C/CAG

CITY/COUNTY ASSOCIATION OF GOVERNMENTS
OF SAN MATEO COUNTY

Atherton • Belmont • Brisbane • Burlingame • Colma • Daly City • East Palo Alto • Foster City • Half Moon Bay • Hillsborough • Menlo Park Millbrae • Pacifica • Portola Valley • Redwood City • San Bruno • San Carlos • San Mateo • San Mateo County • South San Francisco • Woodside

AGENDA

The next meeting of the
Congestion Management & Air Quality Committee
will be as follows.

Date: Monday, February 27, 2006 3:00 p.m. to 5:00 p.m.
Place: San Mateo City Hall
330 West 20th Avenue, San Mateo, California
Conference Room C (across from Council Chambers)

PLEASE CALL WALTER MARTONE (599-1465) IF YOU ARE UNABLE TO ATTEND.

1.	Election of a Chair and Vice Chair to serve through June 30, 2006.	Action (Acting Chair)		3:00 p.m. 10 mins
2.	Public Comment On Items Not On The Agenda	Presentations are limited to 3 minutes.		3:10 p.m. 5 mins
	CONSENT AGENDA			
3.	Minutes of January 9, 2006 meeting.	Action (Martone)	Pages 1-22	3:15 p.m. 5 mins
	REGULAR AGENDA			
4.	Development of an energy strategy for San Mateo County	Action (Board of Supervisors President Jerry Hill)	Pages 23-30	3:20 p.m. 30 mins
5.	Recommendations for the 2006-07 Expenditure Program for the Transportation Fund for Clean Air (TFCA) San Mateo County Program.	Action (Wong)	Pages 31-33	3:50 p.m. 20 mins
6.	Review and approval of proposal for application and scoring of Surface Transportation Program (STP) projects.	Action (Kline)	Pages 35-50	4:10 p.m. 30 mins

555 County Center, 5th Floor, Redwood City, CA 94063 PHONE: 650.599.1406 FAX: 650.361.8227

7.	Introduction and discussion of Joint Principles for Improvements on El Camino Real.	Information/ Discussion (Napier)	Pages 51-54	4:40 p.m. 15 mins
8.	Member comments and announcements.	Information (Chair)		4:55 p.m. 5 mins
9.	Adjournment and establishment of next meeting date for March 27, 2006.	Action (Chair)		5:00 p.m.

NOTE: **All items appearing on the agenda are subject to action by the Committee. Actions recommended by staff are subject to change by the Committee.**

NOTE: ***Persons with disabilities who require auxiliary aids or services in attending and participating in this meeting should contact Nancy Blair at 650 599-1406, five working days prior to the meeting date.***

Other enclosures/Correspondence - Schedule of meetings for 2006

CITY/COUNTY ASSOCIATION OF GOVERNMENTS
COMMITTEE ON CONGESTION MANAGEMENT AND AIR QUALITY (CMAQ)

MINUTES
MEETING OF JANUARY 9, 2006

At 3:07 p.m., the meeting was called to order by Chairman Marland Townsend in Conference Room C of San Mateo City Hall.

Members Attending: Jim Bigelow, Deberah Bringelson, Judith Christensen, Tom Davids, Arthur Lloyd, Karyl Matsumoto, Irene O'Connell, Barbara Pierce, Sepi Richardson, Lennie Roberts, Antoinette Stein, and Chairman Marland Townsend.

Staff/Guests Attending: Walter Martone, Geoff Kline, and Sandy Wong (C/CAG Staff - County Public Works), Tom Madalena and Mark Duino (C/CAG Staff – County Planning), Richard Napier (C/CAG Executive Director), Pat Dixon (Transportation Authority Citizens Advisory Committee), Corinne Goodrich (SamTrans), Sally Tomlinson and Ruth Peterson (Sustainable Silicon Valley), Robert D Cormia (Foothill De Anza Colleges), Jill Boone (County Public Works – Recycleworks), and Christine Maley-Grubl (Peninsula Traffic Congestion Relief Alliance).

1. Public comment on items not on the agenda.

- Geoff Kline provided a copy of a letter sent to Caltrans regarding a request for signage on Route 101 to the Millbrae Intermodal Transit Station.
- Richard Napier made a presentation of a plaque to departing Chairman Marland Townsend.

CONSENT AGENDA

2. Minutes of October 31, 2005 meeting.

Motion: To approve the Minutes as presented. Richardson/Bigelow, unanimous.

REGULAR AGENDA

3. Presentation on CO_2 and Global Warming.

Jill Boone introduced Robert D. Cormia from Skyline Colleges. Mr. Cormia made a presentation on Global Warming and Energy Issues. A copy of the presentation is attached to these minutes. The major topics covered included the "greenhouse effect," the current and future CO_2 trends, the affect of rising temperatures on the earth, the energy challenges that must be solved, the economic opportunity of "energy equity," and a series of recommendations and conclusions. This information is being provided as background information to educate the CMAQ about the issues. At the February 27th CMAQ meeting,

specific recommendations will be provided to the Committee for following up on this information.

Comments included:

a) Are there places where the climate change will not be so severe? Yes. Parts of Europe will get cooler.
b) This is a message that should be provided many times and through numerous venues. Staff was encouraged to offer the presentation for broadcast on the various local cable T.V. stations.
c) Chairman Townsend commented that based on his research with the Navy, he concluded that petroleum sources of fuel should never be used for any stationary source because it is too valuable for its use in medicine, fabric and plastics production, and other applications that have capital value instead of throw away value (i.e. as fuel for mobile sources).

4. ABAG/MTC projections for population growth for the years 2025, 2015, and 2005.

Mark Duino presented the most recent analysis of the data on traffic and commuting that was extrapolated from the 2000 Census and projections done by the Association of Bay Area Governments (ABAG). The information has been correlated with the Traffic Analysis Zones (TAZs), which are the units of geographic areas used in the C/CAG Travel Forecasting Model. This information will ultimately be used to develop policy recommendations for inclusion in the next update of the Countywide Transportation Plan.

Comments included:

a) Will there be any focus on the east-west transit options? The business community is interested in transit that will take workers east of Route 101. 34% of the jobs in San Mateo County are east of Route 101 and only 18% is located in that same area.
b) It was recommended that this information be assimilated into three subregions for the County (North/Central/South) in order to provide a more regional picture of the trends.
c) Have the new residences (30,000) that are projected for Brisbane been included in these projections? It does not appear so.
d) The Countywide Transportation Plan should attempt to link the housing and jobs projections to see where there is a need to provide transit to get people to jobs from homes.
e) There are already parts of San Mateo County that are very densely populated. Daly City is the second most densely populated community in California. Much of the land in the areas that are being looked at for increased density is already in private individual ownership. It is highly unlikely that individual residents will be willing to give up their homes in order to allow for greater density developments. We need to make sure that consideration is given to "what's on the ground now, and what can be done in the future" before we assume that new development can occur. This also needs to include consideration of existing infrastructure and its limits.

f) It appears that the projections for increases of jobs will not reach the dotcom boom levels until 2015.
g) Locations that are dedicated to open space (orange and green areas) should be noted as unavailable for future jobs and housing development.
h) We need to look into providing incentives in the form of transit, as a way to encourage people to live in certain areas because it will be very convenient for them to commute to work.

The next steps in this process will be to develop transportation projections for the different land use projections to see where improvements may need to be planned.

5. Presentation on the San Mateo County Senior Mobility Action Plan.

Corinne Goodrich from Samtrans reported:

a) The majority of the older residents of San Mateo County do not live on spine of the transit network (El Camino Real). This makes accessing transit for this population group very difficult.
b) Over half of the elder population is unable to take transit due to mobility issues (walking, standing, climbing, etc.).
c) This program has a steering committee of 35 individuals who have an interest in this topic and/or are experts in this field.
d) The Committee has developed a number of strategies for addressing these issues and is currently seeking input from other bodies such as C/CAG.
    1. Community transportation: Additional transit service that specifically reaches the older population needs to be developed.
    2. Community-based transportation: This type of service employs the use of volunteers and community based organizations to provide service.
    3. Market transit: New methods need to be used to introduce individuals to transit. One example is the VTA, which is giving free trips to seniors.
    4. Programs that help seniors to stay as safe drivers, know when to give up the keys to their automobile, and what are their options when they no longer drive.
    5. Taxi cabs: There are different requirements depending on the community. None of the cabs in San Mateo County are handicapped accessible; cabs are expensive, and often unreliable. Consideration might be given to providing accessible cabs to providers who agree to certain improvements to their services.
    6. Walking and pedestrian safety: Pedestrian fatalities for seniors are extremely high.
e) Next steps:
    1. Presentations to various groups (CMAQ, C/CAG, etc.) to see if these ideas make sense and to determine how other groups might participate.
    2. Establish a website and a brochure to get information out to the public.
    3. Develop an outreach plan.

Comments included:

a) Invitations to make presentations before city councils and other groups would be welcomed.
b) Samtrans should consider providing free passes to seniors.
c) Presentations before city councils should be focused on that particular city and how it can become involved.
d) What kind of outreach is being done to senior housing complexes? Having contact names would be helpful in this effort.
e) Local cable TV shows would be an excellent way to get this information out to the public. The program will also be developing a video that can be broadcasted.
f) Invitations were extended from various CMAQ members for presentations to the Brisbane City Council and various groups within the City, the Redwood City Council, the San Carlos City Council, and the Peninsula Policy Partnership.
g) There is a problem with using transit when you need to cross county borders. Samtrans should be more flexible with its restrictions on trips to other counties.
h) Special recognition should be given for taxi drivers who receive special training in addressing the needs of seniors. This could also be used as part of a promotional campaign and to advertise certain cab companies.
i) Better information is needed on the destinations that seniors need to get to.
j)

Motion: To provide this presentation to the full C/CAG Board and encourage each of the cites to have a presentation. There should also be an instructional program for seniors on how to use transit and for young people to assist seniors in taking transit. Bigelow/Lloyd, unanimous.

6. Member comments and announcements.

- Appreciation was expressed for the list of acronyms included in the packet.
- Jim Bigelow noted that Caltrans recently joined the Silicon Valley High Speed Rail Coalition. Jim and Arthur will work together to arrange for a presentation from this group at a future CMAQ meeting and at a C/CAG meeting.
- Mike Scanlon will be the presenter at the next Samceda quarterly breakfast to discuss what's next after Measure A.
- When the levies were originally developed they were five feet tall, they are now twenty-five feet tall.
- CMAQ Members were encouraged to pay attention to the Governor's new bond proposal what may or may not be included for high-speed rail.

7. Adjournment and establishment of next meeting date.

The next regular meeting of CMAQ will be on February 27, 2006. There will not be a meeting on January 30, 2006. At 4:40 p.m., the meeting was adjourned.

CMAQ Presentation on Global Warming and Energy Issues

Good afternoon. Global warming and energy challenges are interrelated and critical issues that require our urgent attention. The purpose of this presentation is to explain how the greenhouse effect is integral to the optimum balance of temperature and life on the planet, and to show how anthropogenic (human) carbon emissions will affect the temperature of the planet over the next 200 years, and longer, and the serious and deleterious affects of that warming. A second concern, resource depletion of oil and gas, may actually precede global warming as a global issue, as 'peak oil' predictions may cause economies to suffer, with the potential of armed conflict over resource scarcity. To address both of these issues, we are introducing the notion of 'Energy Equity' as a philosophy for developing independence from fossil fuels, and the significant issues related to global warming, environmental damage, or resource depletion.

Take a quick poll of awareness of the greenhouse effect, forcing models, notion of 'peak oil' and introduce the concept of 'Energy Equity'. This will be a 'quick tour' of these concepts. We have a longer version of this talk which explains these issues in more detail.

The greenhouse effect is a natural and integral part of our planet's health. Without it, we would be 60 degrees F cooler, or freezing on the surface of the planet. Data from the Vostok ice core shows that there is an interrelated effect between sunlight, biomass, atmospheric CO2, and temperature. The greenhouse effect is based on gasses that absorb energy from the sun and reradiate back into the earth. The earth warms to an equilibrium temperature that reflects energy back into the atmosphere. When the two energies are equal, we are at equilibrium. While CO2 varies over 125,000 year cycles, prior to 1900 it always remained within a range of 180 to 280 ppm CO2. The correlation between temperature and ppm CO2 has maintained a perfect correlation for 500,000 years. In the past 100 years, as CO2 has increased from 280 to 380 ppm, temperature has increased a full degree Fahrenheit.

