

# A Proposal to Make Napa County a Net Exporter of Clean Energy

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## Summary

Here in Napa County, we are in a position to restructure our individual and collective lives around climate change, peak oil, and other looming environmental, economic, and social issues to better ourselves, our county, and, ultimately, the world. The County can incorporate into its General Plan and Destination Strategy ways to make the County *an exporter of clean energy*. This can help

- 1) the County's agriculture and tourism industries become stronger, and
- 2) the County develop into an eco-tourism, sustainability, and eco-restoration destination.

The result should be increased personal and public prosperity.

## Purpose of this Document

This document is intended to serve as a starting point for discussions among Napa County residents and other stakeholders about the merits of such a restructuring. With input from visionary leaders and activist residents, I hope the document metamorphoses into a blueprint that individuals, businesses, and governments can use to help themselves, the County, and the rest of the world prosper in the 21<sup>st</sup> century.

## Definitions

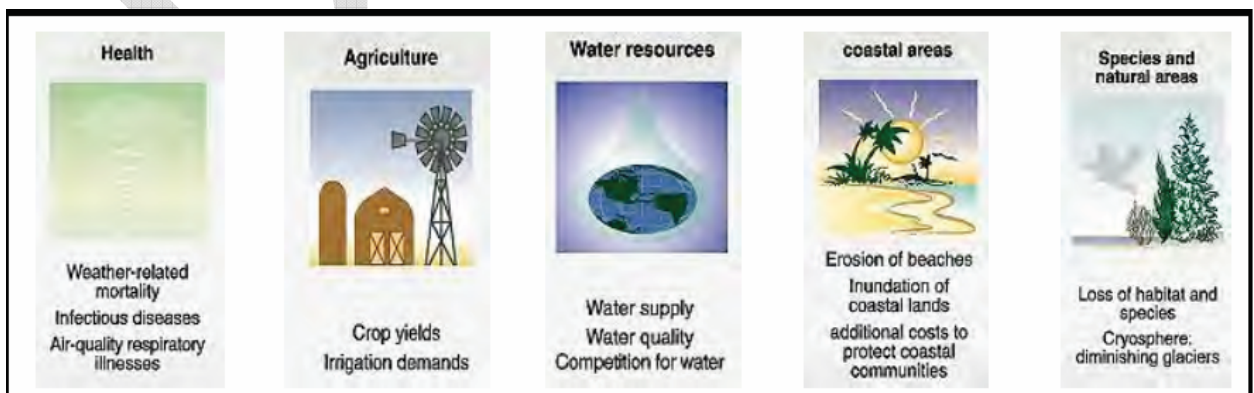
- *Clean Energy* is non-polluting energy generated from renewable resources.
- *Sustainable* development allows the present generation to meet its economic, social, and environmental needs without affecting the ability of future generations to meet their own needs.

## Global Opportunities and Threats

Several worldwide trends prompted me to write this proposal. These are:

### *Climate Change*

- The single most important problem humans will have to contend with in the 21<sup>st</sup> century is that of climate change. We will have to find ways to mitigate the effects of climate change and, to the extent that we don't succeed, adapt to its effects. As can be seen from the following graphic, critical aspects of our lives will be affected.

