowatt, equal to 1,000 watts

kWh: A kilowatt hour (1,000 watts), the work performed by one kilowatt of electric power in one hour

Kyoto Protocol: The United Nations Treaty that targets the reduction of greenhouse gas emissions

LBNL: Lawrence Berkeley National Laboratory

LED: Light emitting diode

LEED: Leadership in Energy and Environmental Design, a commonly used green building standard

MTC: Metropolitan Transportation Commission

Net Zero Energy Buildings: A building that achieves maximum energy efficiency so that any remaining energy needs can be met through onsite renewable energy systems, such as solar water and space heating, solar electricity, or wind energy

OUSD: Oakland Unified School District

Peak Oil: A term used to describe the transition from many decades in which the available supply of oil grew each year to a period in which the rate of oil production enters it terminal decline

PG&E: Pacific Gas & Electric

PV: Photovoltaics, a solar power technology that converts sunlight into electricity

RECO: Residential Energy Conservation Ordinance

RPP: Residential Permit Parking

Solar thermal: A technology that captures solar energy for heat

SR2S: Safe Routes to School program

StopWaste.Org: The Alameda County Waste Management Authority and the Alameda County Source Reduction and Recycling Board serving as one agency

TALC: Transportation and Land Use Coalition, a local organization that advocates for alternative forms of transportation

Therm: 100,000 British Thermal Units (BTUs), equivalent to approximately 100 standard cubic feet of natural gas

Title 24 Energy Code: California's energy efficiency standards for residential and nonresidential buildings

VMT: Vehicle miles traveled

Zero Waste: The City's goal to eliminate waste sent to the landfill. All of the community's discarded material would be recycled or reused.

Endnotes

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