LEAGUE OF WOMEN VOTERS® Berkeley, Albany, Emeryville

Data Show Climate Change is Now...

- Already greenhouse gases are higher, by a lot, than anything in the entire evolution of humans.
- Resulting temperature and rate of heating to expect are uncertain, but certainly serious, and potentially catastrophic.

...and Urgent Action is Needed

- Strong climate action is needed now – even in the current deep recession.
- Costs of inaction could be economically debilitating.

Priorities to Reduce Greenhouse Gas (GHG) Emissions

Energy Efficiency ***Zero cost – puts money in consumers' pockets***

- Energy use: *vehicles, aviation, buildings, infrastructure*
- Energy transport: *transmission, Unified National Smart Grid*
- Energy efficiency standards *(e.g. aggressive mileage standards)*

Global Price on GHG Emissions ***Put the market economy to work***

- Carbon tax, charge or fee, cap and trade (or auction), carbon offsets with strong controls
- Government cannot be exempt from GHG limits and prices

Clean Energy Economy ***Opportunity for jobs***

- Renewable generation – *solar, wind, tides, new ideas*
- Standards for biofuels
- Enforceable limits, real goals *(e.g. 100% clean energy in 10 years)*
- Clean energy transportation infrastructure

Portfolio of Technologies ***Research underlies progress***

- Government support – *incentives (or disincentives), funding, tax credits, market creation*

Our Personal Choices ***Resources are finite***

- Build a new social norm – *move away from consumerism, excess*
- Use less, buy locally, reuse/recycle

A Global Solution ***Alone we make little difference***

- Common global goal, developed countries lead the way
- Fair and sustainable global burden-sharing
- Peace reduces greenhouse gases
- Protect biodiversity; enhance climate-friendly agriculture and land-use practices

Adaptations to Climate Change ***Ease Consequences***

- Minimize economic impact from global warming legislation
- Aid ecosystems vulnerable to harm from global warming
- Ease consequences of climate related hardship to low income households

League of Women Voters – Berkeley, Albany Emeryville
Linda Swift 510 548-4808, Jan Blumenkrantz 510 548-3845 Climate Change Team co-chairs

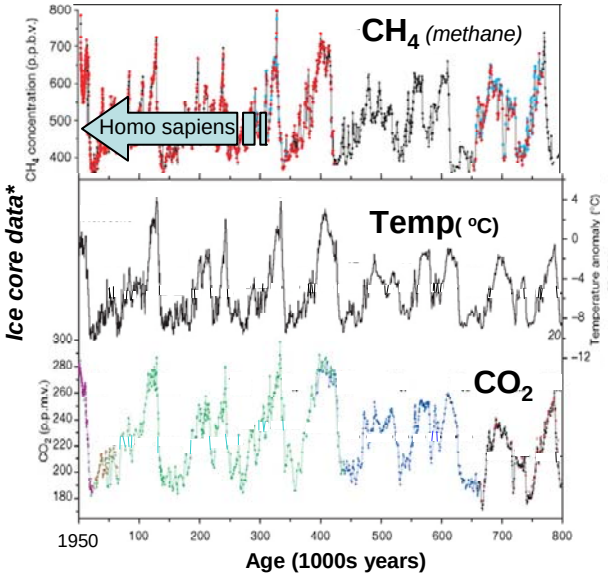
The Climate is Changing…We Need to Change Too

Data Show Climate Change is Now…and Urgent Action is Needed. Data are clear that climate change is happening, and it's caused primarily by human generated greenhouse gas emissions.

The data below, from Antarctic ice cores, show that the levels of two greenhouse gases methane (CH_4) and carbon dioxide (CO_2) correlate with temperature. To put the time scale in perspective, homo sapiens evolved only in the last 200,000 to 300,000 years, and all of civilization occurred in a narrow line on the left of the chart. During the 800,000 years shown, greenhouse gas concentrations varied with in a fairly narrow range, as did temperature. Still temperatures reached about 4°C (7°F) above temperatures in 1950 (zero point on the vertical scale).

Greenhouse gas concentrations today are significantly above the maxima in the last 800,000 years as shown in the table – values are literally off the chart. Further, the rate of change is much more rapid than anything seen during the last 800,000 years. Based on these data we can expect temperatures to rise at least 4°C, but how fast and how far temperatures will actually rise is essentially unknown.

Climate Change is *Now*



	Maxima in 800,000 yrs	Today 2008
CO_2 ppmv	~300	~385
CH_4 ppbv	~800	~1770
Temp °C	~+4°C	~+1°C and rising

Amount and rate of changes are unprecedented.

The resulting temperature and rate of heating to expect is unknown.

•Ice core data and figures from Loulergue et al (p. 383) and Luthi et al (p. 379), Nature, 15 May 2008

**IPCC, 2007 reports, www.ipcc.ch/

[1]ppbv: parts per billion by volume
[2]ppmv: parts per million by volume

14 Aug 2008 Linda Swift © 2008

What Does an Increase of 4°C Mean? Scientists on the Intergovernmental Panel on Climate Change (IPCC) of the United Nations warn of severe consequences if we have as much as 4°C change. Among the consequences we should expect:

- ***Droughts***, especially areas already dry; changes cause loss of grain production. Droughts exacerbate fires, weaken vegetation, cause decrease in food production which can lead to famine, or at the very least, higher food prices.
- ***Severe Weather***, and less predictable weather, leading to flooding and storm losses. Further, changes make it difficult for farmers to know how, when, and what to plant.
- ***Significant Extinctions around the Globe***. Even at an increase of 2°C, we expect up to 30% of species to be at risk of extinction. The most at risk are amphibians and mammals.
- ***Rising Sea Level***. Sea level rose 4-6 meters (13 to 20 feet) in the last 800,000 years. We don't know how fast sea level may rise, but an increase of just 1 meter would affect 100,000,000 people.
- ***Defense Threat***. Displaced populations, food and water stresses will likely lead to major global security threats.