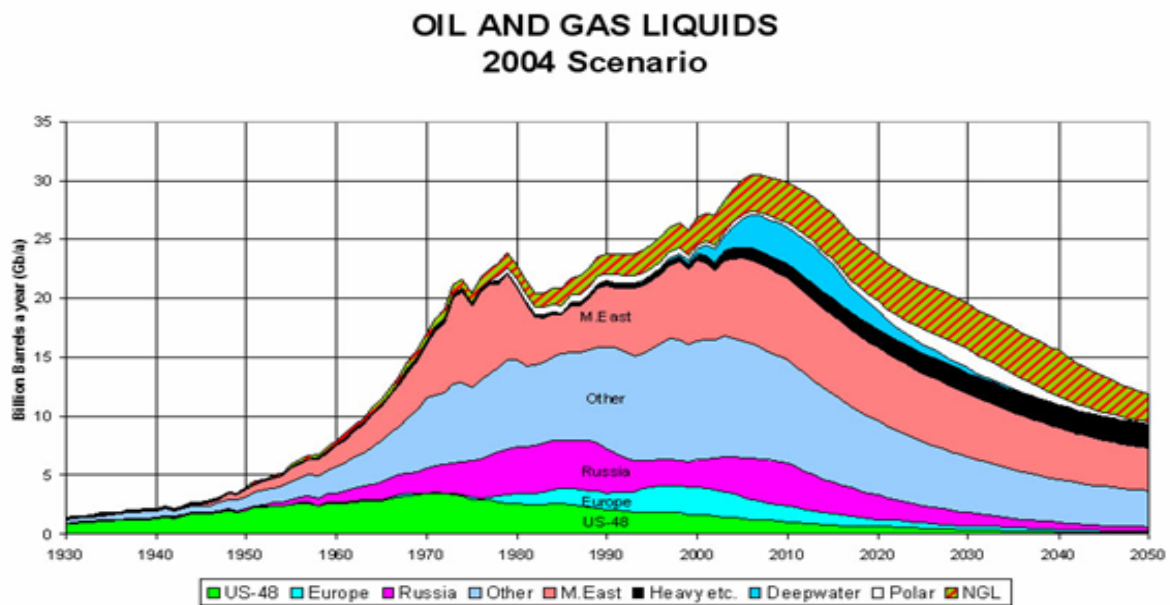


Source: Dr. Rajendra Pachuri, Chairman of the Inter-governmental Panel on Climate Change (IPCC). Climate Change Research Conference, Sacramento (September 13-15, 2006)

- Climate models suggest that anthropogenic CO<sub>2</sub> emissions are the single largest cause of recent climate change. The environmental and economic consequences of continuing to emit CO<sub>2</sub> at “business-as-usual” levels range between unknowable and catastrophic.
- **The environmental and economic consequences of reducing CO<sub>2</sub> emissions are highly beneficial – socially, environmentally, and economically.**

### *Peak Oil*

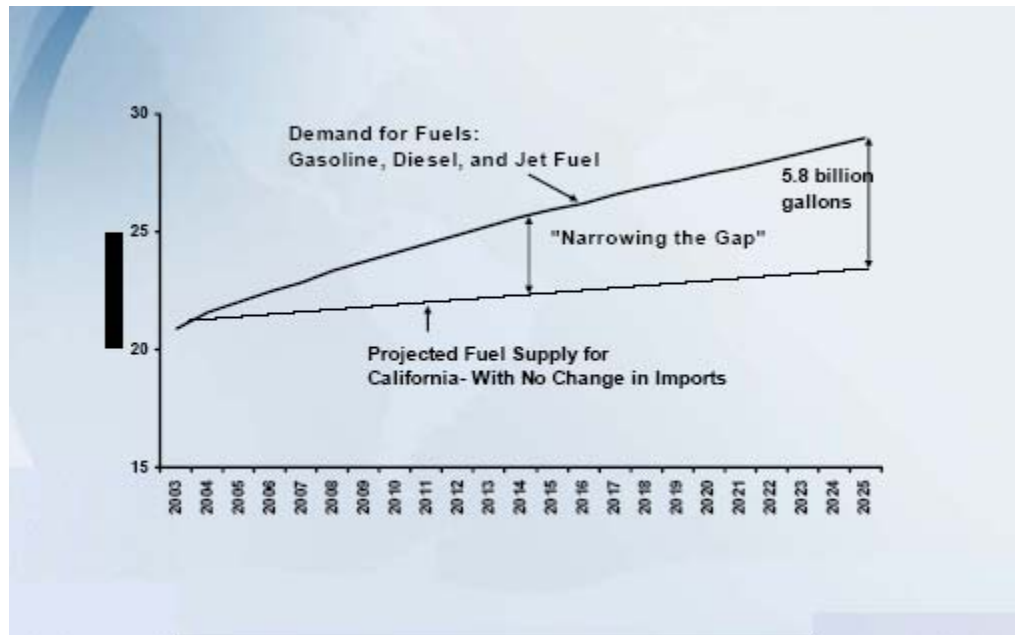
- In the 1950s, M. King Hubbert, a respected American geophysicist, used mathematical models to predict that U.S. oil production would peak between 1968 and 1974. His pronouncements were dismissed, but he was right – U.S. oil production peaked in 1970.
- Global oil and natural gas production are also expected to peak. Some claim that the peak already happened in 2005, others predict it will happen in 2010, 2030, etc. Despite these conflicting opinions about the exact timing of the global oil peak, there is no disagreement that oil production will peak within our lifetimes. The following graphic shows global oil peaking during the second half of this decade.



