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this page is a placeholder for cover art design, including:

Nevada City Hall contact info

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web portal address



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Respectfully submitted to the City Council of Nevada City, California  
on December 8, 2010



## Dedication and Acknowledgments

***This work is dedicated to the future of our community; to our city leaders who saw the need to take steps to prepare for a not-so-distant future of energy-uncertainty; and to other communities everywhere that are preparing for these same challenges.***

### **Members of the Task Force:**

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APPLE-NC would like to extend special thanks to the numerous consultants and reviewers from local community groups, City staff, and local and statewide businesses, and especially to the teams that assembled similar task force reports in other parts of the world, which served as examples for us.

## Previous Task Force Reports

A few more recent energy-contingency plans and reports around the world have been completed since we began the process; more are in progress at press time, even in our region; and more are probably in existence that we are not aware of. However, only the thirteen similar task force reports listed below, in chronological order, were catalogued online at PostCarbonCities.net when when we began the process.

<b>Municipality / General Setting</b>	<b>Population</b>	<b>Report Date</b>
Burnaby, British Columbia, Canada center of metro-Vancouver area (pop. 2.1M; coastal)	203k	2006, January
Brisbane, Queensland, Australia large metropolitan center; coastal	1.9M	2007, March
Portland, Oregon, USA large metropolitan center (pop. 2.2M); coastal	537k	2007, March
Sebastopol, California, USA rural suburb of Santa Rosa (pop. 161k); near-coastal	7k	2007, April
Connecticut, USA New England coastal state	3.4M	2007, November
Darebin, Victoria, Australia inner suburb of Melbourne (pop. 4M; coastal)	128k	2008, February
Haines, Alaska, USA isolated near-coastal-inlet far-northern 'home rule borough'	2k	2008, February
Oakland, California, USA bay-coastal major city in metro-San. Fran. Bay Area (pop. 7.4M)	401k	2008, February
Westerly, Rhode Island, USA coastal outer-suburb of Providence (metro. pop. 1.9M; coastal)	23k	2008, August
Alachua County, Florida, USA semi-rural landlocked county (includes Gainesville, pop. 114k)	240k	2008, December
San Francisco, California, USA peninsula-coastal major city in metro-San. Fran. Bay Area (pop. 7.4M)	744k	2009, March
Berkeley, California, USA bay-coastal major city in metro-San. Fran. Bay Area (pop. 7.4M)	101k	2009, April
Maribyrnong, Victoria, Australia dense inner suburb of Melbourne (pop. 4M; coastal)	63k	2009, June

## Executive Summary

On October 22, 2008, the City Council of Nevada City, California adopted Resolution 2008-58<sup>1</sup> "in support of a community Energy Solutions Task Force". The Task Force, modeled after a handful of similar task forces from around the world, was given two tasks:

1. **Assess** Nevada City's specific vulnerabilities to more expensive and less available energy, especially liquid fuels for transportation.
2. **Recommend** actions that the City could take to reduce these vulnerabilities and to prepare for their effects.

This report is the product of the Task Force's work.

## General Findings and Themes

During the Task Force's work, at least two main vulnerabilities became evident:

### 1. Distance from supply centers

Nevada City and Grass Valley form a relatively isolated 'island' of population.<sup>2</sup> There is no rail service to the area.<sup>3</sup> The nearest air or ship freight is 60 miles away, in Sacramento. There is very little local manufacture or processing of locally consumed goods. Nevada City and its residents are almost entirely dependent on trucks for delivery of goods, including most of the food supply. Most supply trucks have traveled at least 30 miles, from Auburn; many distribution centers are even farther away. Many individual shopping trips are made to shopping centers 45 or more miles away, due to public perception of local shopping selection as being more limited.

### 2. Terrain

Nevada City's location in the forested Sierra Nevada foothills, at 2500 feet in elevation, adds to its natural beauty. This challenging terrain also leads to irregular land use patterns, lower population density, difficulty in personal, commercial, and public transportation, and ultimately to dramatically increased dependence on cars and offroad-capable trucks.

Many strengths unique to our area also became evident, as detailed in the body of this report. One of the most promising strengths is the fact that Nevada City has already shown the awareness of this energy-related risk management problem, and has requested this report.

In addition, a few overarching recommendations are appropriate. The organizers of this report are eager to assist the City with each of these steps:

### 1. Raise awareness of Peak Oil and energy uncertainty among City government and staff

The best ways to prepare for challenges due to energy-uncertainty are to become aware of the topic, to acknowledge that uncertainty does exist, and to give serious thought to the resulting vulnerabilities. Acceptance of this report is a huge step towards these goals. The Task Force

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1 see Appendix A for a complete copy of Resolution 2008-58

2 2009 estimated population: Nevada City = 3,043; Grass Valley = 12,817. Nevada City, Grass Valley, and a few major outlying developments are the only sizable population centers in western Nevada County. Surprisingly, the total 2007 estimated population of the four western-county supervisorial districts is around 75,000, due to large outlying population.

3 The nearest rail service is in Colfax, 15 miles from Nevada City, across steep foothills terrain including the Bear River valley. For more details, see the Transportation section of this report.

recommends that all members of City government and staff invest a small amount of time towards these goals, perhaps starting with a 30-minute group training and discussion session at City Hall, hosted by the organizers of this report.

## **2. Include recommendations from this report in the City strategic plan**

Currently, the City holds strategic planning meetings twice a year. Recommendations from this report could be included when developing and revising the list of strategic goals. The report organizers would be glad to help prioritize the most timely recommendations in advance of each City strategic planning meeting.

## **3. Encourage all businesses, groups, and families to do their own 'energy task force report'**

The questions raised in this report apply to entities other than municipalities. Businesses, nonprofit groups, families, and individuals can all take steps to safeguard their future happiness and success by confronting and planning for energy-uncertainty using this two-step 'assess-and-recommend' process. A more resilient, robust citizenry and local business base are the features that define a resilient, robust city.

## **Methodology**

The Task Force was assembled and organized in 2009 by Alliance for a Post-Petroleum Local Economy of Nevada County (APPLE-NC), a local 501c3 nonprofit focused on the topic of Peak Oil<sup>4</sup>. Task Force members were recruited from City government, City staff, local businesses, and local nonprofits.

Beginning in 2009, after several months of preparation and recruiting, the Task Force commenced a series of monthly meetings to carry out the 'assess and recommend' process. Following the general structure of the 13 other similar task force reports from around the world that were available at the start of the project<sup>5</sup>, the following meetings were convened (one per month):

- one introductory meeting to review general findings of the other task forces
- six 'topical' meetings (one for each of the six topics in the body of the report)
- two summary review meetings (after the first three topics, and again after the final three topics)
- one final draft review meeting (after several 'idle' months while Task Force staff built the report)

Each topical meeting was organized as follows:

1. summary presentation of relevant findings from the other Task Force reports
2. when available, presentation(s) by local subject-area expert(s) regarding the Nevada City-specific interactions between the monthly topic and the topic of Peak Oil
3. open discussion with the entire Task Force, and members of the public in attendance, to develop the list of concerns and recommendations for action at the City level

After each topical meeting, the Task Force staff compiled and published summary notes as well as detailed notes, and developed a draft chart of recommendations along with anticipated Cost / Benefit / level-of-public-Acceptance / level-of-Control ('CBAC') ratings, described in more detail below.

Each summary review meeting was an open discussion and revision of the draft recommendations and CBAC ratings from the previous three topical meetings. The spreadsheet was projected on a screen in

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4 see Appendix B for a brief introduction to the topic of Peak Oil

5 "Government responses to Peak Oil" - <http://postcarboncities.net/peakoilactions>



the meeting hall so that all Task Force members could see the chart and contribute to the discussion.

Over the course of several months in 2010, APPLE-NC sent drafts of the topical report sections to the entire Task Force for review and discussion outside the scope of the meetings. Task Force staff completed the rest of the work of assembling the sections and task force feedback into this finished product, again sending drafts to the entire Task Force for review a few times along the way.

### **Fiscal Impact**

Other than keeping some lights on in City Hall for the meetings, there was no cost to Nevada City for the entire Task Force project, up to and including the publishing of this report. No compensation was paid to any task force members, staff, or presenters: this was an entirely volunteer effort.

The overall motivation for the entire Task Force project dictates that each recommendation is expected to lead to a large net savings to the City in the long run. However, implementation of the recommendations will incur varying initial costs.

This report does not attempt to quantify any of the initial costs, or any of the ultimate fiscal impacts. Note that the anticipated initial costs of many recommendations are low or zero.

### **Structure of the Report**

The body of the report is divided into six topical sections, following the structure of the monthly meetings. Each topical section is generally structured as follows:

1. introduction to the topic and its interactions with Peak Oil and a constrained energy future
2. brief listing of some of Nevada City's specific Strengths and Vulnerabilities that affect local ability to deal with Peak Oil as applied to that topic
3. table of numbered recommendations and CBAC ratings, in no specific order
4. short narrative explanation of each recommendation; these narratives have a widely varying level of detail, and are meant to serve as rudimentary starting points for implementation of that item

### **Rating and Prioritizing the Recommendations**

Each recommendation is rated in each of four areas with an intentionally vague rating of Low (L), Medium (M), or High (H). This system follows the example of at least one of the 13 other task force reports that was used as a starting point during initial research. The categories, referred to as 'CBAC', are as follows:

1. Cost: expected initial cost of implementing the recommendation; variables affecting this rating include specific details of implementation, changing costs of initial energy and material requirements (expected to grow in a constrained energy future), and other unpredictable factors
2. Benefit: expected level of direct benefit to the City of implementing the recommendation
3. Level of Public Aceptance: expected level of public popularity of a decision by the City to implement the recommendation
4. Level of Control: expected level of precision with which the City will be able to control the details of how the recommendation gets implemented

The CBAC ratings are meant to be used as a very general at-a-glance prioritization tool while skimming the report. For example, officials may skim the tables for a recommendation that is Low initial cost,

High benefit, High level of public acceptance, and High level of control, which would appear as ‘L-H-H-H’ in the recommendation tables.

The dynamic nature of the recommendations makes them very difficult to prioritize. Appendix C gives an initial estimate of some detailed priorities, which may be helpful now and in the future.

## **Web Portal**

APPLE-NC is providing an online component, or ‘web portal’, to accompany this report.

The initial version of the web portal contains this full report, as well as an updated sortable listing of all recommendations, and copies of the presentations and the notes from each Task Force meeting. It is designed to allow easier access to the elements of the report (e.g. live web links to referenced documents) and, going forward, to provide for easy revision, discussion, and tracking of progress for each individual recommendation.

The web portal can be accessed from any web browser at [www.apple-nc.org/NevadaCityTaskForce](http://www.apple-nc.org/NevadaCityTaskForce) or by following the ‘Projects’ menu at [www.apple-nc.org](http://www.apple-nc.org).

