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February 16, 2001

The Honorable Richard Cheney, Vice President
The White House
1600 Pennsylvania Avenue, N.W.
Washington, DC 20500

Dear Vice President Cheney:

We applaud your efforts as you begin a comprehensive review of U.S. energy policy. This critical initiative is long overdue, and is particularly relevant today as the California energy crisis illustrates the deficiencies in regional and national energy policy and planning. Additionally, as the threat of global climate change is becoming widely acknowledged in the U.S. there is a growing understanding that a responsible national energy policy includes a global climate change mitigation strategy that can be environmentally effective and economically advantageous.

We are concerned that the current crisis mentality pervading the discussions of energy issues in the country has fostered an ill-founded rush for “quick fix” solutions that, while politically expedient, will ultimately do the country more harm than good. It is critical to examine all energy options. The potential for renewable energy technologies and energy efficiency to have a significant positive impact on our energy future is such an example of an opportunity that demands far greater examination and commitment to implementation than we have seen to date.

In the last decade the case for renewable energy has become compelling economically, socially, and environmentally. For many years renewables were seen as environmentally and socially attractive options that at best occupied niche markets due to barriers of cost and available infrastructure. That situation has dramatically changed. Renewable energy resources and technologies – notably solar, wind, small-scale hydro, and biomass based energy, as well as advanced energy conversion devices such as fuel cells – have undergone a revolution in technological innovation, cost improvements, and in our understanding and analysis of appropriate applications. There are now a number of energy sources, conversion technologies, and applications, where renewable energy options are either equal,

or better, in price, and equal, or better, in services provided than are the prevailing coal, oil, and gas technologies. For example, in a growing number of settings in industrialized nations, wind energy is now the *least cost* option across *all* energy technologies with the added benefits of being quick to install and bring on-line, and modular. In fact, some farmers in the Midwest can generate more income per hectare from the electricity generated by a wind turbine on their land than from their crop or ranching proceeds. Furthermore, photovoltaic panels and solar hot water heaters placed on buildings and houses across America could help reduce consumers' energy costs, produce a healthier living environment, and increase our energy supply while stabilizing our energy demand.

California's energy crisis has recently caught the national attention and raised fundamental questions about regional and national energy strategies. Rising demand suggests the need for new energy supplies, and certainly some new energy capacity is needed. However, there is a wide range of options for achieving supply and demand balance, and some of these options are not being given adequate attention. Governor Davis in California is now emphasizing policies that put the state into the position of brokering power purchases. Not only is this unlikely to be economically efficient, it fails to address the underlying problems of market manipulation and under-investment in capacity expansion of new, clean, technology development and installation. We believe that statewide, public sector investment in renewable energy generation, combined with increased municipal control of electricity production and retail sales, would offer a better and more meaningful long-term solution to the problems that electricity deregulation has raised.

In general, the absence of past state and federal leadership has meant that we have seen too few incentives for energy conservation and efficiency measures, little attention to appropriate power plant siting issues, and lack of long-term concern for transmission and distribution bottlenecks. At the national level drilling for oil in Alaska's Arctic National Wildlife Refuge is one step that could be taken to increase oil supplies. Yet, it would have a *negligible* affect on electricity production, and would not significantly reduce oil prices, improve energy security, or alleviate the trade deficit. Any oil and gas found will be trivial in comparison with global production and long-term U.S. consumption. This combined with the economic and environmental costs of such a proposal make disrupting the Arctic Refuge an unnecessary step, and illustrate a lack of integrated energy planning.

We firmly believe that the ultimate solutions to meeting our nation's energy needs must be based on private sector investment, bolstered by well-targeted government support such as tax incentives for emerging energy technologies and R&D. This must be coupled with policies that *open* markets to new generating capacity, rather than through federal subsidies for programs to increase energy supply using already mature technologies. This latter strategy would only generate near-term and incremental paybacks, while doing little to promote energy security or advance social and environmental goals. Instead, we now have the opportunity to build a sustainable future by engaging and stimulating the tremendous innovative and entrepreneurial capacity of the U.S. private sector. To accomplish this, we must develop policies that guarantee a stable and predictable economic environment for advancing clean energy technologies. This can be further bolstered by market incentives to reward actions that advance the public good. The Federal Energy Task Force has the opportunity to clarify federal policies, build a sustainable energy research base, encourage state and regional initiatives, and build dynamic markets and industries focused on clean energy options. With these thoughts in mind, we present several options that address both the short-term need to increase

energy supply and the long-term goal to have a sustainable, economic and environmentally sound U.S. energy policy.