Source: Association for the Study of Peak Oil.

- A diminishing supply of oil combined with an increasing demand is driving oil prices higher.
- The gap between the U.S. demand for oil, which continues to increase, and its domestic supply has historically been met through imports.
- India’s and China’s economies, and therefore their appetites for energy, are expanding rapidly. They are competing for the same sources of energy as is the U.S.
- Like the U.S., India and China are also building new coal fired plants to meet their electricity needs. These are among the greatest point sources of greenhouse gas emissions (GHG).
- Huge oil reserves are available in tar sands and shale oil. Extracting oil from these sources is expensive and highly polluting.

- California is the second largest consumer of gasoline and diesel in the world – only the U.S. consumes more. With population in California projected to increase to 45 million by 2025, we will need another 5.8 billion gallons of fuel by 2025, as illustrated in the following graphic.



Source: James Boyd, California Energy Commission.  
Climate Change Research Conference, Sacramento (September 13-15, 2006)

### ***Other energy-related realities and trends***

- Regulations restricting GHG emissions are already in place in Japan and Europe and will become increasingly common in the U.S.
- California recently passed AB32 – the global warming solutions act – which requires GHG emissions to be brought down to 1990 levels by 2020.
- Many states have renewable portfolio standards (RPS). In California, the RPS mandates that 20% of electricity must come from renewable energy resources by 2010 and 33% by 2017. PG&E has divested itself of its generation sources. They are soliciting bids from companies for green electricity, but have not yet received enough responses to meet their 20% RPS targets. PG&E will need help achieving these targets.
- Distributed, renewable energy based installations, are increasing.
- Carbon markets and clean energy technology companies and stocks are emerging.
- The electrical grid is aging and, being centralized, is more vulnerable to security threats.
- The renewable energy space is so new that a few passionate individuals can influence policy locally, regionally, and nationally.

## ***Non-energy related realities and trends***

- Corporations are increasingly reporting results on economic, social, and environmental indices.
- The internet and high speed communications are making it possible for anyone anywhere in the world to compete on an equal footing with anyone anywhere else in the world.
- Central governments are finding it increasingly difficult to respond swiftly to multiple emergencies.
- The disruptive effects of existing and potential natural or man-made disasters like hurricanes, security threats, or the bird flu virus are being felt / recognized.

**The global response to these trends must be to implement renewable energy solutions immediately. To the extent that this isn't being done everywhere and immediately is because of a lack of leadership, imagination, and will, not because of a lack of solutions.**

## **Current Situation in Napa County**

- The County has two main economic mainstays: wine and tourism. The impact of wine on the Napa wine economy was \$9.5 billion in 2004. Tourism contributed almost \$1.3 billion to the County's coffers.
- Making a living in the wine business is already fraught with challenges. The answer to the question "How does one make a small fortune in the wine industry?" is "Start with a large fortune"— an answer indicative of these challenges. Consumers' drinking habits can change based on a half-hour television report or a two-hour movie, yet it can take up to 10 years to start recouping an investment in wine.
- Many Napa wineries have traditionally felt less threatened by downswings in the wine or general economy because of Napa Valley's geography, microclimate, limited acreage, etc. But the Napa Valley wine business model will change dramatically if the microclimate changes, if the growing conditions in the Napa Valley become more like, say, the Central Valley's, or the amount and patterns of rainfall change substantially. Napa may not be able to maintain its position as a producer of high-end wines if the climate changes unpredictably.
- The County is currently developing a strategy to remain a viable tourist destination because a number of regions have become or are also becoming wine country destinations. The County is also seeking to improve the relationship between its residents and the tourists on whom so many residents depend for their livelihoods.
- The high cost of living in Napa County has resulted in those working here being forced to commute from more affordable areas in other parts of the County and from neighboring counties.
- Napa's wine and tourism based economies may find it difficult to thrive if the costs of energy increase dramatically. Costs of production will increase and commuters and tourists may not be able to afford travel into the County.
- Napa County and some of its cities are updating their general plans. The County's general plan estimates the energy requirements in future years. The County has also completed a baseline energy study. Some thought needs to be given to **how** the County's future energy needs will be met.