The greenhouse effect is part of the carbon cycle, where carbon has been stored in the oceans, in forests, and over the course of 250 million years, converted to oil, coal, and natural gas. A concern is that in less than 250 years we have released that carbon in one-millionth the time.

Radiative forcing is the central concept in the Greenhouse effect. When the concentration of gases such as CO2, CH4, N2O, and halocarbons increases from their historic levels, more energy is absorbed that reradiates back at the earth. This radiation imbalance requires the earth to warm, and reflect energy back into the atmosphere. When the temperature rises sufficiently, the forcing is removed, and the planet and atmosphere are in 'energy equilibrium' again. Each gas has distinctive absorption and emission characteristics, which are modeled using basic physics. Computational models have been developed that give us an idea of the amount of energy that each gas will radiate given a change in concentration. This diagram shows the amount of forcing from each of the gases in the atmosphere, based on current concentration levels. As concentrations rise,

forcing will increase. What is not shown here is that forcing for gases like methane are 20x more harmful than CO2, but at today's concentrations, methane is less than CO2, and has a much shorter half-life. This could change. As will be discussed later, Goddard Space Sciences, a division of NASA, has developed a quantitative model for predicting warming of the earth related it to changes in greenhouse gas concentrations, and the rates of ocean warming, which is the primary driver in climate change.

Chevron has started an effective ad campaign to introduce the concept of 'peak oil' by drawing attention to the rate of oil consumption, and hinting that the next 30 years, where we consume an equal amount of oil as the previous 125, might be much more difficult, and far more expensive. Why should you care?

Chevron, ExxonMobil, Shell, and BP, now branded as 'beyond petroleum' are all making strong efforts to alert the public that migrating from oil, at some time, is inevitable. However, liquid fuels, based on oil and gas, will be part of an ever growing transportation economy for the next several decades.

The volume of carbon emissions has accelerated, with the period from 1970 to the present equal to all the carbon burned prior to that period. Continuing that acceleration, the period from 2000 to 2030 will equal all the emissions from 1750 to 2000. That's the key takeaway from this message – that given the concern over carbon emissions and global warming from human activities, we are about to double the amount of carbon out into the atmosphere, and in a very short period of time.
This is why you should care.

Since the mid 1950s the cycles of CO2 rising in the fall and decreasing in the spring have been monitored from Hawaii. The steady rise in CO2, from a historic base of 280 ppm, alerted environmental scientists that the impact of human reliance on carbon based energy sources was detectable in the atmosphere. These data became the foundation for early correlations between CO2 rise, and the possibility that a change to the greenhouse gas composition might lead to an increase in planetary temperature.

The correlation between carbon emissions and rise in atmospheric concentrations in CO2 are almost perfect. R2*100 = 99%. This correlation is useful for two reasons. First, it shows that there is a predictable relationship between carbon emissions and rise in CO2, allowing accurate assessment of future CO2 levels based on assumptions of total carbon energy used. Second, and more importantly, is the y-intercept for this statistical regression. 297 ppm is barely above the earth's baseline value of 280 ppm. This suggests that carbon cycle, which exchanges 200 Giga tons a year between the biosphere (plants, ocean, soil, atmosphere) had little interest or ability in 'metabolizing' anthropogenic carbon. In addition to the academic perspective, this further suggests that human interaction with earth's carbon cycle is completely outside of the normal operation of the planet's ecosystem, and direct interference with the greenhouse effect, which has maintained a perfect balance between sunlight, temperature, and optimum conditions for life on the planet.

The carbon cycle and greenhouse effect, and more importantly the Vostok ice core data, added to this observed correlation, is indicative that human carbon emissions may be interacting with the planet's 'thermostat of life'.

For over 1,000 years the earth has maintained a very narrow temperature range, plus or minus a few tenths of a degree Celsius. In the last 100 years, and especially in the last 50, temperatures have risen considerably, roughly 1 degree Fahrenheit (0.6 degrees Celsius). This rise in temperature correlates with the rise in CO2, and will continue as CO2 levels rise further, and as the oceans respond slowly to the forcing, what is known as 'thermal lag' or 'thermal inertia'.

A seminal research piece on climate forcing models and thermal inertia was published in March 2005. Goddard Space Sciences (part of NASA Goddard) conducted a 10-year study using 2,000 sea buoys that sampled ocean temperatures from the ocean surface to a depth of about 1750 feet, over the decade 1990 - 2000. Goddard scientists developed models that showed earth's 'energy imbalance' based on forcing from CO2, and rates of heating in the ocean. More importantly, model also showed a 'lag' in temperature rise as the thermal inertia of ocean can only warm so fast. The GISS work suggested that earth currently experiences a forcing of 1.85 Watts from total CO2, of which 1 degree Fahrenheit has been felt, and another degree Fahrenheit must be experienced. Thermal lag is about 25 to 50 years to experience about 60% of the forcing. Additionally, the equilibrium temperature rise from 1 watt of forcing is about 2/3 degree Celsius per watt.

Using the Goddard algorithm and Excel, it is possible to model the rise in temperature from a known or projected level of CO2, which in turn can be estimated from total carbon emissions. This graph shows the forcing (in degrees F) for moderate carbon emissions throughout the 21st Century. At each 25 year point, the total forcing is shown, with the corresponding 'felt' and 'owed' temperature rise. Two key time intervals are 2000, where we see that we have experienced a 1 degree temperature rise, but also 'owe' and additional 1 degree. As we continue to burn carbon fuels (oil, gas, and coal) we continue to increase forcing, with the amount 'owed' reaching a maximum in 2050. What should be alarming about this graph is the temperature lag of over 50 years to 'equilibrate' with the forcing induced by both continued and increasing carbon emissions. In addition, it is obvious that what we do over the course of the next 25 to 50 years shapes the course of warming well into the 22nd century. If there is a time to act, it is now, or perhaps never, to avoid temperature rise that could prove disastrous to our planet's ecosystem.

Consequences of warming.

The consequences of global warming are impacts to the oceans that lead to climate change over land. These include:
Thinning of polar ice caps (now at 10% per decade and accelerating)
Slowing of the thermohaline cycle (reported to have slowed 30% in a publication last December)
Rising sea levels (half a meter last century, now accelerating)

Extreme weather events (extended drought and heat waves, extremes in storms and hurricanes)
All these consequences are now evident, and as a reminder, based on just one degree Fahrenheit rise over less than 50 years. We must still warm another degree in the next 50 years just to reach equilibrium with today's forcing. As we continue to increase carbon emissions further, this energy debt, and temperature, increases even more. There is a level of 'interference' suggested by some scientists, one degree Celsius, above which we may push the climate into a very different regime.

The North Pole is thinning in area ~10% per decade, and thinning in thickness ~1 meter per decade. At these rates, it may be an open sea as early as 2030 – 2050. As ice melts to form open sea, temperature rise and melting of ice accelerates, as ice is 90% reflective, while open sea is 50 to 80% absorbing. Ice cubes always melt faster towards the end of their life.

The intensity and duration of hurricanes set a record in 2005, with Katrina and Rita doing considerable damage to the Southeast. Warm waters approaching 90 degrees Fahrenheit supplied considerable energy, accelerating hurricane energy from category 1 to category 5 in less than two days. The hurricane season of 2005 proved to be a record in the total number of hurricanes, the intensity of the storms, and the length of the hurricane season.

Peak oil concept – Hubbert's Peak. M King Hubbert's prediction in 1956 that US oil production will peak in 1970-1975. Oil experts are now using the mathematics to predict the midpoint for world oil production – est. ~2005.

Peak oil – the amount of oil and gas in the planet is finite, and oil in particular may have a limit of about 2 trillion barrels. The midpoint of oil production, described by M King Hubbert in 1956, is estimated to occur in 2004–2006, right about now. The era of 'easy oil' is over, and the remaining oil will be harder and more expensive to discover, produce, and will be more damaging to the environment. As demand for petroleum is expected to increase by 50% in the next 20 years (2025) we could face a series of price and supply shocks, especially if remaining oil reserves in Saudi Arabia have been overestimated. There is very little time to act to avoid a severe resource depletion issue.

Oil production minus reserves shows the seriousness of the oil reserves problem. As demand for petroleum and gas increases while reserves grow slowly, and costs of production increase, could lead to serious deficits in liquid fuel, as well as natural gas, increasingly sought as a replacement for coal. Based on this graph, we are producing from 10 to 15 billion barrels more a year than are being added to reserves, a number increasing by 1 to 1.5 billion barrels every year. By 2025, that number will be 45 to 50 billion barrels a year, equal to total oil production.

Demand for energy in developing countries, as well as a steady increase in energy demand (est. 1.02 per annum) will lead to a 50% increase in energy demand by 2025. This also suggests a 50% increase in carbon emissions.

Energy equity. Burning oil is burning money. Compare metaphor of rent vs. own. Economic benefits of building a solar economy, especially in California.
Energy Equity – Burning oil is burning money. Owning a home is always more expensive than renting, but after a period of time, building equity puts you in a better financial position. Building an energy infrastructure that derives primary energy from the sun will help to offset both the issues of global warming and resource depletion. Building such an infrastructure would have a profound economic benefit – energy is a 3 trillion dollar global economy, expected to double in size by 2020. The United States can be a leader in energy technology as it has led in climate research. It is both our single biggest challenge and single biggest opportunity.
Need to build out an infrastructure that lasts, rather than depleting finite resources from the earth.
Solar energy is primary, not alternative. The sun powers almost al life on earth, and provides over 20,000 the energy that human civilization needs. Over time we need to make a commitment to invest in solar technology as a key component of our electricity infrastructure. A solar economy generates more jobs than any other energy investment – 24 jobs in manufacturing, and 8 jobs in service industry and installation. It is a long road of investment, taking 20 years to reach 25% of our electricity infrastructure at a modest 20% CAGR.
Additionally, new technologies must be developed in order to lower the cost and improve the efficiencies in current silicon based PV technology.
Building a solar economy in the United States would also provide energy security for an electricity infrastructure partially dependent on methane, which could become both resource limiting and much higher priced, as seen in the events following hurricane Katrina in 2005.
Last, building an energy economy with new technology in the US could position American to become a supplier of carbon free energy technology for the world, both an economic benefit as well as slowing the acceleration of global warming.

5 key concepts:

Five key concepts.
Green house effect – carbon cycle, thermostat of life. Maintains an equilibrium between and among sunlight, temperature, and biomass over 650,000 years. Keeps the temperature of the planet optimum for life.

Forcing models – relating composition and concentration to absorbed / trapped / reflected energy. Forcing can relate temperature rise to total watts (energy per square meter). Because of thermal mass of the oceans, it takes 25 to 50 years to 'feel' about 60% of the total forcing, a dangerous lag for humans to detect, understand, and react to. What we do in the next 30 years (carbon emissions) will affect the planet well into the 22nd Century. Effect of warming just one degree – and for only 50 years. Accelerated melting of the ice sheets, sea level rise, intensity of storms, number and duration of extreme weather events (extreme heat, droughts, rain) all are the result of just one degree Fahrenheit. As noted in the GISS forcing models, we currently 'owe' one degree Fahrenheit on top of the one degree already felt, which will take 25 to 50 years to reach equilibrium. Thus we are

feeling the effects of just half the temperature rise, we are going to experience. Using moderate economic growth in developing and developed countries, a level of 500 ppm CO2 will be reached by 2100, and a concomitant rise in temperature of 2 to 3 degrees F in this Century (60 degrees F), to an ultimate temperature of 61 degrees in the next century. This may destabilize the Antarctic, with sudden sea level rise as ice sheets fracture and flow into the sea. Thawing of permafrost, over 10 to 50% of the globe by 2050, has the potential to release trapped methane, and even more dangerous greenhouse gas.