At the time of printing of this report, the entire content is viewable by the public (i.e. no user logins are required to view the content). That may change in the future if any compelling security concerns arise, but a large part of the intent is to maintain transparency to the public.

***\*\* APPLE-NC strongly encourages any Nevada City staff or officials to check the web portal and also check with APPLE-NC whenever a certain recommendation is considered for implementation, to find out if any independent progress or updates have already been made.***

## **Learning From the Process**

This type of Task Force is a very new idea on a worldwide scale; Nevada City can be proud to have been among the early pioneers in the field. APPLE-NC expects and hopes that similar groups in other areas will be able to glean useful examples from this report, as well as the other pioneering Task Force reports.

In an effort to streamline the Task Force process in the future and to learn from successes and from mistakes, Task Force members and staffers were asked to contribute to a review and feedback process. Other communities undertaking a similar task force process can obtain a summary of the feedback by contacting APPLE-NC directly.

## **Next Steps**

This report will hopefully serve as a first version of a roadmap for the City to navigate some anticipated energy challenges of the near future. As such, it is expected that the entire process of implementing the recommendations (‘following the map’) will involve periodic discussions and revisions.

APPLE-NC intends to help the City navigate, decipher, and update the report on an ongoing volunteer basis, and to periodically suggest priorities for recommendations that would be ideal to implement at that time. The web portal, as well as brief updates to Council as frequently as practical, will be instrumental in making sure that this first version remains a ‘living document’.

# 1 – Food

Nevada County already has numerous activists and groups working to support our local food system. Collaboration among these entities is facilitated by the Local Food Coalition (LFC) network. Rita de Quercus, co-founder and co-coordinator of LFC, offered to prepare the Food section of the Task Force report, to save effort for the rest of the Task Force and to capitalize on the work that has been going on for several years.

Rita's presentation and recommendations are below. Those recommendations are not ranked in this report, since they were not ranked in Rita's original presentation. Finally, some additional recommendations with rankings from other members of the Task Force are listed. A summary of the Local Food Coalition's participating entities (farmers, ranchers, agricultural agencies and organizations, community organizations, businesses, etc.), originally shown to the Task Force at the end of Rita's presentation, is in Appendix E.

It is important to keep in mind that these local food activists and groups have been looking at a broad spectrum of compelling reasons to localize the food network under any energy regime, while the Task Force only has one primary motivation: reducing vulnerabilities to Peak Oil.

## ***Nevada City Energy Solutions Task force - Presentation on Food Aspect by Rita de Quercus - July 13, 2009 (revised December 2009)***

### A. Opening Remarks:

1. Introduce myself and my relationship to the topic (Local Food Coalition, Nevada County Grown).
2. Introduce other ag/food advocates in the audience: local Nevada City farmers Leo & Debbie Chapman and Tim Van Wagner from Living Lands Agrarian Network, and Alan Haight from Riverhill Farm; local food community activists Thea Blair and Rachel Plevin.
3. Acknowledge influences on my thoughts and how much is going on here and everywhere.
4. This is not intended to be the final word--I'm trying to lay out key concepts, summarize what needs to be done, and what has been done so far. I expect that I will continue to develop and refine this report in consultation with knowledgeable persons.
5. Please take notes and hold questions/discussion until after the whole report is presented.

### B. Overview: Big Picture/Key Concepts:

*Disclaimer: In this section, I'm speaking for myself. I want this made clear in any public rendering of what I say. I am not presenting some kind of unified perspective of the local ag community. Our local ag community is very diverse. Some will undoubtedly disagree with my perspective.*

It is worthwhile to take a few moments to identify some concepts that will have relevance across all the various topics the Task force will consider. In trying to create solutions to the challenges facing us, it's essential that our starting assumptions are accurate. Otherwise, the most carefully crafted plan will

prove to be futile, and a waste of time.

1. We'd need to re-localize our food system (and other essential systems) even if fossil fuels were unlimited and had no destructive effects. Why?
  - a. Globalization (GL) equals:
    1. no knowledge about where things come from and where they go;
    2. no accountability for above or anything else;
    3. no sense of restraint or limits (population growth, population patterns, resource use);
    4. small farmers everywhere are threatened with extinction;
    5. habitat and cultural/community destruction around the world;
    6. degradation of our own habitat and community;
    7. privatize the profits, socialize the costs: true cost of food not reflected in price, people think food is and should be "cheap."
  - b. GL operates on concepts of commodities/consumers, in which buying food is the same as buying a TV. But it's not: food is essential to life. All essential goods and services need to be under local control.

*Good news: Re-localization activity is happening here and everywhere.*

2. We need to critically examine our faith in, and reliance on, mega-technologies. Mega technologies (MT) are entirely dependent on cheap abundant energy, as are all mega-systems. BUT, even if other sources of cheap abundant energy appeared, we would still need to scale down because of 1 above. Scale itself matters. Replace MT with what E.F. Schumacher\* called intermediate technologies and more labor. Richard Heinberg suggests we need at least 50 million new farmers.

*Good news: Small-scale, local agriculture is inherently less dependent on MT and fossil fuels, and in fact, can be practiced with little or no MT and fossil fuels.*

3. GL and MT have occurred mainly in the last 100 years, and especially since WWII, in my lifetime. Our species knows how to live within limits, based on local resources. We've done it for most of our time on the planet. Many human cultures still do live within natural limits (though we're wiping them out fast) and all of wild nature does (we're wiping it out too). We need to reverse the trend of past 100 years. Could we do it in 100 years or less? (The powerful interests that created GL and MT are invested in maintaining the status quo. But GL and MT will gradually dissipate or collapse at some point.)

*Good news: Our community started acting over 3 years ago, and we are already headed in the right direction.*

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\* author of "Small is Beautiful: Economics as if People Mattered", published in 1973

4. Other factors affecting situation:

- a. We treat land as a commodity, i.e., to buy and sell for profit. Result: land valued at development value instead of at agricultural value. Result: loss of farmland (building over and paving farmland, those who want to farm can't afford to buy land).
- b. There are political/social value differences that obscure common interests.
- c. The traditional community foundations that were based on family ties and long-term land ownership have been irreversibly altered. We have to find new basis for community cohesion.

*Good news: A lot of progress has been made in our community in getting many folks working together on common interests and goals.*

C. Overview: Bringing It Home.....Transitioning to a Local Food System/Economy:

Vision: What would a local food system/economy look like?

1. All staple foods produced locally. Limited trade with farther away regions for items that can't be produced locally, and "luxury" items.
2. Most people grow some of their food. Some people grow most of their food. A few people grow all of their food. Lots of informal exchanges and bartering among neighbors.
3. Local farms supply the rest, made available to the public via CSAs, farm stands, farmers markets, other direct sales methods, and locally owned grocery stores.
4. Soil fertility inputs are created locally.
5. Appropriate scale technologies are in use.
6. Food production needs to have high priority when allocating water and energy supplies.
7. There are adequate processing and storage facilities for winter supplies.

Assessment: Where are we now?

1. Defining "local." One way to define it: the population/area presently served by the local farms and grocery stores in NC/GV. How many people is that? From how far out do they come? How much food is that annually?
2. Defining "staple foods." What foods, which would supply the basic nutritional requirements of humans, are most suitable to being grown in our area?
3. What is being grown here now? How much could (or couldn't) be grown here?
4. Obstacles and challenges: high cost of land, development pressures, farming not economically viable, water issues, lack of awareness among the general public and elected representatives, etc.
5. Assessment tools and resources: Local farmers, ranchers, and gardeners; ag agencies and

organizations, the Farm Guide, etc.

*Good news: We already have answers to some of these questions, and have begun to raise public awareness. Plus we have many excellent farmers, ranchers, gardeners, and permaculturists in this area and a communication/coordination network established.*

D. Summarizing vulnerabilities:

1. Current food supply for most of population is grown elsewhere and transported in, i.e., entirely dependent on mega-systems and mega-technologies which are entirely dependent on cheap abundant fuel. This includes transportation fuel, building and maintaining transportation equipment, building and maintaining transportation systems like roads, airports, ports. Also, the processing, packaging, finance, and communication aspects of the global food system.
  - a. Grocery stores carry only about 3 days supply at any given time.
  - b. Local capacity right now is probably only about 10% of need at best.
  - c. We can't assume we can rely on the Central Valley to feed us. It's being paved over, and will be seen as food supply by growing CV population and big cities.
  - d. California is already a net food importer, i.e., does not produce enough for its own population.
2. Same as above for agricultural equipment (irrigation, tractors, etc.) and ag inputs like fertilizers.
3. We have lost and are continuing to lose much of our productive land due to flawed land use values/policies.
4. We are in danger of losing the knowledge required to produce food, i.e., the loss of ag people. Only about 2% of population is involved in agriculture (down from 80% 100 years ago).
5. We are in danger of losing access to seeds and varieties needed for diversity. Mega corps are patenting seeds, etc. Large scale agribusiness requires mono-crops.
6. Government regulations and subsidies benefit large scale agribusiness, and ignore, hamper, or increasingly, threaten, small local farmers.
7. Population growth and patterns are causing tremendous stress on natural and human-made systems.
8. Water supplies are vulnerable to drought conditions and urban demands.

E. Mitigation measures (actions that can be taken by individuals, neighborhoods, cities, county):

1. Emergency:

- a. Buy and store adequate basic food supplies that can be stored well and can last for 3-6 months.
- b. Arrange contracts with CV growers for "guaranteed" supplies of staples like rice?
- c. Develop plan for able-bodied and well-off persons to help vulnerable populations.

2. Short Term (start now and extend into future):

(all of these are already happening or are in the planning stage)

- a. Educate and encourage public to buy locally whenever possible; especially support the farmers in proximity to your location.
- b. Encourage and support home and community gardens and homesteaders; teach folks how to grow, cook, and store food.
- c. Develop gleaning infrastructure, i.e., collect and distribute surplus.
- d. Support local seed saving efforts.
- e. Encourage community spirit (community food events and food sharing).

3. Long Term (start now but will take longer to achieve):

(some of these are already being worked on):

- a. Do in-depth analysis of local farming economics and figure out how to make it viable.
- b. Change incentives and regulations which favor development over agricultural land use.
- c. Provide incentives for land owners to make their land available for farming.
- d. Change regulations to provide affordable housing for farmers and farm employees.
- e. Change regulations to allow chickens, small livestock, etc., within appropriate urban areas.
- f. Change regulations to allow more small-scale processing, etc. (environmental health, zoning, etc.).
- g. Support local farmers in developing and implementing season-extending techniques.
- h. Research and develop local sources of ag inputs.
- i. Research / develop / revive appropriate scale technologies that have low energy needs.
- j. Develop community scale processing and summer/winter storage facilities.
- k. Educate youth about food and farming.
- l. Prioritize water supplies for essential uses like agriculture.