Clearly, Napa County will benefit from a solution that mitigates the risk of doing business here, that brings in higher paying jobs, that enables more people who work here to also live here, and that improves the environment and people's lives.

**Does Napa County have what it takes to implement such a solution?**

## Napa County's Qualifications

**The answer is a resounding yes.** The County has already demonstrated and is continuing to demonstrate its abilities to support such a proposal. Here are some examples of the County's pioneering achievements:

- Preventing unbridled development. Napa County became the first Agricultural Preserve in the United States in 1968.
- Producing world class wines. Stag's Leap Wine Cellars and Chateau Montelena won the 1976 Paris Tasting competition.
- Establishing the New Technology High School in the early nineties. This school is one of four models nationwide that The Bill and Melinda Gates Foundation funded for replication in 2000. The New Technology Foundation has created 28 schools in the U.S. based on the NTHS model. There will be 35 by year end 2007.
- Restoring a 5-mile stretch of the Napa River. Landowners are working with Napa County and other regulatory agencies on a river restoration project that will be used as a public-private partnership model for additional river restoration efforts, by other land owners along the river, and for other rivers in California.
- Creating a flood control plan for the Napa River.
- Etc.

**These examples demonstrate what Napa County leaders and citizens have accomplished in response to real threats to their environment and livelihoods. The people who currently live, work, or visit here are the beneficiaries of these leaders'/citizens' vision and activism. Similarly, there will be generations of beneficiaries, if the leaders and citizens of Napa County participate in and develop this proposal.**

## Benefits

Some of the direct and indirect benefits of becoming net exporters of clean energy include:

- More revenue to individuals, businesses, and the County
- Reduced risk of wildfires and floods
- Lowered insurance costs
- Improved health
- More jobs
- Increased economic, environmental, and social sustainability
- Stronger social fabric
- Reduction of personal and public debt

**These benefits can be realized by designing solutions based on a "new" paradigm shown later in the document. Here are some preliminary guidelines for implementing the proposal.**

## Preliminary Implementation Guidelines

- Benchmark current energy production and consumption
  - According to source of energy (from non-renewable and non-renewable resources)

- Electricity, Natural Gas, Propane, Diesel, Gasoline, etc.
- (Napa County has completed energy baseline study)
- Biomass, Alternative Fuels, Solar photovoltaics, Solar Hot Water
- By various categories
  - industry: wine, tourism, health, etc.
  - sector: public, private
  - utility customer categories: commercial, industrial, agricultural, residential
  - regions within County
  - etc.
  - (This should be available from PG&E)
- Promote energy conservation (immediate payback)
- Implement energy efficiency measures (short term payback)
- Generate energy from renewable resources (intermediate term payback)
  - Identify the County's renewable energy resource potential
  - Map the County for these resources
    - biomass (in unincorporated areas?)
    - wind (in Carneros?)
    - geothermal (in Calistoga?)
    - solar (in urban and unincorporated areas)
      - photovoltaics (for electricity – distributed generation in urban areas and centralized generation in unincorporated areas)
      - solar thermal (for hot water)
    - hydro (in Berryessa and Conn Dams)
    - CO<sub>2</sub> resources – to feed algae from which to produce biodiesel using bioreactors?
  - Use National Renewable Energy Laboratory's tool to determine appropriate renewable mix
  - Match sources and uses of energy
  - Ensure that existing grid infrastructure is capable of handling distributed generation. If not, coordinate with PG&E to upgrade equipment.
  - Establish local incentives to promote and supplement federal, state, and utility incentives to promote clean energy projects
  - Develop renewable energy projects
  - Measure output of renewable energy projects
  - Participate in Renewable Energy Credit Markets
  - Participate in Development of Carbon Markets
  - Become self-sufficient in energy production



