SOUTHERN CALIFORNIA
ASSOCIATION of GOVERNMENTS

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Transportation
Keith Millhouse, Ventura County Transportation Commission

MEETING OF THE

ENERGY AND ENVIRONMENT COMMITTEE

PLEASE NOTE TIME
Thursday, August 1, 2013
10:00 a.m. – 12:00 p.m.

SCAG Main Office
818 W. 7th Street, 12th Floor
Policy Committee Room A
Los Angeles, CA 90017
(213) 236-1800

If members of the public wish to review the attachments or have any questions on any of the agenda items, please contact Lillian Harris-Neal at (213) 236-1858 or via email harris-neal@scag.ca.gov

Agendas & Minutes for the Energy and Environment Committee are also available at: www.scag.ca.gov/committees/eec.htm

SCAG, in accordance with the Americans with Disabilities Act (ADA), will accommodate persons who require a modification of accommodation in order to participate in this meeting. SCAG is also committed to helping people with limited proficiency in the English language access the agency's essential public information and services. You can request such assistance by calling (213) 236-1858. We require at least 72 hours (three days) notice to provide reasonable accommodations. We prefer more notice if possible. We will make every effort to arrange for assistance as soon as possible.

The Regional Council consists of 84 elected officials representing 191 cities, six counties, six County Transportation Commissions, one representative from the Transportation Corridor Agencies, one Tribal Government representative and one representative for the Air Districts within Southern California.

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SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS

Energy and Environment Committee

Members Roster –August 2013

		Members	Representing	
Chair*	**1.**	**Hon. James Johnson**	***Long Beach***	**District 30**
Vice-Chair*	**2.**	**Hon. Lisa Bartlett**	***Dana Point***	TCA
	3.	Hon. Denis Bertone	*San Dimas*	SGVCOG
	4.	Hon. Brian Brennan	*Ventura*	VCOG
*	5.	Hon. Margaret Clark	*Rosemead*	District 32
	6.	Hon. Jordan Ehrenkranz	*Canyon Lake*	WRCOG
*	7.	Hon. Mitchell Englander	*Los Angeles*	District 59
	8.	Hon. Larry Forester	*Signal Hill*	Gateway Cities
	9.	Hon. Sandra Genis	*Costa Mesa*	OCCOG
*	10.	Hon. Ed Graham	*Chino Hills*	District 10
	11.	Hon. Steven Hernandez	*Coachella*	CVAG
	12.	Hon. Linda Krupa	*Hemet*	WRCOG
	13.	Hon. Thomas Martin	*Maywood*	Gateway Cities
*	14.	Hon. Judy Mitchell	*Rolling Hills Estates*	District 40
*	15.	Hon. Mike Munzing	*Aliso Viejo*	District 12
	16.	Hon. Sam Pedroza	*Claremont*	SGVCOG
	17.	Hon. David Pollock	*Moorpark*	VCOG
	18.	Hon. Jeffrey Prang	*West Hollywood*	WSCCOG
	19.	Hon. Carmen Ramirez	*Oxnard*	District 45
	20.	Hon. James Ramos	*San Bernardino County*	SANBAG
*	21.	Hon. Lupe Ramos Watson	*Indio*	District 66
	22.	Hon. Deborah Robertson	*Rialto*	District 8
	23.	Hon. Edward Scott	*Rialto*	SANBAG
*	24.	Hon. Jack Terrazas		Imperial County
*	25.	Hon. Cheryl Viegas-Walker	*El Centro*	District 1
	26.	Hon. Diane Williams	*Rancho Cucamonga*	SANBAG
	27.	Hon. Edward Wilson	*Signal Hill*	Gateway Cities
	28.	Hon. Frank Zerunyan	*Rolling Hills Estates*	SBCCOG

***** Regional Council Member

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ENERGY & ENVIRONMENT COMMITTEE
AGENDA
AUGUST 1, 2013

The Energy & Environment Committee may consider and act upon any of the items listed on the agenda regardless of whether they are listed as Information or Action Items.

CALL TO ORDER & PLEDGE OF ALLEGIANCE
(Hon. James A. Johnson, Chair)

PUBLIC COMMENT PERIOD – Members of the public desiring to speak on items on the agenda, or items not on the agenda, but within the purview of the Committee, must fill out and present a speaker's card to the Assistant prior to speaking. Comments will be limited to three (3) minutes. The Chair may limit the total time for all comments to twenty (20) minutes.

REVIEW AND PRIORITIZE AGENDA ITEMS

			Time	Page No.
1.	Bay Delta Conservation Plan (BDCP) ***(Huasha Liu, Director, Land Use and Environmental Planning)***	**Attachment**	**5 mins.**	**1**

CONSENT CALENDAR

Approval Item

2.	Minutes of the June 6, 2013 Meeting	**Attachment**		**3**

ACTION ITEM

3.	Request for Ex-Officio Member Appointment ***(Hasan Ikhrata, Executive Director)*** **Recommended Action:** Consider whether to recommend that the Regional Council approve the appointment of Steve Schuyler as an Ex-Officio Member of EEC.	**Attachment**	**5 mins.**	**8**

INFORMATION ITEMS

4.	Sidewalks and the Urban Forest: Maximizing Investments for Quality of Life ***(Jeremy Klop, AICP, Principal and Senior Market Leader, Fehr & Peers)***	**Attachment**	**40 mins.**	**16**
5.	Youth Participation in Transportation & Environmental Sustainability Planning ***(Robert J. Leo, Faculty, Environmental Communications, California State University of San Bernardino – Palm Desert Campus)***	**Attachment**	**20 mins.**	**23**

ENERGY & ENVIRONMENT COMMITTEE
AGENDA
AUGUST 1, 2013

INFORMATION ITEMS - *continued*		**Time**	**Page No.**
6. 2013 Update to the AB 32 Scoping Plan ***(Huasha Liu, Director of Land Use and Environmental Planning)***	**Attachment**	**5 mins.**	**24**
7. Subregional Plug-in Electric Vehicle Deployment Plans and Atlases ***(Marco Anderson, SCAG Staff)***	**Attachment**	**30 mins.**	**27**
8. Federal Agencies Climate Change Adaptation Plans ***(Grieg Asher, SCAG Staff)***	**Attachment**	**5 mins.**	**49**
9. Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2011 ***(Rongsheng Luo, SCAG Staff)***	**Attachment**	**5 mins.**	**53**
10. Sustainability Program Call for Proposals Update ***(Hasan Ikhrata, Executive Director)***	**Attachment**	**5 mins.**	**82**

CHAIR'S REPORT
(Hon. James A. Johnson, Chair)

STAFF REPORT
(Jonathan Nadler, SCAG Staff)

FUTURE AGENDA ITEMS

ANNOUNCEMENTS

ADJOURNMENT

The next Energy & Environment Committee (EEC) meeting will be held on Thursday, September 12, 2013 at the SCAG Los Angeles Office.

REPORT

AGENDA ITEM NO. 1

DATE: August 1, 2013

TO: Regional Council (RC)
Energy and Environment Committee (EEC)

FROM: Hasan Ikhrata, Executive Director, ikhrata@scag.ca.gov, (213) 236-1944

SUBJECT: Bay Delta Conservation Plan (BDCP)

EXECUTIVE SUMMARY:
The Governor's Office has requested to update the Regional Council about the Bay Delta Conservation Plan (BDCP). Either the Governor or Dr. Jerry Meral, Deputy Secretary of the California Natural Resources Agency will provide a brief presentation. The BDCP is being prepared to address existing water supply issues and adverse environmental quality impacts to the Sacramento-San Joaquin Rivers Delta and San Francisco Bay (Bay-Delta or Delta) from the State Water Project (SWP) and the federal Central Valley Project (CVP). An administrative draft of the BDCP is currently available for informal public review. The final draft chapters of the BDCP are scheduled to be released for public review and comment in October 2013. Staff has provided a summary background for your information.

STRATEGIC PLAN:
This item supports SCAG's Strategic Plan Goal 1 – Improve Regional Decision-Making by Providing Leadership and Consensus Building on Key Plans and Policies; Objective A: Create and facilitate a collaborative and cooperative environment to produce forward thinking regional plans.

BACKGROUND:
SCAG is looking forward to an update from the Governor or Dr. Jerry Meral, Deputy Secretary of the California Natural Resources Agency, about the Bay Delta Conservation Plan (BDCP). The BDCP addresses existing water supply issues and adverse environmental quality impacts to the Sacramento-San Joaquin Rivers Delta and San Francisco Bay (Bay-Delta or Delta) from the State Water Project (SWP) and the federal Central Valley Project (CVP). As proposed, the plan would cost $24.5 billion over 50 years. Water users would pay for the cost of constructing 37 miles of water tunnels under the Delta, transporting water through sensitive eco areas. The public would pay for restoring the ecosystem.

The BDCP is a Habitat Conservation Plan / Natural Community Conservation Plan (HCP/NCCP) that puts forth a strategy for redesigning SWP and CVP water conveyance operations and facilities and for restoring and preserving sensitive Bay-Delta ecosystems. The HCP/NCCP is intended to provide permitting and regulatory certainty for improvement projects related to the SWP and CVP. In return for conservation and management actions that will protect Bay-Delta ecosystems, permits will be issued to cover negative impacts on threatened and endangered species created by the proposed project. A permit duration of 50 years is being requested as part of the BDCP.

The proposed activities that will be covered by this permit include the following:

- New Water Facilities Construction, Operations, and Maintenance –
  - "The Tunnel" – The proposed facilities will include new intake facilities, pumping plants, a new tunnel and pipelines. There will also be other construction activities related to creating the new water conveyance facility including, new transmission lines, concrete plants, fuel

stations, etc.
  - Conveyance Facilities Maintenance Activities
  - Modifications to the Yolo Bypass
- Operations and Maintenance of (existing) State Water Project Facilities
- Nonproject Diversions – These include water diversions to support agriculture or waterfowl production.
- Habitat Restoration, Enhancement, and Management Activities - Conservation measures of the BDCP will be covered as part of the permit.

There is currently discussion about whether or not the BDCP will address the State's goals (established by the 2009 Delta Reform Act) to provide a more reliable water supply for California while protecting, restoring, and enhancing the Delta ecosystem.

Stakeholders have voiced the following concerns about the proposed tunnel alternative.

- The BDCP does not address water security issues, such as, what happens if the infrastructure fails; Southern California would still be dependent on the Bay Delta supply.
- The proposed tunnel system is too big and will result in the diversion of too much water. This will result in negative impacts to habitat and water quality further upstream as well as negative impacts to the Delta residents and the local economy, which is dependent on healthy, local fisheries and agricultural activities. The proposed restoration and conservation measures in the BDCP will not be enough to mitigate these effects.
- The large tunnel is too expensive; it would be better to put the money to use helping local jurisdictions, water agencies, and other stakeholders to improve water efficiency practices and develop alternative water supplies.
- Smaller tunnels would do a better job and be more cost-effective.

The administrative draft BDCP has been released. The information is subject to change and is not yet open to public comment. The final draft BDCP that will be open for public review and comment is scheduled to be released in October 2013.

It is expected that a water bond measure will be put to voters to help the State finance this infrastructure project. A water bond proposition (SB 2 X7, 2010 Legislative Session) originally slated to go on the November 2, 2010 ballot has been postponed twice due to the unfavorable economic climate. The bond proposition would have enacted the Safe, Clean, and Reliable Drinking Water Supply Act of 2010, which, if approved by the voters, would have authorized the issuance of bonds in the amount of $11.14 billion pursuant to the State General Obligation Bond Law to finance a safe drinking water and water supply reliability program.

The water supply reliability proposal is estimated to produce 177,000 jobs in California. The approved 2012-2035 RTP/SCS estimates an additional 4 million residents in Southern California will require and depend on a reliable water supply.

Energy and Environment Committee
of the
Southern California Association of Governments
June 6, 2013

Minutes

THE FOLLOWING MINUTES ARE A SUMMARY OF ACTIONS TAKEN BY THE ENERGY AND ENVIRONMENT COMMITTEE. A DIGITAL RECORDING OF THE ACTUAL MEETING IS AVAILABLE FOR LISTENING IN SCAG'S OFFICE.

The Energy and Environment Committee (EEC) held its meeting at the SCAG Los Angeles Office. The meeting was called to order by the Hon. James Johnson, Chair. There was a quorum.

Members Present

Hon. Lisa Bartlett, Dana Point	TCA
Hon. Denis Bertone, San Dimas	SGVCOG
Hon. Margaret Clark, Rosemead	District 32
Hon. Jordan Ehrenkranz, Canyon Lake	WRCOG
Hon. Larry Forester, Signal Hill	GCCOG
Hon. Ed Graham, Chino Hills	District 10
Hon. James Johnson, Long Beach	District 30
Hon. Thomas Martin, Maywood	GCCOG
Hon. Judy Mitchell, Rolling Hills Estates	District 40
Hon. Mike Munzing, Aliso Viejo	District 12
Hon. Sam Pedroza, Claremont	SGVCOG
Hon. David Pollock, Moorpark	VCOG
Hon. Carmen Ramirez, Oxnard	District 45
Hon. Lupe Ramos Watson, Indio	District 66
Hon. Jack Terrazas	Imperial County
Hon. Cheryl Viegas-Walker, El Centro	District 1
Hon. Diane Williams, Rancho Cucamonga	SANBAG
Hon. Edward Wilson, Signal Hill	Gateway Cities
Hon. Dennis Zine, City of Los Angeles	District 50

Members Not Present

Hon. Brian Brennan, San Buenaventura	VCOG
Hon. Mitchell Englander, Los Angeles	District 59
Hon. Steve Hernandez, Coachella	CVAG
Hon. Linda Krupa, Hemet	WRCOG
Hon. Jeffery Prang, West Hollywood	WSCCOG
Hon. Ed Scott, Rialto	SANBAG

CALL TO ORDER & PLEDGE OF ALLEGIANCE

Hon. James Johnson, Chair, called the meeting to order at 10:01 a.m.

PUBLIC COMMENT PERIOD – None

REVIEW AND PRIORITIZE AGENDA ITEMS

CONSENT CALENDAR

Approval Item

1. Minutes of the April 4, 2013 Meeting

   A MOTION was made (Wilson) to approve the Consent Calendar. The MOTION was SECONDED (Mitchell) and unanimously APPROVED.

ACTION ITEMS

2. Addendum No. 1 to the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) Program Environmental Impact Report (PEIR)

   Pamela Lee, SCAG, reported that an amendment to the 2012-2035 RTP/SCS was prepared to reflect additions or changes to a number of critical transportation projects, based on requests received from the county transportation commissions. Staff has prepared Addendum No. 1 to the 2012-2035 RTP/SCS PEIR, included in the agenda packet.

   A MOTION was made (Forester) to recommend that the Regional Council adopt Resolution No. 13-550-1 to approving Addendum No. 1 to the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) PEIR. The motion was SECONDED (Viegas-Walker) and unanimously APPROVED.

3. Transportation Conformity Determination for Amendment No. 1 to 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) and Amendment No. 13-04 to the 2013 Federal Transportation Improvement Program (FTIP)

   Rongsheng Luo, SCAG staff, reported that the Draft Transportation Conformity Analysis was released for a 30-day public review and also underwent a public hearing. Only one comment was received on the Amendment No. 1 to the RTP/SCS, and no comments, specifically regarding conformity, were received. The conformity analysis demonstrates that the Amendments meet all transportation conformity requirements.

   A MOTION was made (Forester) to recommend that the Regional Council adopt the transportation conformity determination for Amendment No. 1 to the 2012-2035 RTP/SCS and Amendment No. 13-04 to the 2013 FTIP and direct staff to submit it to the Federal Highway Administration and Federal Transit Administration for approval. The MOTION was seconded (Bertone) and unanimously APPROVED.

INFORMATION ITEMS

4. EEC Agenda Outlook and Discussion

   Hon. James Johnson, EEC Chair, stated that he would like to develop a strategic plan to outline core issues that the EEC might consider over the next twelve (12) months. He sees an opportunity for SCAG to be a regional clearinghouse for best practices for issues that affect local government.

   The Chair and the Committee members discussed the following potential topics for the EEC:

- Streets and sidewalks (safety, repair, funding, etc.)
- Public lighting (energy cost/savings and safety)
- Active Transportation
- Waste (reduction, conversion to energy, transport, etc.)
- Zero-emissions technologies
- Freight movement
- Energy (technologies, efficiency funding, etc.)
- CEQA reform
- Water issues (Delta Water Bond, storm water, desalinization, conservation, etc.)
- Urban forest management
- Open-space planning
- Effectively moving forward projects to meet RTP/SCS goals and policies

A MOTION was made (Johnson) to receive and file. The MOTION was SECONDED (Forester) and unanimously APPROVED.

5. Summary of Watershed Symposium on Southern California's Role in the Delta

Christine Fernandez, SCAG staff, provided a summary of the Watershed Symposium held on May 21, 2013, presented by the non-profit Council for Watershed Health. The purpose of the symposium was to educate Southern Californians about the debate surrounding the Bay Delta Conservation Plan. To keep the public informed, a preliminary administrative draft of the Bay Delta Conservation Plan has been released for public review. The final draft will be released for public review and comment in October 2013.

A MOTION was made (Forester) to receive and file. The MOTION was SECONDED (Mitchell) and unanimously APPROVED.

6. Sustainability Program Call for Proposals Update

Grieg Asher, SCAG staff, stated that May 31, 2013 was the deadline for the Sustainability Grant Program Call for Proposals. He reported that there were seventy-six (76) independent applications submitted and all the counties within the region participated. The total amount requested was approximately $10.25 million dollars. There were fewer funds available than the amount being requested in 2013, and the ranking criteria approved by the Regional Council will be applied. Staff will start reviewing the proposals in the next few weeks and report back to the EEC with a ranked list of projects by the end of summer or early fall.

7. Bottom-up Local Input Process for 2016-40 RTP/SCS and Growth Forecast Development

Simon Choi, SCAG staff, stated that a bottom-up local input process is being conducted for the successful compilation of growth forecast data for the new 2016-2040 RTP/SCS. The deadline for receiving local input data is September 30, 2014. Today, staff presented the same item to CEHD which approved the following actions: 1) Recommend Regional Council approval that jurisdictions' City Manager, County Administrator, Subregional Executive Director (in the case where a subregional organization is submitting the input on behalf of its member jurisdictions), or their respective designee provide approval on growth forecast and land use data. While not required as a method of submittal of information, SCAG jurisdictions may voluntarily choose to utilize the optional Data Verification and Approval Form. If another transmittal method of

information is utilized, it should include the signature of the official designee; and 2) Recommend Regional Council approval that local jurisdictions may also choose to adopt, while optional, a resolution designating a position representing the jurisdiction's input on the growth forecast and land use data for the 2016-2040 RTP/SCS. Other options for the designation may include formal action by the jurisdiction, the transmittal of a letter to SCAG, or meeting minutes. [Samples of both the Data Verification and Approval Form and Resolution were provided as part of the agenda packet.]

Hon. Judy Mitchell, Rolling Hills Estates, stated that the district she represents supports the action taken today by CEHD, as presented by staff. Hon. Cheryl Viegas-Walker, suggested that consideration be given to a requirement that the local jurisdiction who chooses to designate a person responsible for approving and submitting the local growth forecast data to SCAG that the jurisdiction would have an affirmative duty to notify SCAG if the respective designee is no longer employed by the jurisdiction. This language should be included in the materials provided by SCAG so the jurisdiction is made aware of their obligation.

CHAIR'S REPORT

Hon. James Johnson congratulated Hon. Cheryl Viegas-Walker as 2nd Vice-President of the Regional Council; and Hon. Judy Mitchell on her appointment to the Air Resources Board (ARB).

STAFF REPORT

Jonathan Nadler, SCAG staff, announced that the ARB is required to update the AB 32 Scoping Plan every five (5) years, and a regional workshop will be held on June 26, 2013 at the South Coast Air Quality Management District auditorium in Diamond Bar. A kick-off workshop will also be held on June 13, 2013 at the ARB in Sacramento which will be webcast. Information on both workshops will be posted on SCAG's website.

FUTURE AGENDA ITEMS - None

ANNOUNCEMENTS - None

ADJOURNMENT

Hon. James Johnson adjourned the meeting at 10:58 a.m.

The next meeting of the Energy & Environment Committee will be held on Thursday, August 1, 2013 at the SCAG Los Angeles Office.

Action Minutes Approved by:

Jonathan Nadler, Manager
Compliance & Performance
Monitoring

Energy and Environment Committee Attendance Report

2013

Member (including Ex-Officio) LastName, FirstName	Date Appointed if after 1/1/13	Representing	Imperial	Los Angeles	Orange	Riverside	San Bernardino	Ventura	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Mtgs Attended
			X = County Represented						X = Attended Black Shading = Dark												
Bartlett, Lisa		OCCOG			X				X	X	X	X		X							5
Bertone, Denis		SGVCOG		X					X	X	X	X	G	X							5
Brennan, Brian		VCOG						X					E								
Clark, Margaret		Rosemead		X					X	X	X	X	N	X							5
Ehrenkranz, Jordan		WRCOG				X			X	X			E	X							3
Englander, Mitchell		Los Angeles		X							X		R								1
Forester, Larry		Gateway Cities		X					X	X	X	X	A	X							5
Genis, Sandra	June	OCCOG			X								L								
Graham, Ed		Chino Hills					X		X	X	X	X		X							5
Hernandez, Steven	Feb.	CVAG					X			X	X	X	A								3
Johnson James		Long Beach		X						X	X	X	S								3
Krupa, Linda	Feb.	Hemet				X				X			S								1
Martin, Thomas		GCCOG		X					X	X	X	X	E	X							5
Mitchell, Judy		SBCCOG		X							X	X	M	X							3
Munzing, Mike	April	District 12			X						X	X	B	X							3
Pedroza, Sam		SGVCOG		X					X	X	X	X	L	X							5
Pollock, David		VCOG						X	X	X	X	X	Y	X							5
Prang, Jeffery		W. Hollywood		X																	
Ramirez, Carmen	April	Oxnard						X						X							1
Ramos, James	June	SANBAG					x														
Ramos Watson, Lupe		CVAG				X				X				X							2
Robertson, Deborah	August	District 8					X														
Scott, Edward		SANBAG					X														
Terrazas, Jack		Imperial County	X						X	X	X	X		X							5
Viegas Walker, Cheryl		El Centro	X						X	X	X	X		X							5
Williams, Diane		SANBAG					X		X	X	X	X		X							5
Wilson, Edward		Signal Hill		X					X		X	X		X							4
Zerunyan, Frank	April	SBCCOG					X														
Zine, Dennis		Los Angeles		X					X	X				X							3
	TOTALS		2	12	3	3	6	3													

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REPORT

AGENDA ITEM NO. 3

DATE: August 1, 2013

TO: Energy and Environment Committee (EEC)

FROM: Hasan Ikhrata, Executive Director; (213) 236-1944; Ikhrata@scag.ca.gov

SUBJECT: Request for Ex-Officio Member Appointment

EXECUTIVE DIRECTOR'S APPROVAL:

RECOMMENDED ACTION:
Consider whether to recommend that the Regional Council approve the appointment of Steve Schuyler as an Ex-Officio Member of EEC.

EXECUTIVE SUMMARY:
The Building Industry Association of Southern California (BIASC) has requested appointment of Steven Schuyler, BIASC Vice President of Government Affairs, to represent the business sector as an ex-officio (non-voting) member of EEC. Under the SCAG Bylaws, such appointments may be made upon the recommendation of the Policy Committee and approval by the Regional Council.

STRATEGIC PLAN:
This item supports SCAG's Strategic Plan, Goal 1, Improve Regional Decision Making by Providing Leadership and Consensus Building on Key Plans and Policies.

BACKGROUND:
On April 30, 2013, SCAG received a letter from the BIASC, requesting appointment of Steven Schuyler, BIASC Vice President of Government Affairs, to represent the business sector as an ex-officio member of EEC (Attachment 1).

SCAG is also in receipt of a letter from the Orange County Council of Governments (OCCOG), expressing support for the appointment of Mr. Schuyler as an ex-officio member of EEC. The letter from Hon. Leroy Mills, Chairman of OCCOG and response letter from Hon. Glen Becerra, then President of SCAG, are attached for your reference (Attachments 2 and 3).

On May 10, 2013, Hon Gregory Pettis, President of SCAG, responded to the request from BIASC, informing them of the applicable appointment process (Attachment 4).

Under the SCAG Bylaws, appointments of ex-officio Members to SCAG Policy Committees may be made upon the recommendation of the Policy Committee and approval by the Regional Council. Specifically, with regard to appointments of ex-officio members to SCAG Policy Committees, the SCAG Bylaws [Article V E. (2)(c)] provide the following:

> " (2) **Appointments to Policy Committees:** The President with regard to each Policy Committee shall:
>
> ... (c) Appoint ex-officio (non-voting) members to the Policy Committees representing the business sector, labor, community groups and other public interest groups *upon the recommendation of the*

respective Policy Committee and approval by the Regional Council. (Emphasis added)."

Thus, the next step in the process is for the EEC to consider whether to recommend that the Regional Council approve the appointment of Mr. Schulyer as an ex-officio member of EEC. The recommendation of the EEC concerning this appointment request will then be forwarded to the SCAG Regional Council for consideration at its September meeting.

FISCAL IMPACT:
There is no fiscal impact as stipends and related expenses are only paid to elected official representatives on SCAG committees in accordance with SCAG's Stipend Policy.

ATTACHMENTS:
1. Letter dated May 10, 2013 from Gregory S. Pettis, President of SCAG
2. Letter dated April 30, 2013 from Leonard Miller, President, BIASC Governing Board
3. Letter dated April 22, 2013 from Glen Becerra, Immediate Past President of SCAG
4. Letter dated April 2, from Leroy Mills, Mayor Pro Tem, City of Cypress and Chairman of OCCOG

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Energy & Environment
James Johnson, Long Beach

Transportation
Keith Millhouse, Ventura County Transportation Commission

Attachment 1

May 10, 2013

Mr. Leonard Miller
President, Building Industry Association of Southern California
17744 Sky Park Circle, Suite 170
Irvine, California 92614

SUBJECT: Letter of Nomination for Ex-Officio Member Appointment to the SCAG Energy and Environment Committee (EEC)

Dear President Miller:

Thank you for your letter dated April 30, 2013, regarding the Building Industry Association of Southern California's nomination of Steven S. Schuyler for appointment as an Ex-Officio member on the SCAG Energy and Environment Committee (EEC). I am in receipt of the letter and have forwarded it to the appropriate SCAG staff.