F. Further development of report on Mitigation Measures would include:

1. Fleshing out more details of implementation, including time frames.
2. Identifying the appropriate community levels to work on mitigation: individuals, existing organizations, neighborhoods, cities, county, etc.
3. Identifying who is already working on this, and what the results have been so far.
4. If nothing has happened yet, identifying who and how to best address it.
5. Researching what is being done elsewhere, i.e., best management practices (BMPs).

G. Overall conclusions:

*Bad news:* We are not at all prepared to deal with a significant disruption of our external food supply.

*Good news:* We are 3+ years into re-building our local food system/economy.

*Wild card:* Effects of climate change.



## **Recommendations specific to Nevada City**

In addition to the recommendations in the LFC report above, we realized the need to get a bit more specific: what exactly can Nevada City do as a city, since no local farms are actually inside city limits?

As it turns out, there are several specific local recommendations that have clear applications on a city scale. 1.1 and 1.2 below (and their sub-parts) were developed in December 2009 by Rita de Quercus and Tom Grundy as an addendum to the LFC report.

**NOTE:** While they do not appear in the chart below, several key recommendations that apply at the city level are found in Section E from the LFC Report above. The online companion to this report will track those recommendations as '1.E.x.x' according to the numbering in Section E.

<b>Recommendation</b>	<b>COST</b>	<b>BENEFIT</b>	<b>ACCEPTANCE</b>	<b>CONTROL</b>
<b>1.1 – support local farmers</b>				
<b>1.1a – support Nevada City Farmers Market</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>L</b>
<b>1.1b – support NCFM expansion to year-round: request County to allow permit-free tunnels</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>M</b>
<b>1.1c – foster City Hall relationship w/local farmers – ask how City Hall can support them</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>M</b>
<b>1.1d – review/revise ordinances and regulations</b>				
<b>1.1d1 – incentives for landowners to make land available to farmers</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>H</b>
<b>1.1d2 – allow chickens / small livestock</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>H</b>
<b>1.1d3 – support small-scale processing&amp;storage</b>	<b>M</b>	<b>H</b>	<b>H</b>	<b>M</b>
<b>1.1d4 – subsidize local farmer housing</b>	<b>H</b>	<b>H</b>	<b>M</b>	<b>H</b>
<b>1.1e – publicize, promote and support community events like Soup Nights</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>M</b>
<b>1.2 – support home gardeners</b>				
<b>1.2a – promote and support the APPLE Center as a hub for home garden info and support</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>M</b>
<b>1.2b – allow chickens / small livestock (1.1d2)</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>H</b>

### **1.1 – support local farmers**

While there are no actual farms inside city limits, the Nevada City population makes increasing use of local farm products, and farmers markets inside city limits are a great draw to locals as well as tourists. Those are some reasons to support local farms and farmers regardless of energy regime. As the energy regime becomes more restrictive, and as we are forced to relocalize our food networks, reliance on local farm products will most likely see massive increases.

Below are a few suggestions of methods for City Hall to support local farmers – we expect that more methods and channels will be found over time.

### **1.1a – support Nevada City Farmers Market**

The Nevada City Farmers Market<sup>1</sup> (NCFM) began in 2008. The Market is held on about 20 Saturdays during the summer and early fall, in Union Alley, between Bank of America and Robinson Plaza.

At the time of this writing, 13 farms, 8 food vendors, and 10 other booths including nonprofits and activities were signed up for the 2010 summer season at the NCFM.

In 2009, NCFM facilitated around \$150,000 in sales, in addition to boosting sales at downtown stores and restaurants from NCFM shoppers. Since most or all of those were Nevada County vendors, the money is kept local.

For the reasons above, and more, it's clear that the NCFM provides a large economic benefit in any energy regime. For all of the reasons that prompted this report, it's also clear that a strong NCFM program is increasingly vital as the energy regime becomes more constrained. However, it's expected that future challenges that the NCFM will face cannot be predicted now, in an abundant energy regime.

The recommendation here is to maintain an open dialog between City Hall and NCFM management, to address obstacles that the NCFM will face over time.

### **1.1b – support NCFM expansion to year-round**

In the winters up to and including the winter of 2009-2010, while a few local farmers have been experimenting with year-round growing, there has not been enough food grown locally to merit a year-round NCFM.

Increased local use of season-extending techniques, such as greenhouses and high-tunnels, will basically be a prerequisite to any year-round NCFM. In 2009, the USDA offered grants for high-tunnels. The largest challenge with their use has been the county permitting process. One step towards this goal would be for the City to investigate ways to work with the County to eliminate the need for building permits to use high-tunnels.

### **1.1c – foster an ongoing City Hall relationship with local farmers, and ask them how City Hall can support them**

While a few specific suggestions have been made here, the most useful suggestions, directly from the farmers who are actually doing the work, can only come from a good working relationship and open dialog between City Hall and the farmers themselves.

Specifically, *we strongly suggest that a special meeting be called with City Council and local farmers* to begin the discussion. It might also help to request agenda items from local farmers beforehand.

### **1.1d – review / revise ordinances and regulations**

Many of the rules and regulations on the books now may only apply to an abundant energy regime. As energy becomes more scarce, and reliance on local food increases, rules and regulations enacted while energy was abundant may lose meaning and may stand in the way. We expect that many of these

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<sup>1</sup> <http://www.ncfarmersmarket.org>

obstacles will not become obvious until we meet them head-on; as long as these ordinances can be changed as needed, possibly on short notice, then City Hall is well positioned to respond to these challenges. Below are suggestions of some specific ordinances and regulations that could be revisited now, in order to prepare.

### **1.1d1 – incentives for landowners to make land available to farmers**

Despite the small size of Nevada City, there are some plots of land inside city limits, mostly in the form of large yards, that could be used to grow food on a larger-than-home-garden scale.

Often, the homeowner may want to have a farmer come work their unused land. These arrangements benefit the homeowner, the farmer, and the community. While these are completely voluntary arrangements – usually in the form of an invitation or request from the homeowner to the farmer – the municipality can help by finding incentives for homeowners to extend that invitation.

Incentives might come in the form of property tax discounts, water / utility bill discounts, or any number of other channels that have not been tried yet. As part of the ongoing dialog (1.1c), as well as continuing research from community groups and networks such as LFC and APPLE-NC, City Hall will be able to keep abreast of opportunities to enact these incentives as they come up.

### **1.1d2 – allow chickens / small livestock**

Different municipalities have different zoning regulations regarding small livestock. While there are considerations such as sanitation, public health, noise, etc. to take into account before thinking about changes to these regulations, the motivation is clear: small livestock, especially chickens, if managed responsibly, can provide a huge amount of resilience to a more constrained energy regime.

### **1.1d3 – support small-scale food processing and storage**

Very little food processing is performed in Nevada City – but Nevada City residents, like residents everywhere, rely largely on processed food. That is already an economic drain, and the transportation of processed foods into the area is already a large energy drain. Coupled with the fact that we are also dependent on the economic viability of grocery stores to supply us with those processed foods, our processed foods vulnerability is critical.

We strongly urge City Hall to watch for opportunities to incentivize locally owned and operated food processing and storage activities – especially at the home scale or neighborhood scale. As more of the population realizes that this sector holds solid business opportunity, City Hall may see opportunities to invite and incentivize these types of businesses.

### **1.1d4 – subsidize local farmer housing**

While local farms may be outside of city limits, the workers on those farms may live inside city limits. One of the most dire needs is for affordable housing for workers on local farms. The dialog with local farmers will be the best way to provide more detail and to come up with specific ideas on how to meet this need even as budgets become more constrained in the future.

**1.1e – publicize, promote and support community events like Soup Nights**

Local food-based community groups such as NCFM and Living Lands Agrarian Network have held several Soup Night fundraisers in Nevada City.

There are at least two clear benefits of these events: First, they help raise funds for the local food providers on which we are increasingly dependent as our energy regime becomes more limited. Second, they help strengthen community through the networking and fellowship that takes place at these events.

The City already does help promote events like this with literature on the front desk at City Hall. For the reasons above, keeping abreast of additional opportunities to help promote these events will provide increasing benefit to Nevada City as our energy regime becomes more constrained.

**1.2 – support home gardeners**

In early 2010, the APPLE Center for Sustainable Living carried out a food gardening survey of Nevada City residents. Some key findings from the survey:

- 101 respondents
- 80% of respondents are growing some of their own food
- most are unsatisfied with the results
- most want to learn more about growing food
- most want to learn more about composting

These results show clearly that the City's residents are begging for assistance in the home gardening realm. Providing support to this receptive audience would directly increase the City's resilience.

**1.2a – promote and support the APPLE Center for Sustainable Living as a hub for home gardening information and support**

It's clear from the survey results that many residents have definite intentions to grow some of their own food but could use a support network. The APPLE Center, which opened in September 2009 and held a two-month exhibit entitled “Reclaiming our Roots: Growing our food, growing our future”<sup>2</sup> in early 2010, has provided a physical location for people to learn more about the home gardening process and to have a face-to-face conversation with those directly involved in the home gardening movement.

An important note is that this recommendation did not originate from anyone on the staff or the board of directors of APPLE-NC. The Center has already generated its own momentum in the community.

**1.2b – allow chickens / small livestock - see 1.1d2**

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<sup>2</sup> <http://www.applecenter.org/programs/reclaiming-our-roots-project/>

## **2 – Emergency Preparedness**

Peak Oil presents a whole new set of challenges to the current concept of Emergency Preparedness or Emergency Management at the city level. Currently, most City and public perception of 'Emergency Preparedness' deals with responding to 911 calls resulting from a small-scale isolated event; anything beyond that scale can trigger a request for help from the County or the state. In a more constrained energy regime, the entire paradigm of Emergency Preparedness will likely shift considerably.

New planning considerations will likely include:

- What defines an 'emergency' in a constrained energy regime? Does a prolonged fuel shortage, or a prolonged massive gasoline price increase qualify as an 'emergency'?
- Duration of emergencies will likely be much longer. Current duration of an 'emergency' may be defined, for example, by the amount of time needed to get the ambulances to a crash scene and then to the hospital. Conversely, fuel supply emergencies may last for weeks or months or more. The entire way we think about emergency planning may need to change substantially in order to handle these 'long emergencies'.
- Securing a fuel supply for emergency response vehicles is currently something largely taken for granted (though some local backup fuel supplies are in place to handle short-term fuel shortages). While many current plans involve requesting more fuel from the state, to plan for a more constrained energy regime, prioritization of fuel needs for emergency response purposes will be critical.