Peak oil – the amount of oil and gas in the planet is finite, and oil in particular may have a limit of about 2 trillion barrels. The midpoint of oil production, described by M King Hubbert in 1956, is estimated to occur in 2004-2006, right about now. The era of 'easy oil' is over, and the remaining oil will be harder and more expensive to discover, produce, and will be more damaging to the environment. As demand for petroleum is expected to increase by 50% in the next 20 years (2025) we could face a series of price and supply shocks, especially if remaining oil reserves in Saudi Arabia have been overestimated. There is very little time to act to avoid a severe resource depletion issue.
Energy Equity – Burning oil is burning money. Owning a home is always more expensive than renting, but after a period of time, building equity puts you in a better financial position. Building an energy infrastructure that derives primary energy from the sun will help to offset both the issues of global warming and resource depletion. Building such an infrastructure would have a profound economic benefit – energy is a 3 trillion dollar global economy, expected to double in size by 2020. The United States can be a leader in energy technology as it has led in climate research.

It is both our single biggest challenge and single biggest opportunity.

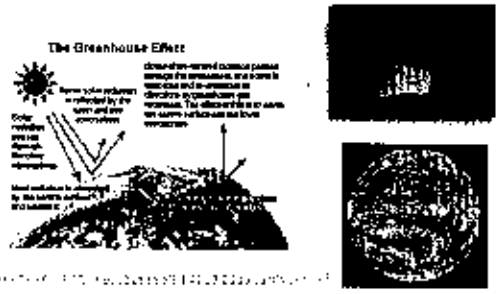
Global Warming *for* ***Dummies***

Cleantech Economy Project
Fall 2005

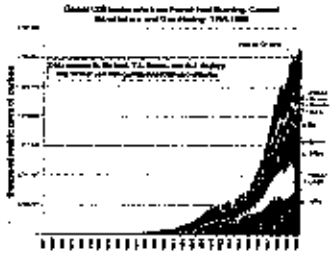
Presentation Goals

- Explain the ***greenhouse effect***
- Show current / future CO_2 trends
- Affect of ***rising temperatures*** on earth
- 10 key ***energy challenges*** to solve
- Economic opportunity of ***'energy equity'***
- Recommendations / conclusions
  - 'sense of ***urgency***, and a call to ***action***'

Solar Energy and earth's Heat

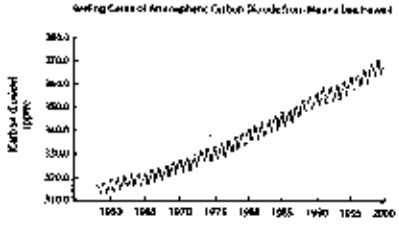


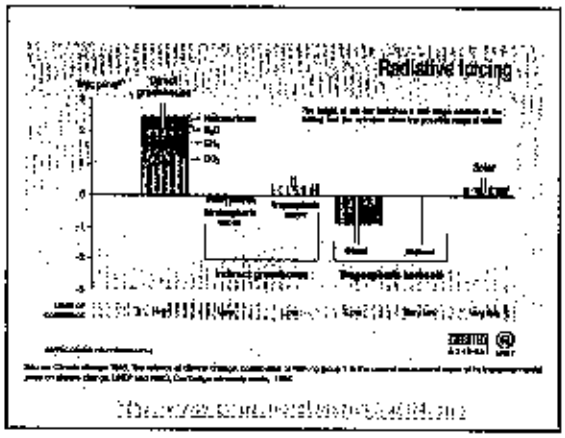
250 yrs of carbon Emissions



It took ***125 years*** to burn ***the first trillion barrels of oil*** – we'll burn ***the next trillion in less than 30 years*** – why should you care?

Rising CO_2 over 50 Years



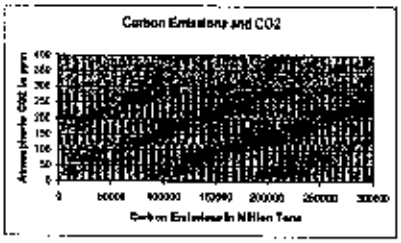


Carbon Burned and CO_2

- Plot atmospheric CO_2 as a function of cumulative carbon burned (mega tons)
- Linear regression has an almost ***perfect correlation coefficient*** (r^2*100) of 99%
- Allows a confident prediction of ***future CO_2 based on future carbon burned.***
- Since forcing can be calculated directly from CO_2, it is a ***very*** important model

Devin Cormia "The Gaia Hypothesis" Carlmont High School AP Bio Term Project 2005

Carbon Emissions and CO_2



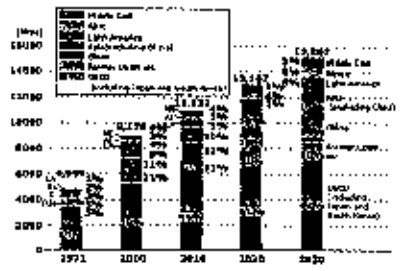
Carbon emissions can be used to predict atmospheric CO_2 with ***99% confidence*** using *simple linear regression data*

Carbon Emissions and CO_2

Year	C burned	ppm CO2
1900	12307	295
1910	16174	300
1920	26050	305
1930	37914	310
1940	48686	310
1950	62324	315
1960	83453	320
1970	115035	325
1980	164053	340
1990	218308	350
2000	283373	370

- Carbon burned => CO_2
- Linear from 1850 to 2000
  - ppm CO_2 =2.55 e$^{144*[M\ tons\ C]}$ + 287 ppm (r^2*100=99%)
- ~ 50% of carbon goes into atmospheric CO_2
  - 30% missing carbon
- Trend is constant over 150 years – is this how the biosphere will react over the next 500 years?

Projected Energy Demand

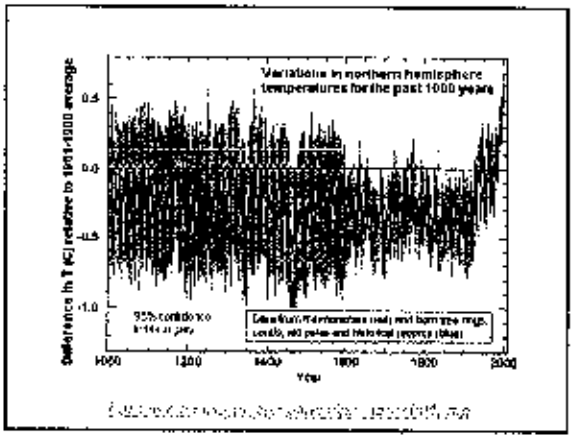


Future CO_2 – the Next 30 Yrs

Year	Emissions	CO_2
2000	283,373	369
2005	318,465	378
2010	357,209	388
2015	399,986	399
2020	447,216	411
2025	499,360	424
2030	556,932	439

Global Climate Models (GCM)

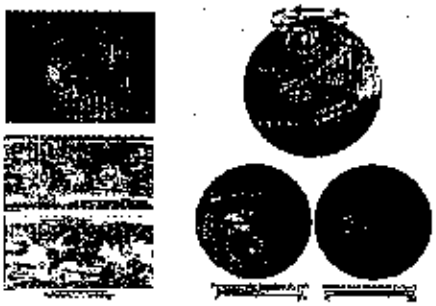
- *Ab initio* modeling
  - From first principles
- Modeling land and sea temps from 1900 - 2000
- Complexity and data
  - Climate is a dynamic system – 'complex' math
- GISS study
  - 10 year study over oceans
  - Sea temps ~7,500 ft depth
  - Satellite data for forcing



Forcing Model from GISS

- [illegible]
- ***Definitive work*** in March 2005
- 1,800 ocean buoys sampling temperatures at depth of 0 to 2,500 meters from 1900 - 2000
- Temps ***must*** rise 0.66 °C per 1 W of forcing
- ***'Thermal Inertia'*** of oceans requires 25 to 50 years to experience 60% of total ***'equilibration'***
- [illegible]

Earth Out of Balance

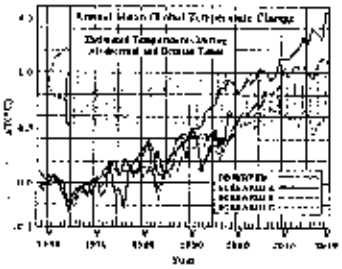


[illegible]

Forcing / Heat From CO_2

Year	CO_2	Forcing (W)	°C / °F
1900	300	0.40	.27 / .48
1950	310	0.60	.40 / .71
1975	325	0.87	.58 / 1.05
2000	380	1.78	1.2 / 2.1
2025	420	2.37	1.6 / 2.8
2050	480	3.15	2.1 / 3.8
2100	540	3.84	2.6 / 4.6

NASA Climate Model

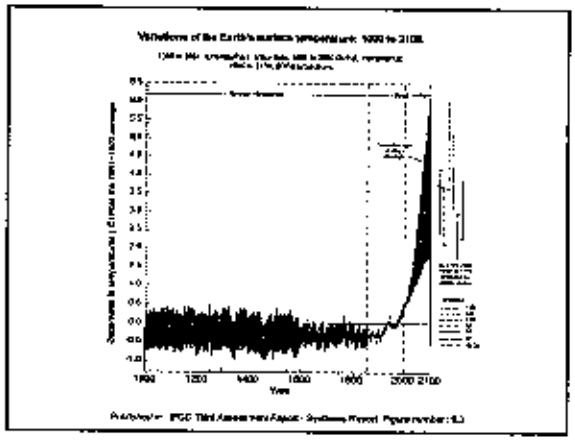


[illegible]

Temperature Predictions

- Rising 0.6° C (~1° F) ***no matter what!***
  - ***Committed*** heat that is ***'in the pipeline'***
- Rising from 58° to 60° F by 2050
  - Based on 2/3 degree C per 1 W of ***'forcing'***
  - 25 to 50 years to ***'equilibrate'*** with ***forcing***
- Between 61° – 63° F by 2100
  - Depending on ***when*** 500 ppm CO_2 reached

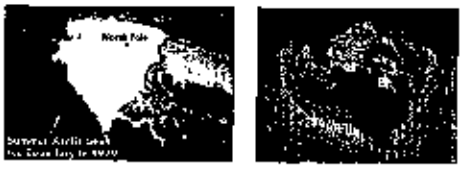
Calculations are based on cumulative carbon burned and GISS 2005 forcing model



Consequences of Warming

- ***Thinning*** of polar ice caps
- ***Slowing*** of the thermohaline cycle
- ***Rising*** sea level, perhaps ***quickly***
- Extended regions of ***drought***
- ***Extreme*** weather events
  - Extremes of *temperature / duration*
  - Extremes of *storms* and ***hurricanes***

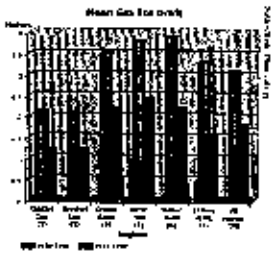
The Melting North Pole



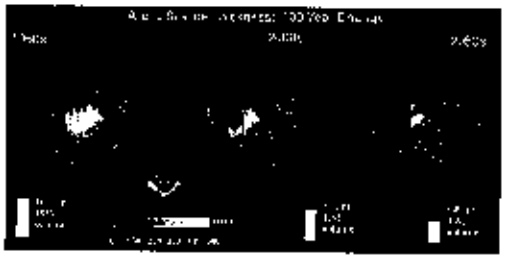
The North Pole is thinning in area ~10% per decade, and thinning in thickness ~1 meter per decade. At these rates, it may be an open sea as early as 2030 – 2050.