With regard to appointments of ex-officio members to SCAG Policy Committees, the SCAG Bylaws [Article V E. (2)(c)] provide the following:

> (2) **Appointments to Policy Committees:** The President with regard to each Policy Committee shall:
>
> > ... (c) Appoint ex-officio (non-voting) members to the Policy Committees representing the business sector, labor, community groups and other public interest groups *upon the recommendation of the respective Policy Committee and approval by the Regional Council*. (Emphasis added).

The Regional Council consists of 84 elected officials representing 191 cities, six counties, six County Transportation Commissions, one representative from the Transportation Corridor Agencies, one Tribal Government representative and one representative for the Air Districts within Southern California.

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Thus, the next steps in the process are to include this request for consideration by the EEC at its June 6, 2013 meeting. The recommendation of the EEC concerning this appointment request will be forwarded to the SCAG Regional Council, which must approve such appointment. The next Regional Council meeting is scheduled on August 1, 2013.

Should you have any further questions or to follow-up on this matter, please contact Joann Africa, Chief Counsel at (213)236-1928 or africa@scag.ca.gov.

Sincerely,

Gregory S. Pettis
President

cc: Steven Schuyler, Building Industry Association of Southern California
Hon. James Johnson, Chair of EEC
Hasan Ikhrata, Executive Director
Sharon A. Neely, Chief Deputy Executive Director
Joann Africa, Chief Counsel

Building Industry Association of Southern California, Inc.

17744 Sky Park Circle, Suite 17
Irvine, California 92614
949.553.9500
fax: 949.769.8943
http://www.biasc.org

April 30, 2013

President Glen Becerra
Southern California Association of Governments
818 West Seventh Street 12th floor
Los Angeles, CA 90017-3435

Dear President Becerra:

As the current President of the Building Industry Association of Southern California (BIASC), I would like to support the nomination of Steve S. Schuyler, BIASC Vice President of Government Affairs, as an ex-officio member representing the business sector on the SCAG Energy and Environmental Committee (EEC).

Mr. Schuyler currently sits as an ex-officio serving the private sector on the Orange County Council of Governments (OCCOG), and has also been nominated by OCCOG for appointment to the SCAG Energy and Environmental Committee.

With almost twenty years of experience in land use and environmental issues, including working in both the private sector as an environmental planner and in the public sector as an infrastructure/environmental policy advisor, Mr. Schuyler will bring relevant experience to policy discussions on the EEC. He also holds a Master of Science in Environmental Policy and Planning.

Thank you for your consideration,

Leonard Miller,
President
BIASC Governing Board

cc: Hon. Cheryl Viegas, Chair EEC
Hon. James Johnson, Chair-Elect EEC
Hasan Ikhrata, Executive Director, SCAG
Sharon Neeley, Chief Deputy Executive Director, SCAG
Joann Africa, Chief Council, SCAG

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SOUTHERN CALIFORNIA
ASSOCIATION of GOVERNMENTS

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Cheryl Viegas-Walker, El Centro

Transportation
Keith Millhouse, Ventura County Transportation Commission

April 22, 2013

Hon. Leroy Mills
Mayor Pro Tem, City of Cypress
SCAG Regional Council Member, District 18
Chairman, Orange County Council of Governments
5275 Orange Avenue
Cypress, CA 90630

SUBJECT: Letter of Support for Ex Officio Member Appointment to the SCAG Energy and Environment Committee

Dear Chairman Mills:

Thank you for your letter dated April 2, 2013, regarding the Orange County Council of Governments' (OCCOG) support for Steven Schuyler to represent his industry as an Ex-Officio Member on the SCAG Energy and Environment Committee (EEC). I am in receipt of the letter and have forwarded it to the appropriate SCAG staff.

As you have indicated, the SCAG Bylaws [Article V E. (2)(c)] provide the following:

> (2) **Appointments to Policy Committees:** The President with regard to each Policy Committee shall:
>
> ... (c) Appoint ex-officio (non-voting) members to the Policy Committees representing the business sector, labor, community groups and other public interest groups *upon the recommendation of the respective Policy Committee and approval by the Regional Council*. [Emphasis added.]

In accordance with the SCAG Bylaws, the next step in the process is for the Building Industry Association of Southern California to request appointment of Mr. Schuyler to represent the business sector as an Ex-Officio Member on EEC. Upon receipt of such request, SCAG staff will include the request on the agenda of the next regularly scheduled EEC meeting for their consideration. The next regular EEC meeting will be held on June 6, 2013. The OCCOG letter of support will be included with this EEC agenda item.

The Regional Council is comprised of 84 elected officials representing 191 cities, six counties, six County Transportation Commissions and a Tribal Government representative within Southern California.

2012.05.07

Should you have any further questions or to follow-up on this matter, please contact Joann Africa, Chief Counsel at (213)236-1928 or africa@scag.ca.gov.

Sincerely,

Glen T. Becerra
President

cc: Steven Schuyler, Building Industry Association of Southern California
Hon. Cheryl Viegas Walker, Chair of EEC
Hon. James Johnson, Chair-Elect of EEC
Hasan Ikhrata, Executive Director
Sharon A. Neely, Chief Deputy Executive Director
Joann Africa, Chief Counsel

ORANGE COUNTY
COUNCIL OF GOVERNMENTS

April 2, 2013

The Honorable Glen Becerra
President
Southern California Association of Governments
818 West Seventh Street, 12th Floor
Los Angeles, CA 90017

Re: Ex-Officio Letter for Support for Energy and Environment Committee

Dear President Becerra:

At the March 28, 2013 Orange County Council of Governments Board of Directors Meeting, the Board unanimously approved the submittal of a Letter of Support for Ex-Officio Board Member Steven Schuyler.

Steven has indicated his interest in serving as an Ex-Officio Member of the SCAG Energy and Environment Policy Committee. The OCCOG Board of Directors also is aware that the SCAG Bylaws do not have a provision to allow non-elected officials to serve on Policy Committees. However, after conferring with your legal counsel, it has been communicated to our Board and to Steven that he may submit a request to both the Chair of the Energy and Environment Policy Committee as well as to you, representing the Regional Council, requesting his appointment to the Committee as an Ex-Officio, representing his industry – not the OCCOG Board of Directors – with the provisions that his appointment receive approval by both the Energy and Environment Committee and the Regional Council.

As a brief introduction, Steven currently serves as Vice President of Government Affairs for the Building Industry Association of Southern California. He has over 15 years of land-use, environmental planning regulatory experience in both the public and private sectors. Steve also has a Master of Science, Environmental Studies-Policy and Planning from California State University, Fullerton.

On behalf of the OCCOG Board of Directors, I would like to personally thank you for consideration of Steven's request to serve SCAG on the Energy and Environment Policy Committee. I thank you for your leadership and service to the SCAG region.

Sincerely,

Leroy Mills, Mayor Pro Tem, City of Cypress
SCAG Regional Council Member District 18
Chairman, Orange County Council of Governments

Cc: Steven Schuyler,
Joann Africa, SCAG

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REPORT

AGENDA ITEM NO. 4

DATE: August 1, 2013

TO: Energy and Environment Committee (EEC)

FROM: Alan Thompson, Senior Regional Planner, 213.236.1940, thompson@scag.ca.gov

SUBJECT: Sidewalks and the Urban Forest: Maximizing Investments for Quality of Life

EXECUTIVE DIRECTOR'S APPROVAL:

RECOMMENDED ACTION:
For Information Only – No Action Required.

EXECUTIVE SUMMARY:
Mr. Jeremy Klop, Fehr and Peers Associates, will present on best practices for local jurisdictions to maintain sidewalks in neighborhoods that have heavily tree-lined streets.

STRATEGIC PLAN:
This item supports SCAG's Strategic Plan, Goal 1, Improve Regional Decision Making by Providing Leadership and Consensus Building on Key Plans and Policies; Objective c) Provide practical solutions for moving new ideas forward.

BACKGROUND:
Many neighborhoods in the SCAG region were built in the early to middle portion of the 20th century and have sidewalks that do not meet current Americans with Disability Act standards that may have shade trees with roots that make sidewalks impassible. These trees are often considered by residents to be an essential neighborhood value, providing shade, and providing a sense of character to various neighborhoods. Various strategies exist that may assist cities in maintaining/upgrading sidewalks without necessarily removing trees and allowing the neighborhood character to remain.

FISCAL IMPACT:
No Fiscal Impact.

ATTACHMENT:
PowerPoint Presentation: "Sidewalks and the Urban Forest"

SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS

Sidewalks and the Urban Forest:
Maximizing our Investments for Quality of Life

Presentation to the Southern California Association of Governments Energy and Environment Committee

August 1, 2013

Jeremy Klop, AICP

FEHR PEERS

Benefits of the Urban Forest

- Air pollution reduction
- Shade and heat protection
- Stormwater storage
- Increased property values
- Carbon offsets

FEHR PEERS

ADA needs:

- Adequate sidewalk width
- Limited grades for sidewalks and cross slopes
- Landing areas in steeper sections
- Slip resistant surface materials with consistent appearance
- Consistent levels and elevations
- Pedestrian space free of obtrusions and obstacles
- Curb ramps at intersections
- Countdown timers, detectable warnings, accessible pedestrian signals, directional ramps at intersections

FEHR PEERS

Santa Monica, 2000: Installed rubber sidewalks

Photo credit: http://terrecon.com

- Pilot project near ficus trees with roots causing sidewalk damage
- Removable 1'x2.5'x2" panels
- ADA compliant
- Follow-up review and maintenance in 2002, 2005
- Expansion of rubber sidewalks program in 2005 to more than 40 locations
- Product: Rubbersidewalks by Terrecon

FEHR PEERS

Rutherford NJ, 2010: Installed plastic sidewalks

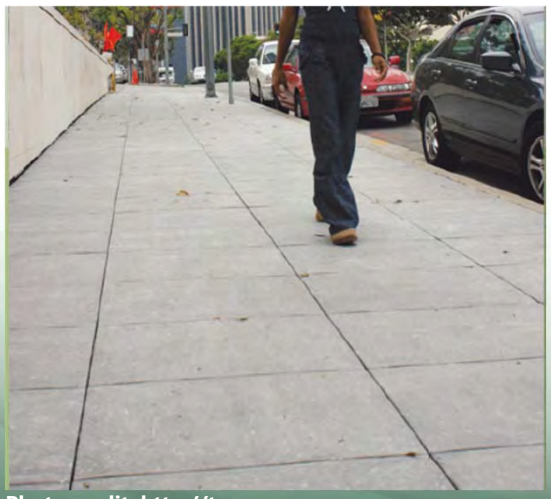


Photo credit: http://terrecon.com

- Pilot project on Erie Avenue in Rutherford
- Interlocking 2'x2.5'x1.75" panels made of recycled plastic
- ADA compliant
- Removable to allow for root maintenance, with channelized undersides to accommodate root growth
- Product: Terrewalks by Terrecon

FEHR PEERS

Burbank CA, 2010: Elevated sidewalks

- Burbank Water & Power demonstration project
- Suspended pavement frames used to raise sidewalk plane above soil layer
- Elevated sidewalks leave space for root growth
- 90% of rainfall stays on site, out of storm drains
- Product: Silva Cells by DeepRoot

Photo credit: http://deeproot.com

FEHR PEERS

What can local communities do?

- Conduct an inventory: understand your problem areas
- Explore options with pilot projects
- Partner with local resources: Street Tree Seminar, International Society of Arboriculturists, Tree People
- New construction: choose tree species carefully to avoid root problems
- Prioritize reinvestment in existing infrastructure.....

FEHR PEERS

THE WALL STREET JOURNAL.

U.S. NEWS

From the Ground Up

States Look to Pay Repair Tab

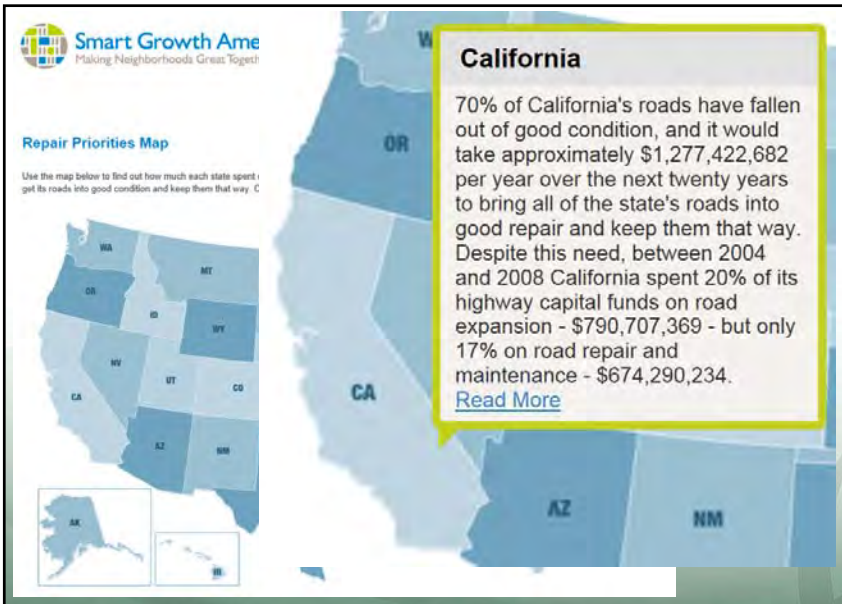
Revenue Problem?

U.S. keeps building new highways while letting old ones crumble

McClatchy Newspapers (Curtis Tate and Greg Gordon)
Posted: 02/03/2013 9:54 AM

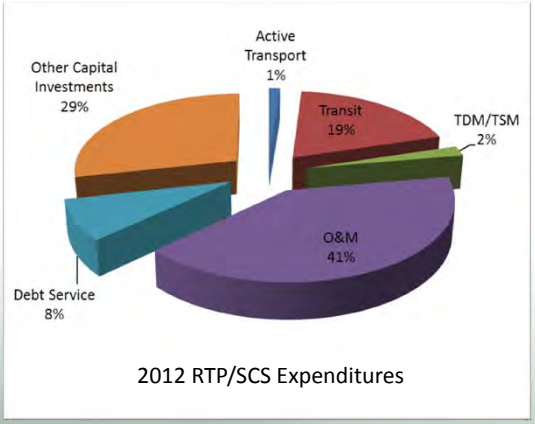
In California, transportation officials estimate that 60 percent of the state's roads and a quarter of its bridges need to be repaired or replaced, at a projected cost of $70 billion over a decade, some $52 billion more than the available funds.

FEHR PEERS



Spending Problem?

FEHR PEERS



Exacerbating the Problem?

What role do spending decisions play?

FEHR PEERS

Questions?

FEHR PEERS

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REPORT

AGENDA ITEM NO. 5

DATE: August 1, 2013

TO: Energy and Environment Committee (EEC)

FROM: Darin Chidsey, Acting Director, Strategy, Policy & Public Affairs; (213) 236-1836; chidsey@scag.ca.gov

SUBJECT: Youth Participation in Transportation & Environmental Sustainability Planning

EXECUTIVE DIRECTOR'S APPROVAL:

RECOMMENDED ACTION:
For Information Only - No Action Required.

EXECUTIVE SUMMARY:
Robert J. Leo, Ph.D., representing the Palm Desert Campus of California State University San Bernardino (CSUSB), will report on a project testing the concept of Coachella Valley youth participation in transportation and environmental sustainability planning, including assisting development of a Transportation and Environmental Sustainability component of a city's General Plan.

STRATEGIC PLAN:
This item supports SCAG's Strategic Plan, Goal 1: Improve Regional Decision Making by Providing Leadership and Consensus Building on Key Plans and Policies; Objective a: Create and facilitate a collaborative and cooperative environment to produce forward thinking regional plans.

BACKGROUND:
Each year the Palm Desert Campus of CSUSB presents an EXPO on Environment and Sustainability. Primarily designed for middle school students, the EXPO provides a forum where students can present science and environmental projects. Initially, as a showcase for approximately 100 students, the EXPO has grown to more than 600 students in 2013.

In 2012, an invitation was extended to high schools in the Coachella Valley and more than 70 students from six high schools attended. A special session, "Planning for Sustainability," was geared to this group which led to the concept of developing a process for student involvement in sustainability planning.

Robert J. Leo, Ph.D., representing the Palm Desert Campus of CSUSB, proposed the idea to the Desert Hot Springs City Council. The primary objectives of the project are as follows: 1) to give students a view of how decisions are made in their municipality as they relate to the environment; and 2) to assist in the general planning process of the City (highlighting sustainability). On June 4, 2013, students from Desert Hot Springs High School Renewable Energy Academy of Learning presented the preliminary results of their research to the City Council.

Funding assistance was provided by SCAG based on a common interest with CSUSB in environmental sustainability planning.

FISCAL IMPACT:
Work associated with this item is included in the FY2013/14 OWP under 266.SCG00715.

ATTACHMENT:
None

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REPORT

AGENDA ITEM NO. 6

DATE: August 1, 2013

TO: Energy and Environment Committee (EEC)

FROM: Huasha Liu; Director, Land Use & Environmental Planning; (213) 236-1838; liu@scag.ca.gov

SUBJECT: 2013 Update to the AB 32 Scoping Plan

EXECUTIVE DIRECTOR'S APPROVAL:

RECOMMENDED ACTION:
For Information Only - No Action Required.

EXECUTIVE SUMMARY:
On June 26, 2013, the California Air Resources Board (ARB), South Coast Air Quality Management District (SCAQMD), and SCAG hosted a regional public workshop to discuss the 2013 Update to the AB 32 Scoping Plan. SCAG First Vice President, Hon. Carl Morehouse represented SCAG during the public workshop, and SCAG Regional Council member Margaret Clark provided testimony. This was the first of several such workshops that will be held around the state this year to provide opportunity for input by stakeholder groups as the Scoping Plan update is being developed and, thus, no action was taken at the workshop. The ARB Board is tentatively scheduled to hear the Scoping Plan Update in November 2013.

STRATEGIC PLAN:
This item supports SCAG's Strategic Plan, Goal 1: Improve Regional Decision Making by Providing Leadership and Consensus Building on Key Plans and Policies; Objective a: Create and facilitate a collaborative and cooperative environment to produce forward thinking regional plans.

BACKGROUND:
In 2006, AB 32 required ARB to develop a Scoping Plan that describes the approach California will take to reduce greenhouse gases (GHG) to achieve the goal of reducing emissions to 1990 levels by 2020. The Scoping Plan, first approved by ARB in 2008, must be updated every five (5) years to evaluate the mix of AB 32 policies to ensure that California is on track to achieve the 2020 GHG reduction goal. The SB 375 GHG targets for SCAG's approved 2012-2035 RTP/SCS are part of AB 32 implementation.

The 2013 AB 32 Scoping Plan Update will define ARB's climate change priorities for the next five (5) years and lay the groundwork to reach post-2020 goals set forth in California Executive Orders S-3-05 (i.e., GHG emissions 80 percent below 1990 levels by 2050) and B-16-2012 (i.e., reduction of GHG emissions from the transportation sector equaling 80 percent less than 1990 levels by 2050). The update will highlight California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan (2008). The update will also evaluate how to align the state's longer-term GHG reduction strategies with other state policy priorities, such as for water, waste, natural resources, clean energy and transportation, and land use.

The June 26, 2013 workshop included three (3) panels. The first panel was comprised of staff representatives from the three (3) host agencies (ARB, SCAQMD and SCAG) that provided an overview of each of their roles in relation to AB 32 and the Scoping Plan. ARB staff discussed overall goals of AB 32

and the objectives of the Scoping Plan Update. SCAQMD staff discussed the challenges of meeting criteria pollutant air quality standards and the relationship to climate goals, as well as key concepts for coordinated air quality and climate planning. SCAG staff presented information on the 2012-2035 RTP/SCS development process, plan components, air quality and co-benefit outcomes, implementation initiatives, and a look-ahead to the 2016 RTP/SCS.

The second panel was comprised of representatives from the six (6) focus areas identified for additional reductions in GHG emissions in the Scoping Plan Update. These focus areas and associated state agencies are:

- Energy - California Energy Commission
- Transportation, Fuels, Land Use, Infrastructure - ARB
- Agriculture - California Department of Food and Agriculture
- Water - State Water Resources Control Board
- Waste - CalRecycle
- Natural and Working Lands - ARB

Representatives from each of these state agencies presented information on the existing efforts and future initiatives considered to meet the 2020 and post-2020 state GHG reduction goals.

Local stakeholders with expertise in affected sectors made up the third panel, including SCAG First Vice President Hon. Carl Morehouse, City of San Buenaventura.

The panel members were:

- Martha Arguello, Physicians for Social Responsibility
- Kristin Eberhard, Natural Resources Defense Council
- Frank Harris, Southern California Edison
- Richard Lambros, Southern California Leadership Council
- George Minter, Southern California Gas Company
- Carl Morehouse, SCAG First Vice-President
- Jonathan Parfrey, Climate Resolve
- Denny Zane, Move LA
- Wendy James, Better World Group (moderator)

Panel 3 members provided ideas and perspectives on updating the Scoping Plan. Hon. Carl Morehouse provided both a regional and local perspective. To complement SCAG staff's earlier presentation, Mr. Morehouse briefly discussed the 2012-2035 RTP/SCS, and provided more detailed information on GHG reduction initiatives and the associated challenges faced by local governments, using the City of Ventura as an example. Mr. Morehouse's comments emphasized the relationship between energy use, waste generation and disposal/recycling, housing, job creation, land use, and transportation as integral to successful GHG emission reduction initiatives and strategies.

Public comments were encouraged after each panel. SCAG Regional Councilmember Hon. Margaret Clark, City of Rosemead, provided comments relative to inter-agency coordination, attention to unintended consequences, and consideration of waste conversion technologies. Other comments ranged from specific technical recommendations to policy considerations (e.g., balancing short- and long-term goals and objectives, competing priorities, economic competitiveness). Of note, some commentators expressed concern with the delay in use of cap and trade funds and the potential for future diversion for state general

fund purposes. Both public commentators and panel members discussed the critical need for coordination and partnerships at local, regional, state, and national levels. The opportunity for providing leadership on a comprehensive, coordinated approach to climate change at the national and international levels was acknowledged.

ARB held similar workshops in Fresno (July 18, 2013) and the Bay Area (July 30, 2013). The public comment period related to the workshops ends on August 30, 2013. Comments may be submitted directly to ARB at: http://www.arb.ca.gov/cc/scopingplan/2013comments.htm.

The preliminary draft Scoping Plan Update is anticipated to be released in mid-August 2013. ARB is scheduled to consider the Scoping Plan Update at its November 21-22, 2013 meeting.

For additional information on the Scoping Plan Update, see
http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm

FISCAL IMPACT:
Work associated with this item is included in the FY 2013/14 OWP under 025-SCG00164.

ATTACHMENT:
None

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REPORT

AGENDA ITEM NO. 7

DATE: August 1, 2013

TO: Energy and Environment Committee (EEC)
Community Economic and Human Development Committee (CEHD)
Transportation Committee (TC)

FROM: Marco Anderson, Senior Regional Planner, (213) 236-1879, anderson@scag.ca.gov

SUBJECT: Subregional Plug-in Electric Vehicle Deployment Plans and Atlases

EXECUTIVE DIRECTOR'S APPROVAL:

RECOMMENDED ACTION:
For Information Only - No Action Required.

EXECUTIVE SUMMARY:
On June 30, 2012, SCAG and the University of California Los Angeles (UCLA) Luskin Center research team submitted the final drafts of the South Bay Cities and Western Riverside County Plug-in Electric Vehicle (PEV) Deployment Plans & Atlases. This report will summarize the continuing subregional PEV Readiness activities and SCAG's contribution to these coordinated efforts.

STRATEGIC PLAN:
This item supports SCAG's Strategic Plan Goal 2 – Obtain Regional Transportation Infrastructure Funding and Promote Legislative Solutions for Regional Planning Priorities; Objective A: Identify new infrastructure funding opportunities with State, Federal and private partners.

BACKGROUND:
In June 2011, SCAG and the South Coast Air Quality Management District (SCAQMD), in conjunction with their regional partners, applied for two (2) PEV readiness grants and were successful in both applications. The first grant, awarded by the U.S. Department of Energy (DOE), resulted in the development of six (6) Regional PEV Readiness Plans throughout the state of California, including one for Southern California.

The second grant was awarded by the California Energy Commission (CEC) and was the result of a collaborative effort between SCAG and SCAQMD in partnership with Southern California Edison (SCE), South Bay Cities Council of Governments (SBCCOG), and Western Riverside Council of Governments (WRCOG). The purpose of the project is to develop two (2) complementary subregional plans in collaboration with SBCCOG and WRCOG. SCAG is the lead agency authorized by CEC to accept and administer the award.

SCAG's staff and research team members will summarize the results, and cover some of the key recommendations for encouraging electric vehicle supply equipment (EVSE) siting and installation. The Subregional PEV Deployment Plans are each comprised of four (4) chapters covering a practical methodology that subregional entities, partner agencies, and local jurisdictions may follow to target promising sites to host publicly available charging stations. The Subregional PEV Atlases contain maps, charts, and data for every city within these two (2) subregional areas that illustrate factors which influence demand for charging equipment at specific locations.

Remaining tasks in the scope of work under the CEC Regional Plans to support PEVs include: 1) develop materials that describe the guidelines and best local and regional practices for PEV infrastructure permitting, installation, deployment, maintenance, and inspection as well as a plan for sharing such guidelines and best practices with the State; and 2) develop a catalogue of educational materials including presentations, brochures, and web content.

FISCAL IMPACT:
Staff and consultant efforts are funded with grants under 13-225.SCG01641.03. Additional grants opportunities are currently sought from state, federal, and private sources.

ATTACHMENT:
PowerPoint Presentation: "Subregional Plug-in Electric (PEV) Vehicle Deployment Plans and Atlases."