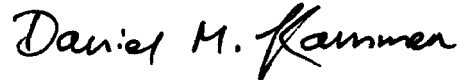
- **Increase federal R&D funding for renewable energy and energy efficiency technologies.** To date, federal investment in renewable energy and energy efficient technologies has been sparse and erratic, with each year producing an appropriations battle that is often lost. The resulting financial and policy uncertainty discourages effective energy technology development and deployment in the marketplace. With energy now a clear national priority, funding for the U.S. Department of Energy's Energy Efficiency and Renewable Energy Program must be substantially and systematically increased. The realization that R&D funding provides a critical driver to economic growth resulted in important commitments, particularly in the life sciences, to doubling R&D funding in five years. The same return on investment exists in the energy sector, but it has not been translated into similarly increased R&D funding for new renewable and energy efficiency technologies. If the U.S. expects to be a world leader in this industry, as it is in the biomedical and high-tech sectors, such investments in renewable energy and energy efficiency are essential. (See Appendix, Note 1)
- **Provide tax credits in addition to tax cuts for companies developing and using renewable energy and energy efficiency technologies.** The R&D tax credit has proven remarkably effective and popular with private industry, so much so that there is a strong consensus in both Congress and the Administration to make this credit permanent. Clean energy must be a national priority, and given the importance of private sector R&D in commercializing new technologies, an additional tax incentive for R&D investment in renewable and energy efficiency technologies is exactly the type of well-targeted federal policy that is needed. Furthermore, tax incentives directed toward those who use the technologies would provide the 'demand pull' to accelerate the technology transfer process and rate of market development. The U.S. has largely lost its position as the global leader in energy innovation resulting in the loss of jobs and earning potential for U.S. companies precisely at the time when the international market for clean energy technologies is booming. Our domestic industries as well as the global energy economy would both benefit directly from a renewed commitment to U.S. clean energy leadership.
- **Institute improved efficiency standards for residential and commercial water heating and space heating and cooling, and motors and appliances.** Significant advances in heating and cooling system efficiency, and for motors and many appliances, have been made, but more improvements are technologically possible and economically feasible. A clear federal statement of desired improvements in system efficiency is needed to remove uncertainty and reduce the economic costs of implementing these changes. If such a federal mandate existed then efficiency standards for heating and cooling, and for motors and appliances would begin to gradually increase, helping to expand the market share of existing high efficiency systems, as well as spurring a wealth of further improvements. (See Appendix, Note 2)
- **A federal renewable portfolio standard (RPS) to help build renewable energy markets.** The RPS is a renewable energy content standard, akin to efficiency standards for vehicles and appliances that have proven successful in the past. A gradually increasing RPS is an economic way of ensuring that a growing proportion of electricity sales are provided by renewable energy, and is designed to integrate renewables into the marketplace in the most cost-effective fashion.

In this manner, the market picks the winning and losing technologies and projects, not administrators. We recommend a 20 – 25 percent renewable energy component within ten to fifteen years, using market dynamics to stimulate innovation through an active trading program of renewable energy credits. (See Appendix, Note 3)