Urgent Action is Needed

The greenhouse gases we have already put into our atmosphere will stay there for 10s to 100s of years. We must start reducing now.

Think of it like a diet. If I weigh 200 pounds and start eating a caloric intake of someone who weights 120, I won't actually weigh 120 for quite awhile. Neither will the atmosphere reach healthy levels overnight. But we can't keep "eating" at the unhealthy level.

Is Action or Inaction More Expensive?

The Stern Review was completed in October, 2006 in the United Kingdom under the auspices of the Chancellor of the Exchequer. It was done to better understand the economics of climate change. What would be the economic ramifications of doing nothing, versus the economics of taking action now?

From the Stern Review

"***There is still time to avoid the worst impacts of climate change, if we take strong action now."***

"The scientific evidence is now overwhelming: climate change is a serious global threat, and it demands an urgent global response."…

"Using the results from formal economic models, the Review estimates that if we don't act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20% of GDP or more.

"In contrast, the costs of action – reducing greenhouse gas emissions to avoid the worst impacts of climate change – can be limited to around 1% of global GDP each year."

http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm

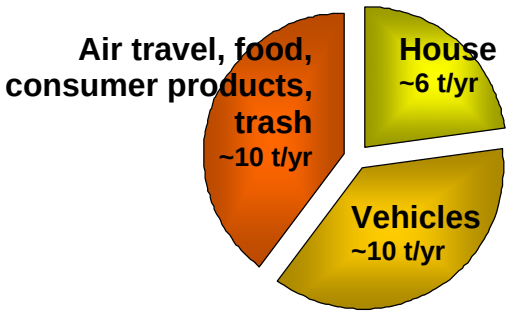
Lord Stern, the author of the quotes above, in a March 15, 2009 Copenhagen talk to scientists, revised upward his estimate of the cost of doing nothing to as high as 33% of GDP. http://www.heatisonline.org/contentserver/objecthandlers/index.cfm?ID=7301&Method=Full

Therefore the cost of doing nothing is *five to thirty times higher* than the cost of action now.

What Can I Do?

Individuals, especially in the U.S., can do a lot. We have one of the largest "carbon footprints" on the globe, with an average American household emitting 26.5 tons/year of CO_2 equivalent (CO_2e is the amount of greenhouse gases emitted calculated as if it were all due to CO_2). This contrasts with the average Indian household emissions of 1.0 CO_2e ton/year.

Within our households, CO_2e emissions are from primarily three sources: our house, our cars, and everything else – more specifically, air travel (the big one), food, consumer products and trash. We can also buy carbon offsets, financially supporting efforts that reduce or offset carbon emissions. A good list is at www.carbonoffsetlist.org/ showing legitimate projects screened by the Environmental Defense Fund. See our website www.lwvbae.org/climateaction.htm for a list of carbon footprint calculators.



Our Houses

- Change to "green" energy (solar or wind) – *savings 6-10 t/yr*
- Insulate, seal and weatherstrip – *savings 1-2 t/yr*
- Conserve energy and water – *use less light, appliances, switch to CFL or LED bulbs*

Our Vehicles

- Walk more, use public transportation, carpool
- Use high mileage, well maintained vehicles *(keep your tires properly inflated)*
- Travel less, combine trips

Data from National Geographic Green Guide, Spring 2008

Consumer Products

- Minimize air travel *(2-3 cross country trips emit about the same as powering your house, 6-10 t/yr)*
- Buy food that is locally grown/produced *(especially avoid products flown in)*
- Grow your own food. Eat everything you buy.
- Reuse and recycle.

What Can *WE* Do?

Ultimately we need a unified, global agreement to go forward together and in harmony. Meanwhile, we need to continue research and education to improve our understanding. And we need to make some real changes – some real actions – to reduce carbon emissions at all scales – as soon as we can. But what?

Social pressure. Together we can build momentum and agree on a common goal – a common mission. Again, this requires good information to know what actions are the most effective.
Consumerism. Our western culture of buying and throwing away must change. We need to think before we follow our normal lifestyle patterns.
Economic. How do we put a value on lowering emissions? Is the best solution cap and trade? Tax? Tradable energy quotas (TEQs)?
Business. Support business efforts to "go green" – those that rely on sustainable, renewable systems and energy. Support businesses that provide "green" products. Invest in those businesses. Buy their products.
Governmental. Support local efforts. Work to find legislation that will make a real positive impact, avoiding actions that will actually hamper climate change mitigation efforts.
Vote. Know the issues and proposals, advocate, support candidates that share your views on climate change.

Join the LWVBAE Climate Change Team to help us learn more!
http://lwvbae.org/climateaction.htm
Linda Swift 510- 548-4808, JanBlumenkrantz 510-548-3845 Team co-chairs