Southern California Plug-In Electric Vehicle (PEV) Subregional Deployment

August 1, 2013

SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS

Background

- Complements the land use pattern in the RTP/SCS
- Southern CA is a key market for PEVs
- Effort supports SCAG's Economic Recovery and Job Creation Strategy

Regional PEV Infrastructure Planning

- So Cal PEV Coordinating Council
  - SCAQMD
  - SCE and public utilities
  - Subregions
  - Local Governments
  - Clean Cities Coalitions
  - Universities
  - Auto manufacturers
  - Charging infrastructure m
  - Installers
  - And more every day…

Regional PEV Infrastructure Planning

SCAG awarded two grants

- U.S. Department of Energy
  - Statewide application led by SCAQMD
  - Award = $1 million statewide, $300,000 for SCAG and Clean Cities Coalitions
  - Goal: Six regional PEV infrastructure plans Completed December 2012
- California Energy Commission
  - Regional application co-led by SCAQMD & SCAG
  - Award = $200,000
  - Goal: complete two subregional plans in the South Bay and Western Riverside Councils of Government

Regional PEV Infrastructure Planning

- Speaking at forums and workshops
- Holding regular SoCalPEVCC meetings
- Clearinghouse for PEV Readiness Information

Regional PEV Readiness Plan

- Conduct literature review
- Research market forces
- Analyze driver behavioral information
- Develop a Regional Plan for charging infrastructure
- Develop in-depth subregional plans for SBCCOG and WRCOG
- Participate in meetings and workshops

Barriers to PEV Adoption

- Vehicle cost
- Accessibility of Charging Stations
- Workplace charging
- Multi-family dwelling units
- Range anxiety
- Marginal Cost of Energy

Types of Electric Vehicles

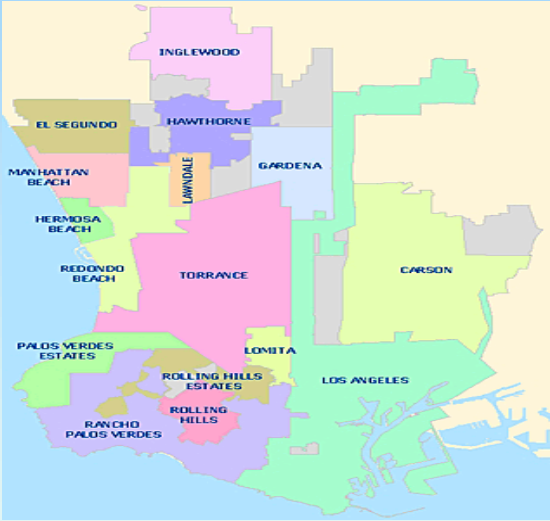
Battery Electric Vehicle (BEV)	•Powered exclusively by the electricity from its on-board battery, which replenishes its battery by plugging-in to the grid, or charging •Sometimes referred to as "pure" EVs •Nissan LEAF, SMART EV, Fiat 500e, BMW E-ACTIV
Extended Range Electric Vehicle	•Operates as a battery electric vehicle for a certain number of miles •After the battery has been discharged, a gas engine powers an electric generator for several hundred miles of "extended-range" driving
Plug-in Hybrid Electric Vehicle (PHEV)	•Has a battery that can be charged off board by plugging into the grid and enables it to travel a certain number of miles solely on electricity •Operates as a hybrid vehicle once electric-only range is exceeded •Toyota PEV Prius, Chevy Volt
Fuel Cell Electric Vehicle	•Converts the chemical energy from a fuel (hydrogen) into electricity through a chemical reaction to drive an electric motor. •Emits only heat and water •Honda Clarity, Toyota FCEV,
Hybrid Electric Vehicle (Hybrid)	•Uses both electric motor and an internal combustion engine to propel the vehicle •Toyota Prius, Kia Optima Hybrid, Ford Fusion Hybrid, etc.

SUBREGIONAL PEV PLANNING

Subregional PEV Planning

- How do we identify where charging opportunities are for MUDs, workplace, retail and single family?
- Why?
  - prioritize planning reforms (permit streamlining, zoning, building codes, parking,) by city as well
  - locate demonstration projects on best parcels.
- Example: MUDs and Workplaces South Bay Cities Council of Government Southern California.

South Bay Cities Council of Governments (SBCCOG)



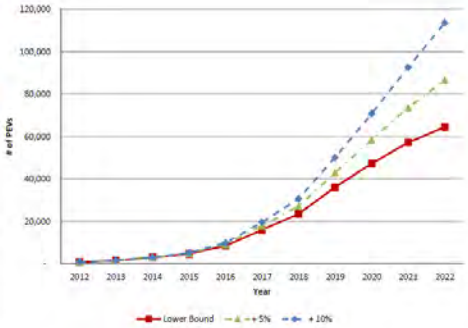
Growth in Plug-in EV Registrations, SBCCOG region

SOUTH BAY CITIES COUNCIL OF GOVERNMENTS

Luskin Center

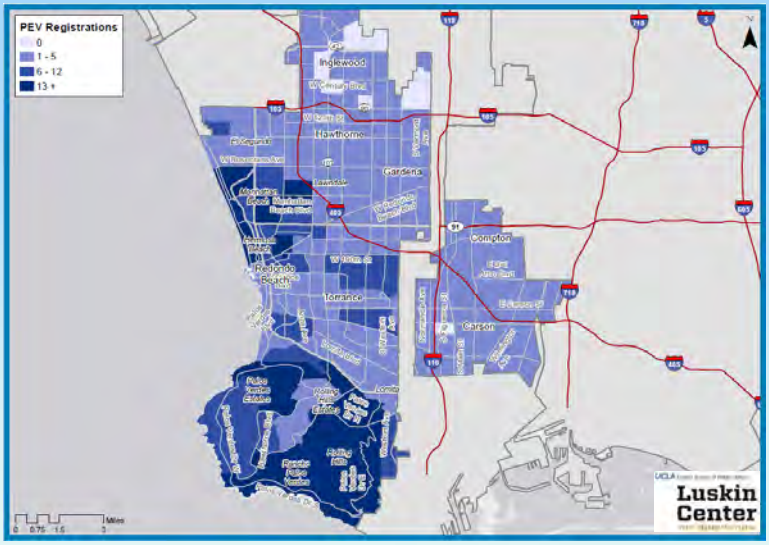
PEV Growth

Year	Cumulative PEV registrations*		
	Lower Bound	+5%	+10%
2012	747	747	747
2013	1,494	1,494	1,494
2014	2,885	2,960	2,988
2015	4,592	4,859	5,054
2016	8,423	9,155	9,776
2017	15,954	17,799	19,496
2018	23,424	27,023	30,574
2019	36,020	42,906	50,072
2020	47,212	58,382	70,636
2021	57,101	73,530	92,495
2022	64,359	86,552	113,501

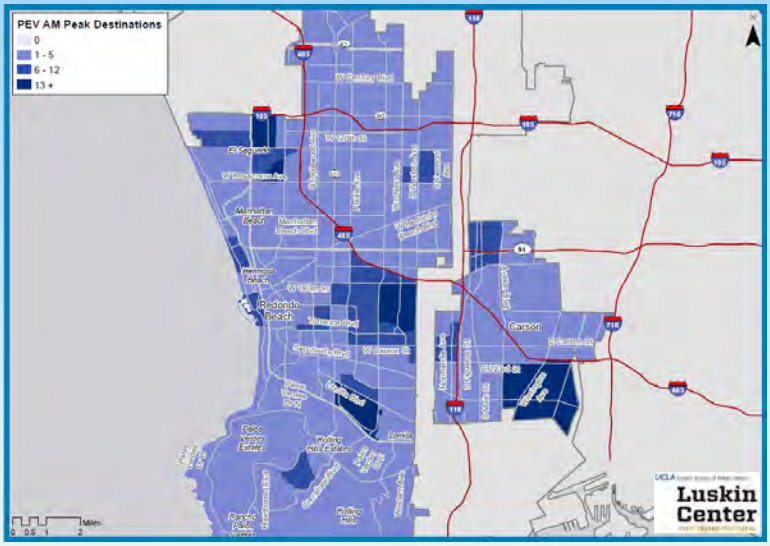


* The +5% and +10% projections begin in 2014, when uncertainty becomes greater.

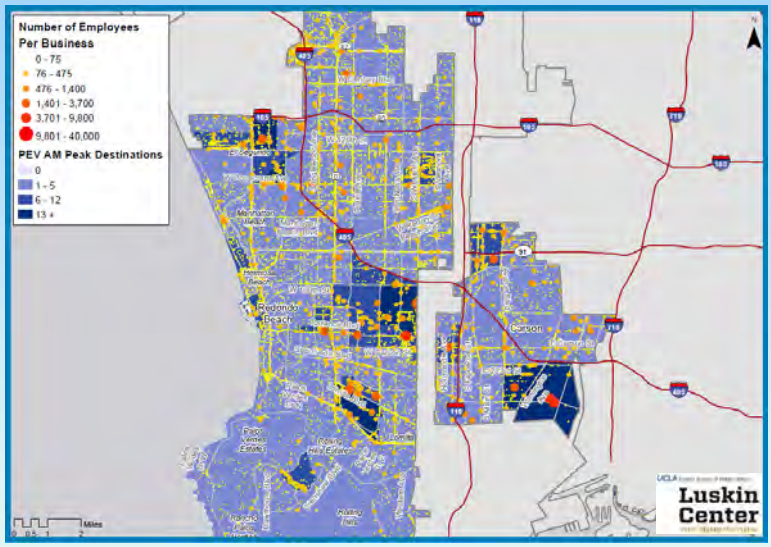
PEV Registrations by TAZ
(Polk Registration Data)



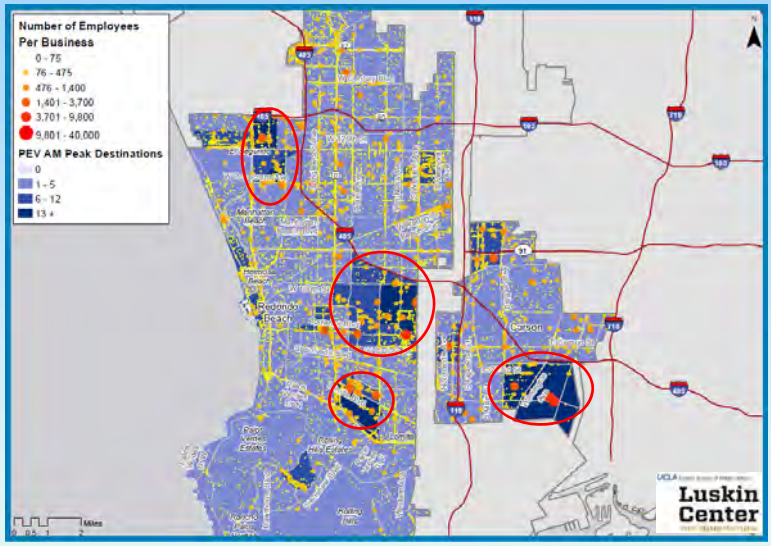
PEV Morning Peak Destinations
(SCAG Transportation Model)



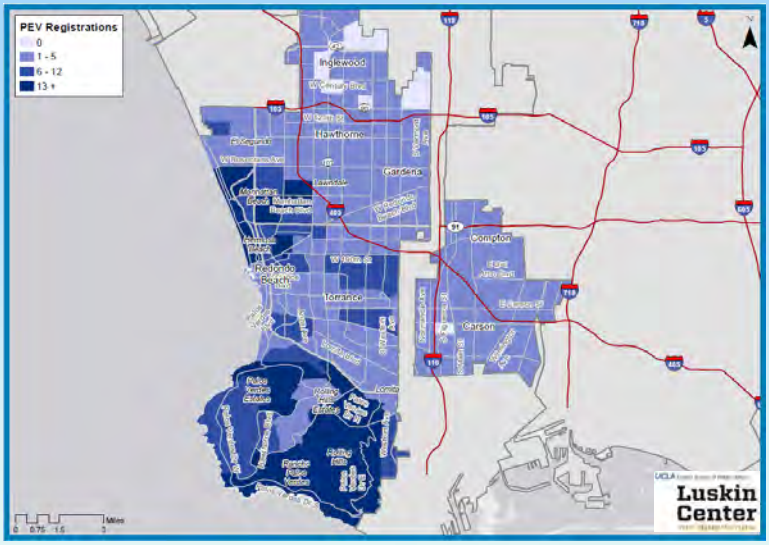
PEV Morning Peak Destinations and Workplaces by Number of Employees



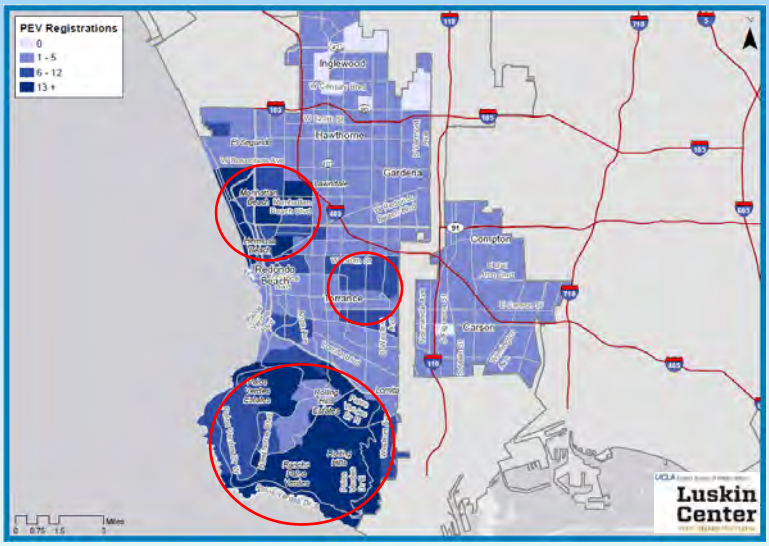
PEV Morning Peak Destinations, Workplaces, and Employment Clusters



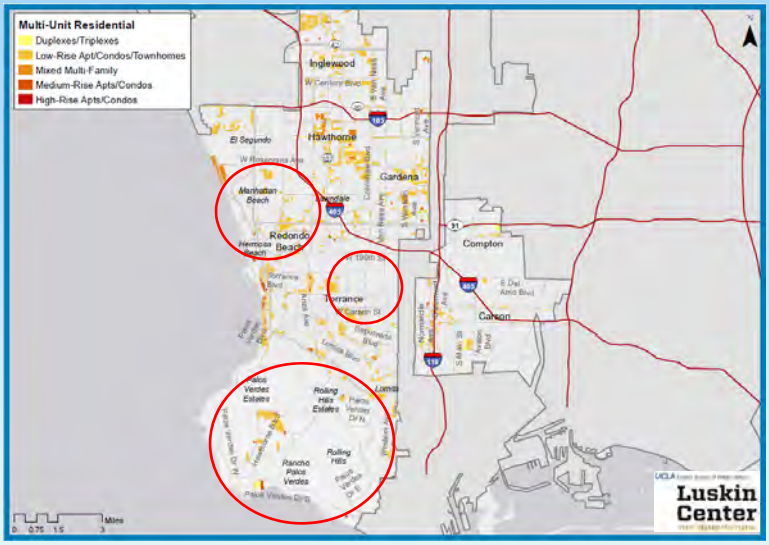
PEV Registrations by TAZ



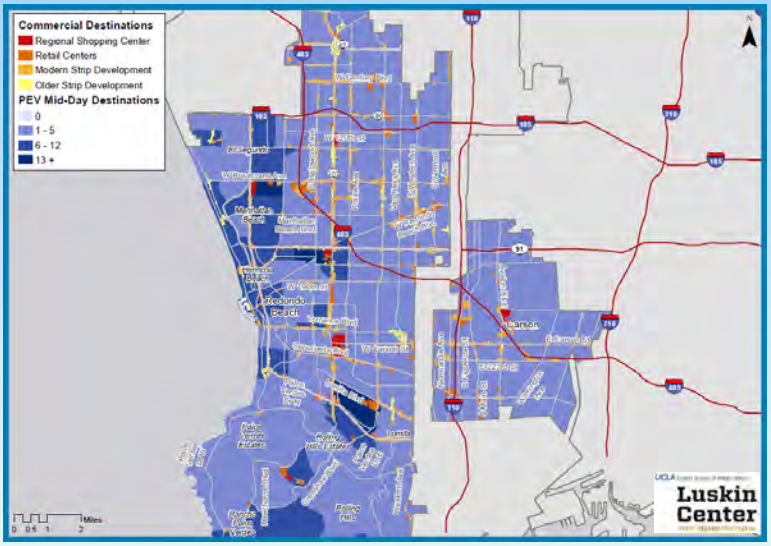
PEV Registrations by TAZ and Residential Clusters



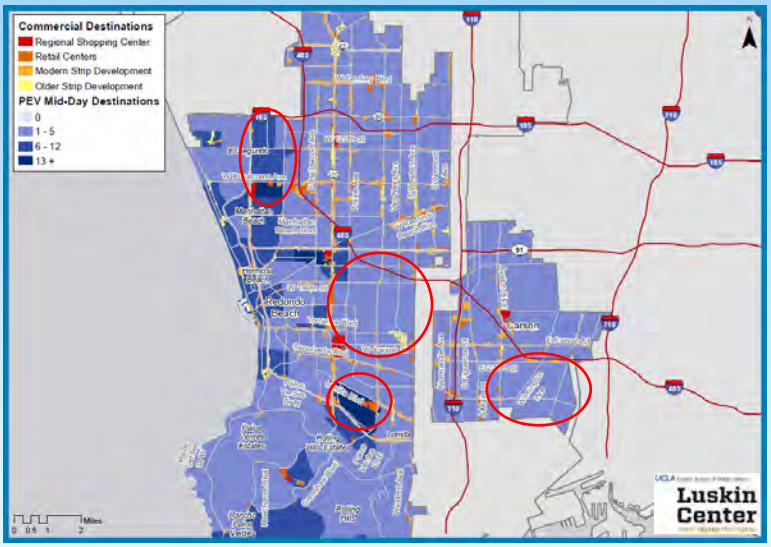
Multi-Unit Residential Dwelling by Type and Residential Clusters



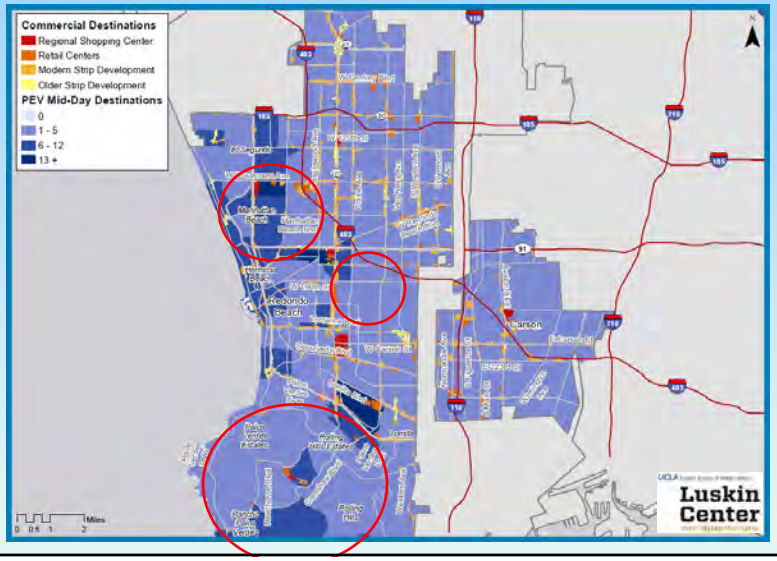
PEV Mid-Day Destinations and Retail Locations



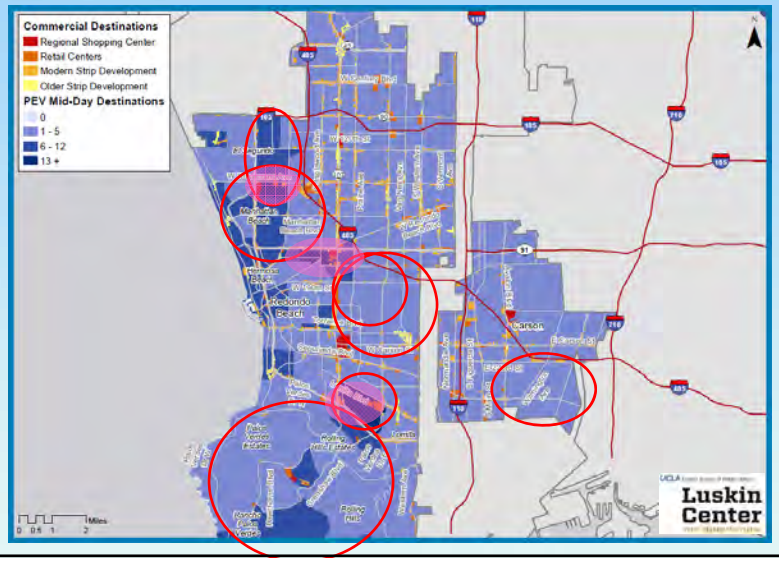
PEV Mid-Day Destinations, Retail Locations, and Employment Clusters



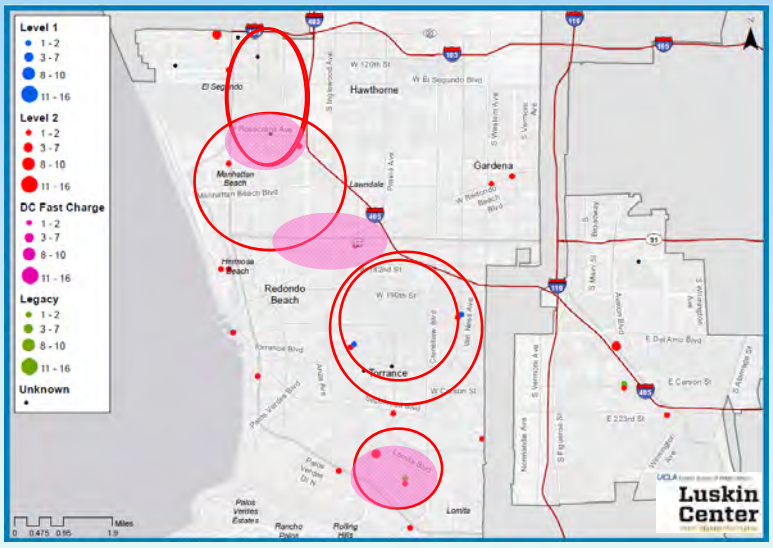
PEV Mid-Day Destinations, Retail Locations, and Residential Clusters



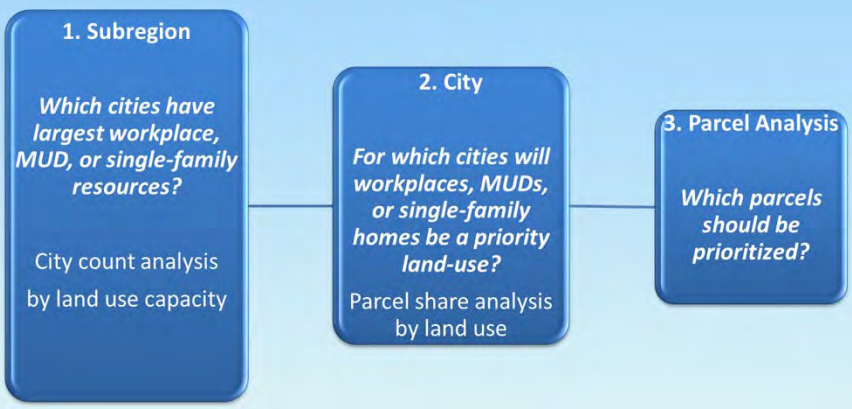
PEV Mid-Day Destinations, Retail Locations, Target Areas



Publicly Accessible Charging Stations (Summer/Fall 2012)



Levels of PEV Planning in Subregional PEV Deployment Plans



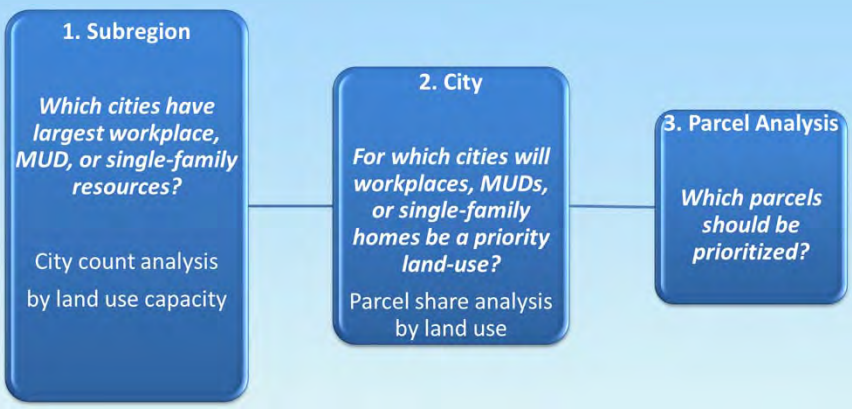
Estimated parking spaces, employment land use, South Bay Cities

	Employee Count	MUD Count	Single-Family Count
Torrance	**97,325**	22,709	35,771
El Segundo	**61,492**	3,721	3,582
Carson	**49,776**	2,920	22,935
Inglewood	**28,604**	21,117	18,192
Gardena	**24,951**	9,427	12,944
Redondo Beach	**23,471**	14,175	16,091
Hawthorne	**19,411**	19,689	10,345
Manhattan Beach	**17,139**	3,215	12,044
Hermosa Beach	**5,865**	5,080	5,401
Lawndale	**5,783**	3,170	7,419
Rancho Palos Verdes	**4,713**	2,340	13,452
Rolling Hills Estates	**4,268**	156	2,928
Lomita	**3,096**	2,695	5,383
Palos Verdes Estates	**2,028**	356	4,922
Rolling Hills	**237**	0	689

Estimated parking spaces by employee *share*, South Bay Cities

	% Employee	% MUD	% Single-Family
El Segundo	**89%**	5%	5%
Carson	**66%**	4%	30%
Torrance	**62%**	15%	23%
Rolling Hills Estates	**58%**	2%	40%
Manhattan Beach	**53%**	10%	37%
Gardena	**53%**	20%	27%
Redondo Beach	**44%**	26%	30%
Inglewood	**42%**	31%	27%
Hawthorne	**39%**	40%	21%
Hermosa Beach	**36%**	31%	33%
Lawndale	**35%**	19%	45%
Palos Verdes Estates	**28%**	5%	67%
Lomita	**28%**	24%	48%
Rolling Hills	**26%**	0%	74%
Rancho Palos Verdes	**23%**	11%	66%

Levels of PEV Planning in Subregional PEV Deployment Plans



Largest workplaces, high PEV density TAZs, weekday mornings, South Bay Cities subregion

Company	Address	City	Employees	High Tech	White Collar
Boeing Satellite Systems	1950 E Imperial Hwy	El Segundo	4,899	Y	Y
Torrance Memorial Medical Center	3330 Lomita Blvd	Torrance	3,018	N	Y
Aero Space Corp	2350 E El Segundo Blvd	El Segundo	2,820	Y*	Y*
Directv Inc	2230 East Imperial Highway	El Segundo	1,823	Y	Y
Mattel Inc	333 Continental Blvd	El Segundo	1,609	N	Y*
American Honda Motor Co	1919 Torrance Blvd	Torrance	1,602	N	Y
Space Exploration Technologies	1 Rocket Road	Hawthorne	1,186	Y*	Y*
BP-Arco	2350 E 223rd St	Carson	1,075		
Robinson Helicopter Co Inc	2901-31 Airport Dr	Torrance	961	Y	Y
Herbalife International of America	950 190th St	Torrance	939	N	Y
Hi-Shear Corporation	2600 Skypark Dr	Torrance	865	N	N
Rhythm & Hues, Inc	2100 E Grand Ave	El Segundo	704		N
L-3 Communications Electron Tech Inc	3100 W Lomita Blvd	Torrance	621	Y	Y
Moog, Inc	20263 S Western Ave	Torrance	445	Y	Y
Leiner Health Products	901 E 233rd St	Carson	381		
Virco Mfg Corp	2027 Harpers Blvd	Torrance	372	N	N
Teledyne Controls	501 Continental Blvd	El Segundo	371	Y*	N
Costco Wholesale	2751 Skypark Dr	Torrance	368	N	N*
Wal-Mart	19503 S Normandie Ave	Torrance	338	N*	N*
R. R. Donnelley & Sons Co	19681 Pacific Gateway Dr	Torrance	337		
Huck Intl Inc. DBA Alcoa Fastening Sys.	900 Watson Center Rd	Carson	331		

Levels of PEV Planning in Subregional PEV Deployment Plans

1. Subregion

Which cities have largest workplace, MUD, or single-family resources?