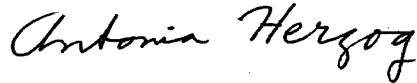
- **Federal standards for net metering of distributed small-scale energy generation.** Net metering allows customers to interconnect and feed surplus power back into the grid during periods when generation exceeds the customer's own use. Such a system makes it easier and more affordable for customers to generate their own power from renewable energy sources or other distributed generation technologies. The use of net metering benefits customers, utilities, and independent power providers, and is particularly important for intermittent renewable sources, such as solar and small wind machines, which generate electricity only when the resource is available. A uniform federal standard is needed to replace the confusing and disparate array of state net metering programs currently in existence. (See Appendix, Note 4)
- **Form a National Public Benefits Fund based on revenue collected from a national, competitively neutral wires charge.** Such a fund could match state funds to assist in continuing or expanding energy efficiency, low-income services, the deployment of renewables, research and development, and similar public purpose programs the costs of which have traditionally been incorporated into electricity rates by regulated utilities. As the utilities have moved toward deregulation such public benefit funds have been disappearing.
- **Improve federal standards for vehicle fuel economy.** New hybrid vehicle technologies are beginning to enter the marketplace, offering significant improvements in vehicle fuel economy at modest incremental vehicle costs. Looking beyond the initial wave of gasoline hybrid vehicles, fuel cell vehicles are currently under active development by all of the large automakers and promise even higher efficiencies and still lower emission levels. The improvements in fuel economy that these new vehicle types offer would help to slow growth in petroleum demand, reducing our oil import dependency and trade deficit. While the Partnership for a New Generation of Vehicles helped to generate some vehicle technology advances, an increase in the Corporate Average Fuel Economy (CAFE) standard is required to provide an incentive for companies to bring these new vehicles rapidly to market. The potential for future hybrid and fuel cell vehicles to achieve over 100 miles per gallon is believed to be both technically and economically viable in the near-term, and needs only clear federal guidelines and support to move from planning to reality. (See Appendix, Note 5)
- **Integrate domestic energy and environmental planning with U.S. global leadership.** The need for leadership on the global climate issue has become particularly apparent with the lack of international cooperation at the recent climate meeting in The Hague. Past domestic political opposition to U.S. leadership in this area was based on outdated views of the science and economics of climate change. It is now widely understood that the costs of inaction on global warming can be catastrophic, while the benefits of actions to reduce the environmental impacts of energy use through new innovation, developing clean energy industries, and improving domestic air quality and health can be substantial. This represents the classic 'win-win' scenario. Significant action on climate change mitigation now appears unlikely unless the U.S. takes on a significant leadership role. (See Appendix, Note 6)

If we hope to enjoy the type of prosperity in the coming century as we have in the past the work of the Task Force on Energy in formulating a new national energy policy must be carried out with careful consideration. We commend you for this auspicious undertaking and would be happy to elaborate further on any of the points raised above. Thank you for the opportunity to weigh in at this critical juncture in our country's history.

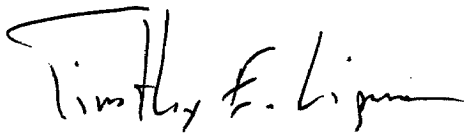
Sincerely,



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Cc:

Secretary Spencer Abraham, Secretary of Energy

Administrator Christine Whitman, Administrator of EPA

Governor Gray Davis, Governor of California

Rosina Biernbaum, Acting Director, Office of Science and Technology Policy

Senator Frank H. Murkowski, Chairman, Senate Committee on Energy and Natural Resources

Senator Jeff Bingaman, Ranking Member, Senate Committee on Energy and Natural Resources

Hon. W.J. "Billy" Tauzin, Chairman House, Committee on Energy and Commerce

Hon. John D. Dingell, Ranking Member House, Committee on Energy and Commerce

Appendix: Supporting Materials and References

Many of the publications listed below are available on line at the Renewable and Appropriate Energy Laboratory's (RAEL) Internet site. The *Publications Page* is:
<http://socrates.berkeley.edu/~rael/papers.html>

Note 1: Federal R&D funding for renewable energy and energy efficiency technologies

Federal funding and leadership for renewable energy and energy efficiency projects has resulted in a small number of notable successes, such as the *Energy Star* and *Green Lights Programs* that has now been emulated in a number of countries. Despite these achievements, funding in this area has been both scant, and so uneven that private sector involvement has been actually discouraged. A combination of a federal program for steadily increasing funding and active political leadership would transform the clean energy sector from a good idea to a pillar of the new economy. In particular, promising technologies such as fuel cells deserve special attention. Fuel cell development is attracting significant public and private funding and offers the promise of being a keystone technology for the ultimate transition from natural gas, petroleum, and coal energy to a renewable and hydrogen based energy economy.