### **Strengths**

- small geographical area: decreased response times; less area to patrol
- strong sense of community and helpfulness, especially in the city center

### **Vulnerabilities**

- high fire danger for five months of each year on average
- aging population may not be able to do the physical work to maintain defensible space
- aging population (highest per capita retiree rate in the state) may have special evacuation needs
- year-round potential for extended power outages due to fires, windstorms, and snowstorms
- potential for winter / spring runoff flooding in parts of the City along Deer Creek
- potential for flooding from dam breaks at Scott's Flat and Little Scott's Flat reservoirs
- loss of garbage collection in upstream outlying areas could result in illegal dumping in streams, causing pollution of City water supply / public health hazard

- food shortages may be aggravated and prolonged due to Nevada City's remoteness / lack of rail
- no hospital or primary medical facility in city limits
- small population may make Nevada City (as well as Grass Valley and Nevada County) a low priority for disaster response resources / funding from the state

### **Recommendations for Immediate Action**

<b>Recommendation</b>	<b>COST</b>	<b>BENEFIT</b>	<b>ACCEPTANCE</b>	<b>CONTROL</b>
<b>2.1 – develop definitions, criteria, and response plans for new, longer, energy-based emergencies</b>	<b>M</b>	<b>H</b>	<b>M</b>	<b>H</b>
<b>2.2 – develop and implement a CERT program (Citizens Emergency Response Training)</b>	<b>M</b>	<b>H</b>	<b>M</b>	<b>M</b>
<b>2.3 – liquid fuels</b>				
<b>2.3a – document fuel usage by agency</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>H</b>
<b>2.3b – develop a fuel supply allocation plan</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>H</b>
<b>2.3c – develop and maintain a list of emergency fuel supply agreements, locations, and contacts</b>	<b>L</b>	<b>H</b>	<b>M</b>	<b>H</b>
<b>2.3d – maintain an open dialog with the North Sierra Biomass Utilization Task Force to explore options for emergency fuel needs</b>	<b>L</b>	<b>H</b>	<b>M</b>	<b>M</b>
<b>2.4 – electricity</b>				
<b>2.4a – develop a list of resources that can continue to operate in a long-term electric grid failure</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>H</b>
<b>2.4b – assess critical electricity needs</b>	<b>L</b>	<b>H</b>	<b>M</b>	<b>H</b>
<b>2.4c – develop a backup electricity plan that is not dependent on gasoline or diesel</b>	<b>M</b>	<b>M</b>	<b>H</b>	<b>M</b>
<b>2.5 – human and material resources</b>				
<b>2.5a – identify local emergency management resources (human resources as well as supplies)</b>	<b>L</b>	<b>H</b>	<b>M</b>	<b>H</b>
<b>2.5b – develop a prioritized list of Nevada City's critical emergency response needs</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>M</b>
<b>2.5c – develop a 'buddy system' to make sure responders can get from home to work</b>	<b>L</b>	<b>H</b>	<b>M</b>	<b>M</b>
<b>2.5d – consider alternate modes of transportation for patrol and emergency response vehicles</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>H</b>
<b>2.5e – investigate cross-training for responders</b>	<b>M</b>	<b>H</b>	<b>L</b>	<b>M</b>
<b>2.6 – develop a comprehensive emergency food plan</b>	<b>M</b>	<b>H</b>	<b>M</b>	<b>L</b>
<b>2.7 – plan for emergency management and response funding cuts from higher levels of government</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>L</b>
<b>2.8 – plan for increased civil unrest</b>	<b>H</b>	<b>H</b>	<b>L</b>	<b>M</b>

## 2.1 – develop definitions, criteria, and response plans for new, longer, energy-based emergencies

Energy-supply and fuel-supply disruptions, whether cost-based, availability-based, or both, can have profound effects on the rest of society. These problems can easily qualify as emergencies in and of themselves, or alternately, as energy-related events that directly trigger many other specific emergencies.

We are already familiar with civil unrest as well as public health and safety emergencies triggered by prolonged blackouts or fuel shortages, giving us some level of experience to call on when implementing this paradigm shift.

The first steps to implement this far-reaching recommendation are to define and set the criteria for energy-based emergencies. The Task Force recommends that the City adopt and plan for the concepts of "fuel emergency", "food emergency", and "electricity emergency", if they have not already done so.

Determining the criteria for these emergencies (i.e., "what constitutes a fuel emergency?") is a much trickier ongoing process that will require frequent revision and will always be highly debatable - but it is important to have a well-defined 'line in the sand' to know when to trigger emergency responses.

Examples of some simplified hypothetical 'fuel emergency' criteria:

- the price of a gallon of gasoline at area stations has been more than twice minimum wage for two continuous weeks
- average closure time due to shortage at all local gas stations has been more than ten hours per week for each of the past three weeks
- Examples of 'food emergency' criteria:
  - average grocery store stock for the past week has been less than 25% of capacity
  - more than a third of local grocery stores close, with no impending prospects for reopening
  - the average local price of a loaf of bread has been more than minimum wage for a month
- Examples of 'electricity emergency' criteria:
  - more than half of the City's population has been without electricity for three consecutive weeks
  - PG&E reports that more than half of the ratepayers within city limits have been delinquent for the past three months

Detailed plans to respond to these emergencies are clearly beyond the scope of this Task Force or this document. The rest of the recommendations in this section all address this issue in general. If these type of emergencies do happen in the first place, their long duration will pose an added challenge.

The Task Force recommends that City emergency planners remain open to consultation with local community groups and subject area experts to develop plans for these longer-duration emergencies.

It may be that these long-term emergencies are fundamentally different enough from typical emergency planning that a new entity is needed to develop energy-emergency planning, and to provide for continuity of shorter-term emergency response needs within the context of the longer energy emergency.

## 2.2 – develop and implement a CERT program (Citizens Emergency Response Training)

Emergency response services (police, fire, and ambulance) may be highly impacted in a more constrained energy regime, leading to longer response times and reduced effectiveness, despite extraordinary efforts.

Encouraging and enabling individuals and community groups to provide for some of their own emergency needs may be one of the best ways to enhance the City's resilience to energy emergencies. In fact, Citizens Emergency Response Teams (CERT)<sup>1</sup> may be one of the best ways to improve a community's resilience to all emergencies, regardless of energy cost or availability.

As of press time, an online search for CERT programs within 50 miles of Nevada City<sup>2</sup> lists nine programs, including a Teen CERT<sup>3</sup> program serving Placer and Sacramento counties, and Nevada County CERT, listed online as follows:<sup>4</sup>

Nevada County CERT is a joint effort between the County Office of Emergency Services and the Public Health Department. Classes are offered several times per year and all Nevada County residents are welcome to attend. All classes are free of charge.

All local fire and law enforcement agencies partner with us in CERT as well as several churches and schools.

For more information on Nevada County CERT, please contact Patti Carter at 530-265-7174 or email at [patti.carter@co.nevada.ca.us](mailto:patti.carter@co.nevada.ca.us).

Nevada County CERT is endorsed by the County of Nevada. For more information on the County of Nevada, please contact Patti Carter at 530-265-7174 or email at [patti.carter@co.nevada.ca.us](mailto:patti.carter@co.nevada.ca.us).

The Task Force recommends that the City take all reasonable steps to foster a productive collaboration with Nevada County CERT, and seriously investigate all available options to ramp up local CERT awareness and trainings.

## 2.3 – liquid fuels

These recommendations refer primarily to diesel and gasoline, but could be extended in the future to encompass whatever types of fuel are used for the bulk of individual and commercial transportation.

### 2.3a – document fuel usage by agency

The Task Force recommends that the City collect and chart the annual liquid fuel consumption for each division of City services, and, wherever possible, for the private-sector businesses and service providers that are the most critical to the City's well-being. This information can be a guideline when creating or revising a fuel supply allocation plan.

1 <http://www.citizencorps.gov/cert>

2 <http://www.citizencorps.gov/cc/searchCert.do?submitByZip>

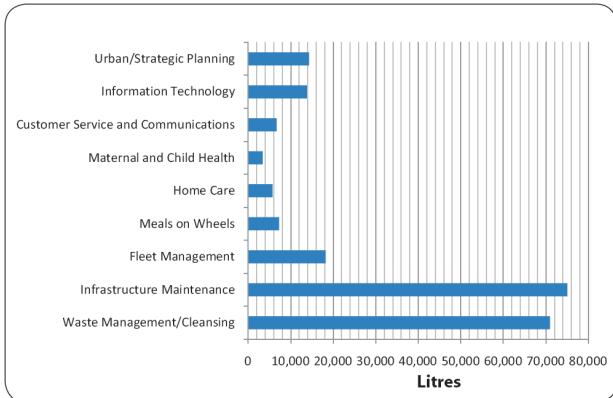
3 [http://srccc.org/teen\\_cert.htm](http://srccc.org/teen_cert.htm)

4 <http://www.citizencorps.gov/cc/showCert.do?id=13045&cert=>



The report from Maribyrnong, Australia (Figures 2.1 and 2.2) contains an excellent example. Note especially the relatively small consumption of City-run services as compared to contracted garbage collection services, which absolutely qualifies as a critical need.

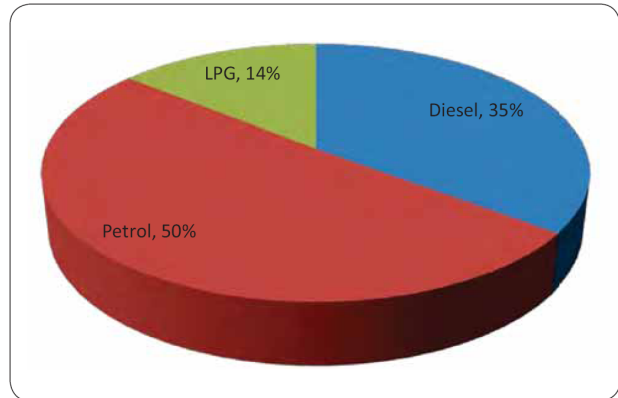
This recommendation is closely connected to the Municipal Services section of the report.



Council fuel use by selected service areas

Source: Compiled using data supplied by Maribyrnong City Council.

NB: Estimate for Garbage Collection (External Contractor) is 2,400,000 litres of fuel



Council Fuel Use Type

Source: Compiled using data supplied by Maribyrnong City Council, 2009

Figures 2.1 and 2.2<sup>5</sup>

### 2.3b – develop a fuel supply allocation plan

If a serious fuel shortage or fuel price spike occurs, the City's ability to continue providing services, as well as the operation of the City's economy, may be seriously impacted. A ready-to-use emergency fuel supply allocation plan may prove to be invaluable in a time of need.

Using the information from recommendation 2.3a, and from various other sources as needed, the City can generate a written emergency fuel supply allocation plan. This will likely be sensitive information and would probably warrant whatever privacy safeguards the City is legally allowed to take.

### 2.3c – develop and maintain a list of emergency fuel supply agreements, locations, and contacts

In the event of a fuel emergency, where can the City turn to get fuel needed to maintain critical services? Several of these arrangements and contacts may already be in place, and the City may develop more such contacts over time. However, if the knowledge of these contacts only exists in the brain of one or two individuals, the City's ability to actually access the fuel may be affected.