City count analysis by land use capacity

2. City

For which cities will workplaces, MUDs, or single-family homes be a priority land-use?

Parcel share analysis by land use

3. Parcel Analysis

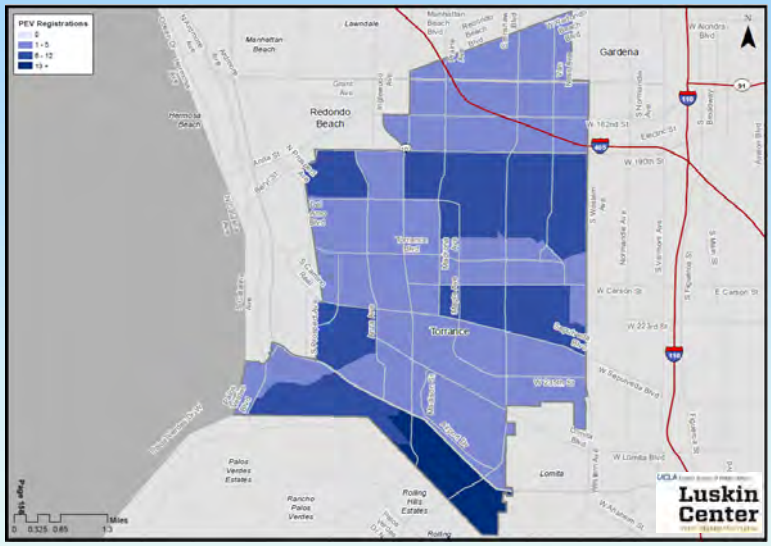
Which parcels should be prioritized?

MUNICIPAL PEV PLANNING

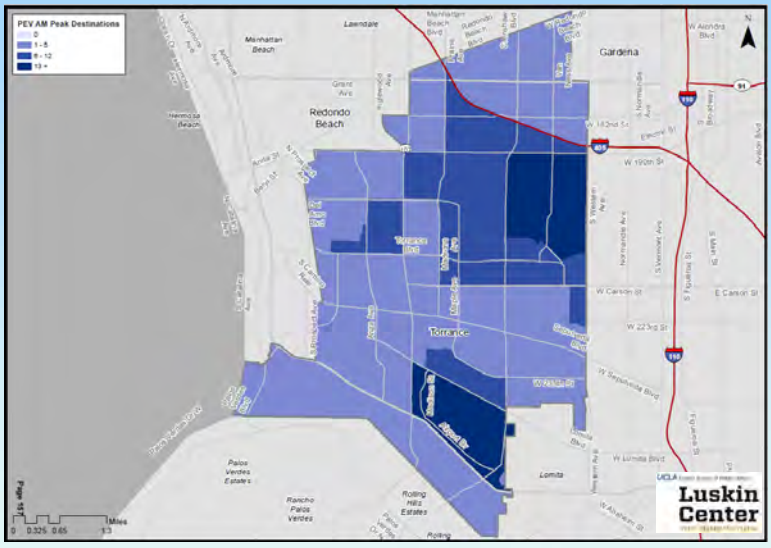
Torrance Example

- Location of PEV Registrations
- PEV morning peak destinations (map)
- Top workplaces by number of employees
- PEV morning peak destinations and top workplaces
- **Top employers (table)**
- Multi-unit residential and PEV registrations
- **Top MUDs (table)**
- Commercial (retail) locations
- PEV mid-day destinations and commercial (retail) locations
- **Top retailers (table)**
- Publicly-accessible charging stations

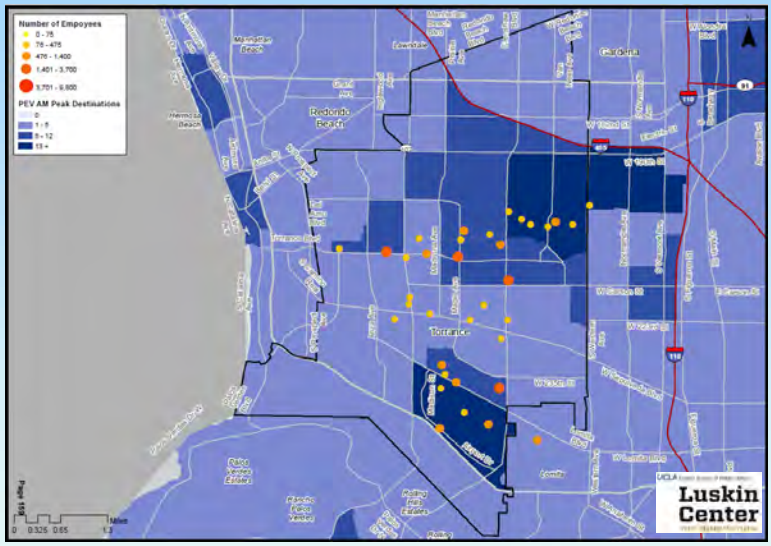
PEV Registrations, Torrance
(Polk Registration Data)



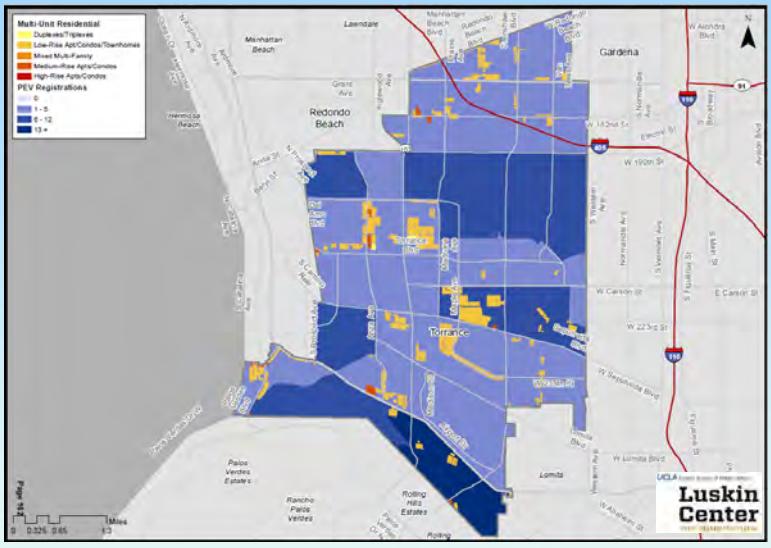
PEV Morning Peak Destinations, Torrance
(SCAG Transportation Model)



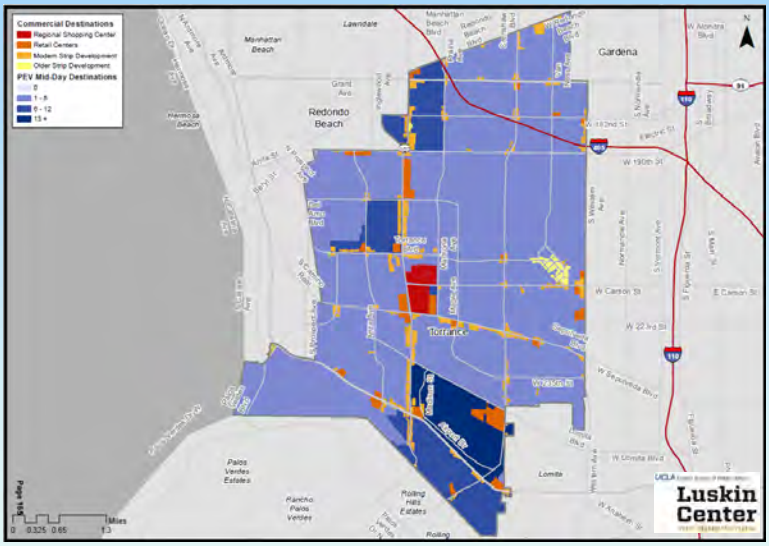
Top Ranked Employers and PEV Morning Peak Destinations, Torrance



Multi-Unit Residential and PEV Registrations, Torrance



Retail Locations and PEV Mid-Day Destinations, Torrance



Next Steps

- Complete Subregional Deployment Plans (November 2013)
- Promote Plans at 2013 Alt Car Expo
- Discuss Subregional PEV Plans at all member COGs
- Continue partnering with SCAQMD
- Continue hosting bi-monthly So Cal PEVCC meetings

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SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS

REPORT

AGENDA ITEM NO. 8

DATE: August 1, 2013

TO: Energy and Environment Committee (EEC)

FROM: Grieg Asher, Program Manager, 213-236-1869, asher@scag.ca.gov

SUBJECT: Federal Agencies Climate Change Adaptation Plans

EXECUTIVE DIRECTOR'S APPROVAL:

RECOMMENDED ACTION:
For Information Only – No Action Required.

EXECUTIVE SUMMARY:
The White House Council on Environmental Quality recently announced that 35 federal agencies had completed draft Climate Change Adaptation Plans, in response to Executive Order (EO) 13514, signed by President Obama on October 5, 2009 (see attached list.) EO 13514 mandates that all federal agencies develop Sustainability Plans which provide an overview of how agencies are saving taxpayer dollars, reducing carbon emissions, cutting waste, and saving energy.

STRATEGIC PLAN:
This item supports SCAG's Strategic Plan Goal 1: Improve Regional Decision Making by Providing Leadership and Consensus Building on Key Plans and Policies.

BACKGROUND:
On February 7, 2013, 35 federal agencies released their third annual, draft Sustainability Plans, which for the first time included Climate Change Adaptation Plans to help federal agencies reach sustainability and climate change resilience goals. These adaptation plans are included within the broader sustainability plans. Public comments on the draft Sustainability Plans were due April 9, 2013. After addressing comments received, federal agencies are expected to release final Sustainability Plans later this year.

SCAG staff has examined these agencies' adaptation planning efforts with an eye toward potential impacts on our planning efforts, and on the larger transportation planning field. To that end, staff focused review on the U.S. Department of Transportation (DOT), given DOT's role in providing direction and planning funds to Metropolitan Planning Organizations (MPOs). The DOT plan may be accessed at: http://www.dot.gov/sites/dot.dev/files/docs/DOT%20Adaptation%20Plan.pdf.

Based on staff's review, the adaptation effort to this point is broad and is in its early stage. The substance of the plans, including the DOT plan, is to signal areas of policy and practice that will need to reflect adaptation over time. In the DOT plan specifically, these areas include the following:

- **Planning** – The plan identifies transportation planning as an area that will need to address adaptation needs. This may result in specific guidance for future Regional Transportation Plan (RTP) cycles.
- **Asset management** – The plan cites the potential to readdress operational and maintenance standards for some infrastructure, given a changing climate.

- **Tools** – The plan commits DOT to providing tools, case studies, and best practices for adaptation. These may also impact regional planning in the future.

It should be clearly noted that the adaptation plans at this stage are general, and it is premature to reach conclusions about any new planning requirements. However, the plans may focus areas for discussion within the region and allow us to anticipate potential changes in our work.

SCAG's recently adopted 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy included the following information on climate change adaptation:

> Climate change ***mitigation*** means reducing or sequestering greenhouse gases; whereas ***adaptation*** is preparing for known impacts of climate change. Over the coming century, some climate change studies, such as the 2009 California Adaptation Strategy, project that Southern California will be expected to manage extremes of precipitation and temperature, increased storm frequency and intensity, and sea-level rise. These climate changes would impact streamflow, flooding, water supply, sea level, and soil water content. These impacts would affect agriculture, stormwater, waste-water treatment, wildfire risk, roads, forest health, and biodiversity. These impacts will also have consequences for public health, economic livelihoods, the financial sector, the insurance industry, individual comfort, and recreation. In practice, these impacts would mean coping with the following changes:
>
> - Longer and hotter heat waves,
> - Increased urban heat island impacts, such as heat-related illness and higher cooling demand and costs,
> - More damaging storms and storm surges,
> - Greater river flooding,
> - Increased frequency and intensity of combined sewer overflows,
> - More intense and extended duration of droughts,
> - Longer water supply shortages, and
> - Declines in local ecosystem services, such as species loss or the loss of specific ecosystem types (e.g., forests or coastal wetlands). [7]
>
> The associated impacts on buildings, water and transportation infrastructure, emergency preparedness, planning, and quality-of-life issues have only now begun to be considered. Climate and impact modeling can offer a scientific basis for more informed planning, including improved data gathering. However, additional monitoring, development of improved management practices, and coordination among state and local agencies and the private sector are critical needs as well. Failure to anticipate and plan for climate variability and the prospect of extreme weather and related events could have serious impacts on the regional economy and quality of life. Starting now and continuing in the years and decades ahead, we can adapt to these risks through resilient resource and land use choices.
>
> Footnote 7. 2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008. Available at http://resources.ca.gov/climate_adaptation/docs/Statewide_Adaptation_Strategy.pdf

The federal agencies' adaptation plans vary quite a bit, but they all address to some degree the following issues:

- Identification of potential vulnerability and impacts to the agency's facilities,
- Identification of Priority Actions to help the agency adapt to climate change,
- Recent progress and/or accomplishments in implementing adaptation strategies.

While adaptation plans do not immediately require significant changes in the way the federal agencies do business, it is clear that over time, adaptation planning will eventually be incorporated into planning and investment decisions, and will require greater collaboration and integration with state and local agencies.

FISCAL IMPACT:
None

ATTACHMENT:
List of Federal Agencies completing Climate Adaptation Plans in 2013

List of Federal Agencies completing Climate Adaptation Plans in 2013:

1. Advisory Council on Historic Preservation
2. Commodity Futures Trading Commission
3. Department of Agriculture
4. Department of Commerce
5. Department of Defense
6. Department of Education
7. Department of Energy
8. Department of Health and Human Services
9. Department of Homeland Security
10. Department of Housing and Urban Development
11. Department of Justice
12. Department of Labor
13. Department of State
14. Department of the Interior
15. Department of the Treasury
16. Department of Transportation
17. Department of Veterans Affairs
18. Environmental Protection Agency
19. Farm Credit Administration
20. Federal Trade Commission
21. General Services Administration
22. Marine Mammal Commission
23. National Aeronautics and Space Administration
24. National Archives and Records Administration
25. National Capital Planning Commission
26. Nuclear Regulatory Commission
27. Office of Personnel Management
28. Overseas Private Investment Corporation
29. Peace Corps
30. Railroad Retirement Board
31. Small Business Administration
32. Smithsonian Institution
33. Tennessee Valley Authority
34. U.S. Army Corps of Engineers
35. U.S. Postal Service

REPORT

AGENDA ITEM NO. 9

DATE: August 1, 2013

TO: Energy and Environment Committee (EEC)

FROM: Rongsheng Luo, Program Manager, (213) 236-1994, luo@scag.ca.gov

SUBJECT: Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2011

EXECUTIVE DIRECTOR'S APPROVAL:

RECOMMENDED ACTION:
For Information Only – No Action Required.

EXECUTIVE SUMMARY:
On April 15, 2013, the U.S. Environmental Protection Agency (EPA) published the 18th annual U.S. greenhouse gas (GHG) inventory. The report, Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2011, tracks total annual U.S. emissions and removals by source, economic sector, and greenhouse gas from 1990 through 2011. "Sinks" are natural or artificial reservoirs that absorb more carbon than they release. From 2000 to 2011, U.S. GHG emissions declined by 1.6 percent and 2011 total GHG emissions were nearly seven percent lower than 2005 levels. The recent downward trends were influenced by several factors such as cleaner electricity generation, improved vehicle fuel efficiency, reduction in vehicle miles traveled, and changes in prevailing weather. Staff will present highlights of the report.

STRATEGIC PLAN:
This item supports Strategic Plan Goal 1. Improve Regional Decision Making by Providing Leadership and Consensus Building on Key Plans and Policies; Objective (a) Create and facilitate a collaborative and cooperative environment to produce forward thinking regional plans.

BACKGROUND:
In 1992, the United States signed and ratified the United Nations Framework Convention on Climate Change (UNFCCC). The ultimate objective of the Convention is to achieve "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." By ratifying, parties to the Convention are committed to "develop, periodically update, publish and make available…national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies." EPA prepares the annual inventory to fulfill these commitments.

Based on national energy data, data on national agricultural activities, and other national statistics, this report provides a comprehensive accounting of total GHG emissions for all man-made sources in the United States (no breakdown by state) since 1990. The annual U.S. GHG emissions inventory is comparable to those of other UNFCCC Parties.

The key findings of the 1990-2011 U.S. Inventory include:

- In 2011, U.S. GHG emissions totaled 6,702 million metric tons carbon dioxide (CO_2) equivalent.

- U.S. emissions decreased by 1.6 percent from 2010 to 2011. Recent trends can be attributed to multiple factors including reduced emissions from electricity generation, improvements in fuel efficiency in vehicles with reductions in miles traveled, and year-to-year changes in the prevailing weather.
- Total U.S. GHG emissions in 2011 were 6.9 percent below 2005 levels.

FISCAL IMPACT:
Work associated with this item is included in the current FY2013/14 Overall Work Program (14-025-0164A.01 Air Quality Planning and Conformity).

ATTACHMENT:
Executive Summary of Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2011.

EPA 430-R-13-001

Inventory of U.S. Greenhouse Gas Emissions and Sinks:

1990 – 2011

APRIL 12, 2013

U.S. Environmental Protection Agency

1200 Pennsylvania Ave., N.W.

Washington, DC 20460

U.S.A.

Executive Summary

An emissions inventory that identifies and quantifies a country's primary anthropogenic[1] sources and sinks of greenhouse gases is essential for addressing climate change. This inventory adheres to both (1) a comprehensive and detailed set of methodologies for estimating sources and sinks of anthropogenic greenhouse gases, and (2) a common and consistent mechanism that enables Parties to the United Nations Framework Convention on Climate Change (UNFCCC) to compare the relative contribution of different emission sources and greenhouse gases to climate change.

In 1992, the United States signed and ratified the UNFCCC. As stated in Article 2 of the UNFCCC, "The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner."[2]

Parties to the Convention, by ratifying, "shall develop, periodically update, publish and make available…national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies…"[3] The United States views this report as an opportunity to fulfill these commitments.

This chapter summarizes the latest information on U.S. anthropogenic greenhouse gas emission trends from 1990 through 2011. To ensure that the U.S. emissions inventory is comparable to those of other UNFCCC Parties, the estimates presented here were calculated using methodologies consistent with those recommended in the Revised 1996 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories (IPCC/UNEP/OECD/IEA 1997), the IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories (IPCC 2000), and the IPCC Good Practice Guidance for Land Use, Land-Use Change, and Forestry (IPCC 2003). Additionally, the U.S. emission inventory has continued to incorporate new methodologies and data from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC 2006). The use of the most recently published calculation methodologies by the IPCC, as contained in the 2006 IPCC Guidelines, is considered to improve the rigor and accuracy of this inventory and is fully in line with the prior IPCC guidance. The structure of this report is consistent with the UNFCCC guidelines for inventory reporting.[4] For most

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[1] The term "anthropogenic," in this context, refers to greenhouse gas emissions and removals that are a direct result of human activities or are the result of natural processes that have been affected by human activities (IPCC/UNEP/OECD/IEA 1997).

[2] Article 2 of the Framework Convention on Climate Change published by the UNEP/WMO Information Unit on Climate Change. See <http://unfccc.int>.

[3] Article 4(1)(a) of the United Nations Framework Convention on Climate Change (also identified in Article 12). Subsequent decisions by the Conference of the Parties elaborated the role of Annex I Parties in preparing national inventories. See <http://unfccc.int>.

[4] See < http://unfccc.int/resource/docs/2006/sbsta/eng/09.pdf>.

source categories, the IPCC methodologies were expanded, resulting in a more comprehensive and detailed estimate of emissions.

Box ES- 1: Methodological Approach for Estimating and Reporting U.S. Emissions and Sinks

In following the UNFCCC requirement under Article 4.1 to develop and submit national greenhouse gas emissions inventories, the emissions and sinks presented in this report are organized by source and sink categories and calculated using internationally-accepted methods provided by the IPCC.[5] Additionally, the calculated emissions and sinks in a given year for the United States are presented in a common manner in line with the UNFCCC reporting guidelines for the reporting of inventories under this international agreement.[6] The use of consistent methods to calculate emissions and sinks by all nations providing their inventories to the UNFCCC ensures that these reports are comparable. In this regard, U.S. emissions and sinks reported in this inventory report are comparable to emissions and sinks reported by other countries. Emissions and sinks provided in this inventory do not preclude alternative examinations, but rather this inventory report presents emissions and sinks in a common format consistent with how countries are to report inventories under the UNFCCC. The report itself follows this standardized format, and provides an explanation of the IPCC methods used to calculate emissions and sinks, and the manner in which those calculations are conducted.

On October 30, 2009, the U.S. Environmental Protection Agency (EPA) published a rule for the mandatory reporting of greenhouse gases (GHG) from large GHG emissions sources in the United States. Implementation of 40 CFR Part 98 is referred to as the Greenhouse Gas Reporting Program (GHGRP). 40 CFR part 98 applies to direct greenhouse gas emitters, fossil fuel suppliers, industrial gas suppliers, and facilities that inject CO_2 underground for sequestration or other reasons[7]. Reporting is at the facility level, except for certain suppliers of fossil fuels and industrial greenhouse gases. The GHGRP dataset and the data presented in this inventory report are complementary and, as indicated in the respective methodological and planned improvements sections in this report's chapters, EPA is using the data, as applicable, to improve the national estimates presented in this inventory.

ES.1. Background Information

Greenhouse gases trap heat and make the planet warmer. The most important greenhouse gases directly emitted by humans include CO_2, CH_4, N_2O, and several other fluorine-containing halogenated substances. Although the direct greenhouse gases CO_2, CH_4, and N_2O occur naturally in the atmosphere, human activities have changed their atmospheric concentrations. From the pre-industrial era (i.e., ending about 1750) to 2010, concentrations of these greenhouse gases have increased globally by 39, 158, and 18 percent, respectively (IPCC 2007 and NOAA/ESLR 2009). This annual report estimates the total national greenhouse gas emissions and removals associated with human activities across the United States.

Global Warming Potentials

Gases in the atmosphere can contribute to the greenhouse effect both directly and indirectly. Direct effects occur when the gas itself absorbs radiation. Indirect radiative forcing occurs when chemical transformations of the substance produce other greenhouse gases, when a gas influences the atmospheric lifetimes of other gases, and/or when a gas affects atmospheric processes that alter the radiative balance of the earth (e.g., affect cloud formation or

[5] See < http://www.ipcc-nggip.iges.or.jp/public/index.html>.

[6] See < http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5270.php>.

[7] See <http://www.epa.gov/climatechange/emissions/ghgrulemaking.html> and <http://ghgdata.epa.gov/ghgp/main.do>.

albedo).[8] The IPCC developed the Global Warming Potential (GWP) concept to compare the ability of each greenhouse gas to trap heat in the atmosphere relative to another gas.

The GWP of a greenhouse gas is defined as the ratio of the time-integrated radiative forcing from the instantaneous release of 1 kilogram (kg) of a trace substance relative to that of 1 kg of a reference gas (IPCC 2001). Direct radiative effects occur when the gas itself is a greenhouse gas. The reference gas used is CO_2, and therefore GWP-weighted emissions are measured in teragrams (or million metric tons) of CO_2 equivalent (Tg CO_2 Eq.).[9,10] All gases in this Executive Summary are presented in units of Tg CO_2 Eq.

The UNFCCC reporting guidelines for national inventories were updated in 2006,[11] but continue to require the use of GWPs from the IPCC Second Assessment Report (SAR) (IPCC 1996). This requirement ensures that current estimates of aggregate greenhouse gas emissions for 1990 to 2011 are consistent with estimates developed prior to the publication of the IPCC Third Assessment Report (TAR) (IPCC 2001) and the IPCC Fourth Assessment Report (AR4) (IPCC 2007). Therefore, to comply with international reporting standards under the UNFCCC, official emission estimates are reported by the United States using SAR GWP values. All estimates are provided throughout the report in both CO_2 equivalents and unweighted units. A comparison of emission values using the SAR GWPs versus the TAR and AR4 GWPs can be found in Chapter 1 and, in more detail, in Annex 6.1 of this report. The GWP values used in this report are listed below in Table ES-1.

Table ES-1: Global Warming Potentials (100-Year Time Horizon) Used in this Report

Gas	GWP
CO_2	1
CH_4*	21
N_2O	310
HFC-23	11,700
HFC-32	650
HFC-125	2,800
HFC-134a	1,300
HFC-143a	3,800
HFC-152a	140
HFC-227ea	2,900
HFC-236fa	6,300
HFC-4310mee	1,300
CF_4	6,500
C_2F_6	9,200
C_4F_{10}	7,000
C_6F_{14}	7,400
SF_6	23,900

Source: IPCC (1996)

* The CH_4 GWP includes the direct effects and those indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to the production of CO_2 is not included.

[8] Albedo is a measure of the Earth's reflectivity, and is defined as the fraction of the total solar radiation incident on a body that is reflected by it.

[9] Carbon comprises 12/44^{ths} of carbon dioxide by weight.

[10] One teragram is equal to 10^{12} grams or one million metric tons.

[11] See <http://unfccc.int/resource/docs/2006/sbsta/eng/09.pdf>.

Global warming potentials are not provided for CO, NO_x, NMVOCs, SO_2, and aerosols because there is no agreed-upon method to estimate the contribution of gases that are short-lived in the atmosphere, spatially variable, or have only indirect effects on radiative forcing (IPCC 1996).