Arctic Ice Loss

- Accelerating ice loss over the last 30 years
- One meter already lost, in ~20 years (1975-1995)
- Rate now at 0.1 meters / yr or ~1 meter / decade
- North pole could be gone in summer by ~ 2030/50
- Affects the thermohaline cycle, is already slowing



Arctic Sea Ice Thickness



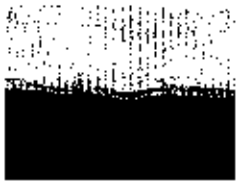
Antarctica Cracking

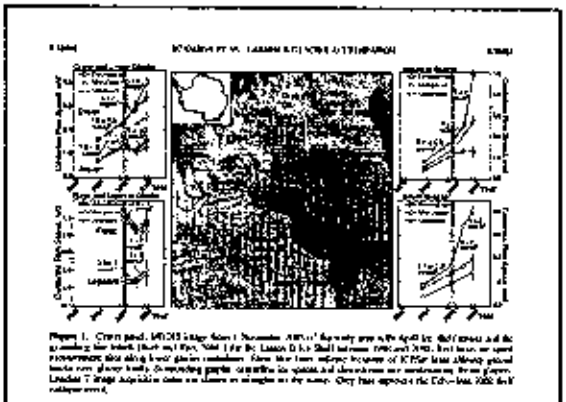
Calving Ice Shelf Process

Antarctic holds >80% of earth's fresh water

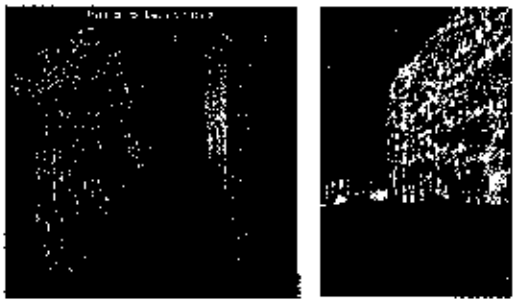
Like the Arctic it moderates the climate

- Calving at the edge of the ice shelf
- Shelves hold the main ice flows back
- As they break, ice flows into the sea
  - Melt water fills the ice crevice
  - Water sinks, crevices expand -
  - Fissuring the shelf into pieces





Greenland Ice Change

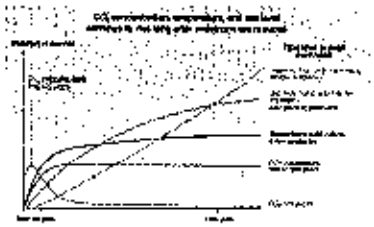


Thermohaline Cycle

Sea Level ***Expansion***

- Sea ***expands*** from water molecule changing 0.0002 in volume for each °C
- Over 6,000 to 7,500 meters, ***it adds up***
- Thermal expansion is 1 – 2 cm / 10 yrs.
- But is ***accelerating*** to 2.5 cm / decade
- For every 1 °C, sea expands ~1 meter in height - sea cannot expand ***'down or out'***

Long Term Warming Effects

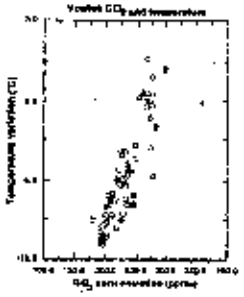


Ice Cores – the Story of Vostok

The Thermostat of Life

- Vostok ice core data show ***regular and repeating*** cycles of temps and CO_2 over last ~500,000 years
- Oscillate between 180 and 280 ppm CO_2 and 10° C
- Hypothesis that earth regulates the temperature of the planet through ***CO_2 / greenhouse effect***
  - Biosphere maintains a ***precise*** level of CO_2 for life
- But the biosphere ***isn't*** really absorbing ***our*** CO_2
  - Y intercept of cum. carbon burn / CO_2 is 287 ppm
- [illegible]

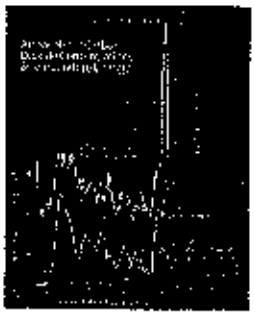
Vostok CO_2 and Temperature



- The relationship between CO_2 and temperature is nearly perfect (r^2*100 = 99)
- However, the casual relationship is the basis for significant (expen) controversy
- Why does this occur?

The Vostok Equilibrium

- Vostok 'equilibrium'
- 100K year cycles
  - earth's orbital eccentricity
- Sun heats up the planet
  - ***Biosphere expands***
- CO_2 maintains temp
  - Otherwise earth would be very cold ~ ***0 degrees F***
  - CO_2 ***has not exceeded*** 280 ppm in the last 500K years and 4 major cycles



A Warmer – and ***Hotter*** Earth

CO_2 benefits plants ***only*** if temperatures rise ***significantly***

Storms on the Move

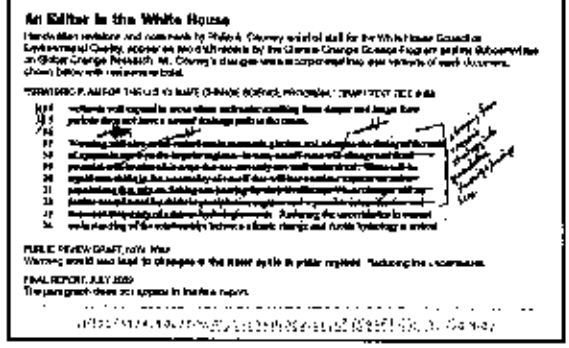
Katrina moving across Florida in late August 2005 ***finds warm water*** in the Gulf of Mexico

And grows from a ***category*** 1 to a ***category*** 5 hurricane ***in less than*** 2 ***days!***

Why ***isn't*** the US ***Concerned?***

- Global warming is ***just a 'theory'***
  - And *'we still need to do more research'*
- We can't ***slow down*** the economy
  - We would lose jobs or growth ***or both***
- We'll find more oil – ***maybe in Alaska***
- ***Technology*** will ***solve*** the problem
- It won't happen in ***our lifetime!***

An Editor in the Whitehouse



An Editor in the White House

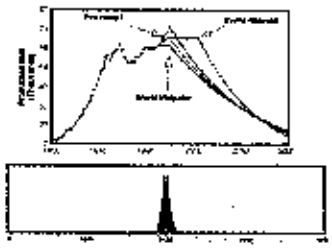
PUBLIC PREVIEW DRAFT, not final

FINAL REPORT, JULY 2003

Peak Oil

- ***Peak oil production*** around 2004 - 2010
  - After that, more expensive to ***find / refine***
- Economies built on oil / gas will ***struggle***
- Need energy (***equity***) solutions in place:
  - Solar
  - Nuclear
  - Hydroelectric, wind
- http://en.wikipedia.org/wiki/Peak_oil

Peak Oil – ***'After the Crash'***



http://www.lifeafterthecrash.net/

An ***Energy Dependent*** Economy

- "Without timely mitigation, world supply / demand balance will be achieved through massive demand destruction (shortages), accompanied by huge oil price increases, both of which would create a long period of **significant economic hardship** worldwide."
- "Waiting until world conventional oil production peaks before initiating crash program mitigation leaves the world with a significant liquid fuel deficit for two decades or longer."

http://www.mindfully.org/Energy/2005/HIRSCH-Report-Feb05.htm

Quiet Denial / *Acknowledgement*

The ***energy industry*** has ***quietly acknowledged the seriousness of the situation.*** For instance, the ***president of Exxon Mobil Exploration Company***, Jon Thompson, recently stated:

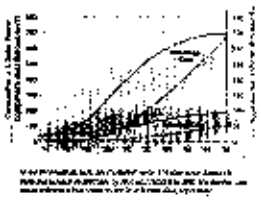
"By 2015, we will need to find, develop and produce a volume of new oil and gas that is equal to eight out of every 10 barrels being produced today. In addition, the cost associated with providing this additional oil and gas is expected to be considerably more than what industry is now spending." http://www.mindfully.org/Energy/2005/HIRSCH-Report-Feb05.htm

Energy ***Equity***

- ***Burning oil*** is ***burning money!***
- Build an energy infrastructure with ***equity***
- Solar energy is ***primary***, not alternative
- Every MW of solar energy creates 24 jobs in manufacturing, and 8 in ***local installers***
- ***Built in America, by Americans***, for ***America*** – what could be ***more patriotic***?

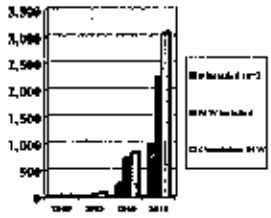
Building a Solar Economy

- Solar power is ***a primary***, not ***alternative*** energy
- ***25% of electricity*** could be generated by solar in 2025
- Solar brings *true* energy independence from ***carbon***
- It requires ***a commitment***, not just an investment of $s
- Research in newer thin film technology shows ***promise***



One ***Million*** Solar Roofs

- California is trying to pass a ***landmark*** bill
- 1 million solar roofs (10% of homes) in about 10 years
- It is a start of what could be a ***new era***
- ***'California, the Solar State'***

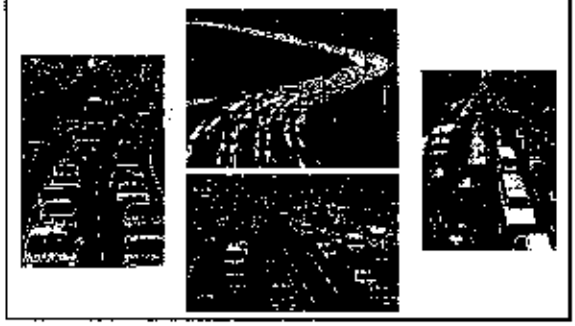


Value of a '***Solar Economy***'

- 10,000,000 installations by 2015*
  - 30,000 MW cumulative power added
  - 7,200 US manufacturing jobs
  - 2,400 local installation jobs
- Anticipated ***experience curve***
  - $5 watt => $3 watt => $1 watt (SI thin film)
- 25% of electric power by 2025
  - 50% of 'new electricity' watts in 2025

* 10% of 100M households in the US, total cost of about $250 billion (subsidized)

Cars - a Growing ***Global*** Problem

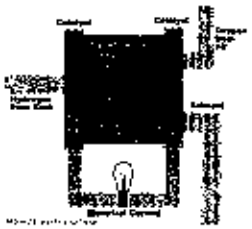


A New Auto Economy?

- New types of cars
  - Electric cars
  - Hydrogen cars
  - Hydrogen ***hybrids***
- Transportation is a key area of ***growing*** CO_2
  - And one area where we can ***individually*** make key changes in the CO_2 that we each produce

Hydrogen Fuel Cells

- *'Burn'* hydrogen using *electrodes* in a stack
- Pull electrons off of hydrogen / recombine with oxygen => water
- Hydrogen is more of a *'battery' than a 'fuel'*
- Make hydrogen 'fuel' from 'reforming' of methane, or electrolysis of water (from electricity)



http://www.worldfuelcellcouncil.com

Myth of a Hydrogen Economy

- **To replace gasoline with hydrogen....**
  - 400,000,000 gallons a day / 10 *10⁹ miles / day (25 mpg)
  - 55 KWhr to produce a kg of H_2 using electrolysis at 75% efficiency thus 1 kg of H_2 will move a car ~ 55 miles
- ~1 KWhr per mile and 10 billion miles day would need...
  - ***10 billion KwHrs per day!***
- ***US produces / consumes 3,800 billion KWhr per year***
  - Or about 10 billion KwHrs per day (see bullet point 2)
  - ***Or all the electricity we currently use for everything we do! We would need to have a 'second power grid'***

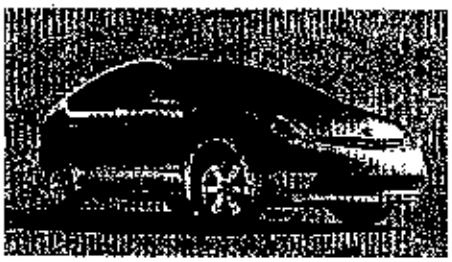
Honda Insight – MPG Champ

61 / 70 MPG
Seating for two

1 liter - 3 cylinders
'electric turbocharger'

2,000 pounds
All aluminum body

A ***Real*** Hybrid Vehicle



Gas Electric *Synergy Drive*™ - 'plug-in hybrids' coming soon

Flexible Fuel Electric Plug-in Hybrids

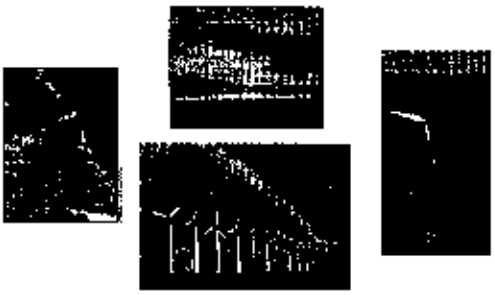
- 1 KWhr will power this 'hybrid' car about 4 miles
- Burning natural gas for electricity, will generate about 1 lb. of CO_2
- Compare to 2 pounds of CO_2 at 40 mpg (petrol)
- Recharge car at night, when power rates are low.
- Put 'power on the grid' in the day with solar.