Points of information to be documented may include:

- contact person (multiple contact people would provide some redundancy)
- multiple methods of communication with the contact(s)
- expected amount of fuel

<sup>5</sup> “Maribyrnong Peak Oil Contingency Plan”, p. 55 – available on the Web Portal

- location of the fuel
- method of access to the fuel (required equipment, tools, etc.)

The Task Force recommends that City staff and officials generate some robust method to ensure that this information is both:

- redundant enough to ensure access in the event that some of the City workers cannot be found or cannot get to the required locations to access the fuel, and
- as secure and private as legally allowed, i.e. safeguarded by trusted individuals.

### **2.3d – maintain an open dialog with the North Sierra Biomass Utilization Task Force to explore options for emergency fuel needs**

While biomass cannot be expected to provide the amounts of fuel needed to operate the entire diesel-based portion of the local economy, some biodiesel might be available to continue the most critical services, including emergency services and some City services. There is currently no such locally-produced fuel supply in the Nevada City area. One effective option might be to install a local biodiesel refinery or converter, possibly at an emergency service depot.

The North Sierra Biomass Utilization Task Force produced a report in late 2009<sup>6</sup>, and discussions on this topic have been ongoing up to the time of the writing of this report. The City may wish to keep an open dialog with the Biomass Task Force, especially regarding emergency services fuel requirement quantities. APPLE-NC and other community groups can serve as a hub of communication in this regard, and can provide direct contact information as needed.

## **2.4 – electricity**

Reliable connection to the electric 'grid', with minimal downtime, has become a mainstay requirement of modern society and the modern economy. Widescale outages lasting longer than a few hours are extremely rare, but recent examples do exist that we can take lessons from. The following recommendations deal with the ability to maintain services of all sorts during an extended outage.

### **2.4a – develop a list of resources that can continue to operate in a long-term electric grid failure**

If a prolonged or catastrophic electric outage does occur, a ready-to-go list of facilities and resources that are still usable could be invaluable. This might be analogous to emergency offices and Red Cross offices in eastern coastal states maintaining a list of certified hurricane shelters.

Among other criteria, this list could be based on a list of facilities that do not use electricity in the first place, and facilities that already have renewables installed that are expected to continue to partially power the building even when the grid supply is down.

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6 “A Review of Biomass Utilization Technologies for Nevada and Sierra Counties”, December 28, 2009; available online at [http://apple-nc.org/biomass\\_report](http://apple-nc.org/biomass_report)

**2.4b – assess critical electricity needs**

These needs may be from City departments as well as some of the other private or public sector electric consumers that are most critical to the City's operation. Many of the items for this list may already be equipped with gas or diesel backup electric generators. Key data points for the list might be description, location and minimum consumption level for each critical need.

If appropriate, this list could be provided to the County, the state, PG&E, the California Independent Systems Operator, and any other relevant agencies so that they can have a clear, well-thought-out assessment of the critical electricity needs for use in an energy crisis. It can also help the City by clearly defining some priorities for installation of renewable electricity.

**2.4c – develop a backup electricity plan that is not dependent on gasoline or diesel**

Currently, most facilities (including businesses and individual households) that need a steady supply of electricity during electric grid outages use internal-combustion-powered generators, fueled by diesel or gasoline.

Peak Oil underscores at least a few vulnerabilities due to our gasoline and diesel dependence in this regard. First, the cost and availability of liquid fuel for the generators becomes more uncertain. Second, declining liquid and fossil fuels on a larger scale may lead to more, and longer-duration, electric grid outages – not just due to the fact that much of California's electric grid is powered directly by natural gas, but also due to the liquid fuel dependence of the maintenance and repair crews and equipment, the individual employees that oversee the grid, and so on.

Note carefully that the best way to increase resilience in this regard is to reduce consumption. This must absolutely be considered first, without question. After reduction, efficiency efforts should be explored to minimize loss wherever electricity is absolutely needed.

Finally, there are a few options to ensure backup electricity without use of conventional diesel or gasoline. A short list of ideas is given here, not intended to be exhaustive: building-scale renewables (wind, solar, geothermal, etc.); building-scale hydrogen fuel cells or other high-capacity electricity storage devices; local independent electric grids, coupled with local renewables or storage devices; biodiesel for existing generators, if possible<sup>7</sup>; capability to power the building from external electric sources like electric vehicles.

The Task Force recommends that a more detailed research effort be undertaken to find out which methods are appropriate for the facilities as prioritized in recommendation 2.4b.

**2.5 – human and material resources**

Human resources are an integral part of any social or business operation. Stranded staffers for any number of reasons present a serious vulnerability; energy scarcity increases the possibility of stranded or less mobile emergency staffers or emergency equipment.

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<sup>7</sup> It has been noted that biodiesel has a shorter usable storage lifetime than conventional diesel. This, along with other questions such as fuel quality control and safety should be considered when planning for any backup-only biodiesel stockpiles. Since the technology changes rapidly, updated research at implementation time is recommended.

### **2.5a – identify local emergency management resources (human resources as well as supplies)**

In an extended emergency that may necessitate accessing City facilities and infrastructure in non-standard methods, the knowledge and skill provided by City staff, especially public works employees, could be invaluable.

The Task Force recommends that the City compile and secure a list of these human resources, as well as the materials and equipment that might be needed in energy emergency scenarios. For redundancy, the list should be secured by the City, and several officials, staff, and/or employees should keep their own copy, away from City Hall.

### **2.5b – develop a prioritized list of Nevada City's critical emergency response needs**

Expanding on the list of materials and equipment from recommendation 2.5a, the Task Force recommends that the list be prioritized and shared with local and state agencies.

A more restricted energy regime, leading to strained emergency response services across the country, might also lead to greater redistribution of emergency response resources through inter-agency mutual aid requests. This type of list would serve as a very helpful guideline, both to help planners determine what aid to request, and to determine what aid can be provided to neighboring agencies. Additionally, the fact that this list would be designed specifically to ensure emergency service delivery within a constrained energy regime could provide a helpful context at the right time.

### **2.5c – develop a 'buddy system' or other backup plan to make sure responders can get from home to work**

When gas prices rise and remain high enough to impact the average citizen, then they will also by definition impact the average emergency responder. City Hall staff, public works crews, police, firefighters and more all share this vulnerability.

If emergency responders cannot get to work because gas is too expensive to fill their personal vehicles, then the City and the entire region are placed at increased risk. The Task Force recommends that emergency service providers be urged to develop backup plans to reliably transport emergency responders from their homes to their assigned posts in the event of a prolonged energy emergency. These plans could involve 'buddy systems', organized ridesharing or carpooling, keeping emergency response vehicles at home when appropriate, promoting options for responders to stay at the stations for longer periods of time, or other options that have not yet been considered.

### **2.5d – consider alternate modes of transportation for patrol and emergency response vehicles**

Hybrids and smaller vehicles have been tried in other cities around the state and country with varying levels of success, but concerns about performance, reliability, maintenance costs, and more are a serious part of the equation. Clearly, if and when the City decides to investigate these options, up-to-date research will need to be done at that time. APPLE-NC would be glad to help with that research.

This recommendation goes beyond the question of applying various technologies to the same general types of heavy four (or more)-wheeled vehicles. The Task Force recommends that the City remain open

to the topic of alternative modes of transportation for emergency response. Some of these modes are already in place. Options might include bicycle, Segway, motorcycle, scooter, horse, foot, etc. Many of these are not at all sufficient for the task at hand in an abundant energy regime, but if and when the choices become more desperate, these ideas may prove increasingly useful.

### **2.5e – investigate cross-training for responders**

Reduction in emergency responder travel could be realized by cross-training. For example, firefighters and police officers could be trained to respond to some level of medical emergencies, and vice versa. Locally, cross-training is already a goal, and has been implemented where budget allows. This already provides a huge benefit to the City and its residents. The Task Force recommends that the City consider reprioritizing the cross-training budgets where appropriate.

### **2.6 – develop a comprehensive emergency food plan**

The details of a comprehensive emergency food plan are beyond the scope of this document. The Food section of this report addresses the entire topic in more detail. Other local agencies, community networks, and groups such as the Local Food Coalition, Nevada County Grown, or the Nevada County Food Bank have more expertise in addressing this question.

The Task Force recommends that the City maintain an open dialog with these groups to provide for a much larger-scale emergency food plan.

### **2.7 – plan for emergency management and response funding cuts from higher levels of government**

If an energy emergency were to set in for a long period of time, the implicit assumptions that the state will provide for our needs may be proven incorrect, despite best good-faith efforts at all levels. Where does Nevada County lie on the priority list when the state must decide how to allocate emergency supplies in a longer energy emergency?

The Task Force recommends that the City urge local emergency responders to begin planning for extended emergency scenarios of all types when outside aid is not available or is greatly diminished.

### **2.8 – plan for increased civil unrest**

Detailed planning for scenarios of civil unrest is clearly not within the scope of this document. Police forces and other agencies already plan for these scenarios. However, planning for more frequent and possibly prolonged civil unrest, especially in a time when liquid fuel and human resources for the response are already stretched thin, may not have been done in Nevada City.

These scenarios could arise from any number of anticipated or unanticipated effects of a tighter energy regime. Several possibilities can be found in or derived from the various sections of this report. Examples might include a prolonged failure of regular garbage removal service, food shortage due to grocery store supply chain and transportation difficulties, or prolonged gas or diesel shortage or even a simple price spike.

The Task Force recommends that the City begin and maintain an open dialog with the local and regional Police and Sheriff departments along these lines. At some point, the City may actually want to instruct

the Police to make detailed plans for more frequent or prolonged civil unrest. Clearly, the Police force would not be able to develop such a plan without a clear understanding of the motivation and the possible scenarios, i.e. Peak Oil and its various local effects. APPLE-NC would be glad to help in the dialog in any way, especially by providing a presentation or discussion with the City and the Police.

### **3 – Local Economy**

One of the goals of City government during, and in advance of, a constrained energy future should be to support and facilitate a local economy that contains a measure of robustness against anticipated negative forces in the larger regional and national economies. This can come in such forms as relocalization of staple commodities where possible (for example, as discussed in the food section); encouraging relocalization by creating local currencies and “Buy Local” initiatives; helping to educate businesses (and consumers) on ways to remain economically viable in an environment of higher energy costs; and attracting and retaining businesses and industries that are expected to fare better in an environment of declining fossil fuel production (such as businesses and industries with a focus on sustainable or alternative products and technologies). Some of these changes will take a long time to develop, so it is recommended that these trends be encouraged well in advance of actual shortages and/or large sudden price increases. Even though the City is limited in how it can influence the marketplace, this transition to a more resilient local economy can be supported in many ways.