Duke, R. D., and Kammen, D. M. (1999), "The economics of energy market transformation initiatives", *The Energy Journal*, **20**, pages 15 – 64.

Kammen, D. M. and Margolis, R. M. (1999) "Evidence of Under-Investment in Energy R&D Policy in the United States and the Impact of Federal Policy," *Energy Policy*, **27** pages 575 - 584.

Margolis, R. M. and Kammen, D. M. (1999) "Underinvestment: The Energy Technology and R&D Policy Challenge," *Science*, **285**, pages 690 - 693.

President's Committee of Advisors on Science and Technology (PCAST) (1997) *Federal Energy Research and Development for the Challenges of the Twenty-First Century* (Washington, D.C.: Energy Research and Development Panel, President's Committee of Advisors on Science and Technology), November.

A second, and related issue is the structure of the Department of Energy itself. We have hindered, even crippled, the ability of the Department of Energy to investigate, promote and champion innovation in the energy sector by focusing much of its activities on the clean-up of the legacy of nuclear energy research and waste. While this is an important mission, it dominates the resources of the Department of Energy and prevents the focus from moving to current and future energy needs and opportunities. A separation of these functions is in order.

Note 2: Efficiency standards for residential and commercial water heating and space heating and cooling, and motors and appliances.

A confluence of technical advances and economic and policy mechanisms now exists that could be utilized to dramatically reduce domestic, commercial and industrial energy needs. Federal leadership and partnership programs with state and regional organizations could produce dramatic improvements and cost reductions.

Interlaboratory Working Group (2000) *Scenarios for a Clean Energy Future* (Oak Ridge, TN; Oak Ridge National Laboratory and Berkeley, CA; Lawrence Berkeley National Laboratory), ORNL/CON-476 and LBNL-44029, November.

Note 3: A federal Renewable Portfolio Standard

All federal RPS proposals should use tradable renewable energy credits for compliance. Renewable credit trading is analogous to the sulfur allowance trading system established in the Clean Air Act. Like emissions trading, it is designed to be administratively simple and to increase flexibility and decrease the cost of compliance with the standard. Electricity suppliers can generate renewable electricity themselves, purchase renewable electricity and credits from generators, or buy credits in a secondary trading market.

The RPS is the surest mechanism for securing the public benefits of renewables and for reducing their cost to enable them to become more competitive. It is a market mechanism, setting a uniform standard and allowing companies to determine the best way to meet it. The RPS will reduce renewable energy costs by:

- Providing a revenue stream that will enable manufacturers and developers to obtain reasonable cost financing and make investments in expanding capacity to meet an expanding renewable energy market.
- Allowing economies of scale in manufacturing, installation, operation and maintenance of renewable energy facilities.
- Promoting vigorous competition among renewable energy developers and technologies to meet the standard at the lowest cost.
- Inducing development of renewables in the regions of the country where they are the most cost-effective, while avoiding expensive long-distance transmission, by allowing national renewable energy credit trading.
- Reducing transaction costs, by enabling suppliers to buy credits and avoid having to negotiate many small contracts with individual renewable energy projects.

Clemmer, S.L., Noguee, A., and Brower, M. (1999) "A Powerful Opportunity: Making Renewable Electricity the Standard," Union of Concerned Scientists, January.

Note 4: Federal standards for net metering

Net metering eliminates the administrative expense of installing, reading, and billing for an additional meter to measure generation separately from consumption. During surplus generation

periods, the single meter spins backwards, so that the customer is billed only for the net amount of electricity consumed during a billing period. By facilitating small-scale generation by customers, net metering will help reduce loads on central generation, transmission and distribution, enhancing reliability as well as fuel diversity.

Wan, Y. (1996) *Net Metering Programs*, NREL/SP-460-21651, National Renewable Energy Laboratory, December.