http://www.pluginhybrids.com

Move ***Differently***

- ***SolarSegway™***
- Range ~8 - 12 miles
- Battery packs can be charged locally (~5 hrs)
- ***Emission free*** vehicle
  - Solar panels 'extra'
- Projected cost of $2,500 in ***quantity***

Wind Power – ***Real*** Power

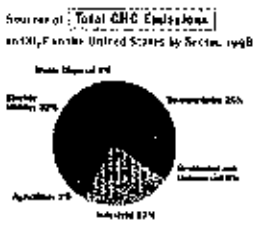


The ***Complexity*** of the Problem

- Several ***variables***
- ***Population*** growth
- Income rise and ***development***
- Energy ***mix*** (fuel type)
- Manufacturing vs. service economies
- Energy driven ***activities***
  - Production, consumption, transportation

GHG Emissions by Source

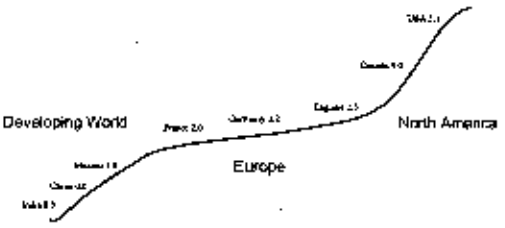
- Sources of GHGs in the United States 98'
- Electricity
  - 32%
- Transportation
  - 28% across the US
  - 50% *in California!*
- Industrial
  - 23%
- All are important to the global economy
  - All use coal, oil or gas



The ***Population*** Problem

8 billion people @ 1.25 tons each = 10 G tons of carbon / year
That is 50% *more* carbon emissions than today!

Global Carbon Profiles



Tons of carbon per person – year 2000 average = 1.1

Zero Emission Economy

- ***Global population*** pressure creates a big problem in controlling carbon emissions
- ***8 billion people*** * 1.25 tons carbon burned
  - 10 G tons of carbon burned per year
  - ***50% more*** than the 6.6 G tons of carbon today
- The ***only answer*** is ***zero-emission power***
  - *Nuclear and solar are the only practical options, with contributions from hydroelectricity and wind*

10 Key Energy Challenges

- Fuel cells
- Hydrogen
- Solar energy
- Batteries
- Motors
- New power grid
- Low power lighting
- Insulation materials
- Safe nuclear power
- CO_2 sequestration

Establishing Technical ***Leadership*** in a ***New Energy Economy***
An ***Apollo style program*** on a ***Manhattan Project Timeline***

A New Energy Economy

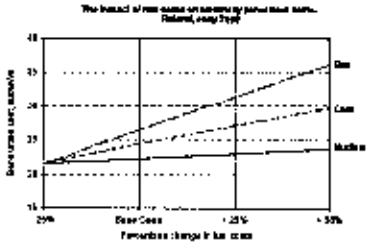
- $1 - 2 trillion for ***solar energy***
- $1 trillion in a ***new power grid***
- $2.5 trillion in ***fuel saving cars***
  - **$1** trillion in new electric motor and battery technology for cars and other appliances
- $1 trillion in developing ***safe nuclear energy*** to ***power*** the hydrogen economy
- This is a ***once in a lifetime*** opportunity!

'***Costs***' of Carbon as a Fuel

- Oil costs $1 billion a day* (***at $50 a barrel***)
- US consumers and industry pay ***$1 billion every day**** for gasoline (***at $2.50 a gallon***)
- Natural gas has ***doubled in price*** in 5 months, and ***may double again*** in <5 yrs
- Coal remains cheap, but ***CO_2 emissions are problematic***, gas is the best alternative

*Based on 20 million barrels of oil per day, of which 8.8 million are used for gasoline

The Case for ***Nuclear Power***



Nuclear **is insensitive** to fuel costs, carbon very sensitive

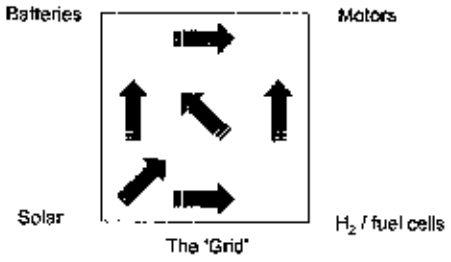
Change ***Management***

- Electricity and heating
  - Coal => gas => solar => wind => hydrogen
- Transportation
  - MPG needs to go >50, gasoline cut by half
- Population growth
  - Tripled in 50 years, must ***stabilize*** at ~8B
- Technology investment
  - ***Innovation doesn't happen without effort!***

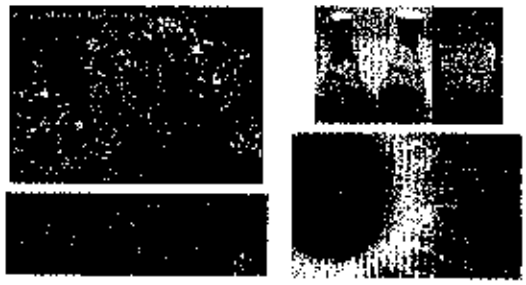
Three ***Immediate*** Solutions

- Coal to oil to gas, increase ***H/C ratio***
  - Then shift to solar energy and hydrogen
- Investing in a ***multi pronged*** program
  - Batteries, motors, fuel cells, solar power
  - Revisit a '***sustainable***' nuclear energy plan
- Terraform the earth
  - Bioengineer a CO_2 ***'super-scrubber'***
  - Attempt to ***stabilize*** and ***reduce*** CO_2

Intelligent Investment



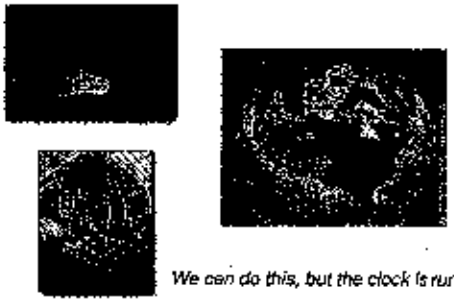
Terraform the Earth



Sense of ***Urgency,*** call to ***Action***

- We are at ***the end of the oil age***
  - Need ***'energy equity'*** in place ***soon***
- ***Solar energy is obvious***
  - Deployable ***now*** and in ***quantity***
- Need ***safe nuclear energy***
  - To replace coal and gas
  - To create ***hydrogen*** for transportation ***'fuel'***
- Time to market is ***less than 10 years!***

From Information to Choices



We can do this, but the clock is running!

What ***You*** Can Do

- Drive ***less,*** drive ***smart***
- Invest in ***solar energy***
- ***Conserve*** on energy use
- We need to cut CO_2 emissions by ***half***
- Be ***deeply*** aware of the problem
  - This is the most ***significant problem*** facing the planet over the ***next 50 to 100 years***
  - Single largest ***economic opportunity*** ever

References

- [illegible]
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CMAQ AGENDA REPORT

Date: February 27, 2006

To: Congestion Management and Air Quality Committee

From: Jerry Hill, President of the Board of Supervisors, San Mateo County

Subject: Development of an Energy Strategy for San Mateo County

(For further information contact Jill Boone at 650 599-1433)

RECOMMENDATION

That the CMAQ Committee:

Authorize the development of an ad hoc Energy Working Group, which will report to CMAQ, to consider the future energy needs of San Mateo County and make recommendations to CMAQ.

FISCAL IMPACT

None anticipated. Staff support will be provided by the County.

SOURCE OF FUNDS

Not applicable.

BACKGROUND/DISCUSSION

According to the information in the 2005 Indicators for a Sustainable San Mateo County (published by Sustainable San Mateo County), electricity use has increased by 1% from 2002 to 2003 and 8% since 1990. Natural gas usage is up only 1% over 1990 amounts (data available through 2003).

The recent filing for bankruptcy by Calpine raised questions about how this might affect electricity prices. Calpine has given assurances that power plants in California will continue to operate and provide electricity. However, as consumers, we are beholden to their expertise and must rely on the accuracy of their predictions as well as those predictions from our utilities. The County and many cities went through a similar experience with the approval of PG&E's Jefferson-Martin project as we questioned the value of the project for San Mateo County, the benefit, if any, to our citizens and the potential impacts.

We need to be better informed and better prepared to deal with energy issues. As with other utilities, electricity is something we take for granted until something happens that affects us personally. Developing our own expertise will allow us to make better-informed decisions when situations arise. An energy policy can help address the energy challenges facing us, and coupled with conservation and consideration of alternative power sources, we will be better prepared for the future.

The aforementioned the Jefferson-Martin Transmission Line will allow for an additional 400 megawatts of electricity to flow into the region – enou gh energy to power about 300,000 average homes. Although the new transmission line adds capacity, the increased demand for electricity will continue to challenge the infrastructure in San Mateo County.

The focus of the Energy Working Group will be to consider the future energy needs of the County and to identify and recommend solutions that will address these needs in an environmentally, socially and fiscally responsible manner.

ENERGY WORKING GROUP

Members of the Working Group will include city council members, county supervisors, planning commissioners, utilities staff (PG&E, BAWSCA), business representation, nonprofit representation, technical experts (in conservation, efficiency, renewable energy, infrastructure), CMAQ staff and other stakeholders as identified. It would also be useful for a representative from San Francisco to participate, since we share the use of the transmission lines and San Francisco's usage affects the capacity of our system.

The Working Group would:

1. Identify and collect data that is needed to understand current and future energy needs of the county and the capacity of our system.
2. Develop a working plan to identify, evaluate and consider solutions that will meet the needs and work within or expand the capacity of the system.
3. Evaluate and prioritize the options.
4. Report to CMAQ with options and recommendations.

ATTACHMENTS

- Energy Overview

Energy Overview – February 2006

Introduction

Gathering data on energy use for 21 different jurisdictions is challenging at best and at the time of printing, very little information is available. However, we do know that usage continues to rise, new transmission lines are under construction, and that energy usage is having an environmental impact, such as increased CO_2 emissions. This overview covers some key environmental issues, a bit of an overview and the programs currently in place to address energy issues.

The Big Picture – CO_2 Emissions and Global Warming

The Kyoto Protocol, an international treaty on global warming, recognizes the effects on the climate of CO_2 and other greenhouse gas emissions, which include the possible increase in the average global precipitation; soil moisture decline in many regions, intense rainstorms becoming more frequent; and an estimated rise in the sea level of two feet along most of the United States coast. The Protocol was negotiated in 1997 and ratified in February 2005, with the United States as a notable exception.

Although there is a glaring absence of Federal leadership on global warming issues, local and grassroots efforts are becoming widespread. In October 2005, 182 mayors representing nearly 40 million Americans committed to the U.S. Mayors Climate Protection Agreement to "meet or exceed" the Kyoto Protocol goals of 5.2% reduction in greenhouse gases by 2010 from the 1990 levels. Other local efforts include all jurisdictions of Sonoma County joining ICLEI (International Council for Local Environmental Initiatives) and creating a Climate Protection Campaign, the State of California creating a Climate Change Registry, and Sustainable Silicon Valley choosing CO_2 emission reduction as its first initiative. Their goal for our region is to reduce CO_2 emissions to 20% below 1990 levels by 2010.

Why is this issue gaining attention? The Earth's temperature has risen by one degree in the last century, with an unprecedented acceleration of temperature increase in the last two decades. Most of the change is caused by human activities that create greenhouse gases, which then trap energy in the atmosphere, causing the earth to warm and also creating air pollution. The Bay Area Air Quality Management District's 2005 Ozone Report states,

> "In California, climate change indicators measured over the past 100 years such as air temperature, annual Sierra Nevada snow melt runoff, and sea level rise all indicate that California's climate is warming. Warming in the 21st century is expected to be much greater than in the 20th Century, with temperatures in the United States rising five to nine degrees F. The climate change experienced in California so far has been gradual, as assumed in most climate change projections. However, paleoclimatological researchers, studying past changes in the climate system, are discovering that the Earth's climate has experienced sudden and violent shifts and that global warming may trigger thresholds resulting in dramatic changes in the climate.