A note on the recommendations: A number of the recommendations in this section also appear in similar form in other sections of the report. The economy is a fundamental driving force in society and is intertwined with nearly all other activities. In a few cases, the economic aspects of some of the recommendations on other issues were significant enough that they warranted being re-examined from an economic perspective in this section.

A note on scope: Nevada City contains only a fraction of the population, businesses, and land area of western Nevada County, and as such represents only a portion of the total local economy. While this report focuses specifically on Nevada City, it should be noted that many recommendations to improve the health of the local economy would have much greater impact if implemented on a larger scale than just within the confines of Nevada City. Since Nevada City holds influence beyond its borders, many of the recommendations contain suggestions to encourage changes at other levels of government.

#### ***Strengths***

Although public awareness of Peak Oil issues is just beginning to grow, the Nevada City area has a long history of environmental and economic relocalization awareness which can be leveraged, since many of the end goals of these movements are similar. Many City residents are open to alternative approaches in energy use and transportation. There is a high level of volunteering to support numerous non-profit organizations. Nevada City, although composing only a portion of western Nevada County as a whole, nevertheless enjoys an amount of influence beyond its own City limits which is disproportionate to its share of the population.

#### ***Vulnerabilities***

Nevada City, and many businesses located within city limits, have been dependent on tourism, which is profoundly affected by gasoline prices and economic conditions in general. During the gas price spike in summer 2008, when gas prices approached \$5/gallon, the City’s Tourism Tax revenue dropped significantly. Also, Nevada City is small in land area, which poses some limitations on certain types of economic activities which may be land intensive or industrial in nature. Nevada City can, however, work to influence policies at the county level and higher.

## Recommendations for Immediate Action

Recommendation	COST	BENEFIT	ACCEPTANCE	CONTROL
<b>3.1 – support “Buy Local” initiatives</b>	<b>L</b>	<b>H</b>	<b>M</b>	<b>M</b>
<b>3.2 – investigate local currency</b>	<b>M</b>	<b>H</b>	<b>M</b>	<b>M</b>
<b>3.3 – support / recruit energy-resilient businesses</b>	<b>M</b>	<b>H</b>	<b>H</b>	<b>L</b>
<b>3.4 – encourage local manufacturing businesses</b>	<b>L</b>	<b>H</b>	<b>L</b>	<b>M</b>
<b>3.5 – encourage local food processing businesses</b>	<b>L</b>	<b>H</b>	<b>L</b>	<b>M</b>
<b>3.6 – organize “energy summit” for local business</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>H</b>
<b>3.7 – work with APPLE Center on green job support</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>H</b>
<b>3.8 – incorporate local economic considerations when defining triggers for this report</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>H</b>
<b>3.9 – support public transit plan development, focused on preserving the local economy</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>L</b>
<b>3.10 – support County transportation plan (public and private) development</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>L</b>
<b>3.11 – create energy conservation incentives</b>	<b>L</b>	<b>M</b>	<b>L</b>	<b>H</b>

### 3.1 – support “Buy Local” initiatives (such as “Think Local First Sierra Foothills”<sup>1</sup>)

Buy Local initiatives are being put in place across the country. These programs are documented to keep more money circulating in the local economy and prevent money from leaving the community, and to strengthen local businesses.

In addition to clear economic benefits regardless of energy regime, the specific connection to Peak Oil and a tighter future energy regime is this: supporting local businesses now increases the chances that they will still be in business when energy becomes constrained to the point that remotely owned chain stores pack up and leave. Under business-as-usual, practices such as predatory pricing and chain store grand-opening sales can put locally owned competition out of business; later, when the chain stores leave due to higher transportation costs, we will be without those locally owned stores. While there is no solid track record to prove this yet, as we are still in an abundant energy regime, the danger is real.

Buy Local initiatives can be supported and boosted by mechanisms such as local currencies and local food credits for landowners who allow farming of unused land (see specific recommendations below). The Task Force recommends that the City stay abreast of opportunities for specific ways to support Think Local First Sierra Foothills and any other “Buy Local” initiatives as they arise.

### 3.2 – investigate local currency

Local currency efforts across the nation (as an supplemental or substitute trading medium to the dollar) have had community-building benefits already. However, it is the Task Force's opinion that local currencies will not have a statistically significant uptake unless / until the dollar enters terminal decline.

<sup>1</sup> [www.localfirstfoothills.org](http://www.localfirstfoothills.org)



Since this is a distinct possibility as a consequence of a tighter energy regime, or for any number of other macroeconomic reasons, the Task Force recommends that the City investigate and keep abreast of options to be prepared for local currency implementation.

Local community groups will likely be able to provide the best input on the local currency topic as the situation changes. For instance, NC-GV Trademark<sup>2</sup> (a local currency effort in Grass Valley) was featured at an APPLE-NC Town Hall Meeting in 2008.

If and when a local currency becomes practical on a large scale, several benefits are expected to become clear. Because of the efficiency of a tighter economic loop, local currencies can often have a lower interest rate than the national rates, which can have a positive effect on the economy. On the supply side, construction work funded by local currency is more likely to result in use of local labor, which can reduce local unemployment. Special forms of bartering can also be put in place, such as a system of incentives for landowners getting local food credits (or other benefits) for allowing their unused land to be used by local farmers to grow food. A local currency would also increase the effectiveness of Buy Local initiatives, since the local currency establishes an internal trade barrier.

### **3.3 – support/recruit energy-efficient businesses**

Encourage, recruit, and support businesses and companies which are in industries that will be impacted less — or even possibly fare better — in an environment of declining fossil fuel production and availability. Such businesses or industries might include alternative energy and transportation technologies, green building products, energy efficiency experts and products, local processing/production of food, clothing, or other basic staples, etc. A larger percentage of Nevada City's economy is based on tourism compared to the County as a whole. Tourism can be expected to decline in an environment of much higher energy costs, and a diversification of the economy into “greener” businesses and industries could provide an extra measure of robustness. The City is encouraged to leverage the experience of local business development organizations such as the Nevada County ERC and various chambers of commerce in achieving these goals, and to also encourage such changes at broader governmental levels.

### **3.4 – encourage local manufacturing businesses**

Put forward policies friendly to the creation of local manufacturing facilities, especially for basic necessities that are the most vulnerable to fossil fuel shortages (e.g., items that weigh more or are shipped in over longer distances). Due to the City's small size, where possible the City should also encourage such policies at the county level.

### **3.5 – encourage local food processing businesses**

Due to the small size of the City and the possibility that it may turn out to be challenging to locate food processing plants within City limits, this may also involve working with the County to create a favorable environment for such businesses to develop.

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<sup>2</sup> [www.ncgvtrademark.org](http://www.ncgvtrademark.org)

**3.6 – organize “energy summit” for local businesses**

Host (or assist a group that would like to host) an “energy summit” for local businesses, with the goal of helping them conserve energy, lower their overhead, and otherwise remain economically viable in a more constrained energy regime accompanied by higher transportation and shipping costs, etc.

**3.7 – work with APPLE Center on green job support**

Certain types of jobs and specialties may become in higher demand as the cost of energy rises. Work with the APPLE Center to identify such “green jobs” that would make sense for our area, and encourage the creation of green jobs; create a memorandum of understanding with the APPLE Center to facilitate educational events when the City lacks resources to do the same; provide free access to Vet’s Hall for APPLE Center to conduct events where larger crowds are expected.

**3.8 – incorporate local economic considerations when defining triggers for this report**

Work with groups such as the ERC or Chamber of Commerce to ensure that local economic considerations are taken into account in the setting of triggers and responses defined in the emergency management section of this document. Determine if various triggers and responses are optimized to protect economic activity as much as possible during a crisis situation.

**3.9 – support public transit plan development, focused on preserving local economy**

Encourage and support the creation of a public transit master plan, which would be most effective if done at the county level. Such a plan would examine the public transportation needs and usage patterns and adjust the delivery of public transit based on demographics and other variables such as fuel cost trends. Although many of the specific issues that a public transit plan would need to address are outlined in the transportation section of this document, efficient public transportation will be important to the robustness of the local economy in an era of higher fuel costs.

**3.10 – support County transportation plan (public and private) development**

As fossil fuel prices rise, a larger share of local wealth will be lost to fuel costs. Most of the money spent on fossil fuels leaves the City/County since there are no (and won't ever be any) oil companies or gasoline or diesel refineries located here. Money spent on gas in single-occupant vehicles at extremely high fuel prices is money that is not available to be spent on local, re-localized, alternative, and sustainable products. Public transit is most economically efficient when fully utilized. A transportation master plan would defer to specific plans, such as the bicycle master plan or public transit master plan, for details, but would help encourage these plans to interact with each other in an economically efficient way. A transportation master plan could promote improved economic efficiency in private as well as public transportation by providing mechanisms to facilitate such things as car and van pooling, bicycling, car and truck sharing, use of EV's, more efficient transport and delivery, etc.

**3.11 – create energy conservation incentives**

Consider creating some form of economic incentives for lower energy or fuel consumption. An example of this might be higher parking fees.

## **4 – Transportation**

### ***Strengths***

- small walkable size of Nevada City limits
- strong sense of community
- County bicycle master plan already exists

### ***Vulnerabilities***

- sprawl and lower population density outside of city limits affects demand for public transit
- limited public transit options
- poor bicycle and pedestrian infrastructure
- hills
- far from major big-city services / distribution centers
- supply chain is completely dependent on trucking (no rail, no boats, no air freight)
- large aging population with different transportation needs (Meals on Wheels, Telecare, etc.)

Nevada City's location, 15 miles from the nearest rail service (in Colfax), and 60 miles from the nearest shipping channels and major distribution centers (port of Sacramento), raises the serious question of whether this area can sustain its current population under a tighter energy regime.

### ***Rail***

Rail service was a major enabler for growth in our area's population and economy, especially before the advent of cars and trucks.

In the 1850s, our area was developed as a major gold mining town. In 1876, the Nevada County Narrow Gauge (NCNG) railroad began service connecting Nevada City and Grass Valley to Colfax.

Passengers and freight, including more than \$200 million in gold bars produced in our region, used the railway for well over half a century. NCNG service was shut down in 1942 in anticipation of gold mine closure during World War II.

The idea of bringing rail service back to the region has been brought up several times recently. While there are serious challenges to overcome in terms of public acceptance, right-of-way, permitting, funding, and much more, it is an open question that may directly affect the very ability of our region to continue to exist as a center of population in a more constrained energy regime. The Task Force encourages the City to continue this open dialog over the course of time.