ES.2. Recent Trends in U.S. Greenhouse Gas Emissions and Sinks

In 2011, total U.S. greenhouse gas emissions were 6,702.3 Tg, or million metric tons, CO_2 Eq. Total U.S. emissions have increased by 8.4 percent from 1990 to 2011, and emissions decreased from 2010 to 2011 by 1.6 percent (108.0 Tg CO_2 Eq.). The decrease from 2010 to 2011 was due to a decrease in the carbon intensity of fuels consumed to generate electricity due to a decrease in coal consumption, with increased natural gas consumption and a significant increase in hydropower used. Additionally, relatively mild winter conditions, especially in the South Atlantic Region of the United States where electricity is an important heating fuel, resulted in an overall decrease in electricity demand in most sectors. Since 1990, U.S. emissions have increased at an average annual rate of 0.4 percent. Figure ES-1 through Figure ES-3 illustrate the overall trends in total U.S. emissions by gas, annual changes, and absolute change since 1990.

Table ES-2 provides a detailed summary of U.S. greenhouse gas emissions and sinks for 1990 through 2011.

Figure ES-1: U.S. Greenhouse Gas Emissions by Gas

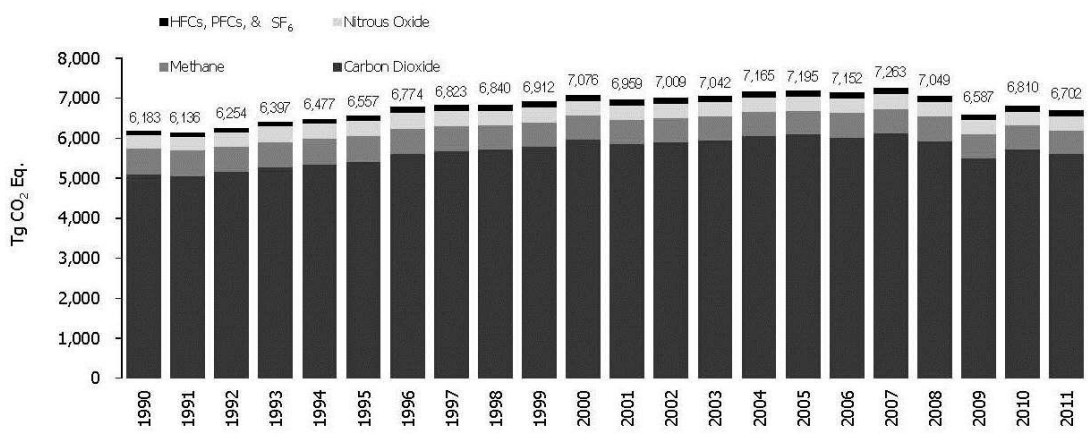


Figure ES-2: Annual Percent Change in U.S. Greenhouse Gas Emissions

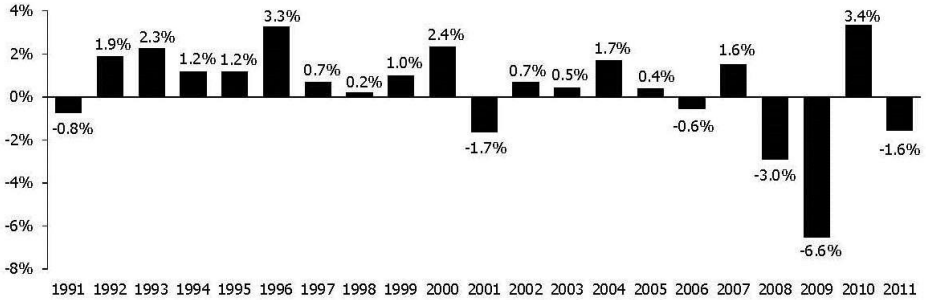


Figure ES-3: Cumulative Change in Annual U.S. Greenhouse Gas Emissions Relative to 1990

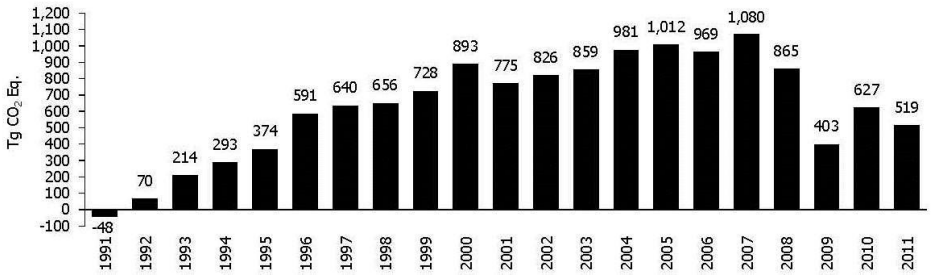


Table ES-2: Recent Trends in U.S. Greenhouse Gas Emissions and Sinks (Tg or million metric tons CO_2 Eq.)

Gas/Source	1990	2005	2007	2008	2009	2010	2011
CO_2	**5,108.8**	**6,109.3**	**6,128.6**	**5,944.8**	**5,517.9**	**5,736.4**	**5,612.9**
Fossil Fuel Combustion	4,748.5	5,748.7	5,767.7	5,590.6	5,222.4	5,408.1	5,277.2
Electricity Generation	1,820.8	2,402.1	2,412.8	2,360.9	2,146.4	2,259.2	2,158.5
Transportation	1,494.0	1,891.7	1,904.7	1,816.0	1,749.2	1,763.9	1,745.0
Industrial	848.6	823.4	844.4	802.0	722.6	780.2	773.2
Residential	338.3	357.9	341.6	347.0	337.0	334.6	328.8
Commercial	219.0	223.5	218.9	223.8	223.4	221.8	222.1
U.S. Territories	27.9	50.0	45.2	41.0	43.8	49.6	49.7
Non-Energy Use of Fuels	117.4	142.7	134.9	139.5	124.0	132.8	130.6
Iron & Steel & Metallurgical Coke Production	99.8	66.7	71.3	66.8	43.0	55.7	64.3
Natural Gas Systems	37.7	29.9	30.9	32.6	32.2	32.3	32.3
Cement Production	33.3	45.2	44.5	40.5	29.0	30.9	31.6
Lime Production	11.5	14.3	14.6	14.3	11.2	13.1	13.8
Incineration of Waste	8.0	12.5	12.7	11.9	11.7	12.0	12.0
Other Process Uses of Carbonates	4.9	6.3	7.4	5.9	7.6	9.6	9.2
Ammonia Production	13.0	9.2	9.1	7.9	7.9	8.7	8.8
Cropland Remaining Cropland	7.1	7.9	8.2	8.6	7.2	8.4	8.1
Urea Consumption for Non-Agricultural Purposes	3.8	3.7	4.9	4.1	3.4	4.4	4.3
Petrochemical Production	3.4	4.3	4.1	3.6	2.8	3.5	3.5
Aluminum Production	6.8	4.1	4.3	4.5	3.0	2.7	3.3

Soda Ash Production and Consumption	2.8	3.0	2.9	3.0	2.6	2.7	2.7
Titanium Dioxide Production	1.2	1.8	1.9	1.8	1.6	1.8	1.9
Carbon Dioxide Consumption	1.4	1.3	1.9	1.8	1.8	2.2	1.8
Ferroalloy Production	2.2	1.4	1.6	1.6	1.5	1.7	1.7
Glass Production	1.5	1.9	1.5	1.5	1.0	1.5	1.3
Zinc Production	0.6	1.0	1.0	1.2	0.9	1.2	1.3
Phosphoric Acid Production	1.5	1.3	1.2	1.2	1.0	1.1	1.2
Wetlands Remaining Wetlands	1.0	1.1	1.0	1.0	1.1	1.0	0.9
Lead Production	0.5	0.6	0.6	0.5	0.5	0.5	0.5
Petroleum Systems	0.4	0.3	0.3	0.3	0.3	0.3	0.3
Silicon Carbide Production and Consumption	0.4	0.2	0.2	0.2	0.1	0.2	0.2
Land Use, Land-Use Change, and Forestry (Sink)[a]	*(794.5)*	*(997.8)*	*(929.2)*	*(902.6)*	*(882.6)*	*(888.8)*	*(905.0)*
Wood Biomass and Ethanol Consumption[b]	*218.6*	*228.7*	*238.3*	*251.7*	*245.1*	*264.5*	*264.5*
International Bunker Fuels[c]	*103.5*	*113.1*	*115.3*	*114.3*	*106.4*	*117.0*	*111.3*
CH_4	**639.9**	**593.6**	**618.6**	**618.8**	**603.8**	**592.7**	**587.2**
Natural Gas Systems	161.2	159.0	168.4	163.4	150.7	143.6	144.7
Enteric Fermentation	132.7	137.0	141.8	141.4	140.6	139.3	137.4
Landfills	147.8	112.5	111.6	113.6	113.3	106.8	103.0
Coal Mining	84.1	56.9	57.9	67.1	70.3	72.4	63.2
Manure Management	31.5	47.6	52.4	51.5	50.5	51.8	52.0
Petroleum Systems	35.2	29.2	29.8	30.0	30.5	30.8	31.5
Wastewater Treatment	15.9	16.5	16.6	16.6	16.5	16.4	16.2
Forest Land Remaining Forest Land	2.5	8.0	14.4	8.7	5.7	4.7	14.2
Rice Cultivation	7.1	6.8	6.2	7.2	7.3	8.6	6.6
Stationary Combustion	7.5	6.6	6.4	6.6	6.3	6.3	6.3
Abandoned Underground Coal Mines	6.0	5.5	5.3	5.3	5.1	5.0	4.8
Petrochemical Production	2.3	3.1	3.3	2.9	2.9	3.1	3.1
Mobile Combustion	4.6	2.4	2.1	1.9	1.8	1.8	1.7
Composting	0.3	1.6	1.7	1.7	1.6	1.5	1.5
Iron & Steel & Metallurgical Coke Production	1.0	0.7	0.7	0.6	0.4	0.5	0.6
Field Burning of Agricultural Residues	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Ferroalloy Production	+	+	+	+	+	+	+
Silicon Carbide Production and Consumption	+	+	+	+	+	+	+
Incineration of Waste	+	+	+	+	+	+	+
International Bunker Fuels[c]	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
N_2O	**344.3**	**356.1**	**376.1**	**349.7**	**338.7**	**343.9**	**356.9**
Agricultural Soil Management	227.9	237.5	252.3	245.4	242.8	244.5	247.2
Stationary Combustion	12.3	20.6	21.2	21.1	20.7	22.6	22.0
Mobile Combustion	44.0	36.9	29.0	25.5	22.7	20.7	18.5
Manure Management	14.4	17.1	18.0	17.8	17.7	17.8	18.0
Nitric Acid Production	18.2	16.9	19.7	16.9	14.0	16.8	15.5
Forest Land Remaining Forest Land	2.1	6.9	12.1	7.4	5.0	4.2	11.9
Adipic Acid Production	15.8	7.4	10.7	2.6	2.8	4.4	10.6
Wastewater Treatment	3.5	4.7	4.8	4.9	5.0	5.1	5.2
N_2O from Product Uses	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Composting	0.4	1.7	1.8	1.9	1.8	1.7	1.7

Settlements Remaining Settlements	1.0	1.5	1.6	1.5	1.4	1.5	1.5
Incineration of Waste	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Field Burning of Agricultural Residues	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Wetlands Remaining Wetlands	+	+	+	+	+	+	+
International Bunker Fuels[c]	*0.9*	*1.0*	*1.0*	*1.0*	*0.9*	*1.0*	*1.0*
HFCs	**36.9**	**115.0**	**120.0**	**117.5**	**112.0**	**121.3**	**129.0**
Substitution of Ozone Depleting Substances[d]	0.3	99.0	102.7	103.6	106.3	114.6	121.7
HCFC-22 Production	36.4	15.8	17.0	13.6	5.4	6.4	6.9
Semiconductor Manufacture	0.2	0.2	0.3	0.3	0.2	0.4	0.3
PFCs	**20.6**	**6.2**	**7.7**	**6.6**	**4.4**	**5.9**	**7.0**
Semiconductor Manufacture	2.2	3.2	3.8	3.9	2.9	4.4	4.1
Aluminum Production	18.4	3.0	3.8	2.7	1.6	1.6	2.9
SF_6	**32.6**	**15.0**	**12.3**	**11.4**	**9.8**	**10.1**	**9.4**
Electrical Transmission and Distribution	26.7	11.1	8.8	8.6	8.1	7.8	7.0
Magnesium Production and Processing	5.4	2.9	2.6	1.9	1.1	1.3	1.4
Semiconductor Manufacture	0.5	1.0	0.8	0.9	0.7	1.0	0.9
Total	**6,183.3**	**7,195.3**	**7,263.2**	**7,048.8**	**6,586.6**	**6,810.3**	**6,702.3**
Net Emissions (Sources and Sinks)	**5,388.7**	**6,197.4**	**6,334.0**	**6,146.2**	**5,704.0**	**5,921.5**	**5,797.3**

+ Does not exceed 0.05 Tg CO_2 Eq.

[a] Parentheses indicate negative values or sequestration. The net CO_2 flux total includes both emissions and sequestration, and constitutes a net sink in the United States. Sinks are only included in net emissions total.

[b] Emissions from Wood Biomass and Ethanol Consumption are not included specifically in summing energy sector totals. Net carbon fluxes from changes in biogenic carbon reservoirs are accounted for in the estimates for Land Use, Land-Use Change, and Forestry.

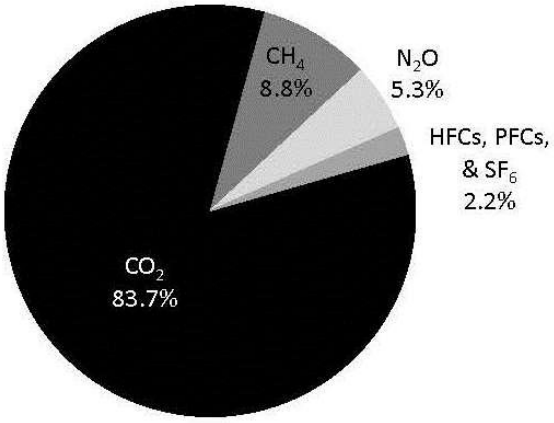
[c] Emissions from International Bunker Fuels are not included in totals.

[d] Small amounts of PFC emissions also result from this source.

Note: Totals may not sum due to independent rounding.

Figure ES-4 illustrates the relative contribution of the direct greenhouse gases to total U.S. emissions in 2011. The primary greenhouse gas emitted by human activities in the United States was CO_2, representing approximately 83.7 percent of total greenhouse gas emissions. The largest source of CO_2, and of overall greenhouse gas emissions, was fossil fuel combustion. CH_4 emissions, which have decreased by 8.2 percent since 1990, resulted primarily from natural gas systems, enteric fermentation associated with domestic livestock, and decomposition of wastes in landfills. Agricultural soil management, mobile source fuel combustion and stationary fuel combustion were the major sources of N_2O emissions. Ozone depleting substance substitute emissions and emissions of HFC-23 during the production of HCFC-22 were the primary contributors to aggregate HFC emissions. PFC emissions resulted from semiconductor manufacturing and as a by-product of primary aluminum production, while electrical transmission and distribution systems accounted for most SF_6 emissions.

Figure ES-4: 2011 Greenhouse Gas Emissions by Gas (Percentages based on Tg CO_2 Eq.)



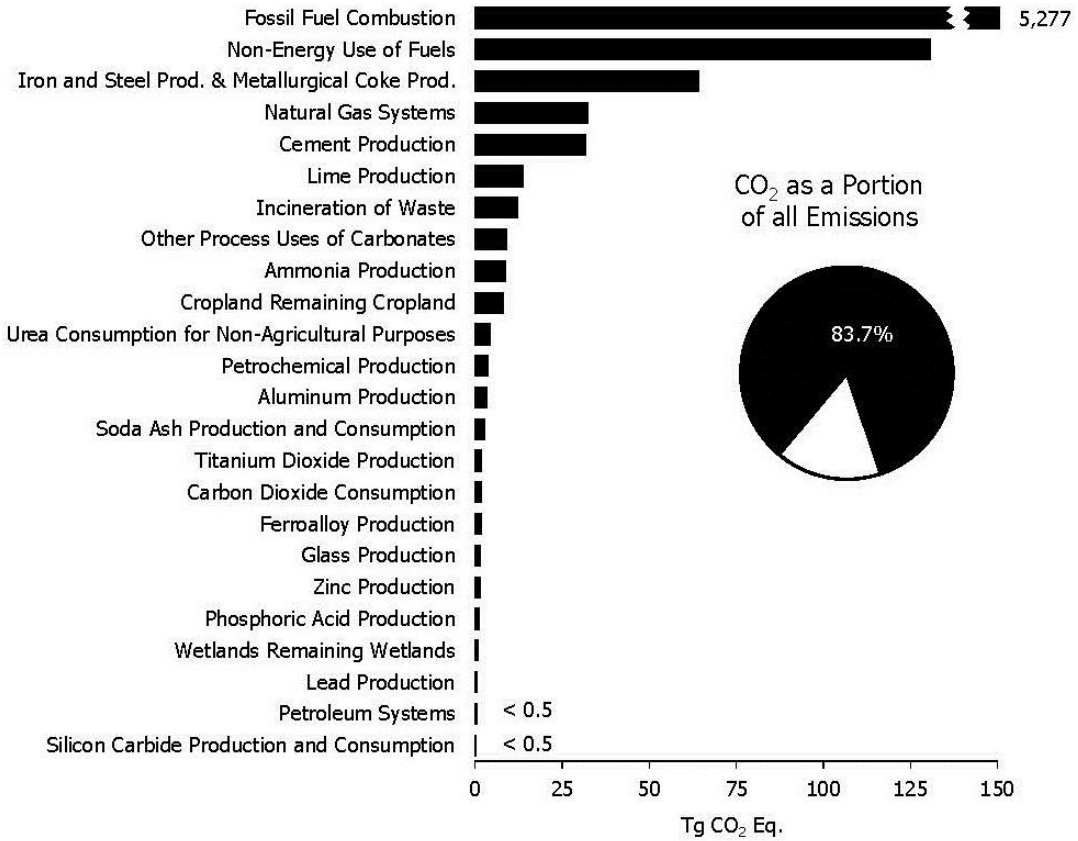
Overall, from 1990 to 2011, total emissions of CO_2 increased by 504.0 Tg CO_2 Eq. (9.9 percent), while total emissions of CH_4 decreased by 52.7 Tg CO_2 Eq. (8.2 percent), and N_2O increased by 12.6 Tg CO_2 Eq. (3.6 percent). During the same period, aggregate weighted emissions of HFCs, PFCs, and SF_6 rose by 55.1 Tg CO_2 Eq. (61.1 percent). From 1990 to 2011, HFCs increased by 92.0 Tg CO_2 Eq. (249.3 percent), PFCs decreased by 13.6 Tg CO_2 Eq. (66.1 percent), and SF_6 decreased by 23.3 Tg CO_2 Eq. (71.3 percent). Despite being emitted in smaller quantities relative to the other principal greenhouse gases, emissions of HFCs, PFCs, and SF_6 are significant because many of these gases have extremely high global warming potentials and, in the cases of PFCs and SF_6, long atmospheric lifetimes. Conversely, U.S. greenhouse gas emissions were partly offset by carbon sequestration in forests, trees in urban areas, agricultural soils, and landfilled yard trimmings and food scraps, which, in aggregate, offset 13.5 percent of total emissions in 2011. The following sections describe each gas's contribution to total U.S. greenhouse gas emissions in more detail.

Carbon Dioxide Emissions

The global carbon cycle is made up of large carbon flows and reservoirs. Billions of tons of carbon in the form of CO_2 are absorbed by oceans and living biomass (i.e., sinks) and are emitted to the atmosphere annually through natural processes (i.e., sources). When in equilibrium, carbon fluxes among these various reservoirs are roughly balanced. Since the Industrial Revolution (i.e., about 1750), global atmospheric concentrations of CO_2 have risen about 39 percent (IPCC 2007 and NOAA/ESLR 2009), principally due to the combustion of fossil fuels. Within the United States, fossil fuel combustion accounted for 94.0 percent of CO_2 emissions in 2011. Globally, approximately 31,780 Tg of CO_2 were added to the atmosphere through the combustion of fossil fuels in 2010, of which the United States accounted for about 18 percent.[12] Changes in land use and forestry practices can also emit CO_2 (e.g., through conversion of forest land to agricultural or urban use) or can act as a sink for CO_2 (e.g., through net additions to forest biomass). In addition to fossil-fuel combustion, several other sources emit significant quantities of CO_2. These sources include, but are not limited to non-energy use of fuels, iron and steel production and cement production (Figure ES-5).

[12] Global CO_2 emissions from fossil fuel combustion were taken from Energy Information Administration *International Energy Statistics 2010* < http://tonto.eia.doe.gov/cfapps/ipdbproject/IEDIndex3.cfm> EIA (2013).

Figure ES-5: 2011 Sources of CO_2 Emissions



Note: Electricity generation also includes emissions of less than 0.05 Tg CO_2 Eq. from geothermal-based generation.

As the largest source of U.S. greenhouse gas emissions, CO_2 from fossil fuel combustion has accounted for approximately 78 percent of GWP-weighted emissions since 1990, and is approximately 79 percent of total GWP-weighted emissions in 2011. Emissions of CO_2 from fossil fuel combustion increased at an average annual rate of 0.5 percent from 1990 to 2011. The fundamental factors influencing this trend include (1) a generally growing domestic economy over the last 22 years, and (2) an overall growth in emissions from electricity generation and transportation activities. Between 1990 and 2011, CO_2 emissions from fossil fuel combustion increased from 4,748.5 Tg CO_2 Eq. to 5,277.2 Tg CO_2 Eq.—an 11.1 percent total increase over the twenty-two-year period. From 2010 to 2011, these emissions decreased by 130.9 Tg CO_2 Eq. (2.4 percent).

Historically, changes in emissions from fossil fuel combustion have been the dominant factor affecting U.S. emission trends. Changes in CO_2 emissions from fossil fuel combustion are influenced by many long-term and short-term factors, including population and economic growth, energy price fluctuations, technological changes, and seasonal temperatures. In the short term, the overall consumption of fossil fuels in the United States fluctuates primarily in response to changes in general economic conditions, energy prices, weather, and the availability of non-fossil alternatives. For example, in a year with increased consumption of goods and services, low fuel prices, severe summer and winter weather conditions, nuclear plant closures, and lower precipitation feeding hydroelectric dams, there would likely be proportionally greater fossil fuel consumption than a year with poor economic performance, high fuel prices, mild temperatures, and increased output from nuclear and hydroelectric plants. In the long term, energy consumption patterns respond to changes that affect the scale of consumption (e.g., population, number of cars, and size of houses), the efficiency with which energy is used in equipment (e.g., cars, power plants, steel mills, and light bulbs) and behavioral choices (e.g., walking, bicycling, or telecommuting to work instead of driving).

Figure ES-6: 2011 CO_2 Emissions from Fossil Fuel Combustion by Sector and Fuel Type

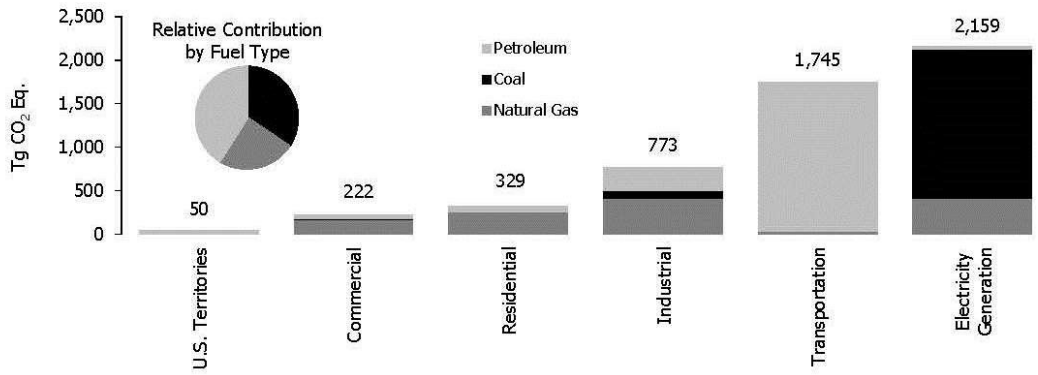
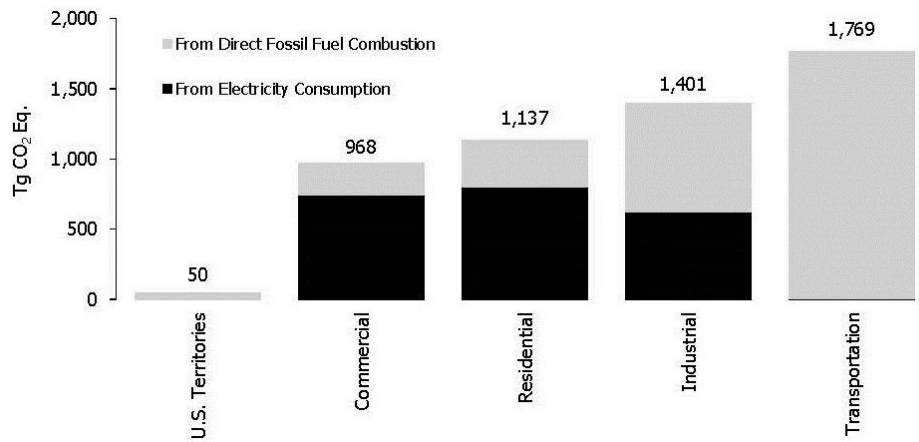


Figure ES-7: 2011 End-Use Sector Emissions of CO_2, CH_4, and N_2O from Fossil Fuel Combustion



The five major fuel consuming sectors contributing to CO_2 emissions from fossil fuel combustion are electricity generation, transportation, industrial, residential, and commercial. CO_2 emissions are produced by the electricity generation sector as they consume fossil fuel to provide electricity to one of the other four sectors, or "end-use" sectors. For the discussion below, electricity generation emissions have been distributed to each end-use sector on the basis of each sector's share of aggregate electricity consumption. This method of distributing emissions assumes that each end-use sector consumes electricity that is generated from the national average mix of fuels according to their carbon intensity. Emissions from electricity generation are also addressed separately after the end-use sectors have been discussed.

Note that emissions from U.S. territories are calculated separately due to a lack of specific consumption data for the individual end-use sectors. Figure ES-6, Figure ES-7, and Table ES-3 summarize CO_2 emissions from fossil fuel combustion by end-use sector.

Table ES-3: CO_2 Emissions from Fossil Fuel Combustion by Fuel Consuming End-Use Sector (Tg or million metric tons CO_2 Eq.)