> Increased global warming is expected to result in more extreme precipitation and faster evaporation of water, disrupting water supplies, energy supply and demand, agriculture, forestry, natural habitat, outdoor recreation, air quality, and public health. Climate change affects public health because the higher temperatures result in more air pollutant emissions, increased smog, and associated respiratory disease and heart-related illnesses."

One other key fact must be recognized to understand the importance of this information. Thermal inertia is the time lag between CO_2 and other greenhouse gases collecting in our atmosphere and the resultant temperature gain on Earth. Currently, we have already put enough CO_2 into the atmosphere to heat up the planet another one degree. By the time the change in temperature is realized, we will have already created atmospheric conditions for another 1.5 – 2 degrees increase.... Waiting to act until we see the effects of what we are doing is a bit like continuing to charge things to your credit card and thinking there is no problem until you get your credit card bill.

Excessive atmospheric CO_2 is caused by an imbalance of systems on Earth. Energy use, transportation, land use changes, and some building materials (e.g. cement and concrete) create the energy imbalance. We can reduce our contribution to global warming by reducing energy use through efficiency and conservation efforts, creating cleaner sources of energy (solar and other renewables), factoring climate change effects into land use decisions, and choosing and using our resources wisely in building projects.

This paper addresses the energy piece of the equation – electricity and natural gas. PG&E serves the entire County of San Mateo and we are fortunate that it is a fairly clean source of electricity. PG&E serves almost 5% of the U.S. population but emits less than 1% of the greenhouse gas emissions from the utility sector.

Electricity

Only 1.7% of PG&E's electricity is generated by burning coal, the dirtiest of the sources of electricity. Natural gas plants also cause CO_2 and air pollution. San Francisco has two natural gas plants – Hunters Point and Portrero – which are the two largest stationery sources of air pollution in the city. These are used to supplement the electricity that San Francisco gets from the electricity infrastructure that traverses San Mateo County. Therefore, San Francisco's energy needs are interdependent with San Mateo County's.

The PG&E mix includes 42.6% from natural gas plants. The other 55.7% is from clean sources considered to be carbon neutral or renewable, such as nuclear (24.3%), large hydro (19%) (which has other environmental concerns), biowaste (4.6%), small hydro (3.9%), geothermal (2.5%) and wind (1.4%). Solar is still less than 1%. (Peters, PG&E Perspectives on Climate Change Powerpoint)

The relationship between energy and water

The relationship between energy use and water consumption is key. The 2004 report by Natural Resources Defense Council (NRDC), *Energy Down the Drain* states that 2-3% of electricity use in CA is used to move water from San Francisco Bay to Southern CA and 5-7% of electricity usage statewide is used to transport water. In addition to this figure, energy is used for treatment, local distribution, end uses (heating or purifying in the home) and then wastewater treatment. (p. 2)

Water is used to cool electric plants, bringing the relationship between water and electricity full circle. Therefore, an integrated approach to water and energy conservation could be a significant factor in reaching energy reduction goals.

Natural Gas

California uses over 6 million cubic feet of natural gas per day, with half of this amount used to generate electricity. Natural gas can be produced along with crude oil (associated gas) or can be produced from gas fields where no oil is produced (non-associated gas). PG&E gets natural gas from Canada, the Southwest, Colorado and California, compresses it and stores it in underground storage fields (sometimes depleted oil and gas wells) until needed. High pressure transmission lines transport gas to the regulation stations, where it is depressurized and sent to the customer.

US natural gas production has been flat since 1990, even though the number of wells drilled has increased by 80%. This indicates a depletion in natural gas resources and results in more dependence on importing natural gas. Canada's production, which has helped supply the US, began to flatten and decline in 2002. California's overall natural gas consumption grows by 1% a year – mostly due to increased electricity generation. (CEC p. 12, 16) Data for San Mateo County is not yet available from PG&E.

Based on current production levels, the US supply is expected to last for 66 years. (PG&E)

Meeting Future Needs

Given that the trends show an increase in electricity and natural gas usage, there is an urgency to addressing the question of how to meet the needs of the next generations. There are five approaches to consider:

1. **Conservation:** What strategies encourage residents and businesses to reduce their use of electricity, natural gas and water? Conservation has proven to be useful strategy in times of need. For instance, water usage dropped 20-30% in 1991, the last major drought we experienced.

   Bay Area Water Supply and Conservation Agency (BAWSCA) is a special district created in 2003 to represent the interests of the 26 cities and water districts and two private utilities, that purchase water on a wholesale basis from the regional water system (Hetch Hetchy). BAWSCA's conservation efforts include rebates, landscape conservation and school programs. www.bawsca.org

Currently, PG&E supports Flex Your Power (FYP) as its conservation and efficiency program. FYP offers tips and information for reducing energy use (from simple things like reducing your thermostat settings to bigger items such as best practices for designing commercial buildings).

Billing based on baseline usage for water, electricity and gasoline provide financial incentives for using less.

2. **Efficiency**

Programs that encourage residents and businesses to purchase more efficient equipment – such as Energy Star – can make a large difference in usage. Many programs are available in San Mateo County but there is no coordination of outreach on these programs or clearinghouse for what is available.

Grants are available that could fund collaborative programs in San Mateo County, once the objective is identified and program is conceived.

The California Energy Commission's Consumer Energy Center is a source for consumer info on energy efficiency, energy rebates, transportation & renewable energy: http://www.consumerenergycenter.org/rebate/index.html

Flex Your Power has a site that links to rebate and incentive programs in PG&E's service area: http://www.fypower.org/com/tools/rgl.html

PG&E offers rebates and incentives for retrofit projects as well as incentives and design assistance for new construction projects to help businesses and residences save money and manage energy costs.
Businesses: http://www.pge.com/biz/rebates/
Residences: http://www.pge.com/res/rebates/

Local Government Energy Partnership, an ABAG program funded by PG&E ratepayers, provides small and medium-sized local governments with sustained technical assistance to help them achieve the benefits of improved energy efficiency both in their own municipal buildings and in their local communities.
www.abag.ca.gov/lgep/

Right Lights provides subsidized lighting upgrades and free professional assistance to small businesses in San Mateo County and other areas.
www.rightlights.org

The Energy Star Partners Business Improvement Program provides a strategy for commitment, energy performance assessment, goals and action plan. This information is available at: http://www.energystar.gov/index.cfm?c=business.bus_index

3. **Renewable Sources**

Photovoltaics, wind generation, and solar hot water systems can provide substantial amounts of energy and can both reduce demand on the energy infrastructure and offer a more secure energy system based on many local sources instead of a central facility. These options remain costly and need to be subsidized in order to accomplish large changes.

Rebates continue to be available for solar, wind and fuel cell installations for residential and commercial. There is also currently a Pilot Performance Based Incentive Program for new solar installations. Instead of a traditional rebate, the program pays $.50/generated kWh for three years. http://www.consumerenergycenter.org/erprebate/index.html

Due to increased interest in solar energy in Sacramento, additional rebates and incentive opportunities can be anticipated.

4. **Infrastructure**

Increasing infrastructure to meet energy needs should be considered only after other options have been exhausted and when needed should be developed carefully and collaboratively in the county with attention to social justice issues, environmental impacts and economics.

5. **Policies and Programs**

Policies, ordinances and programs that promote conservation, efficiency and renewable energy in new and existing buildings, offer incentives or regulate can have significant impact on energy use and therefore reduce CO_2 emissions.

The County of San Mateo has a Sustainable Building Policy, a CO_2 Reduction Resolution, and a Fly Ash Policy in the Public Works Department.

The City of San Mateo has passed a Sustainable Development Policy.

Several cities have wood burning ordinances, which reduce the pollution as well as the CO_2 from fireplaces and backyard burning.

Portola Valley reduced permitting fees for photovoltaic installations to $50 as an incentive to increase the number of solar applications in the town.

Marin County requires that large homes meet energy requirements of smaller homes, which reduces energy use and promotes renewable energy sources.

Aspen has a Renewable Energy Mitigation Fund that requires a large fee be paid for projects that will consume significant amounts of energy. This fee is not charged if the

applicant includes sufficient renewable energy sources in the project. Collected fees fund installation of photovoltaics on public buildings and provide incentives for others to install solar.

Information on all of these policies and links can be found at http://www.recycleworks.org/greenbuilding/gb_prog_policies.html

Closing

The continuing upward trend of energy consumption points to the need for a planning process to develop a strategy for meeting or reducing the needs of the county. Key steps will be to acquire more accurate and informative data from PG&E, to research different policy and program options available to the cities and county and to engage the community and all stakeholders in a process for determining the best course of action.

References

Peters, Roger. *PG&E Perspectives on Climate Change*. April 2005. Powerpoint presented at the California Climate Action Registry Conference. Peter Rogers is the Senior Vice President and Legal Counsel, PG&E,

NRDC. *Energy Down the Drain, The Hidden Costs of California's Water Supply*. August 2004. http://www.nrdc.org/water/conservation/edrain/contents.asp

California Energy Commission (CEC). *Natural Gas Assessment Update*. February 2005. http://www.energy.ca.gov/2005publications/CEC-600-2005-003/CEC-600-2005-003.PDF

PG&E Science and Safety of Electricity and Natural Gas. It's a Gas. http://www.pge.com/microsite/PGE_dgz/gas/facts.html

Jefferson-Martin
http://www.pge.com/field_work_projects/street_construction/jefferson_martin/

Overview prepared by Jill Boone, County of San Mateo RecycleWorks Programs Manager. You can reach Jill at jboone@co.sanmateo.ca.us or 650-599-1433.

C/CAG AGENDA REPORT

Date: February 27, 2006

To: Congestion Management and Air Quality Committee (CMAQ)

From: Technical Advisory Committee (TAC)

Subject: RECOMMENDATION OF THE 2006-07 EXPENDITURE PROGRAM FOR THE TRANSPORTATION FUND FOR CLEAN AIR (TFCA) SAN MATEO COUNTY PROGRAM

(For further information or questions contact Sandy Wong at 599-1409)

RECOMMENDATION

That the CMAQ endorse the recommendations contained in this report for the funding of 2006-07 Transportation Fund for Clean Air (TFCA) projects.

FISCAL IMPACT

The allocation of TFCA funds for 2006-07 is expected to be approximately $1,000,000, of which $50,000 (5%) will be allocated to administration. It is recommended that the remaining funds ($950,000) be distributed based on the policies adopted in past years by C/CAG with modifications detailed in the Discussion section. The following table shows how the funds would be distributed based on these policies. The funding provided in these categories for the past three years is also shown.

CATEGORY		*2003-04*	*2004-05*	*2005-06*	*2006-07*
Employer Based Shuttle Projects	SamTrans	$471,544	$495,000	$605,000	$535,000
	Menlo Park	$ 30,732	$ 35,000	$ 40,000	$ 38,000
Countywide TSM Program (Peninsula Traffic Congestion Relief Alliance)		$810,767	$350,000	$430,000	$377,000
Administration		$50,000	$50,000	$50,000	$50,000
Totals		$1,363,043	$930,000	$1,125,000	$1,000,000

SOURCE OF FUNDS

The Bay Area Air Quality Management District (Air District) is authorized under Health and Safety code Section 44223 and 44225 to levy a fee on motor vehicles. Funds generated by the fee are referred to as the Transportation Fund for Clean Air (TFCA) and are used to implement projects to reduce air pollution from motor vehicles. Health and Safety Code Section 44241(d) stipulates that forty percent (40%) of funds generated within a county where the fee is in effect shall be allocated by the Air District to one or more public agencies designated to receive the funds, and for San Mateo County, C/CAG has been designated as the overall Program Manager to receive the funds.