- Export excess clean energy production
- Restructure society around fossil fuels no longer being readily and cheaply available (long-term payback)
  - Plan to be completely independent of fossil fuels by 2012?
  - (No country maintains its leadership position when the dominant source of energy changes. The 19<sup>th</sup> century was the British-dominated century of coal and the 20<sup>th</sup> century the American-dominated century of oil. Most likely, no one nation will dominate in the 21<sup>st</sup> century because energy sources will be based on renewable resources, which by their nature tend to be distributed.
  - The reason that a country loses its dominant position is that it is likely to promote the status quo rather than develop new solutions, if it has invested heavily in a particular technology / infrastructure. For instance, solar photovoltaic technologies were invented in the U.S. but found greater acceptance in Japan and Germany.)

**Restructuring society around the end of cheap and readily available fossil fuels can be the most challenging, but also the most rewarding and exciting, task. The following are some principles for readers to consider when fleshing out this proposal, so the benefits are universal and plentiful.**

### **Principles to use when restructuring Napa County**

- Mimic nature for inspiration when designing solutions (biomimicry) – nature does not waste, nature fosters interdependence; nature diversifies; nature simplifies; nature is holistic; nature is elegant; nature is infinitely creative
- Think big, think holistically, think collaboratively
  - Implement solutions that are universally beneficial.
  - Take multiple viewpoints into consideration to combat the limiting nature of individual minds. (Mind works by division. It breaks up a large problem into smaller and smaller sub-problems, until it arrives at a sub-problem that it can solve. Because solutions aren't examined for their "upward scalability", they often create problems that are larger than the original problem that the mind was trying to solve).
  - Find solutions that promote interdependence over independence over dependence.
- Identify highest and best use of resources
- Find ways to convert the byproducts of one subsystem into inputs for another
- Recognize that the problem is the solution
- Leapfrog technology (disregard sunk investments)
- Leverage efforts
  - Adapt best practices from around the world to own situation
  - Bring in outside expertise where we lack it.
  - Promote changes in local, state, and federal policies
  - Supplement local resources with federal and state grants (DOE, USDA)
- Recognize that the existing paradigm is failing and needs to be replaced by a better one

<b>Old Paradigm</b>	<b>New Paradigm</b>
Inefficient and ineffective use of fossil fuels	Effective use of renewable energies, including through conservation and efficiency
CO <sub>2</sub> is mitigated and sequestered	CO <sub>2</sub> becomes an energy source
Solutions create new problems are unscalable are less bad Are zero sum	Solutions solve multiple problems are scalable are more good are universally beneficial
Makes us leap from denial to despair	Releases creativity and prosperity

## **Implementation Strategy: Preliminary Suggestions**

### Local Government

- Identify the energy consumed in every step of daily operations. Determine which of the steps can be eliminated.
- Reduce CO<sub>2</sub> emissions through energy conservation, efficiency upgrades, producing electricity on site (solar, cogeneration, fuel cells, etc.), and replacing fleet with electric/hybrid/clean diesel/alternative fuel vehicles
- Partners – Department of Energy’s Clean Cities Program, ICLEI (Cities for Sustainable Development), KyotoUSA, etc.
- Create a Climate Change Policy

### Schools, Napa Valley College, and Pacific Union College

- Identify the energy consumed in every step of daily operations. Determine which of the steps can be eliminated.
- Reduce CO<sub>2</sub> emissions through conservation, efficiency upgrades, producing electricity on site (solar, cogeneration, fuel cells, etc.), replacing fleet with electric/hybrid/clean diesel/alternative fuel vehicles
- Tie in with New College, Sonoma State University, and other institutions offering courses in energy and sustainability
- Develop courses and internship programs in sustainability and renewable energy system installation, operations, and maintenance
- Develop courses to support transfer students intending to study research, development, design, engineering, and manufacturing of clean technologies
- Partners – Solar Schools, Green Schools, etc.