**Recommendations for Immediate Action**

<b>Recommendation</b>	<b>COST</b>	<b>BENEFIT</b>	<b>ACCEPTANCE</b>	<b>CONTROL</b>
<b>4.1 – reprioritize land use decisions by integrating transportation issues in all planning</b>	<b>L</b>	<b>H</b>	<b>M</b>	<b>H</b>
<b>4.2 – increase allowable density in transit-ready areas</b>	<b>L</b>	<b>H</b>	<b>M</b>	<b>L</b>
<b>4.3 – increase bicycle accessibility</b>				
<b>4.3a – implement the County bicycle master plan</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>H</b>
<b>4.3b – prioritize the uphill direction when adding new bike lanes</b>	<b>L</b>	<b>H</b>	<b>M</b>	<b>M</b>
<b>4.3c – sponsor a contest for local welders to make decorative and effective bike racks</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>H</b>
<b>4.3d – keep bike lanes clean, clear, and smooth</b>	<b>M</b>	<b>M</b>	<b>H</b>	<b>M</b>
<b>4.3e – educate bikers and motorists (especially student drivers) about safe bicycle behavior</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>M</b>
<b>4.3f – investigate local bike commuter incentives</b>	<b>M</b>	<b>H</b>	<b>M</b>	<b>H</b>
<b>4.3g – consider converting car parking to bike parking / 'bike corrals'</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>H</b>
<b>4.4 – investigate/promote rideshare options</b>	<b>L</b>	<b>H</b>	<b>M</b>	<b>H</b>
<b>4.5 – investigate/promote carshare options</b>	<b>L</b>	<b>H</b>	<b>M</b>	<b>H</b>
<b>4.6 – appoint a committee to investigate local use of alternative fuels</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>H</b>
<b>4.7 – provide education in meal planning and purchase planning to reduce number of car trips</b>	<b>M</b>	<b>M</b>	<b>H</b>	<b>M</b>
<b>4.8 – host social competitions to encourage fuel conservation</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>H</b>
<b>4.9 – encourage aggregate propane purchasing</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>M</b>
<b>4.10 – apply for grants to install EV-ready parking meters</b>	<b>M</b>	<b>H</b>	<b>H</b>	<b>H</b>
<b>4.11 – encourage and support local online shopping and delivery options</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>H</b>

#### **4.1 – reprioritize land use decisions by integrating transportation issues in all planning**

Land use planning is the very basis for our transportation needs. While there may not be much unused land inside city limits, the redevelopment projects that are considered over the course of time will always determine transportation needs.

At a national level, the advent of sprawl and 'suburbia', made commonplace in the decades following World War II, has made us much more dependent on cheap abundant liquid fuel for our transportation needs. In Nevada County, sprawl in the form of 'outlying residences' has had much the same result: while the population of Nevada City is about 3,000, the population of our 95959 zip code is about 18,000.

Reducing sprawl will directly reduce our transportation needs, thereby increasing our resilience to a tighter energy regime. The Task Force recommendation here is twofold:

- prioritize higher-density development for any projects that do happen inside of city limits
- encourage the County to do the same, via letters of support and any other channels available

#### **4.2 – increase allowable density in transit-ready areas**

Public transportation works best in areas of higher population density. While western Nevada County as a whole is currently at a major disadvantage in this regard due to our low population density, future developments and redevelopment projects can change the equation.

When development projects are planned in areas that already have good public transit access, the best way to take full advantage of that access is to increase the project's allowable population density. Planning agencies across the country have been building a knowledge base of elegant, vibrant ways to accomplish this goal. Even small increases in allowable density can have huge transit benefits.

The Task Force recommends that relevant best-management practices from other communities regarding access to public transit be investigated when any new development is considered: even if the area to be developed is not already amenable to public transit, the development project itself may have the potential to create a new public transit hub.

#### **4.3 – increase bicycle accessibility**

Encouraging bicycle commuting is one of the best ways to increase the City's resilience to a tighter energy regime. Transportation of workers and customers to the places where commerce happens is the very foundation of any economy. Providing for that transportation in a world of more expensive or less available gasoline and diesel is a direct path to bolstering the City's economy.

##### **4.3a – implement the County bicycle master plan**

In 2007, the Nevada County Transportation Commission, contracting to Alta Planning and Design, completed the Nevada County Bicycle Master Plan<sup>1</sup>. Local bicycle advocacy groups – recreational as well as commuting – were involved in the process. Certain state funding opportunities for bicycle

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<sup>1</sup> Available on the Nevada County Transportation Commission web page: <http://www.nctc.ca.gov/Reports/Pedestrian--Bicycle-Reports/index.html>

improvements are only available to communities that have official bicycle master plans.

As with implementation of any other plan, there are challenges to implementing the bicycle master plan, including studies, approvals, specifications, environmental review, and funding. Section 6.1 of the master plan, copied here, contains a quick list of the general steps that need to be taken to turn the listed project plans into reality:

The steps between the concepts identified in this Plan and final completion vary from project to project, but typically include:

1. Adoption of this Plan by the Nevada County Transportation Commission, Nevada County, City of Grass Valley, Nevada City and the Town of Truckee.
2. Completion of a project level Feasibility Study, which typically includes preliminary design, environmental analysis, alternatives analysis, related agency coordination, local staff, or by consultants. The final product should yield a preferred design alternative, environmental clearance, and an accurate cost estimate.
3. Approval of the preferred project by the local governing board, including acceptance of any environmental documentation. Local agency typically must commit to providing 10% of the project cost, and assume responsibility for the cost, operation, and liability for the project.
4. Funding applied for and obtained for the project. Typically, all environmental work must be completed, local approval obtained, and the right-of-way in public control.
5. Completion of final Plans, Specifications, and Estimates (P,S&E). Once completed, bids for construction services can be obtained.
6. Construction of the Project.

The concepts of a tighter economy or a more constrained energy regime were not a part of the bicycle master plan. The Task Force encourages the City to weigh the challenges of implementing these projects against the specific benefits to a more orderly transportation network under any energy regime, but especially as times get much tighter, likely leading to dramatic increases in bicycle traffic.

While the bicycle master plan clearly provides a huge benefit, the Task Force additionally recommends that the City consult local bicycle advocacy groups whenever it begins to consider implementing any of the projects in the master plan.

#### **4.3b – prioritize the uphill direction when adding new bike lanes**

One of the greatest perceived impediments to bicycle commuting in our area is the consistently hilly and often steep terrain. While lower gears available on mountain bikes can help make hill-climbing much easier, the reality is that “the hills” will always be one of the most common excuses for lack of desire to commute by bicycle in our area.

In addition to the perceived difficulty, hills do pose a safety concern for bicyclists, which can be addressed. The differential speed between bicycles going uphill and the cars closest to them will be

much greater than for bicycles going downhill. High differential speeds between bicycles and the cars next to them increase the safety risk to both the bicyclists and the motorists.

On many downhills, bicycles can often maintain the speed limit, making some downhill bicycle lanes unnecessary. Omitting downhill bicycle lanes can save money, and can save space, possibly making some bicycle lane projects feasible that were previously ruled out due to lack of available space when bicycle lanes in both directions were taken as a 'given' requirement of the project.

The Task Force suggests that whenever bicycle lane projects are considered, local bicycle advocacy groups be consulted to help determine whether downhill bicycle lanes are needed. In addition, the Task Force recommends that the City keep in mind that only adding an uphill bicycle lane is much better than adding no bicycle lanes at all.

#### **4.3c – sponsor a contest for local welders to make decorative and effective bike racks**

As of the writing of this report, there are very few bicycle racks in Nevada City. The need for bicycle racks at strategic, convenient locations is clear. If a bicycle rack is added in an inconvenient location, even if only a few extra feet out of the way, then closer options such as light posts or parking meters will likely be used instead – often blocking the sidewalk.

Hosting a decorative bicycle rack contest might be one way to accomplish several goals at the same time: public art and beautification, functional bicycle parking, and even a tourist attraction.

If this option is pursued, especially inside the historic district, the Task Force recommends that the City, as well as contest entrants, consult with local bicycle shops and local bicycle advocacy groups to determine the most functional designs for our area.

#### **4.3d – keep bike lanes clean, clear, and smooth**

Various hazards in bike lanes can cause cyclists to divert into the main traffic lane, creating direct hazards for both cyclists and for motorists. These hazards might include:

- debris after winter storms
- potholes, cracks, bumps, or other disrepair
- drainage grates with grooves parallel to the bike lane (perpendicular grates are available)
- encroaching vegetation from roadside bushes, trees, landscaping, etc.

The Nevada City public works department previously investigated the purchase of a bike lane cleaning attachment for the street sweeper. It was decided against due to numerous obstacles such as light posts and parking meters in the bicycle lane area. There may be other options for cleaning the bike lanes, which might include making a second pass with the street sweeper, cleaning by hand (a worker with a pushbroom), or other options not yet thought of.

#### **4.3e – educate bikers and motorists (especially student drivers) about safe bicycle behavior**

A more constrained energy regime will lead to higher gasoline prices, causing more of the population to look for ways to commute other than by car. The number of bicycles on the road will likely increase. The need for safer car-bike interactions will become paramount to maintaining a functioning local

economy. Even in an abundant energy regime, this need is evident.

The Task Force recommends that the City work proactively with local bicycle advocacy groups, especially bicycle commuting advocacy groups, to help distribute information on safe bicycling. Specifically, the information could be distributed through the school systems and through any third-party driver training companies. In addition, the City could encourage the State Department of Motor Vehicles to increase its education efforts on safe driving around bicyclists.

#### 4.3f – investigate local bike commuter incentives

In 2008, the Bicycle Commuter Act was signed into law (after a seven-year wait) as a part of larger renewable energy legislation.<sup>2</sup> As it turns out, there have been so many roadblocks to eligibility – largely centered around the fact that employers must choose to sign up for the tax break program – that there has not been widespread adoption.<sup>3</sup>

As a result, several communities have undertaken their own bicycle commuter incentive packages, including Yolo county.<sup>4</sup> High population levels or densities are not needed to see the benefit from these packages. While creative financing may be needed, local bicycle advocacy groups could be enlisted to help the City brainstorm these ideas.

In addition to the clear and immediate benefits of reducing local traffic congestion, reducing local air pollution, and improving the health of local citizens, these incentives will help to build a larger base of experienced bicycle commuters and advocates – clear assets under a more constrained energy regime.

#### 4.3g – consider converting car parking to bike parking / 'bike corrals'

According to a 2010 Portland State University report on the success of 'bike corrals'<sup>5</sup>:

A bicycle corral ... generally consists of 6-12 bicycle staple racks (inverted U-shaped racks) that lie either diagonal or perpendicular to the roadway (see Fig. 4.1). The corral is the same width as the parking lane and 1 to 2 parking spaces long. The corral does not extend into the pedestrian zone, or frontage area, and is not elevated above the existing roadway grade.