BACKGROUND/DISCUSSION

For the past eight years the C/CAG Board has allocated the funding among three programs (SamTrans Shuttle Program, City of Menlo Park Shuttle Program, and Peninsula Traffic Congestion Relief Alliance Countywide Voluntary Trip Reduction Program). It is recommended that this allocation methodology be continued for 2006-07 as follows:

- It is recommended that the SamTrans Shuttle Program receive an allocation of $535,000 for its current shuttle program and maintain the existing cost sharing formula with SamTrans contributing approximately 25% of the cost of these shuttles and the remaining 25% through employer contributions. This funding recommendation shall be contingent upon SamTrans submitting an acceptable work plan for use of the monies.
- It is recommended that the City of Menlo Park receive an allocation of $38,000 for its local shuttle program.
- It is recommended that Peninsula Traffic Congestion Relief Alliance receive an allocation of $377,000 TFCA funds and continue to receive $500,000 from the Congestion Relief Plan for a total allocation of $877,000 for its Countywide Voluntary Trip Reduction Program.
- It is recommended that Peninsula Traffic Congestion Relief Alliance also continue to receive an allocation of $70,000 in Regional Rideshare funds that are provided to C/CAG from MTC in order to satisfy the requirements for San Mateo County to be a part of the comprehensive Bay Area wide regional program that assists employers in providing commute alternatives for its workers.

The following are the C/CAG Board policies that will continue to be in effect for the 2006-07 Program.

Overall Policies:

- Cost Effectiveness, as defined by the Bay Area Air Quality Management District (BAAQMD), will be used as initial screening criteria for all projects. Projects must show a cost effectiveness of less than $90,000 per ton of reduced emissions based upon the TFCA funds allocated in order to be considered.
- The funds allocated for the Alliance is subject to the submission of an acceptable work plan for use of the funds.

Shuttle Projects:

- Shuttle projects are defined as the provision of local feeder bus or shuttle service to rail and ferry stations and airports.
- All shuttles must be timed to meet the rail or ferry lines being served.
- C/CAG encourages the use of electric and other clean fuel vehicles for shuttles.
- Beginning with the 2003-04 TFCA funding cycle, all vehicles used in any shuttle/feeder bus service must meet the applicable California Air Resources Board (CARB) particulate matter standards for public transit fleets. This requirement has been made by the BAAQMD and is applicable to the projects funded by the Congestion Management Agencies.

If the recommendations to adopt these policies and revisions to the policies are accepted, the following is a summary of the C/CAG program for 2006-07:

Project	**Recommendations**
Administration	$50,000
Regional Rideshare Program	$0
SamTrans	$535,000
Menlo Park TSM Program	$38,000
Peninsula Congestion Relief Alliance	$377,000
Total funds obligated	$1,000,000
Total funds anticipated	$1,000,000
Balance	$0

ATTACHMENTS

- None.

C/CAG AGENDA REPORT

Date: February 27, 2006

To: Congestion Management and Air Quality (CMAQ) Committee

From: Technical Advisory Committee (TAC)

Subject: Review and Approval of Proposal for Application and Scoring of Surface Transportation Program (STP) Projects

(For further information or response to questions, contact Geoff Kline at 363-4100)

RECOMMENDATION

That the Congestion Management and Air Quality (CMAQ) Committee approve the proposal for application and scoring of Surface Transportation Program (STP) transportation projects.

FISCAL IMPACT

This scoring proposal will develop a procedure to competitively allocate approximately $5.5 million in Federal Transportation Funding to the jurisdictions and transportation agencies throughout San Mateo County.

SOURCE OF FUNDS

Federal funds will be made available from the reauthorization bill titled Safe, Accountable, Flexible, and Efficient Transportation Equity Act - Legacy for Users. For purposes of simplicity, it will hereafter be referred to as T-3.

BACKGROUND/DISCUSSION

The Third Cycle of T-3, covering FYs 2006/2007 through 2008/2009 will have money available for the Local Streets and Roads Program. Eligible roadway projects will comprise rehabilitation, reconstruction, and resurfacing work within the road or street pavement area. All projects must be recognized as being on a road or street on the Federal Classification system- Federal aid eligible.

It is recommended that the following rules to develop an STP priority list be approved:

1. The current and modified scoring system, developed for TEA-21 project application cycles, be used to rank projects.

2. A cap of funds for individual jurisdictions/agencies be set at $1 million. This guarantees a minimum of six (6) jurisdictions receiving funding.

3. A maximum of ten (10) applications from an individual jurisdiction/agency be accepted. "Local" applications need only be initially submitted.

4. The application deadline will be Friday, April 7, 2006. This is the date that "local" applications are to be received by the City/County Association of Governments (C/CAG). No late submittals will be accepted.

5. Amenities - examples: bike paths, signalization, transit pull-outs, sidewalk ramps, guard rails, sidewalks, curbs, and culverts - are allowed up to 20% of the total project cost. Amenities exceeding 20% of total project cost are considered to be non-pavement and make the project ineligible for STP funding.

The STP Program should be processed in a competitive setting because of time constraints, increased deliverability requirements, and new eligibility requirements. In addition, it is what the Federal Highway Administration (FHWA) has directed the Metropolitan Transportation Commission (MTC) to promote. No formula or equity consideration which guarantees funding to all jurisdictions or transportation agencies is being recommended. To insure that all possible projects are considered, a maximum ten (10 project applications, will be accepted.

Applications will be distributed on March 13, 2006, and the deadline for project application submission will be Friday, April 7, 2006. Funding will be distributed based upon project score and specific program funding caps. All jurisdictions and recognized transportation agencies within San Mateo County are eligible to participate in the program.

ATTACHMENTS

1. Application Material.

2. State and Federal Funds Scoring Proposal.

Year 2006/2007 Local Streets and Roads (LS&R)
Program Schedule

27 Feb 06	CMAQ Committee application/scoring approval
9 March 06	C/CAG application/scoring approval
13 March 06	"Call for Projects"
7 April 06	Applications due to C/CAG (1600)
Week of 10 April 06	Project application scoring
20 April. 06	TAC presentation (projects list)
24 April 06	CMAQ Committee presentation (projects/list)
11 May 06	C/CAG approval of projects lists
28 July 06	MTC applications and resolutions submitted to C/CAG (Sandy Wong)
31 August 06	Submission of entire program to MTC

SURFACE TRANSPORTATION PROGRAM (STP) FEDERAL FUNDS APPLICATION

PROJECT TITLE _____

PROJECT SCOPE/DESCRIPTION _____

_____

_____

_____

PROJECT LOCATION WITH LIMITS _____

SPONSORING JURISDICTION _____

CONTACT PERSON _____ TELEPHONE NUMBER _____

PLANNED OBLIGATION DATE: _____ IS PROJECT ON FEDERAL CLASSIFICATION SYSTEM?
YES_____ NO_____

TOTAL PROJECT COST ($000) _____

FUNDS REQUESTED ($000)* _____
*Maximum Federal funds at 88.5% of total project cost.

A. PROJECT AMENITIES % (Cost of Amenities/Total Project Cost)** _____
**Provide cost estimate to verify amenity percentage greater than zero.
Estimate attached.

READINESS: Field Review/Project Study Report or equivalent Yes / No

DBE Status: _____ Approved Draft _____ Approved Final

Environmental Review Status _____

Right-of-Way Acquisition Status _____

PS&E Status _____

Agreements/Permits Status _____

Y / N Have bicycle/pedestrian facilities been considered for inclusion in the project?

B. Local Funds ($) _____ $\frac{\text{Total Cost - Fed. \$ Requested}}{\text{Total Cost}}$ = _____ %

C. Multi-Jurisdictional/Agency Participation: 1 2 3 4 5 5+

List Partners: _____ _____ _____ _____ _____

D. Road or Street/Transit Classification _____

E. Convenience/Safety/Sense of Community: _____

F. County Regionality: Complete / Significant / Medium / Minor / None

Remarks: _____

NOTES:

1. Project applications are due to the City/County Association of Governments no later than: **4:00 P.M., Friday, April 7, 2006. . THIS IS THE FINAL DEADLINE FOR RECEIPT OF APPLICATIONS FOR THE STP FEDERAL FUNDING PROGRAM**.
2. Applications will be limited to a maximum of ten (10) submittals per jurisdiction.
3. A funding cap of $1 million per jurisdiction/agency will be in effect.
4. Amenities are defined as signalization, bike paths, transit pullouts, sidewalk ramps, guardrails, culverts, landscaping, and similar non-pavement portions of the project.

FOR OFFICIAL USE ONLY:

Local Match % _____

Project qualifies for funding consideration _____

Amenities % _____

Federal Funds Scoring Proposal

In August 1990, a subcommittee of the City/County Engineers' Association met to incorporate State of Readiness in its scoring criteria. The major problem facing the subcommittee was how to distinguish between a lesser important project in a high state of readiness and an acknowledged important project in a low state of readiness, consiging both projects may compete for a limited amount of funds. To that end, the subcommittee developed a proposal which uses a factored value based upon readiness to be multiplied against the total of other scored values. This proposed method tended to eliminate the bias which may surface when evaluating state of readiness versus project importance.

State of Readiness of Federally funded projects will be evaluated as follows at ten (10) points total:

STATE OF READINESS (10 pts Max)

Field Review/Project Study Report or equivalent: Yes (1) _____ No (0) _____ 1

Disadvantaged Business Enterprise (DBE):

Approved Draft _____(1) Approved Final _____ (2)

Environmental Review:

Status _____ 1

Expected completion _____

1 - CALTRANS final approval/Categorically Excluded (CAT EX) certified

0 - Presubmission stage of review process

Right-of-Way Acquisition:

Status _____ 2

Expected completion _____

2 - Final certification from CALTRANS/ Not Applicable (N/A)

1 - Entered agreement with approved right-of-way agency

0 - No action

PS&E:

Status _____ 2

Expected completion _____

2 - Submitted to CALTRANS: 100% design complete

0 - Presubmission stage of design/concept only

Agreements/Permits:

Status _____

2 - Complete/ Not Applicable (N/A)

0 - Incomplete

State of Readiness may vary between 0 and 10 points. Conversion to the weighting factor will be as follows:

State of Readiness Points	Weighting Factor
0	1
1	1.1
2	1.2
3	1.3
4	1.4
5	1.5
↓	↓
10	2

The weighting factor will then be applied to the sum of a number of other values which collectively total 40 points as follows:

		Max. Points
A.	Amenities to Project	5
B.	Local Funds Match	10
C.	Multi-Jurisdictional/Agency	10
D.	Road or Street Classification	10
E.	Convenience/ Safety/ Sense of Community	5

The maximum number of points for Items A, B, C, D, and E is 80 (State of Readiness Factor = 2 times 40 points above). The entire scoring criteria will be 100 points as follows:

(Readiness Factor) x (Sum of Specified Items) = 80 pts

F. County-Wide Significance = 10 pts

G. Effectiveness (Cost/Benefit) = 10 pts

100 pts maximum

A. Amenities to Project: Percentage of Total Project Cost (5 pts).

	Points
Ø	5
≤ 5%	4
≤ 10%	3
≤ 15%	2
≤ 20%	1
> 20%	Project Ineligible for Consideration

B. Local Funds (10 pts)*

	Points
50% or more or >$2M for Federal projects	10
≥45%	9
≥40%	8
≥35%	7
≥30%	6
≥25%	5
≥20%	4
≥15%	3
≥10%	2
≥5%	1
<5%	0

*Local funds for Federal projects: Any non-Federal funds used in the project which are supplemental to the requested allocation amount.

C. Multi-Jurisdictional/Agency (10 pts)*

No. of jurisdictions or agencies	Points
Single jurisdiction or agency	0
2	3
3	5
4	7
5 or more jurisdictions or agencies	10

*Refers only to those city or county jurisdictions or transportation agencies which are active participants in the project by contributing local funds, administering the project, or taking action to deliver the project.

D. Road or Street Classification (10 pts)*

	Points
State highway	10
Arterial street	6
Collector street	4
Unpaved street or road or not on Federal system	0

*As shown on the Federal Classification System.

E. Convenience Safety/Sense of Community (5 pts)

		Points
1.	Directly serves transit	1
2.	Pedestrian safety element	1
3.	Accommodates turn lanes	1
4.	Connects freeway ramp (metering)	1
5.	Community support	1
6.	Improves El Camino Real	1

F. County Regionality (10 pts)*

	Points
Complete regionality	10
Significant regionality	7
Medium regionality	5
Minor regionality	3
No regionality	0

*This relates to how much influence the project has on affecting the travel habits of the residents of San Mateo County. It is a measure of the percentage of the population whose behavior is changed because of the positive effects of the project.