End-Use Sector	1990		2005		2007	2008	2009	2010	2011

Transportation	**1,497.0**	**1,896.5**	**1,909.7**	**1,820.7**	**1,753.7**	**1,768.4**	**1,749.3**
Combustion	1,494.0	1,891.7	1,904.7	1,816.0	1,749.2	1,763.9	1,745.0
Electricity	3.0	4.7	5.1	4.7	4.5	4.5	4.3
Industrial	**1,535.3**	**1,560.4**	**1,559.9**	**1,499.3**	**1,324.6**	**1,421.3**	**1,392.1**
Combustion	848.6	823.4	844.4	802.0	722.6	780.2	773.2
Electricity	686.7	737.0	715.4	697.3	602.0	641.1	618.9
Residential	**931.4**	**1,214.7**	**1,205.2**	**1,189.9**	**1,123.5**	**1,175.0**	**1,125.6**
Combustion	338.3	357.9	341.6	347.0	337.0	334.6	328.8
Electricity	593.0	856.7	863.5	842.9	786.5	840.4	796.9
Commercial	**757.0**	**1,027.2**	**1,047.7**	**1,039.8**	**976.8**	**993.9**	**960.5**
Combustion	219.0	223.5	218.9	223.8	223.4	220.6	222.1
Electricity	538.0	803.7	828.8	816.0	753.5	773.3	738.4
U.S. Territories[a]	**27.9**	**50.0**	**45.2**	**41.0**	**43.8**	**49.6**	**49.7**
Total	**4,748.5**	**5,748.7**	**5,767.7**	**5,590.6**	**5,222.4**	**5,408.1**	**5,277.2**
Electricity Generation	**1,820.8**	**2,402.1**	**2,412.8**	**2,360.9**	**2,146.4**	**2,259.2**	**2,158.5**

Note: Totals may not sum due to independent rounding. Combustion-related emissions from electricity generation are allocated based on aggregate national electricity consumption by each end-use sector.

[a] Fuel consumption by U.S. territories (i.e., American Samoa, Guam, Puerto Rico, U.S. Virgin Islands, Wake Island, and other U.S. Pacific Islands) is included in this report.

Transportation End-Use Sector. Transportation activities (excluding international bunker fuels) accounted for 33 percent of CO_2 emissions from fossil fuel combustion in 2011.[13] Virtually all of the energy consumed in this end-use sector came from petroleum products. Nearly 65 percent of the emissions resulted from gasoline consumption for personal vehicle use. The remaining emissions came from other transportation activities, including the combustion of diesel fuel in heavy-duty vehicles and jet fuel in aircraft. From 1990 to 2011, transportation emissions rose by 17 percent due, in large part, to increased demand for travel and the stagnation of fuel efficiency across the U.S. vehicle fleet. The number of vehicle miles traveled by light-duty motor vehicles (passenger cars and light-duty trucks) increased 34 percent from 1990 to 2011, as a result of a confluence of factors including population growth, economic growth, urban sprawl, and low fuel prices over much of this period. It is noted that the more recent trend for transportation has shown a general decline in emissions, due to recent slow growth in economic activity, higher fuel prices, and an associated decrease in the demand for passenger transportation.

Industrial End-Use Sector. Industrial CO_2 emissions, resulting both directly from the combustion of fossil fuels and indirectly from the generation of electricity that is consumed by industry, accounted for 26 percent of CO_2 from fossil fuel combustion in 2011. Approximately 56 percent of these emissions resulted from direct fossil fuel combustion to produce steam and/or heat for industrial processes. The remaining emissions resulted from consuming electricity for motors, electric furnaces, ovens, lighting, and other applications. In contrast to the other end-use sectors, emissions from industry have steadily declined since 1990. This decline is due to structural changes in the U.S. economy (i.e., shifts from a manufacturing-based to a service-based economy), fuel switching, and efficiency improvements.

Residential and Commercial End-Use Sectors. The residential and commercial end-use sectors accounted for 21 and 18 percent, respectively, of CO_2 emissions from fossil fuel combustion in 2011. Both sectors relied heavily on electricity for meeting energy demands, with 71 and 77 percent, respectively, of their emissions attributable to electricity consumption for lighting, heating, cooling, and operating appliances. The remaining emissions were due to the consumption of natural gas and petroleum for heating and cooking. Emissions from the residential and commercial end-use sectors have increased by 21 percent and 27 percent since 1990, respectively, due to increasing electricity consumption for lighting, heating, air conditioning, and operating appliances.

Electricity Generation. The United States relies on electricity to meet a significant portion of its energy demands. Electricity generators consumed 36 percent of U.S. energy from fossil fuels and emitted 41 percent of the CO_2 from fossil fuel combustion in 2011. The type of fuel combusted by electricity generators has a significant effect on their

[13] If emissions from international bunker fuels are included, the transportation end-use sector accounted for 34.5 percent of U.S. emissions from fossil fuel combustion in 2011.

emissions. For example, some electricity is generated with low CO_2 emitting energy technologies, particularly non-fossil options such as nuclear, hydroelectric, or geothermal energy. Electricity generators relied on coal for approximately 42 percent their total energy requirements in 2011, and accounted for 95 percent of all coal consumed for energy in the United States in 2011. Recently a decrease in the carbon intensity of fuels consumed to generate electricity has occurred due to a decrease in coal consumption, and increased natural gas consumption and other generation sources. Across the time series, changes in electricity demand and the carbon intensity of fuels used for electricity generation have a significant impact on CO_2 emissions.

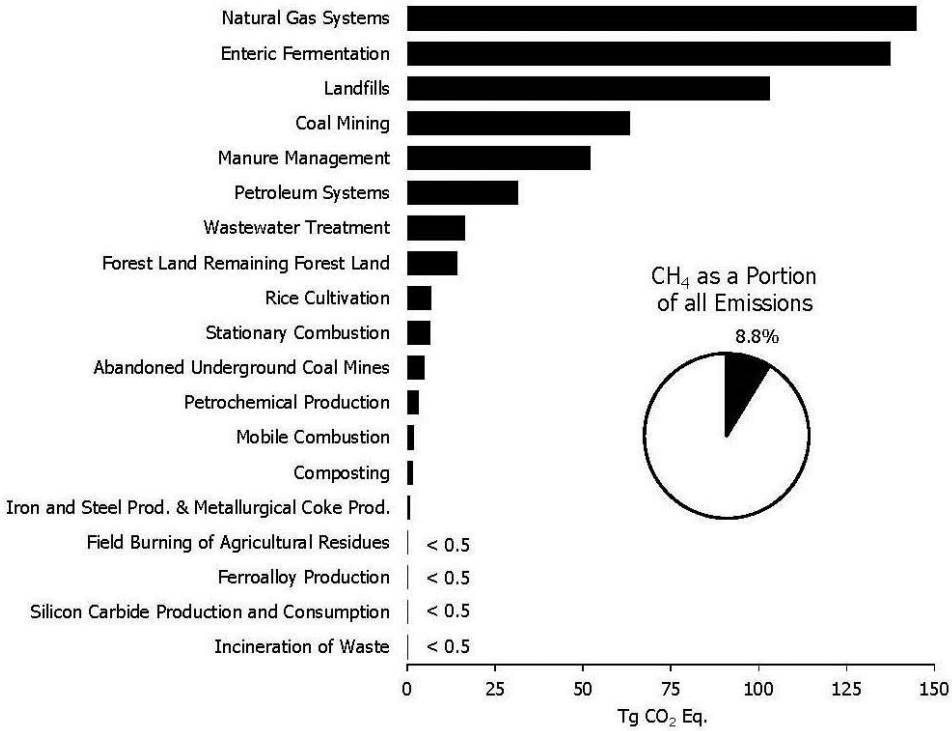
Other significant CO_2 trends included the following:

- CO_2 emissions from non-energy use of fossil fuels have increased by 13.1 Tg CO_2 Eq. (11.2 percent) from 1990 through 2011. Emissions from non-energy uses of fossil fuels were 130.6 Tg CO_2 Eq. in 2011, which constituted 2.3 percent of total national CO_2 emissions, approximately the same proportion as in 1990.
- CO_2 emissions from iron and steel production and metallurgical coke production increased by 8.5 Tg CO_2 Eq. (15.3 percent) from 2010 to 2011, continuing a two-year trend of increasing emissions primarily due to increased steel production associated with improved economic conditions. Despite this, from 1990 through 2011, emissions declined by 35.6 percent (35.5 Tg CO_2 Eq.). This overall decline is due to the restructuring of the industry, technological improvements, and increased scrap utilization.
- In 2011, CO_2 emissions from cement production increased by 0.7 Tg CO_2 Eq. (2.3 percent) from 2010. After decreasing in 1991 by 2.2 percent from 1990 levels, cement production emissions grew every year through 2006. Since 2006, emissions have fluctuated through 2011due to the economic recession and associated decrease in demand for construction materials. Overall, from 1990 to 2011, emissions from cement production have decreased by 4.9 percent, a decrease of 1.6 Tg CO_2 Eq.
- Net CO_2 uptake from Land Use, Land-Use Change, and Forestry increased by 110.5 Tg CO_2 Eq. (13.9 percent) from 1990 through 2011. This increase was primarily due to an increase in the rate of net carbon accumulation in forest carbon stocks, particularly in aboveground and belowground tree biomass, and harvested wood pools. Annual carbon accumulation in landfilled yard trimmings and food scraps slowed over this period, while the rate of carbon accumulation in urban trees increased.

Methane Emissions

Methane (CH_4) is more than 20 times as effective as CO_2 at trapping heat in the atmosphere (IPCC 1996). Over the last two hundred and fifty years, the concentration of CH_4 in the atmosphere increased by 158 percent (IPCC 2007). Anthropogenic sources of CH_4 include natural gas and petroleum systems, agricultural activities, landfills, coal mining, wastewater treatment, stationary and mobile combustion, and certain industrial processes (see Figure ES-8).

Figure ES-8: 2011 Sources of CH_4 Emissions



Some significant trends in U.S. emissions of CH_4 include the following:

- Natural gas systems were the largest anthropogenic source category of CH_4 emissions in the United States in 2011 with 144.7 Tg CO_2 Eq. of CH_4 emitted into the atmosphere. Those emissions have decreased by 16.5 Tg CO_2 Eq. (10.2 percent) since 1990. The decrease in CH_4 emissions is due largely to a decrease in emissions from transmission and storage due to increased voluntary reductions and a decrease in distribution emissions due to a decrease in cast iron and unprotected steel pipelines. Emissions from field production accounted for approximately 37 percent of CH_4 emissions from natural gas systems in 2011. CH_4 emissions from field production decreased by 12 percent from 1990 through 2011; however, the trend was not stable over the time series-emissions from this source increased by 43 percent from 1990 through 2006, and then declined by 38 percent from 2006 to 2011. Reasons for this trend include such factors as increased voluntary reductions, as well as the effects of the recent global economic slowdown.

- Enteric fermentation is the second largest anthropogenic source of CH_4 emissions in the United States. In 2011, enteric fermentation CH_4 emissions were 137.4 Tg CO_2 Eq. (23.4 percent of total CH_4 emissions), which represents an increase of 4.6 Tg CO_2 Eq. (3.5 percent) since 1990. This increase in emissions from 1990 to 2011 in enteric generally follows the increasing trends in cattle populations. From 1990 to 1995 emissions increased and then decreased from 1996 to 2001, mainly due to fluctuations in beef cattle populations and increased digestibility of feed for feedlot cattle. Emissions generally increased from 2002 to 2007, though with a slight decrease in 2004, as both dairy and beef populations underwent increases and the literature for dairy cow diets indicated a trend toward a decrease in feed digestibility for those years. Emissions decreased again from 2008 to 2011 as beef cattle populations again decreased.

- Landfills are the third largest anthropogenic source of CH_4 emissions in the United States, accounting for 17.5 percent of total CH_4 emissions (103.0 Tg CO_2 Eq.) in 2011. From 1990 to 2011, CH_4 emissions from landfills decreased by 44.7 Tg CO_2 Eq. (30.3 percent), with small increases occurring in some interim years. This downward trend in overall emissions can be attributed to a 21 percent reduction in the amount of decomposable materials (i.e., paper and paperboard, food scraps, and yard trimmings) discarded in MSW landfills over the time series (EPA 2010) and an increase in the amount of landfill gas collected and

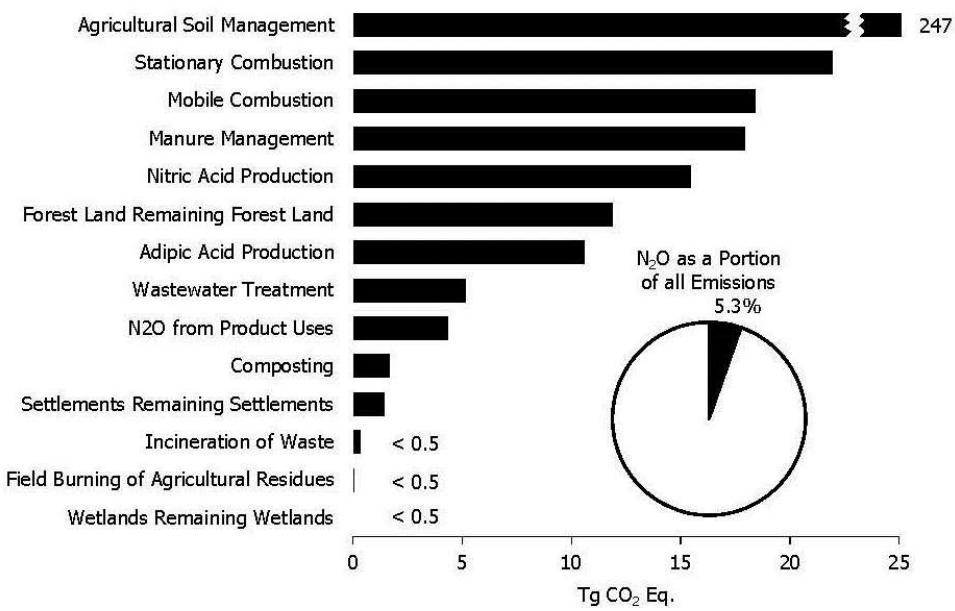
combusted,[14] which has more than offset the additional CH_4 emissions resulting from an increase in the amount of municipal solid waste landfilled.

- In 2011, CH_4 emissions from coal mining were 63.2 Tg CO_2 Eq., a 9.2 Tg CO_2 Eq. (12.6 percent) decrease under 2010 emission levels. The overall decline of 20.8 Tg CO_2 Eq. (24.8 percent) from 1990 results from the mining of less gassy coal from underground mines and the increased use of CH_4 collected from degasification systems.
- Methane emissions from manure management increased by 65.3 percent since 1990, from 31.5 Tg CO_2 Eq. in 1990 to 52.0 Tg CO_2 Eq. in 2011. The majority of this increase was from swine and dairy cow manure, since the general trend in manure management is one of increasing use of liquid systems, which tends to produce greater CH_4 emissions. The increase in liquid systems is the combined result of a shift to larger facilities, and to facilities in the West and Southwest, all of which tend to use liquid systems. Also, new regulations limiting the application of manure nutrients have shifted manure management practices at smaller dairies from daily spread to manure managed and stored on site.

Nitrous Oxide Emissions

N_2O is produced by biological processes that occur in soil and water and by a variety of anthropogenic activities in the agricultural, energy-related, industrial, and waste management fields. While total N_2O emissions are much lower than CO_2 emissions, N_2O is approximately 300 times more powerful than CO_2 at trapping heat in the atmosphere (IPCC 1996). Since 1750, the global atmospheric concentration of N_2O has risen by approximately 19 percent (IPCC 2007). The main anthropogenic activities producing N_2O in the United States are agricultural soil management, stationary fuel combustion, fuel combustion in motor vehicles, manure management and nitric acid production (see Figure ES-9).

Figure ES-9: 2011 Sources of N_2O Emissions



Some significant trends in U.S. emissions of N_2O include the following:

[14] The CO_2 produced from combusted landfill CH_4 at landfills is not counted in national inventories as it is considered part of the natural C cycle of decomposition.

- Agricultural soils accounted for approximately 69.3 percent of N_2O emissions and 3.7 percent of total emissions in the United States in 2011. Estimated emissions from this source in 2011 were 247.2 Tg CO_2 Eq. Annual N_2O emissions from agricultural soils fluctuated between 1990 and 2011, although overall emissions were 8.5 percent higher in 2011 than in 1990. Annual N_2O emissions from agricultural soils fluctuated between 1990 and 2011, largely as a reflection of annual variation in weather patterns, synthetic fertilizer use, and crop production.
- N_2O emissions from stationary combustion increased 9.7 Tg CO_2 Eq. (79.3 percent) from 1990 through 2011. N_2O emissions from this source increased primarily as a result of an increase in the number of coal fluidized bed boilers in the electric power sector.
- In 2011, N_2O emissions from mobile combustion were 18.5 Tg CO_2 Eq. (5.2 percent of U.S. N_2O emissions). From 1990 to 2011, N_2O emissions from mobile combustion decreased by 58.0 percent. However, from 1990 to 1998 emissions increased by 25.6 percent, due to control technologies that reduced NO_x emissions while increasing N_2O emissions. Since 1998, newer control technologies have led to an overall decline of 36.8 Tg CO_2 Eq. (66.6 percent) in N_2O from this source.
- N_2O emissions from adipic acid production were 10.6 Tg CO_2 Eq. in 2011, and have decreased significantly in recent years due to the widespread installation of pollution control measures. Emissions from adipic acid production have decreased by 32.9 percent since 1990 and by 39.6 percent since a peak in 1995.

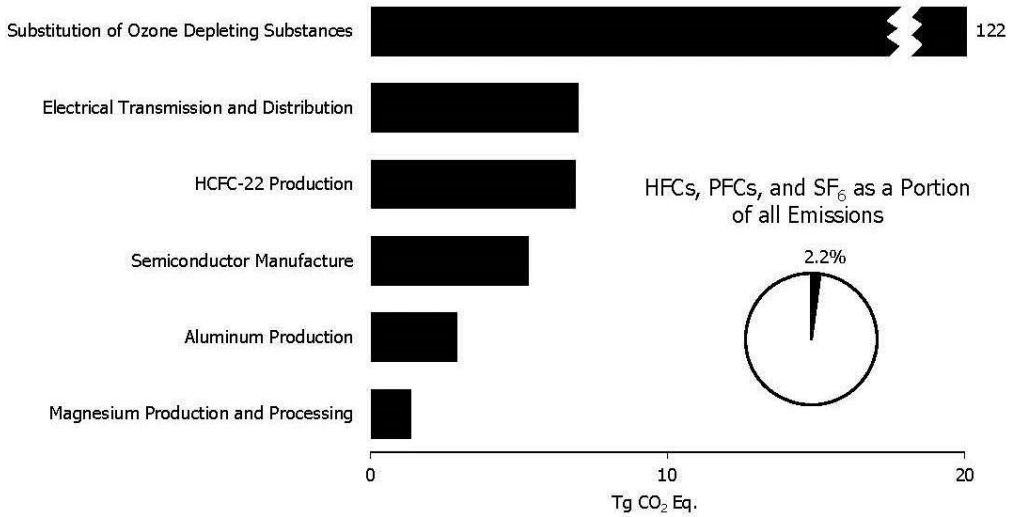
HFC, PFC, and SF_6 Emissions

HFCs and PFCs are families of synthetic chemicals that are used as alternatives to Ozone Depleting Substances, which are being phased out under the Montreal Protocol and Clean Air Act Amendments of 1990. HFCs and PFCs do not deplete the stratospheric ozone layer, and are therefore acceptable alternatives under the Montreal Protocol.

These compounds, however, along with SF_6, are potent greenhouse gases. In addition to having high global warming potentials, SF_6 and PFCs have extremely long atmospheric lifetimes, resulting in their essentially irreversible accumulation in the atmosphere once emitted. Sulfur hexafluoride is the most potent greenhouse gas the IPCC has evaluated (IPCC 1996).

Other emissive sources of these gases include electrical transmission and distribution systems, HCFC-22 production, semiconductor manufacturing, aluminum production, and magnesium production and processing (see Figure ES-10).

Figure ES-10: 2011 Sources of HFCs, PFCs, and SF_6 Emissions



Some significant trends in U.S. HFC, PFC, and SF_6 emissions include the following:

- Emissions resulting from the substitution of ozone depleting substances (ODS) (e.g., CFCs) have been consistently increasing, from small amounts in 1990 to 121.7 Tg CO_2 Eq. in 2011. Emissions from ODS substitutes are both the largest and the fastest growing source of HFC, PFC, and SF_6 emissions. These emissions have been increasing as phase-out of ODS required under the Montreal Protocol came into effect, especially after 1994, when full market penetration was made for the first generation of new technologies featuring ODS substitutes.
- HFC emissions from the production of HCFC-22 decreased by 81.0 percent (29.5 Tg CO_2 Eq.) from 1990 through 2011, due to a steady decline in the emission rate of HFC-23 (i.e., the amount of HFC-23 emitted per kilogram of HCFC-22 manufactured) and the use of thermal oxidation at some plants to reduce HFC-23 emissions.
- SF_6 emissions from electric power transmission and distribution systems decreased by 73.6 percent (19.6 Tg CO_2 Eq.) from 1990 to 2011, primarily because of higher purchase prices for SF_6 and efforts by industry to reduce emissions.
- PFC emissions from aluminum production decreased by 84.0 percent (15.5 Tg CO_2 Eq.) from 1990 to 2011, due to both industry emission reduction efforts and declines in domestic aluminum production.

ES.3. Overview of Sector Emissions and Trends

In accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC/UNEP/OECD/IEA 1997), and the 2003 UNFCCC Guidelines on Reporting and Review (UNFCCC 2003), Figure ES-11 and Table ES-4 aggregate emissions and sinks by these chapters. Emissions of all gases can be summed from each source category from IPCC guidance. Over the twenty-two-year period of 1990 to 2011, total emissions in the Energy, Industrial Processes, and Agriculture sectors grew by 478.4 Tg CO_2 Eq. (9.1 percent), 10.3 Tg CO_2 Eq. (3.3 percent), and 47.6 Tg CO_2 Eq. (11.5 percent), respectively. Emissions from the Waste and Solvent and Other Product Use sectors decreased by 40.2 Tg CO_2 Eq. (23.9 percent) and less than 0.1 Tg CO_2 Eq. (0.4 percent), respectively. Over the same period, estimates of net C sequestration in the Land Use, Land-Use Change, and Forestry (LULUCF) sector (magnitude of emissions plus CO_2 flux from all LULUCF source categories) increased by 87.6 Tg CO_2 Eq. (11.2 percent).

Figure ES-11: U.S. Greenhouse Gas Emissions and Sinks by Chapter/IPCC Sector

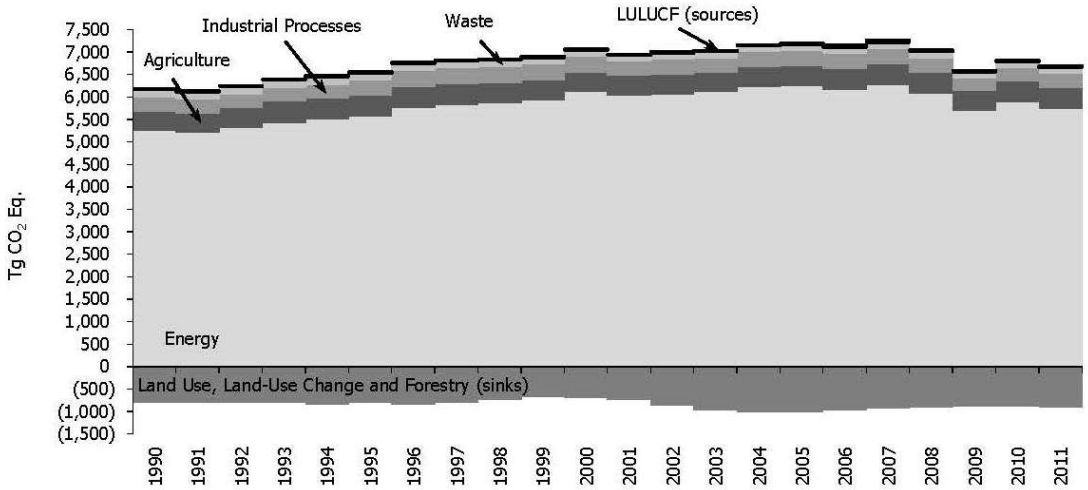


Table ES-4: Recent Trends in U.S. Greenhouse Gas Emissions and Sinks by Chapter/IPCC Sector (Tg or million metric tons CO_2 Eq.)

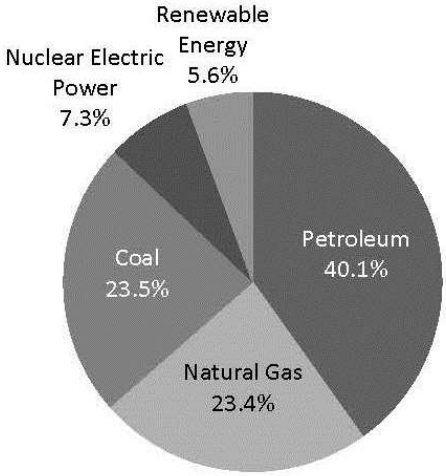
Chapter/IPCC Sector	1990	2005	2007	2008	2009	2010	2011
Energy	5,267.3	6,251.6	6,266.9	6,096.2	5,699.2	5,889.1	5,745.7
Industrial Processes	316.1	330.8	347.2	318.7	265.3	303.4	326.5
Solvent and Other Product Use	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Agriculture	413.9	446.2	470.9	463.6	459.2	462.3	461.5
Land-Use Change and Forestry	13.7	25.4	37.3	27.2	20.4	19.7	36.6
Waste	167.8	136.9	136.5	138.6	138.1	131.4	127.7
Total Emissions	**6,183.3**	**7,195.3**	**7,263.2**	**7,048.8**	**6,586.6**	**6,810.3**	**6,702.3**
Land-Use Change and Forestry (Sinks)	*(794.5)*	*(997.8)*	*(929.2)*	*(902.6)*	*(882.6)*	*(888.8)*	*(905.0)*
Net Emissions (Emissions and Sinks)	**5,388.7**	**6,197.4**	**6,334.0**	**6,146.2**	**5,704.0**	**5,921.5**	**5,797.3**

* The net CO_2 flux total includes both emissions and sequestration, and constitutes a sink in the United States. Sinks are only included in net emissions total.
Note: Totals may not sum due to independent rounding. Parentheses indicate negative values or sequestration.