Note 5: Improved federal standards for vehicle fuel economy

After five years of Congressional bans, studies on the potential for increases in CAFE standards to cost-effectively reduce petroleum demand are now underway by the Department of Transportation and the National Academy of Sciences. These studies, with results due in July 2001, will help to suggest optimal levels of increased standards, given the costs and benefits of higher fuel economy, as well as phase-in schedules that will protect the competitive interests of domestic automakers. The issue of raising CAFE standards is becoming increasingly relevant with progress in the PNGV program, and as several automakers are preparing to introduce high-efficiency fuel cell vehicles beginning as soon as 2003-2004.

Duleep, K. G. (1997) "Evolutionary and Revolutionary Technologies for Improving Fuel Economy," *Transportation, Energy, and Environment: How Far Can Technology Take Us?*, Edited by J. DeCicco and M. Delucchi, ACEEE, Washington, D.C.

Mark, J. (1999) "Greener SUVs: A Blueprint for Cleaner, More Efficient Light Trucks," Union of Concerned Scientists, July.

Office of Technology Assessment (1995) *Advanced Vehicle Technology: Visions of a Super-Efficient Family Car*, OTA-ETI-638, Office of Technology Assessment, U.S. Congress, Washington, D.C., September.

Note 6: Climate change and the need for federal leadership

The U.S. can reduce greenhouse gas (GHG) emissions while improving our economic efficiency, creating jobs and saving consumers money, maintaining our technological leadership, and achieving other environmental benefits. The options presented in this letter not only represent a responsible energy strategy, but can also simultaneously address the need to reduce U.S. GHG emissions. In particular, they would support a range of strategies to reduce power plant emissions, which account for a substantial percentage of total U.S. emissions of greenhouse gases, 29 percent in 1998. These include switching from our current reliance on high-carbon fossil fuels, particularly coal and oil, to renewable fuel sources, which have zero carbon emissions, and lower-carbon natural gas; and increasing the efficiency of electricity generation and use.

We strongly support the recent initiatives in Congress, for which the current Administration has indicated it's backing, to reduce pollutant emissions from electricity generation. In the 106th Congress Senator Jeffords and Senator Lieberman introduced, S.1369, the Clean Energy Act of

1999. This legislation contained provisions that addressed the environmental damage and competitive distortions created by the patchwork of unequal and inadequate standards that currently apply to electric power plants nationwide. The bill put a national cap on emissions from all power plants of nitrogen oxides, sulfur oxides, mercury, and carbon dioxide. The reductions in carbon dioxide would have brought emissions levels back to 1990 levels by 2005, the same level implied by the non-binding targets of the Rio Treaty of 1992, as ratified by the U.S. Senate. Legislation that controls the four major power plant pollutants in an integrated package will help reduce uncertainties for electric generators and will be less costly than separate programs for each pollutant. Integrated control encourages system-wide efficiency improvements and increased utilization of cleaner fuels. And while voluntary action by American companies is an attractive option to consider, in the last ten years voluntary actions have failed to reduce carbon dioxide emissions in the U.S. Instead, emissions have increased by 15 percent since 1990 and continue to increase.

Baer, P., Harte, J., Haya, B., Herzog, A.V., Holdren, J., Hultman, N.E., Kammen, D.M., Norgaard, R.B., and Raymond, L. (2000) "Equity and Greenhouse Gas Responsibility," *Science*, **289**, page 2287.

Interlaboratory Working Group (2000) *Scenarios for a Clean Energy Future*, (Oak Ridge, TN; Oak Ridge National Laboratory and Berkeley, CA; Lawrence Berkeley National Laboratory), ORNL/CON-476 and LBNL-44029, November.

IPCC (Intergovernmental Panel on Climate Change) (2001) *Climate Change 2001: The Scientific Basis*, January.

Kinzig, A. P. and Kammen, D. M. (1998) "National trajectories of carbon emissions: Analysis of proposals to foster the transition to low-carbon economies", *Global Environmental Change*, **8 (3)**, pages 183 - 208.

Natural Resources Defense Council (2001) *A Responsible Energy Policy for the 21st Century*, February.