Examples of County regionality - the relative number of people who may be affected by a transportation project, of which the following may apply:

US101 (Bayshore Freeway) or CALTRAIN - complete regionality

El Camino Real (State Route 82) or BART from Colma Station - significant regionality

Holly Street in San Carlos or a city-wide bus route - medium regionality

Hillside Boulevard in Daly City and Colma or a specific bus shelter or bus turnout - minor regionality

Local minor street or absence of transit - no regionality

G. Effectiveness (Cost/Benefit) @ 10 pts

Point Range: - $\frac{\text{Funds Requested}}{\sum \text{ of Items A,B,C,D,E, and F \& Readiness that apply}}$

Point Ranges:

0	-	5000	=	10 Pts
>5000	-	10000	=	+ 9 Pts
>10000	-	15000	=	+ 8 Pts
>15000	-	22000	=	+ 7 Pts
>22000	-	28000	=	+ 6 Pts
>28000	-	35000	=	+ 5 Pts
>35000	-	40000	=	+ 4 Pts
>40000	-	50000	=	+ 3 Pts
>50000	-	60000	=	+ 2 Pts
>60000	-	75000	=	+ 1 Pts
>75000	-			0 Pts

A hypothetical example follows:

Project information - A collector roadway channelization project has had a field review. The project is designated CAT EX and certified. An agreement for right-of-way certification has only been signed with an appropriate agency, PS&E is still incomplete, and a final approved DBE has been completed. Amenities equal 2% of the cost of the project, which in turn make it safer for pedestrians. Match is minimal. Agreements or permits have been submitted to CALTRANS. The project is requesting $450,000 in Federal Funds. Scoring Values for Items A, B, C, D, and E total 12 points. County-wide significance is found to be 6 points. Calculations are made accordingly.

State of Readiness:

Field Review	=	1
DBE: final approved	=	2
CAT EX certified	=	1
Right-of-Way agreement made	=	1
PS&E incomplete	=	0
Agreements/permits submitted	=	0
Total Points	=	5

Weighting Factor	=	1.5	
X Sum of (A, B, C,D, & E)	=	12	
[4+3+0+4+1]		18	= 18 pts

\+ F. County-Wide Significance = 6

\+ Effectiveness = $\frac{\$ \text{ Requested}}{\text{Sum of (A+B+C+D+E+F+ Readiness)}}$

$$= \frac{450{,}000}{(12 \text{ as given}) + (\text{Significance} = 6) + (\text{Readiness} = 5)} = \frac{450{,}000}{12+6+5}$$

= 19,565.2 (represents 7 pts. from cost effectiveness chart)

Total Score* = 31 points of a possible 100 points

*(Weighted Score + F + Effectiveness) = (18 + 6 + 7)

Surface Transportation Program (STP) Federal Funds Project Scoring

State of Readiness				A. Amenities to Project		B. Local Funds		
Field Review/Project Study Report or equivalent:		1	0	Percentage of Total Project Cost:		50% or more or >2 million	-	10
				0	5	≥45%	-	9
DBE:	2	1	0			≥40%	-	8
				≤5%	4			
Environmental Review:		1	0			≥35%	-	7
				≤10%	3	≥30%	-	6
Right-of- Way Acquisition:	2	1	0			≥25%	-	5
				≤15%	2			
PS&E:	2		0			≥20%	-	4
				≤20%	1	≥15%	-	3
Agreements/Permits:	2		0			≥10%	-	2
				>20%	Project Ineligible for Consideration			
Total Readiness Points: _____						≥5%	-	1
						<5%	-	0
Readiness Weighting Factor: _____								

Surface Transportation Program (STP) Federal Funds Project Scoring

C. Multi-Jurisdictional/Agency		D. Road or Street Classification		E. Convenience/ Safety/ Sense of Community*	
5 or more jurisdictions or agencies	- 10	State highway	- 10	Directly serves transit	- 1
4	- 7	Arterial street	- 6	Pedestrian safety element	- 1
3	- 5	Collector street	- 4	Accommodates turn lanes	- 1
2	- 3	Unpaved street or road or not on Federal system	- 0	Connects freeway ramp (metering)	- 1
1	- 0			Community support	- 1
				Improves El Camino Real	- 1

*5 points maximum.

Surface Transportation Program (STP) Federal Funds Project Scoring

F. County Regionality			G. Effectiveness (Cost/Benefit)				
Complete regionality	-	10			>5000	-	10
			>5000	-	10000	-	9
			>10000	-	15000	-	8
Significant regionality	-	7	>15000	-	22000	-	7
			>22000	-	28000	-	6
Medium regionality	-	5	>28000	-	35000	-	5
			>35000	-	40000	-	4
Minor regionality	-	3	>40000	-	50000	-	3
			>50000	-	60000	-	2
			>60000	-	75000	-	1
No regionality	-	0	>75000			-	0

Surface Transportation Program (STP) Federal Funds Project Scoring

Point Scoring

State or Readiness Points	Readiness Weighting Factor
0	1
1	1.1
2	1.2
↓	↓
10	2

Effectiveness Point Range = $\frac{\text{Funds Requested}}{\Sigma \text{ of Items A through F + Readiness Points}}$

G. Effectiveness points related to corresponding point range.

STP Program:)		Maximum Points
(Readiness Weighting Factor) (Σ of A, B, C, D, and E)	=	80
F. County Regionality	=	10
G. Effectiveness (Cost/Benefit)	=	10
	=	100

Jurisdiction/Agency: _____ Score: _____

Project: _____

Surface Transportation Program (STP) Federal Funds Project Scoring

1. Points score will be the sole mechanism to determine project ranking and priority. Item G - Effectiveness - will be used to break tie project scores.

2. Project submittals will be limited to a maximum of ten (1) submittals per jurisdiction or agency.

3. There will be a maximum allocation of $1 Million per jurisdiction or agency for roadway projects.

4. Amenities to the project are allowed to a maximum of 20% of the total project cost. Amenities exceeding 20% of total project cost will cause the project to become ineligible for further funding consideration. It is very critical that this provision of the STP Program be followed.

5. Project submittals which divide a large project into smaller segments of the same project in order to develop high score points and gain an unfair advantage over other projects will be accepted only as one (1) large project unless there is a very valid reason for dividing the project initially.

6. Project must be entirely on a Federal Classification System (FCS) street or road. Any portion of a street or road within project boundaries which is not on the FCS will make the project ineligible for further funding consideration.

7. Failure to provide requested information will result in a corresponding loss of potential scoring points from any designated scoring category.

8. Failure to submit STP Program project applications before the established submission deadline is reached will eliminate that project from further consideration for funding in the current project funds program cycle.

C/CAG AGENDA REPORT

Date: February 27, 2006

To: Congestion Management and Air Quality Committee

From: Richard Napier, Executive Director

Subject: INTRODUCTION AND DISCUSSION OF JOINT PRINCIPLES FOR IMPROVEMENTS ON EL CAMINO REAL.

(For further information contact Richard Napier at 650 599-1420)

RECOMMENDATION

That the CMAQ Committee review and discuss the draft Principles for Improvements on El Camino Real, that are attached to this report. This item represents one of the initial steps that will be addressed as part of the El Camino Real Corridor Project that was previously approved by CMAQ and the C/CAG Board.

FISCAL IMPACT

No specific financial impact will result from this recommendation.

SOURCE OF FUNDS

Not applicable.

BACKGROUND/DISCUSSION

On October 31, 2005 CMAQ approved a proposal from C/CAG Staff to develop and implement an incentive program for land use and transportation improvements on El Camino Real. On November 10, 2005 the C/CAG Board adopted this strategy recommended by CMAQ. One of the first actions included in the proposal is to develop broad transportation principles for roadway improvements on the El Camino Real Corridor. These principles must be acceptable to both C/CAG, because El Camino Real is part of the Congestion Management Program Roadway Network, and to Caltrans, because the State of California is the owner and entity responsible for the maintenance of this road.

C/CAG staff has been working with Caltrans staff to develop a draft of these principles so each that each agency can begin to review it internally. The purpose of this item before the CMAQ is to introduce the draft principles and solicit input. A final version of the principles will be brought back to CMAQ for action at a later date.

ATTACHMENTS

California Department of Transportation (Caltrans) and C/CAG Joint Principles for Improvements on El Camino Real.

CALIFORNIA DEPARTMENT OF TRANSPORTATION (DEPARTMENT)
AND CITY/ COUNTYASSOCIATION OF GOVERNMENTS
OF SAN MATEO COUNTY (C/CAG)
JOINT PRINCIPLES FOR IMPROVEMENTS ON EL CAMINO REAL

El Camino Real in San Mateo County is a thoroughfare that connects the individual downtowns/ communities in the County. El Camino Real (ECR) corridor provides an opportunity for improved community aesthetics, transit connections, mixed use developments, and housing at various levels of densities. It is critical that each City and the County along the corridor define their unique character while preserving the transportation role of El Camino Real. A theme could be used along the corridor while preserving the individual character if desired by the Cities and County.

Transportation

Mobility - Seek to optimize mobility on El Camino Real as a thoroughfare connecting community centers from county line to county line. This includes mobility for multiple modes of transportation such as public transit, private and commercial vehicles. Bicycle and pedestrian movement along and crossing the corridor will also be considered.

Through Capacity - Preserve the through lanes on El Camino Real to:

a- Allow for planned growth and increased densities.
b- Allow for potential dedicated bus lane for Express Bus or Bus Rapid Transit.
c- Facilitate Incident Management

Turning Capacity - Flexible. Primarily determined by operating characteristics and safety considerations on a location specific basis. Work with local Cities and County.

Transit - Fully consider development of Express Bus or Bus Rapid Transit. Encourage Transit ridership through easy and attractive pedestrian connection between the downtown centers and Caltrain/ Bart stations through design, aesthetics, and special crosswalk treatments.

Land Use

El Camino Real is an opportunity for housing and mixed-use (with housing) developments especially in areas where there is easy access to transit (bus and rail). The needs of existing businesses and other uses along the corridor must be fully considered as planning and development decisions take place. While there are many opportunities for redevelopment, it is recognized that ECR may still provide an appropriate location for many of the less attractive, though necessary, uses such as auto repair and other repair activities.

Flexibility

Reasonable flexibility will be provided in the design standards as long as the basic transportation principles in this policy and safety are maintained.

The practices of context sensitivity as discussed in Department policy and guidelines will be used in the application of design standards and project features along the corridor. This includes consideration of safety, operational efficiencies and surrounding

environment as well as community's vision and interests. Early consultation concerning the application of context sensitive solutions and regular public involvement will be emphasized.

Congestion Management Plan

These principles will be incorporated into the San Mateo County Congestion Management Plan and as such will be a conformity issue.

Richard S. Napier C/CAG Executive Director	Bijan Sartipi Caltrans Director District IV
Date	Date

C/CAG

CITY/COUNTY ASSOCIATION OF GOVERNMENTS
OF SAN MATEO COUNTY

Atherton • Belmont • Brisbane • Burlingame • Colma • Daly City • East Palo Alto • Foster City • Half Moon Bay • Hillsborough • Menlo Park Millbrae • Pacifica • Portola Valley • Redwood City • San Bruno • San Carlos • San Mateo • San Mateo County • South San Francisco • Woodside

Date: December 27, 2005

To: Congestion Management and Air Quality Committee

From: Walter Martone

Subject: SCHEDULE OF MEETINGS FOR 2006

The schedule for regular meetings in 2006 will be as follows:

Congestion Management & Air Quality
Mondays 3:00 p.m. to 5:00 p.m.
January 9
February 27
March 27
April 24
May 22 – moved up one week due to Memorial Day
June 26
July 31
August 28
September 25
October 30
November 27
December 18 – moved up one week due to Christmas

All meetings are scheduled for the last Monday of the month except for May 22nd and December 18th. They were moved up one week due to holidays. The meetings begin at 3:00 p.m. and end at 5:00 p.m. and are held in Conference Room C, San Mateo City Hall.