Energy

The Energy chapter contains emissions of all greenhouse gases resulting from stationary and mobile energy activities including fuel combustion and fugitive fuel emissions. Energy-related activities, primarily fossil fuel combustion, accounted for the vast majority of U.S. CO_2 emissions for the period of 1990 through 2011. In 2011, approximately 87 percent of the energy consumed in the United States (on a Btu basis) was produced through the combustion of fossil fuels. The remaining 13 percent came from other energy sources such as hydropower, biomass, nuclear, wind, and solar energy (see Figure ES-12). Energy-related activities are also responsible for CH_4 and N_2O emissions (43 percent and 11 percent of total U.S. emissions of each gas, respectively). Overall, emission sources in the Energy chapter account for a combined 85.7 percent of total U.S. greenhouse gas emissions in 2011.

Figure ES-12: 2011 U.S. Energy Consumption by Energy Source



Industrial Processes

The Industrial Processes chapter contains by-product or fugitive emissions of greenhouse gases from industrial processes not directly related to energy activities such as fossil fuel combustion. For example, industrial processes can chemically transform raw materials, which often release waste gases such as CO_2, CH_4, and N_2O. These processes include iron and steel production and metallurgical coke production, cement production, ammonia production and urea consumption, lime production, other process uses of carbonates (e.g., flux stone, flue gas desulfurization, and glass manufacturing), soda ash production and consumption, titanium dioxide production, phosphoric acid production, ferroalloy production, glass production, CO_2 consumption, silicon carbide production and consumption, aluminum production, petrochemical production, nitric acid production, adipic acid production, lead production, and zinc production. Additionally, emissions from industrial processes release HFCs, PFCs, and SF_6. Overall, emission sources in the Industrial Process chapter account for 4.9 percent of U.S. greenhouse gas emissions in 2011.

Solvent and Other Product Use

The Solvent and Other Product Use chapter contains greenhouse gas emissions that are produced as a by-product of various solvent and other product uses. In the United States, emissions from N_2O from product uses, the only source of greenhouse gas emissions from this sector, accounted for about 0.1 percent of total U.S. anthropogenic greenhouse gas emissions on a carbon equivalent basis in 2011.

Agriculture

The Agricultural chapter contains anthropogenic emissions from agricultural activities (except fuel combustion, which is addressed in the Energy chapter, and agricultural CO_2 fluxes, which are addressed in the Land Use, Land-Use Change, and Forestry chapter). Agricultural activities contribute directly to emissions of greenhouse gases through a variety of processes, including the following source categories: enteric fermentation in domestic livestock, livestock manure management, rice cultivation, agricultural soil management, and field burning of agricultural residues. CH_4 and N_2O were the primary greenhouse gases emitted by agricultural activities. CH_4 emissions from enteric fermentation and manure management represented 23.4 percent and 8.9 percent of total CH_4 emissions from anthropogenic activities, respectively, in 2011. Agricultural soil management activities such as fertilizer application and other cropping practices were the largest source of U.S. N_2O emissions in 2011, accounting for 69.3 percent. In 2011, emission sources accounted for in the Agricultural chapters were responsible for 6.9 percent of total U.S. greenhouse gas emissions.

Land Use, Land-Use Change, and Forestry

The Land Use, Land-Use Change, and Forestry chapter contains emissions of CH_4 and N_2O, and emissions and removals of CO_2 from forest management, other land-use activities, and land-use change. Forest management practices, tree planting in urban areas, the management of agricultural soils, and the landfilling of yard trimmings and food scraps resulted in a net uptake (sequestration) of C in the United States. Forests (including vegetation, soils, and harvested wood) accounted for 92 percent of total 2011 net CO_2 flux, urban trees accounted for 8 percent, mineral and organic soil carbon stock changes accounted for 1 percent, and landfilled yard trimmings and food scraps accounted for 1 percent of the total net flux in 2011. The net forest sequestration is a result of net forest growth and increasing forest area, as well as a net accumulation of carbon stocks in harvested wood pools. The net sequestration in urban forests is a result of net tree growth in these areas. In agricultural soils, mineral and organic soils sequester approximately 5 times as much C as is emitted from these soils through liming and urea fertilization. The mineral soil C sequestration is largely due to the conversion of cropland to permanent pastures and hay production, a reduction in summer fallow areas in semi-arid areas, an increase in the adoption of conservation tillage practices, and an increase in the amounts of organic fertilizers (i.e., manure and sewage sludge) applied to agriculture lands. The landfilled yard trimmings and food scraps net sequestration is due to the long-term accumulation of yard trimming carbon and food scraps in landfills.

Land use, land-use change, and forestry activities in 2011 resulted in a net C sequestration of 905.0 Tg CO_2 Eq. (Table ES-5). This represents an offset of 16.1 percent of total U.S. CO_2 emissions, or 13.5 percent of total greenhouse gas emissions in 2011. Between 1990 and 2011, total land use, land-use change, and forestry net C flux resulted in a 13.9 percent increase in CO_2 sequestration, primarily due to an increase in the rate of net C accumulation in forest C stocks, particularly in aboveground and belowground tree biomass, and harvested wood pools. Annual C accumulation in landfilled yard trimmings and food scraps slowed over this period, while the rate of annual C accumulation increased in urban trees.

Table ES-5: Net CO_2 Flux from Land Use, Land-Use Change, and Forestry (Tg or million metric tons CO_2 Eq.)

Sink Category	1990	2005	2007	2008	2009	2010	2011
Forest Land Remaining Forest Land	(696.8)	(905.0)	(859.3)	(833.3)	(811.3)	(817.6)	(833.5)
Cropland Remaining Cropland	(34.1)	(20.3)	(6.6)	(5.2)	(4.6)	(3.0)	(2.9)
Land Converted to Cropland	21.0	13.5	14.5	14.5	14.5	14.5	14.5
Grassland Remaining Grassland	(5.3)	(1.0)	7.1	7.2	7.3	7.3	7.4
Land Converted to Grassland	(7.7)	(10.2)	(9.0)	(9.0)	(8.9)	(8.8)	(8.8)
Settlements Remaining Settlements	(47.5)	(63.2)	(65.0)	(66.0)	(66.9)	(67.9)	(68.8)
Other (Landfilled Yard Trimmings and Food Scraps)	(24.2)	(11.6)	(10.9)	(10.9)	(12.7)	(13.3)	(13.0)
Total	**(794.5)**	**(997.8)**	**(929.2)**	**(902.6)**	**(882.6)**	**(888.8)**	**(905.0)**

Note: Totals may not sum due to independent rounding. Parentheses indicate net sequestration.

Emissions from Land Use, Land-Use Change, and Forestry are shown in Table ES-6. Liming of agricultural soils and urea fertilization in 2011 resulted in CO_2 emissions of 8.1 Tg CO_2 Eq. (8,117 Gg). Lands undergoing peat extraction (i.e., *Peatlands Remaining Peatlands*) resulted in CO_2 emissions of 0.9 Tg CO_2 Eq. (918 Gg), and N_2O emissions of less than 0.05 Tg CO_2 Eq. The application of synthetic fertilizers to forest soils in 2011 resulted in direct N_2O emissions of 0.4 Tg CO_2 Eq. (1 Gg). Direct N_2O emissions from fertilizer application to forest soils have increased by 455 percent since 1990, but still account for a relatively small portion of overall emissions. Additionally, direct N_2O emissions from fertilizer application to settlement soils in 2011 accounted for 1.5 Tg CO_2 Eq. (5 Gg). This represents an increase of 51 percent since 1990. Forest fires in 2011 resulted in CH_4 emissions of 14.2 Tg CO_2 Eq. (675 Gg), and in N_2O emissions of 11.6 Tg CO_2 Eq. (37 Gg).

Table ES-6: Emissions from Land Use, Land-Use Change, and Forestry (Tg or million metric tons CO_2 Eq.)

Source Category	1990	2005	2007	2008	2009	2010	2011
CO_2	**8.1**	**8.9**	**9.2**	**9.6**	**8.3**	**9.4**	**9.0**

Cropland Remaining Cropland: Liming of Agricultural Soils	4.7	4.3	4.5	5.0	3.7	4.7	4.5
Cropland Remaining Cropland: Urea Fertilization	2.4	3.5	3.8	3.6	3.6	3.7	5.3
Wetlands Remaining Wetlands: Peatlands Remaining Peatlands	1.0	1.1	1.0	1.0	1.1	1.0	0.9
CH_4	**2.5**	**8.0**	**14.4**	**8.7**	**5.7**	**4.7**	**14.2**
Forest Land Remaining Forest Land: Forest Fires	2.5	8.0	14.4	8.7	5.7	4.7	14.2
N_2O	**3.1**	**8.4**	**13.7**	**8.9**	**6.4**	**5.6**	**13.4**
Forest Land Remaining Forest Land: Forest Fires	2.0	6.6	11.7	7.1	4.7	3.8	11.6
Forest Land Remaining Forest Land: Forest Soils	0.1	0.4	0.4	0.4	0.4	0.4	0.4
Settlements Remaining Settlements: Settlement Soils	1.0	1.5	1.6	1.5	1.4	1.5	1.5
Wetlands Remaining Wetlands: Peatlands Remaining Peatlands	+	+	+	+	+	+	+
Total	**13.7**	**25.4**	**37.3**	**27.2**	**20.4**	**19.7**	**36.6**

+ Less than 0.05 Tg CO_2 Eq.
Note: Totals may not sum due to independent rounding.

Waste

The Waste chapter contains emissions from waste management activities (except incineration of waste, which is addressed in the Energy chapter). Landfills were the largest source of anthropogenic greenhouse gas emissions in the Waste chapter, accounting for 80.7 percent of this chapter's emissions, and 17.5 percent of total U.S. CH_4 emissions.[15] Additionally, wastewater treatment accounts for 16.7 percent of Waste emissions, 2.8 percent of U.S. CH_4 emissions, and 1.5 percent of U.S. N_2O emissions. Emissions of CH_4 and N_2O from composting are also accounted for in this chapter, generating emissions of 1.5 Tg CO_2 Eq. and 1.7 Tg CO_2 Eq., respectively. Overall, emission sources accounted for in the Waste chapter generated 1.9 percent of total U.S. greenhouse gas emissions in 2011.

ES.4. Other Information

Emissions by Economic Sector

Throughout the Inventory of U.S. Greenhouse Gas Emissions and Sinks report, emission estimates are grouped into six sectors (i.e., chapters) defined by the IPCC: Energy; Industrial Processes; Solvent Use; Agriculture; Land Use, Land-Use Change, and Forestry; and Waste. While it is important to use this characterization for consistency with UNFCCC reporting guidelines, it is also useful to allocate emissions into more commonly used sectoral categories. This section reports emissions by the following economic sectors: Residential, Commercial, Industry, Transportation, Electricity Generation, Agriculture, and U.S. Territories.

Table ES-7 summarizes emissions from each of these sectors, and Figure ES-13 shows the trend in emissions by sector from 1990 to 2011.

[15] Landfills also store carbon, due to incomplete degradation of organic materials such as wood products and yard trimmings, as described in the Land-Use, Land-Use Change, and Forestry chapter of the Inventory report.

Figure ES-13: Emissions Allocated to Economic Sectors

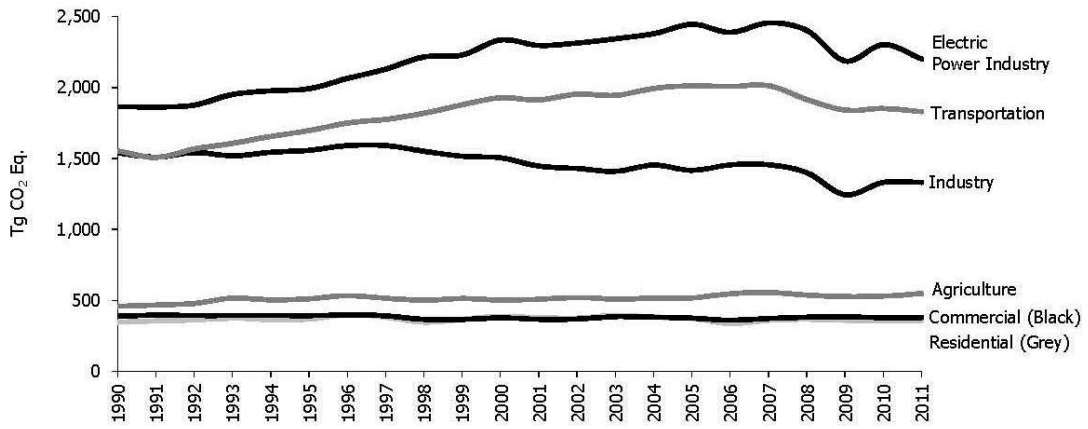


Table ES-7: U.S. Greenhouse Gas Emissions Allocated to Economic Sectors (Tg or million metric tons CO_2 Eq.)

Implied Sectors	1990	2005	2007	2008	2009	2010	2011
Electric Power Industry	1,866.1	2,445.7	2,455.6	2,402.0	2,187.6	2,303.0	2,200.9
Transportation	1,553.2	2,012.3	2,013.1	1,916.0	1,840.6	1,852.2	1,829.4
Industry	1,538.8	1,416.2	1,456.1	1,398.8	1,244.2	1,331.8	1,332.0
Agriculture	458.0	517.4	555.6	535.3	525.4	528.7	546.6
Commercial	388.1	374.1	372.0	380.9	382.9	376.9	378.0
Residential	345.4	371.3	358.2	366.0	358.1	359.6	357.3
U.S. Territories	33.7	58.2	52.6	49.8	47.9	58.0	58.0
Total Emissions	**6,183.3**	**7,195.3**	**7,263.2**	**7,048.8**	**6,586.6**	**6,810.3**	**6,702.3**
Land Use, Land-Use Change, and Forestry (Sinks)	(794.5)	(997.8)	(929.2)	(902.6)	(882.6)	(888.8)	(905.0)
Net Emissions (Sources and Sinks)	**5,388.7**	**6,197.4**	**6,334.0**	**6,146.2**	**5,704.0**	**5,921.5**	**5,797.3**

Note: Totals may not sum due to independent rounding. Emissions include CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6.
See Table 2-12 for more detailed data.

Using this categorization, emissions from electricity generation accounted for the largest portion (33 percent) of U.S. greenhouse gas emissions in 2011. Transportation activities, in aggregate, accounted for the second largest portion (27 percent), while emissions from industry accounted for the third largest portion (20 percent) of U.S. greenhouse gas emissions in 2011. In contrast to electricity generation and transportation, emissions from industry have in general declined over the past decade. The long-term decline in these emissions has been due to structural changes in the U.S. economy (i.e., shifts from a manufacturing-based to a service-based economy), fuel switching, and energy efficiency improvements. The remaining 20 percent of U.S. greenhouse gas emissions were contributed by, in order of importance, the agriculture, commercial, and residential sectors, plus emissions from U.S. Territories. Activities related to agriculture accounted for 8 percent of U.S. emissions; unlike other economic sectors, agricultural sector emissions were dominated by N_2O emissions from agricultural soil management and CH_4 emissions from enteric fermentation. The commercial and residential sectors accounted for 6 and 5 percent, respectively, of emissions and U.S. Territories accounted for 1 percent of emissions; emissions from these sectors primarily consisted of CO_2 emissions from fossil fuel combustion. CO_2 was also emitted and sequestered by a variety of activities related to forest management practices, tree planting in urban areas, the management of agricultural soils, and landfilling of yard trimmings.

Electricity is ultimately consumed in the economic sectors described above. Table ES-8 presents greenhouse gas emissions from economic sectors with emissions related to electricity generation distributed into end-use categories (i.e., emissions from electricity generation are allocated to the economic sectors in which the electricity is

consumed). To distribute electricity emissions among end-use sectors, emissions from the source categories assigned to electricity generation were allocated to the residential, commercial, industry, transportation, and agriculture economic sectors according to retail sales of electricity.[16] These source categories include CO_2 from fossil fuel combustion and the use of limestone and dolomite for flue gas desulfurization, CO_2 and N_2O from incineration of waste, CH_4 and N_2O from stationary sources, and SF_6 from electrical transmission and distribution systems.

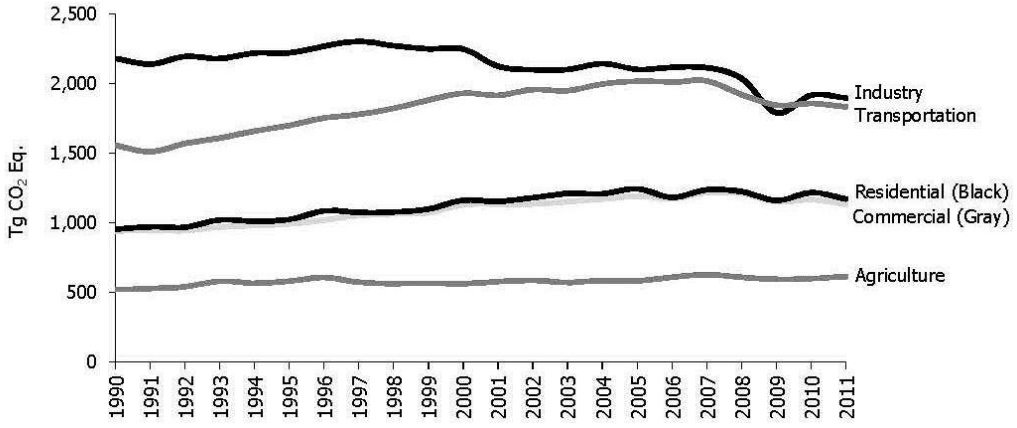
When emissions from electricity are distributed among these sectors, industrial activities account for the largest share of U.S. greenhouse gas emissions (28 percent) in 2011. Transportation is the second largest contributor to total U.S. emissions (27 percent). The residential and commercial sectors contributed the next largest shares of total U.S. greenhouse gas emissions in 2011. Emissions from these sectors increase substantially when emissions from electricity are included, due to their relatively large share of electricity consumption (e.g., lighting, appliances, etc.). In all sectors except agriculture, CO_2 accounts for more than 80 percent of greenhouse gas emissions, primarily from the combustion of fossil fuels. Figure ES-14 shows the trend in these emissions by sector from 1990 to 2011.

Table ES-8: U.S Greenhouse Gas Emissions by Economic Sector with Electricity-Related Emissions Distributed (Tg or million metric tons CO_2 Eq.)

Implied Sectors	1990	2005	2007	2008	2009	2010	2011
Industry	2,181.3	2,102.4	2,113.6	2,036.3	1,789.8	1,916.9	1,897.2
Transportation	1,556.3	2,017.2	2,018.2	1,920.8	1,845.2	1,856.9	1,833.7
Residential	939.5	1,192.4	1,215.6	1,211.1	1,150.8	1,165.2	1,131.0
Commercial	953.1	1,243.6	1,237.1	1,223.6	1,159.6	1,216.3	1,169.8
Agriculture	519.3	581.5	626.2	607.1	593.3	597.1	612.6
U.S. Territories	33.7	58.2	52.6	49.8	47.9	58.0	58.0
Total Emissions	**6,183.3**	**7,195.3**	**7,263.2**	**7,048.8**	**6,586.6**	**6,810.3**	**6,702.3**
Land Use, Land-Use Change, and Forestry (Sinks)	(794.5)	(997.8)	(929.2)	(902.6)	(882.6)	(888.8)	(905.0)
Net Emissions (Sources and	**5,388.7**	**6,197.4**	**6,334.0**	**6,146.2**	**5,704.0**	**5,921.5**	**5,797.3**

See Table 2-14 for more detailed data.

Figure ES-14: Emissions with Electricity Distributed to Economic Sectors



[16] Emissions were not distributed to U.S. territories, since the electricity generation sector only includes emissions related to the generation of electricity in the 50 states and the District of Columbia.

Box ES- 2: Recent Trends in Various U.S. Greenhouse Gas Emissions-Related Data

Total emissions can be compared to other economic and social indices to highlight changes over time. These comparisons include: (1) emissions per unit of aggregate energy consumption, because energy-related activities are the largest sources of emissions; (2) emissions per unit of fossil fuel consumption, because almost all energy-related emissions involve the combustion of fossil fuels; (3) emissions per unit of electricity consumption, because the electric power industry—utilities and nonutilities combined—was the largest source of U.S. greenhouse gas emissions in 2011; (4) emissions per unit of total gross domestic product as a measure of national economic activity; and (5) emissions per capita.

Table ES-9 provides data on various statistics related to U.S. greenhouse gas emissions normalized to 1990 as a baseline year. Greenhouse gas emissions in the United States have grown at an average annual rate of 0.4 percent since 1990. This rate is slightly faster than that for total energy and for fossil fuel consumption, and much slower than that for electricity consumption, overall gross domestic product and national population (see Figure ES-15).

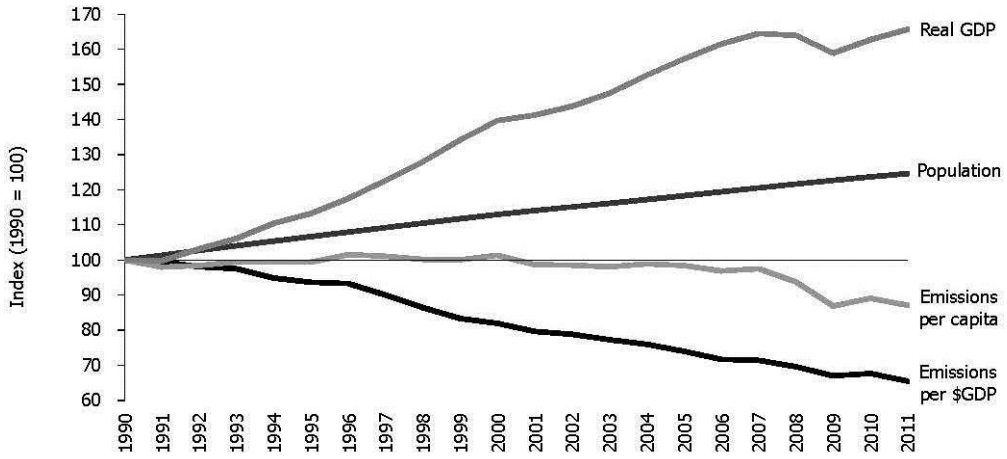
Table ES-9: Recent Trends in Various U.S. Data (Index 1990 = 100)

Variable	1990	2005	2007	2008	2009	2010	2011	Growth Rate[a]
GDP[b]	100	157	165	164	159	163	166	2.5%
Electricity Consumption[c]	100	134	137	136	131	137	136	1.5%
Fossil Fuel Consumption[c]	100	119	119	116	109	112	101	0.1%
Energy Consumption[c]	100	119	120	117	111	115	102	0.1%
Population[d]	100	118	121	122	123	124	125	1.1%
Greenhouse Gas Emissions[e]	100	116	117	114	107	110	108	0.4%

[a] Average annual growth rate
[b] Gross Domestic Product in chained 2005 dollars (BEA 2012)
[c] Energy content-weighted values (EIA 2013)
[d] U.S. Census Bureau (2012)
[e] GWP-weighted values

Figure ES-15: U.S. Greenhouse Gas Emissions Per Capita and Per Dollar of Gross Domestic Product

Source: BEA (2012), U.S. Census Bureau (2012), and emission estimates in this report.



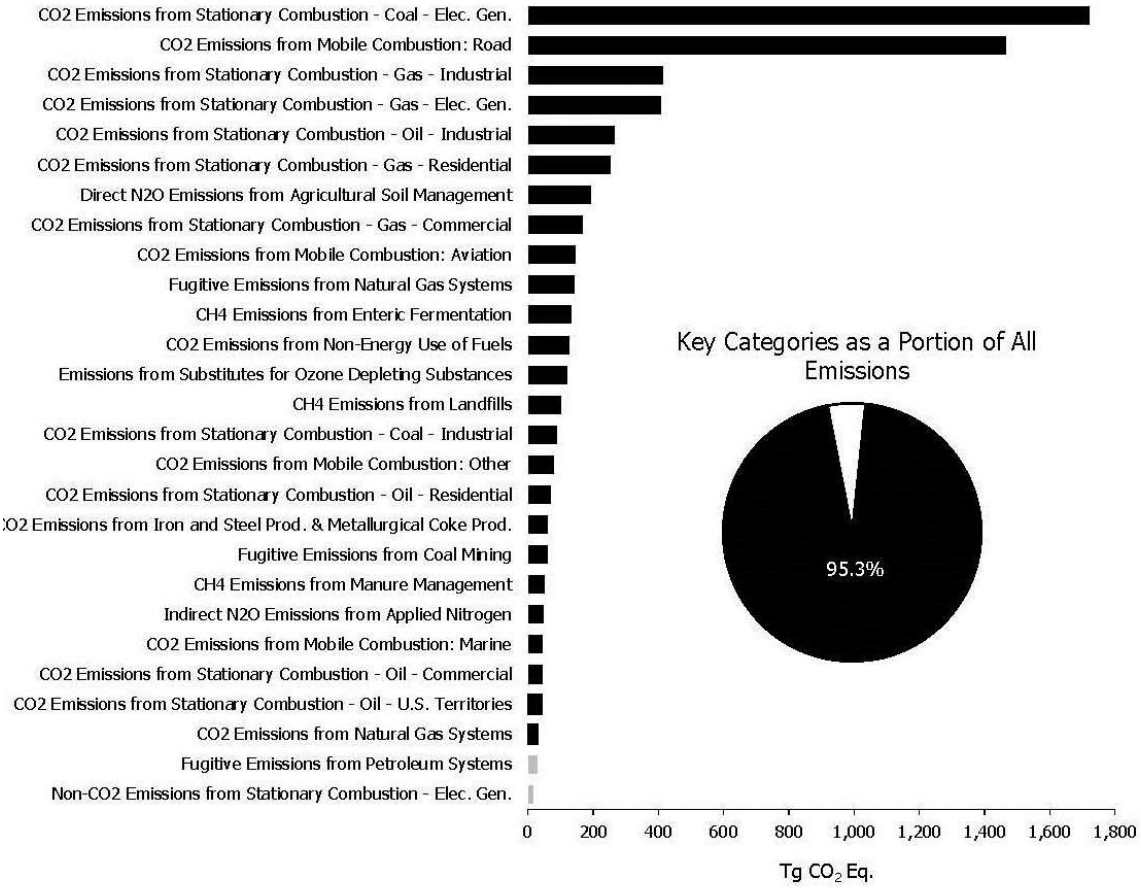
Key Categories

The IPCC *Good Practice Guidance* (IPCC 2000) defines a key category as a "[source or sink category] that is prioritized within the national inventory system because its estimate has a significant influence on a country's total inventory of direct greenhouse gases in terms of the absolute level of emissions, the trend in emissions, or both."[17] By definition, key categories are sources or sinks that have the greatest contribution to the absolute overall level of national emissions in any of the years covered by the time series. In addition, when an entire time series of emission estimates is prepared, a thorough investigation of key categories must also account for the influence of trends of individual source and sink categories. Finally, a qualitative evaluation of key categories should be performed, in order to capture any key categories that were not identified in either of the quantitative analyses.