### Destination Strategy

- Promote Napa County as a destination for eco-tourism, sustainability, and eco-restoration
- Promote Napa County as a carbon neutral destination
  - Neutrality can be achieved by offsetting remaining CO<sub>2</sub> emissions through afforestation programs in partner communities around the world
- Promote longer term visitors over day trippers
- Promote Napa County as a place where people come to make friends, get educated, and get inspired

### Wineries

- Identify the energy consumed in every step of daily operations. Determine which of the steps can be eliminated.
- Reduce CO<sub>2</sub> emissions through conservation, efficiency upgrades, producing electricity on site (solar, cogeneration, fuel cells, etc.), and replacing fleet with electric/hybrid/clean diesel/alternative fuel vehicles.
- Create an energy plan
- Capture CO<sub>2</sub> emitted during fermentation. Find uses for captured CO<sub>2</sub>
- Tie in with CSWA/Wine Institute/CAWG, NVV/Napa Green Wineries
- Promote local production and consumption of wines
- Find alternative packaging materials
- Require suppliers to be more sustainable
- Promote international distribution of solar cookers, afforestation, etc. to offset residual CO<sub>2</sub> emissions

### General Plan (right category?)

- Examine regional climate models to determine which areas might be under water with sea level rises, and discourage development in those areas
- Promote projects that meet economic, environmental, and social sustainability criteria
- Promote LEED certification of architects and builders
- Promote rainwater harvesting
- Promote waterless and composting toilets
- Promote construction of net energy exporting buildings using insulation, geothermal, passive and active solar (photovoltaics and hot water), and emerging clean technologies
- Streamline / fast-track approval process to permit cutting edge but proven technologies / methodologies that have been adopted elsewhere
- Promote construction of multi-purpose spaces
- Promote use of multi-purpose furniture

- Promote use of local materials with minimized embodied energy
- Promote reuse of construction materials
- Promote multi-storied housing
- Promote co-housing
- Promote active involvement of seniors in communities
- Permit mixed use zoning to eliminate commuting
- Redesign communities so the automobile isn't required to run errands
  - Provide public bicycles
- Invest heavily in wireless telecommunications and software technologies to promote online group work and reduce need to travel
- Provide incentives to individuals to get rid of their second automobiles
- Promote co-ownership of vehicles
- Permit electric golf carts on city streets
- Provide charging outlets for electric cars in public parking spaces
- Reduce width of roads for motor vehicles and create a separate protected bike/pedestrian path
- Expand railroad right of way and create a bike / pedestrian path along tracks
- Build animal bridges to reduce road kill (estimated nationwide daily road kill statistics: 1 million vertebrates; as temperatures change, animal migrations will increase, resulting in increased road kill and associated economic costs)
- Encourage gas stations to offer alternative fuels, which they can buy from individual and businesses within the County (bio-diesel from algae / restaurant grease, etc.)
- Promote homes to become electronic cottages, i.e., encourage people to make money off of their homes by permitting certain non-agricultural uses.
- Promote permaculture
- Promote local food and wine production and consumption
- Reduce importation of foods from outside County
- Promote agriculture that doesn't use petroleum based inputs
- Promote fuel crop production
- Attract international non-governmental organizations that promote eco-restoration, environmental remediation, etc.
- Attract renewable energy trade associations and policy organizations
- Promote development of carbon credit market
- Generate revenues from "green" component of electricity generation; carbon offsets from installing solar thermal
- Send letters to homes with best solar resource and finance/subsidize small scale solar hot water systems

- Promote investment by Napa County residents in local renewable energy projects as a viable alternative to the stock market
- Promote community renewable energy projects
- Evaluate pros and cons of Napa County becoming its own utility district

### **Immediate Next Steps**

- Watch An Inconvenient Truth before the 11<sup>th</sup> of January
- Attend the Calistoga Rotary Club meetings at 12:15 p.m. on the
  - 11<sup>th</sup> to learn about Peak Oil
  - 18<sup>th</sup> to learn about this plan
  - 25<sup>th</sup> to learn what students from the New Technology High School are doing to become energy independent.

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