Figure ES-16 presents 2011 emission estimates for the key categories as defined by a level analysis (i.e., the contribution of each source or sink category to the total inventory level). The UNFCCC reporting guidelines request that key category analyses be reported at an appropriate level of disaggregation, which may lead to source and sink category names which differ from those used elsewhere in the inventory report. For more information regarding key categories, see section 1.5 and Annex 1.

[17] See Chapter 7 "Methodological Choice and Recalculation" in IPCC (2000). <http://www.ipcc-nggip.iges.or.jp/public/gp/gpgaum.htm>

Figure ES-16: 2011 Key Categories



Note: For a complete discussion of the key category analysis, see Annex 1. Black bars indicate a Tier 1 level assessment key category. Gray bars indicate a Tier 2 level assessment key category.

Quality Assurance and Quality Control (QA/QC)

The United States seeks to continually improve the quality, transparency, and credibility of the Inventory of U.S. Greenhouse Gas Emissions and Sinks. To assist in these efforts, the United States implemented a systematic approach to QA/QC. While QA/QC has always been an integral part of the U.S. national system for inventory development, the procedures followed for the current inventory have been formalized in accordance with the QA/QC plan and the UNFCCC reporting guidelines.

Uncertainty Analysis of Emission Estimates

While the current U.S. emissions inventory provides a solid foundation for the development of a more detailed and comprehensive national inventory, there are uncertainties associated with the emission estimates. Some of the current estimates, such as those for CO_2 emissions from energy-related activities and cement processing, are considered to have low uncertainties. For some other categories of emissions, however, a lack of data or an incomplete understanding of how emissions are generated increases the uncertainty associated with the estimates presented. Acquiring a better understanding of the uncertainty associated with inventory estimates is an important step in helping to prioritize future work and improve the overall quality of the Inventory. Recognizing the benefit of conducting an uncertainty analysis, the UNFCCC reporting guidelines follow the recommendations of the IPCC

Good Practice Guidance (IPCC 2000) and require that countries provide single estimates of uncertainty for source and sink categories.

Currently, a qualitative discussion of uncertainty is presented for all source and sink categories. Within the discussion of each emission source, specific factors affecting the uncertainty surrounding the estimates are discussed. Most sources also contain a quantitative uncertainty assessment, in accordance with UNFCCC reporting guidelines.

Box ES- 3: Recalculations of Inventory Estimates

Each year, emission and sink estimates are recalculated and revised for all years in the Inventory of U.S. Greenhouse Gas Emissions and Sinks, as attempts are made to improve both the analyses themselves, through the use of better methods or data, and the overall usefulness of the report. In this effort, the United States follows the 2006 IPCC Guidelines (IPCC 2006), which states, "Both methodological changes and refinements over time are an essential part of improving inventory quality. It is good practice to change or refine methods" when: available data have changed; the previously used method is not consistent with the IPCC guidelines for that category; a category has become key; the previously used method is insufficient to reflect mitigation activities in a transparent manner; the capacity for inventory preparation has increased; new inventory methods become available; and for correction of errors." In general, recalculations are made to the U.S. greenhouse gas emission estimates either to incorporate new methodologies or, most commonly, to update recent historical data.

In each Inventory report, the results of all methodology changes and historical data updates are presented in the "Recalculations and Improvements" chapter; detailed descriptions of each recalculation are contained within each source's description contained in the report, if applicable. In general, when methodological changes have been implemented, the entire time series (in the case of the most recent inventory report, 1990 through 2011) has been recalculated to reflect the change, per the 2006 IPCC Guidelines (IPCC 2006). Changes in historical data are generally the result of changes in statistical data supplied by other agencies. References for the data are provided for additional information.

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REPORT

AGENDA ITEM NO. 10

DATE: August 1, 2013

TO: Community, Economic and Human Development Committee (CEHD)
Energy and Environment Committee (EEC)
Transportation Committee (TC)

FROM: Hasan Ikhrata, Executive Director, Ikhrata@scag.ca.gov; 213.236.1944

SUBJECT: Sustainability Program Call For Proposals Update

RECOMMENDED ACTION:
For Information Only – No Action Required.

EXECUTIVE SUMMARY:
The 2013 Sustainability Program consolidated Call for Proposals was released on April 4, 2013 to the cities and counties, with an application deadline of May 31, 2013. The Sustainability Program builds on the success of the Compass Blueprint effort to provide services for communities and partners with two (2) new components: Active Transportation and the Green Region Initiative. As reported to the Policy Committees and Regional Council at the June 6, 2013 meetings, SCAG received a total of seventy-six (76) proposals, with total funding requests slightly exceeding $10 million.

A review committee has completed a ranking of proposals. Staff is recommending funding of all eligible project applications in three (3) phases over the 2014 and 2015 fiscal years, allowing time to process the grants and develop additional funding for applications in phases 2 and 3. Staff will return to the September Regional Council meeting for action.

STRATEGIC PLAN:
This item supports SCAG's Strategic Plan Goal 1: Improve Regional Decision Making by Providing Leadership and Consensus Building on Key Plans and Policies; and Goal 4: Develop, Maintain and Promote the Utilization of State of the Art Models, Information Systems and Communication Technologies.

BACKGROUND:
On April 4, 2013, the Regional Council approved ranking criteria for the Sustainability Program consolidated Call for Proposals. The Call for Proposal was released later that day with a proposal deadline of May 31, 2013. Seventy-six (76) proposals were received seeking just over $10 million. A review committee comprised of SCAG staff and Terry Roberts of the California Air Resources Board, has now ranked all of the proposals in accordance with the selection criteria. All eligible projects are recommended for funding and divided into three (3) phases in order to accommodate available funding, pending funding and administrative processing of 73 of 76 grants (3 of 76 applications are from non-SCAG members. Should their status change, staff will return with a funding recommendation). The attached matrix shows the ranking for each grant application, along with other relevant information for the three (3) phases.

SCAG is actively pursuing Phases 2 and 3 funding in order to accelerate the grants and implement the approved 2012-2035 Sustainable Communities Strategy (SCS). Potential funding sources include, but are not limited to, future planning grants from the California Strategic Growth Council; Cap-and-Trade revenues; Environmental Protection Agency grants; California Energy Commission; U.S. Department of

Energy; California Air Resources Board, and South Coast Air Quality Management District grants.

FISCAL IMPACT:
Funding for the selected projects resulting from the Sustainability Program's Call for Proposals is included in SCAG's FY 2013-14 Overall Work Program (OWP) Budget which includes grant funds from federal, state and local sources. Staff's work for the current fiscal year is included in FY 2013-14 OWP 225.SCG01641E.01 and 065.SCG00137.01.

ATTACHMENT:
SCAG Sustainability Program Proposal Review Matrix

SCAG Sustainability Program - Proposal Review

Total Proposals Received: ***76***

Total Amount Requested: ***$10,024,300***

25-Jul-13

Rank	Applicant	Project Description *[Project benefits in italics]*	Est. Cost	Local Match Commit	Cat	County	Subreg		Past Awd	tab
1	San Bernardino County	Bloomington Area Valley Blvd. Specific Plan Active Mobility Element - Public health; Active transportation; Livability; Open space - ***[Improve public health; reduce VMT]***	$90,000	$400,000	CB	SBD	SANBAG			$90,000
2	Los Angeles - Department of City Planning	Van Nuys & Boyle Heights Modified Parking Requirements - Economic development; TOD; Livability - ***[Reduce GHG; improve transit mode share; improve economic development]***	$195,000		CB	LA	CLA		Y	$285,000
3	Los Angeles - Department of City Planning	Bicycle Plan Performance Evaluation - Active transportation; performance measures - ***[Improve public health; improve safety; reduce GHG]***	$43,000		AT	LA	CLA		Y	$328,000
4	Western Riverside Council of Governments	Public Health: Implementing the Sustainability Framework - Public health; Multi-jurisdiction coordination; Sustainability ***- [Improve public health; increase physical activity; reduce GHG]***	$70,000		GRI	RIV	WRCOG		Y	$398,000
5	Santa Ana	Complete Streets Plan - Complete streets; Active transportation; Livability - ***[Improve safety; reduce GHG; improve transit mode share; improve public health]***	$151,000		AT	OC	OCCOG		Y	$549,000
6	San Bernardino Associated Governments	Climate Action Plan Implementation Tools - GHG reduction; Multi-jurisdiction coordination; Implementation - ***[Reduce GHG; improve public health]***	$50,000	$50,000	GRI	SBD	SANBAG		Y	$599,000
7	Riverside	Restorative Growthprint Riverside - GHG reduction; Infrastructure investment; Economic development - ***[Reduce GHG; improve public health; improve economic development]***	$150,000		GRI	RIV	WRCOG		Y	$749,000
8	Orange County Parks	Orange County Bicycle Loop - Active transportation; Multi-jurisdictional; Public health - ***[Improve public health; increase physical activity; improve safety; reduce GHG]***	$180,000		AT	OC	OCCOG			$929,000
9	Ventura County	Connecting Newbury Park - Multi-Use Pathway Plan - Active transportation; Public health; Adaptive re-use - ***[Improve public health; increase physical activity; increase accessibility to destinations; improve safety; reduce GHG]***	$40,000	$3,000	AT	VEN	VCOG		Y	$969,000

Rank	Applicant	Project Description *[Project benefits in italics]*	Est. Cost	Local Match Commit	Cat	County	Subreg		Past Awd	tab
10	Imperial County Transportation Commission	Safe Routes to School Plan - Multi-modal; Active transportation ***- [Improve public health; increase physical activity; improve safety; reduce GHG]***	$14,000	$3,900	AT	IMP	ICTC			$983,000
11	Yucaipa	College Village/Greater Dunlap Neighborhood Sustainable Community - Complete Streets; TOD ***- [Reduce GHG; improve transit mode share; improve safety; increase accessibility to destinations; increase physical activity]***	$175,000		CB	SBD	SANBAG			$1,158,000
12	Las Virgenes-Malibu Council of Governments	Multi-Jurisdictional Regional Bicycle Master Plan - Active transportation; Public health; Adaptive re-use ***- [Improve public health; increase physical activity; improve safety; reduce GHG]***	$185,000		AT	LA	LVMCOG			$1,343,000
13	Eastvale	Bicycle & Pedestrian Master Plan - Active Transportation ***- [Improve public health; increase physical activity; improve safety; reduce GHG]***	$80,000		AT	RIV	WRCOG			$1,423,000
14	West Covina	Downtown Central Business District - Multi-modal; Active transportation ***- [Improve public health; increase physical activity; improve safety; reduce GHG; improve transit mode share]***	$200,000		CB	LA	SGVCOG			$1,623,000
15	Placentia	General Plan/Sustainability Element & Development Code Assistance - General Plan Update; Sustainability Plan ***- [Reduce GHG; improve public health; improve community engagement]***	$150,000		GRI	OC	OCCOG			$1,773,000
16	Paramount/Bellflower	Regional Bicycle Connectivity - West Santa Ana Branch Corridor - Active transportation; multi-jurisdiction ***- [Improve public health; increase physical activity; improve safety; increase accessibility to destinations; reduce GHG]***	$140,000		AT	LA	GCCOG			$1,913,000
17	Costa Mesa	Implementation Plan for Multi-Purpose Trails - Active Transportation ***- [Improve public health; increase physical activity; improve safety; reduce GHG]***	$170,000		AT	OC	OCCOG			$2,083,000
	Subtotal Phase 1		***$2,083,000***							

Rank	Applicant	Project Description *[Project benefits in italics]*	Est. Cost	Local Match Commit	Cat	County	Subreg		Past Awd	tab
18	Fullerton	East Wilshire Avenue Bicycle Boulevard - Active transportation; Livability; Demonstration project - ***[Improve public health; increase physical activity; improve safety; reduce GHG]***	$112,300	$10,600	AT	OC	OCCOG		Y	$2,195,300
19	Beaumont	Climate Action Plan - GHG reduction - ***[Reduce GHG; improve public health; improve community engagement]***	$200,000	$104,100	GRI	RIV	WRCOG			$2,395,300
20	Palm Springs	Sustainability Master Plan Update - Leverages larger effort; commitment to implement - ***[Reduce GHG; improve public health; improve community engagement]***	$85,000		GRI	RIV	CVAG		Y	$2,480,300
21	Big Bear Lake	Rathbun Corridor Sustainability Plan - Multi-modal; Economic development; Open space - ***[Increase open space/conservation; reduce GHG; improve safety; increase physical activity; improve public health]***	$198,000	$30,000	AT	SBD	SANBAG			$2,678,300
22	Western Riverside Council of Governments	Land Use, Transportation, and Water Quality Planning Framework - Integrated planning, Sustainability - ***[Reduce GHG; improve transit mode share; improve community engagement]***	$160,000		CB	RIV	WRCOG		Y	$2,838,300
23	Anaheim	Bicycle Master Plan Update - Active transportation - ***[Improve public health; increase physical activity; improve safety; reduce GHG]***	$200,000	$94,120	AT	OC	OCCOG		Y	$3,038,300
24	Ontario	Ontario Airport Metro Center - Multi-modal; Visualization; Integrated planning - ***[Reduce GHG; improve transit mode share; improve community engagement]***	$200,000		CB	SBD	SANBAG		Y	$3,238,300
25	Coachella Valley Association of Governments	CV Link Health Impact Assessment - Active transportation; Public health; Multi-jusrisdiction - ***[Improve public health; increase physical activity; reduce GHG]***	$101,000		AT	RIV	CVAG			$3,339,300
26	San Bernardino Associated Governments	San Bernardino Countywide Complete Streets Strategy - Multi-modal; Livability; Multi-jurisdiction - ***[Reduce GHG; improve transit mode share; improve safety; improve community engagement]***	$25,000	$30,000	AT	SBD	SANBAG		Y	$3,364,300
27	Chino Hills	Climate Action Plan and Implementation Strategy - GHG reduction; Implementation; Sustainability - ***[Reduce GHG; improve public health; improve community engagement]***	$125,000		GRI	SBD	SANBAG		Y	$3,489,300
28	Coachella	La Plaza East Urban Development Plan - Mixed-use, TOD, Infill - ***[Reduce GHG; improve transit mode share; improve community engagement; improve economic development]***	$60,000		CB	RIV	CVAG		Y	$3,549,300

Rank	Applicant	Project Description *[Project benefits in italics]*	Est. Cost	Local Match Commit	Cat	County	Subreg		Past Awd	tab
29	South Bay Bicycle Coalition/Hermosa, Manhattan, Redondo	Bicycle Mini-Corral Plan - Active transportation; implementable; cost-effective **- *[Improve public health; increase physical activity; improve safety; reduce GHG]***	$40,000		AT	LA	SBCCOG			$3,589,300
30	Hawthorne	Crenshaw Station Area Active Transporation Plan and Overlay Zone - Multi-modal; Active transportation; GHG reduction **- *[Improve public health; increase accessibility to destinations; increase physical activity; improve safety; reduce GHG]***	$70,000		AT	LA	SBCCOG			$3,659,300
31	Chino	Bicycle & Pedestrian Master Plan - Multi-modal; Active transportation **- *[Improve public health; increase physical activity; improve safety; reduce GHG]***	$200,000	$15,100	AT	SBD	SANBAG		Y	$3,859,300
32	Stanton	Green Planning Academy - Innovative; Sustainability; Education & outreach **- *[Reduce GHG; improve public health; improve community engagement]***	$50,000	$19,100	GRI	OC	OCCOG			$3,909,300
33	Hermosa Beach	Carbon Neutral Plan - GHG reduction; Sustainability **- *[Reduce GHG; improve public health; improve community engagement]***	$25,000	$9,500	GRI	LA	SBCCOG			$3,934,300
34	Palm Springs	Urban Forestry Initiative - Sustainability; Unique; Resource protection **- *[Reduce GHG; increase physical activity; improve community engagement]***	$80,000		GRI	RIV	CVAG		Y	$4,014,300
	Subtotal Phase 2		***$1,931,300***							
35	Orange County	"From Orange to Green" - County of Orange Zoning Code Update - Sustainability; implementation **- *[Reduce GHG; improve public health; improve community engagement]***	$200,000	$56,000	CB	OC	OCCOG			$4,214,300
36	Calimesa	Wildwood and Calimesa Creek Trail Master Plan Study - Active transportation; Resource protection **- *[Improve public health; increase physical activity; improve safety; reduce GHG]***	$50,000	$50,000	AT	RIV	WRCOG		Y	$4,264,300
37	Western Riverside Council of Governments	Climate Action Plan Implementation - GHG Reduction; Multi-jurisdiction; implementation **- *[Reduce GHG; improve public health; improve community engagement]***	$170,000		GRI	RIV	WRCOG		Y	$4,434,300
38	Lynwood	Safe and Healthy Community Element - Public health & safety, General Plan update **- *[Improve public health; increase physical activity; improve safety; reduce GHG]***	$100,000		GRI	LA	GCCOG			$4,534,300

Rank	Applicant	Project Description *[Project benefits in italics]*	Est. Cost	Local Match Commit	Cat	County	Subreg		Past Awd	tab
39	Palmdale	Avenue Q Feasibility Study - Mixed-use; Integrated planning **- *[Improve economic development; reduce GHG]***	$100,000	$20,000	CB/AT	LA	NLA			$4,634,300
40	Long Beach	Willow Springs Wetland Habitat Creation Plan - Open space; Resource protection **- *[Increase open space and habitat conservation; increase physical activity; improve public health]***	$50,000		GRI	LA	GCCOG		Y	$4,684,300
41	Indio	General Plan Sustainability and Mobility Elements - Sustainability; Multi-modal, General Plan update **- *[Improve public health; increase physical activity; improve safety; reduce GHG]***	$175,000		CB	RIV	CVAG		Y	$4,859,300
42	Glendale	Space 134 - Open space/Freeway cap; Multi-modal **- *[Improve public health; increase physical activity; improve safety; reduce GHG]***	$200,000		CB	LA	SFVCOG	Y	Y	$5,059,300
43	Rancho Palos Verdes/City of Los Angeles	Western Avenue Corridor Design Implementation Guidelines - Urban Infill; Mixed-use; Multi-modal **- *[Reduce GHG; improve transit mode share; improve community engagement]***	$165,000	$30,000	CB	LA	BCCOG/CL	Y	Y	$5,224,300
44	Moreno Valley	Nason Street Corridor Plan - Multi-modal; Economic development **- *[Reduce GHG; improve transit mode share; improve community engagement]***	$150,000		AT	RIV	WRCOG		Y	$5,374,300
45	Park 101/City of Los Angeles	Park 101 District - Open space/Freeway cap; Multi-modal **- *[Improve public health; increase physical activity; improve safety; reduce GHG]***	$200,000		CB	LA	CLA	Y	Y	$5,574,300
46	Los Angeles/San Fernando	Northeast San Fernando Valley Sustainability & Prosperity Strategy - Multi-jurisdiction; Economic development; Sustainability **- *[Reduce GHG; improve economic development; improve community engagement]***	$175,000		GRI	LA	SFVCOG			$5,749,300
47	San Dimas	Downtown Specific Plan - Mixed use; Infill **- *[Reduce GHG; improve transit mode share; improve community engagement]***	$86,000		CB	LA	SGVCOG			$5,835,300
48	Los Angeles - Department of City Planning	CEQA Streamlining: Implementing the SCS Through New Incentives - CEQA streamlining **- *[Reduce GHG; improve project delivery]***	$150,000		CB	LA	CLA		Y	$5,985,300
49	Pico Rivera	Kruse Road Open Space Study - Open space; Active transportation **- *[Increase open space/conservation; improve community engagement; increase physical activity]***	$150,000		GRI	LA	GCCOG			$6,135,300
50	South Bay Cities Council of Governments	Neighborhood-Oriented Development Graphics - Public outreach; Neighborhood design **- *[Reduce GHG; improve safety; improve community engagement]***	$25,000		CB	LA	SBCCOG		Y	$6,160,300

Rank	Applicant	Project Description *[Project benefits in italics]*	Est. Cost	Local Match Commit	Cat	County	Subreg		Past Awd	tab
51	San Bernardino Associated Governments	Safe Routes to School Inventory - Active transportation; Public health ***- [Improve public health; increase physical activity; improve safety; reduce GHG]***	$40,000	$40,000	AT	SBD	SANBAG		Y	$6,200,300
52	Burbank	Mixed-Use Development Standards - Mixed use; Urban infill ***- [Reduce GHG; improve economic development; improve community engagement]***	$200,000		CB	LA	SFVCOG		Y	$6,400,300
53	San Bernardino Associated Governments	Countywide Habitat Preservation/Conservation Framework - Open Space; Active Transportation ***- [Increase open space/conservation; improve community engagement; increase physical activity]***	$50,000	$40,000	GRI	SBD	SANBAG		Y	$6,450,300
54	Rancho Cucamonga	Healthy RC Sustainability Action Plan - Public health; implementation ***- [Reduce GHG; improve public health; improve community engagement]***	$150,000		GRI	SBD	SANBAG			$6,600,300
55	Pasadena	Form-Based Street Design Guidelines - Complete Streets; Multi-modal; Livability - ***[Reduce GHG; improve transit mode share; improve community engagement]***	$175,000		AT	LA	SGVCOG			$6,775,300
56	South Gate	Gateway District/Eco Rapid Transit Station Specific Plan - Land Use Design; Mixed Use; Active Transportation ***- [Reduce GHG; improve transit mode share; improve community engagement]***	$400,000		CB	LA	GCCOG	Y	Y	$7,175,300
57	Bell – Pending SCAG membership*	Bicycle and Pedestrian Master Plan - Active transportation ***- [Improve public health; increase physical activity; improve safety; reduce GHG]***	$130,000		AT	LA	GCCOG			$7,305,300
58	Lancaster	Complete Streets Master Plan - Active transportation ***- [Reduce GHG; improve transit mode share; increase physical activity]***	$125,000		AT	LA	NLA		Y	$7,430,300
59	Rancho Cucamonga	Feasibility Study for Relocation of Metrolink Station - Transit Access ***- [Reduce GHG; improve transit mode share; improve community engagement]***	$150,000		CB	SBD	SANBAG			$7,580,300
60	Santa Clarita	Soledad Canyon Road Corridor Plan - Land Use Design; Mixed Use Plan ***- [Reduce GHG; increase economic development; improve community engagement]***	$150,000		CB	LA	SFVCOG		Y	$7,730,300
61	Seal Beach	Climate Action Plan - Climate Action Plan - ***[Reduce GHG; improve public health; improve community engagement]***	$150,000	$20,500	GRI	OC	OCCOG			$7,880,300
62	Bell – Pending SCAG membership*	General Plan Update - General Plan Update; Community outreach ***- [Reduce GHG; improve community engagement]***	$200,000		CB	LA	GCCOG			$8,080,300

Rank	Applicant	Project Description *[Project benefits in italics]*	Est. Cost	Local Match Commit	Cat	County	Subreg		Past Awd	tab
63	La Mirada	Industrial Area Specific Plan - Land Use Design **- *[Reduce GHG; improve community engagement]***	$135,000	$60,000	CB	LA	GCCOG		Y	$8,215,300
64	Hemet	Downtown Hemet Specific Plan - Land Use Design; Mixed Use Plan **- *[Reduce GHG; increase economic development; improve community engagement]***	$200,000	$50,000	CB	RIV	WRCOG			$8,415,300
65	Hollywood Central Park/City of Los Angeles	Hollywood Central Park EIR - Open Space/Freeway Cap; Multi-modal **- *[Improve public health; increase physical activity; improve safety; reduce GHG]***	$200,000		CB	LA	CLA	Y	Y	$8,615,300
66	Desert Hot Springs	Bicycle/Pedestrian Beltway Planning Project - Active Transportation **- *[Improve public health; increase physical activity; improve safety; reduce GHG]***	$125,000		AT	RIV	CVAG		Y	$8,740,300
67	Cathedral City	General Plan Update - Sustainability - General Plan Update; Sustainability Plan - ***[Reduce GHG; improve community engagement]***	$50,000		GRI	RIV	CVAG		Y	$8,790,300
68	Westminster	General Plan Update - Circulation Element - General Plan Update; Complete Streets **- *[Reduce GHG; improve community engagement]***	$200,000	$1,250,000	CB	OC	OCCOG			$8,990,300
69	La Canada Flintridge	Climate Action Plan - Climate Action Plan - ***[Reduce GHG; improve public health; improve community engagement]***	$75,000		GRI	LA	SGVCOG			$9,065,300
70	Huntington Beach	Neighborhood Electric Vehicle Plan - Electric Vehicle **- *[Reduce GHG; improve safety]***	$89,000		GRI	OC	OCCOG			$9,154,300
71	Pasadena	Green House Gas (GHG) Emission Reduction Evaluation Protocol - Climate Action Plan **- *[Reduce GHG; improve public health; improve community engagement]***	$175,000		GRI	LA	SGVCOG			$9,329,300
72	San Bernardino Associated Governments	Countywide Bicycle Route Mobile Application - Active Transportation **- *[Improve public health; increase physical activity; improve safety; reduce GHG]***	$20,000	$5,000	AT	SBD	SANBAG		Y	$9,349,300
73	Dana Point	General Plan Update - General Plan Update **- *[Reduce GHG; improve community engagement]***	$125,000	$135,000	CB	OC	OCCOG		Y	$9,474,300
74	Garden Grove	RE:IMAGINE Downtown - Pedals & Feet - Active Transportation; Infill - ***[Reduce GHG; increase physical activity; improve community engagement]***	$200,000		AT	OC	OCCOG			$9,674,300
75	Barstow	Housing Element and Specific Plan Update - Housing; Land Use Design **- *[Reduce GHG; improve community engagement]***	$175,000		CB	SBD	SANBAG			$9,849,300

Rank	Applicant	Project Description *[Project benefits in italics]*	Est. Cost	Local Match Commit	Cat	County	Subreg		Past Awd	tab
	Subtotal Phase 3		***$5,835,000***							
	Below are non SCAG Member applicants*									
76	Omnitrans - Not eligible for becoming a SCAG member*	Route 61 Corridor Station Area Planning - Corridor Planning ***- [Improve transit mode share]***	$175,000		CB	SBD	SANBAG			$10,024,300
	Bell	See above #57 and #62								

* Non-member organizations not eligible for funding per Sustainability Program guidelines

Grand Total ***$10,024,300***