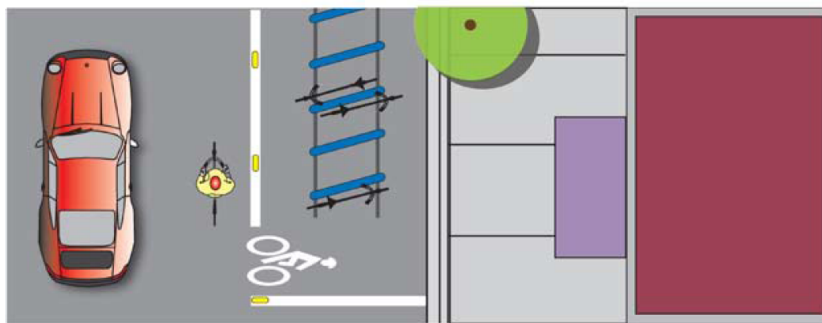


Figure 4.1 - Bike Corral (Meisel, 2010, p.2)

2 <http://www.bikeleague.org/news/100708faq.php>

3 <http://bikeportland.org/2009/01/27/blumenauer-will-work-to-improve-bike-commute-tax-benefit/>

4 [http://yolotma.org/pages/incentives\\_bicycle.html](http://yolotma.org/pages/incentives_bicycle.html)

5 “Bike Corrals: Local Business Impacts, Benefits, and Attitudes” (2010) Drew Meisel, Portland State University, School of Urban Studies and Planning [http://bikeportland.org/wp-content/uploads/2010/05/PDX\\_Bike\\_Corral\\_Study.pdf](http://bikeportland.org/wp-content/uploads/2010/05/PDX_Bike_Corral_Study.pdf)



Bicycle corrals have had great success in other areas. For example, Portland, Oregon has a permitting process for businesses that request bicycle corrals.<sup>6</sup> Considering that bicycle riders spend money in local businesses; that bicycle trips are expected to increase dramatically as gas prices increase; that 6 to 12 bicycles can fit in the space otherwise reserved for only one car; and that many car trips are made with only the driver and no passengers, bike corrals could provide a large economic boost to the area, for a relatively low installation cost. Social, aesthetic, and behavioral benefits are immediate.

The Task Force recommends that the City seriously consider installation of one corral (that is, 6 U-racks, or parking for a maximum of 12 bicycles) in a central location, perhaps across from City Hall.

#### **4.4 – investigate/promote rideshare options**

Ridesharing, or carpooling, offers a direct and immediate reduction in fossil fuel needs for transportation. Ridesharing will probably not become widespread in an abundant energy regime. In a tighter energy regime, spontaneous ridesharing will happen everywhere, but lack of organized ridesharing may become a serious obstacle.

Planning now to organize rideshare options has the potential to dramatically increase the effectiveness of future widespread ridesharing.

One of the best opportunities for widespread organized ridesharing is presented by parents driving their children to and from school. In fact, some organized carpooling already takes place even in a relatively abundant energy regime. The City could encourage local schools to provide assistance to parents who want to engage in organized carpooling.

In the workplace, several municipalities and many employers provide direct incentives to workers who carpool, in the form of 'points', credits, or even cash. Certain federal guidelines may provide for reimbursement to the employers, in the form of tax breaks, for offering carpooling incentive programs to their employees. Since this is a fairly dynamic area of federal and state law, with new tax credits for ridesharing, the Task Force recommends that the City look to local community groups for suggestions to promote organized ridesharing for the workplace.

There is also plenty of precedent and opportunity to form municipal organized ridesharing networks that are not conducted by schools or by employers. Just a few notable examples include Casual Carpooling<sup>7</sup> and 511 RideMatch in the San Francisco Bay Area<sup>8</sup>, Rideshare Etc. in Madison, Wisconsin<sup>9</sup>, and iRideShare in San Luis Obispo county<sup>10</sup>. It may also be an option to enable a local 'portal' of larger online rideshare websites such as erideshare.com. Local community groups could be enlisted to possibly help the City set up these features on its website.

#### **4.5 – investigate/promote carshare options**

Carsharing is basically a form of community car rental, where the car is rented for shorter periods of time, usually measured in hours. Carsharing programs exist in many cities around the country and around the world. Even in an abundant energy regime, carsharing programs gain popularity where

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6 <http://www.portlandonline.com/transportation/index.cfm?a=250076&c=34813>

7 <http://rideshare.511.org/carpooling/casual.asp>

8 <https://www.ridematch.511.org/SanFrancisco/>

9 <http://www.cityofmadison.com/rideshare/>

10 <https://www.irideshare.org>

population density is high enough, and distance to services is low enough, to make car ownership a hassle. High population density also ensures enough demand to make carsharing an attractive business opportunity for new entrepreneurs.

While rural and lower population density areas such as Nevada City pose serious challenges to the feasibility of carsharing, it is important to note that demand may increase quickly as the energy regime becomes significantly more constrained. In addition, even in a more abundant energy regime, there may be considerable demand for a trucksharing plan, to make occasional trips to the garbage transfer station or to haul other heavier or bulkier goods.

The Task Force recommends that the City investigate carshare and truckshare options now, even if implementation may not become feasible until gas prices reach and stay above a certain level. Local nonprofits would be happy to help the City with this investigation.

#### **4.6 – appoint a committee to investigate local use of alternative fuels**

Currently available 'alternative fuels' include biodiesel, vegetable oil, corn-kernel ethanol, other forms of ethanol, natural gas, propane, battery-electric, and more. The list is expected to grow in the future as alternative fuel research matures.

Each of these alternative fuels may offer opportunity to reduce dependence on oil, but each type of fuel presents a wide variety of pitfalls, costs, and hazards, and many may even be more harmful to the economy and to the environment than conventional gasoline or diesel. A huge amount of due diligence must be exercised before advocating any alternative fuel for any given situation.

Two main concepts must be kept in mind before any alternative fuel is recommended:

1. The incredible energy density, portability, versatility, and relative safety of oil and oil products (such as gasoline, diesel, and jet fuel) are extremely hard to compete with. No currently available alternative fuel comes close. This means that we may be lulled into thinking that we can just “swap” gasoline for, say, ethanol. In fact, the lower energy density, the massive agricultural runoff, the less-than-one net energy returned on energy invested ratio, and other detriments of corn-kernel ethanol make it a much worse option than gasoline.
2. No alternative fuel will ever provide as much benefit as simply reducing the amount of weight that we transport. Chasing alternative fuel options may decrease dependence on gasoline, but may unwittingly increase dependence on land consumption, petroleum-based fertilizers, fresh water resources, and other forms of energy.

Nevertheless, alternative fuels may be important when there are no other options for high-priority transportation needs. For example, emergency service depots (fire stations, police stations, hospitals) could benefit from on-site biodiesel storage – or even on-site biodiesel refineries – in a severely constrained energy regime or long-term gasoline or diesel shortages or outages.

Every location has its own alternative fuel considerations, such as amount of available biomass, access to ethanol pipelines, access to propane fueling stations, power needed to drive in the local terrain, and so forth.

The Task Force recommends that the City form a committee of local subject-area experts from various fields to address the topic and to make optimal local alternative fuel recommendations. This is also

likely to be a dynamic question, so the committee should re-evaluate its recommendations on a regular basis.

#### **4.7 – provide education in meal planning and purchase planning to reduce number of car trips**

In a tighter energy regime, we will all be looking desperately for new and easy ideas to reduce the number of car trips needed to go about our daily business. There are many 'low hanging fruit' ideas that would be easy to implement at any time, but lack financial incentive in an abundant energy regime. This is just one such idea.

An inherent recommendation throughout this document is to maintain the critical thinking skills needed to continually develop and explore more of these ideas as the need arises. Additionally, in this case, the Task Force specifically recommends working with local nonprofits to advertise and distribute readily available information on meal planning and purchase planning for vehicle trip consolidation.

#### **4.8 – host social competitions to encourage fuel conservation**

Different people will have different motivations for conserving fuel and driving less. While some individuals are 'elastic consumers', meaning they will cut consumption significantly as prices go up, others are 'inelastic consumers', meaning a considerable price rise will not alter their consumption patterns very much. Due to our dangerous dependence on oil, but especially on gasoline and diesel in this context, it's reasonable to expect that most consumers will be fairly inelastic: a doubling in the price of gasoline would not necessarily lead to a 50% reduction in the amount of driving. This can be expected to be the case across all income levels, since gasoline is seen widely as a 'need'.

Therefore, other forms of motivation may be necessary, even as prices rise significantly.

Again, critical thinking skills will be essential in order to search out and explore new opportunities for external motivators as the need arises.

A series of social competitions, hosted by the City, could be one method to provide some fun external motivation. The Task Force recommends that the City solicit ideas from local nonprofits for safe, sane, practical fuel-conservation social competitions that would actually engage people from all walks of life.

#### **4.9 – encourage aggregate propane purchasing**

Building a more resilient transportation network involves not only transport of people, but also transport of goods. Propane delivery to residences is a prime example and a prime opportunity, since it has a stable customer base and a steady demand.

As the economy gets tighter, propane companies will be incentivized to optimize their routes and consolidate their trips whenever possible. The Task Force recommends that the City help jumpstart this process, and make it more optimal, by encouraging citizens and neighborhoods that use propane to engage in aggregate propane purchasing.

Nevada City, Grass Valley, and Nevada County could partner to further research this idea and distribute information to residents in areas with a high density of propane purchasers, such as Lake of the Pines, Lake Wildwood, Alta Sierra, etc. Areas that already engage in aggregate propane purchasing could be used as examples to learn from.

For another example of aggregate purchasing opportunity, see Recommendation 5.9: “investigate water / wastewater treatment chemical supply chain vulnerability”.

#### **4.10 – apply for grants to install EV-ready parking meters**

The US Department of Energy (DoE) and the California Public Utilities Commission, among other state and federal agencies, have already awarded several grants geared towards installing electric-vehicle and plug-in hybrid infrastructure, in the form of charging stations. This infrastructure can be as simple as replacing parking meters with EV-ready parking meters, where the user can plug their car into the meter to charge for a per-minute fee.

Beginning in late 2010, DoE is planning massive increases in its funding opportunities for EV charging infrastructure.<sup>11</sup> While the only partnering California city in the referenced plan is San Diego, it's expected that this plan will extend beyond the 'partnering cities' before the project ends in 2013, and that other similar DoE-funded projects will continue the EV infrastructure funding after this project ends.

The Task Force recommends that the City develop a list of locations that would be best for EV-ready parking meters, in order to be ready for any EV-meter installation grants that become available.

#### **4.11 – encourage and support local online shopping and delivery options**

This is another form of ridesharing for goods that are delivered to residences – similar to the aggregate propane purchasing described in Recommendation 4.9, and municipal aggregate purchasing described in Recommendation 5.9. In contrast, this recommendation refers to goods that are not purchased under contract, but are instead purchased locally as needed, and are typically purchased much more frequently than something like propane. For example, this model could be applied to groceries, convenience store items, department store items, and more.

This model holds potential for massive fuel savings, but only if the deliveries are carried out in a smart and carefully planned manner to reduce the number of vehicle trips needed and the number of miles driven. Since this level of detailed planning is beyond the scope of City Hall, the Task Force recommends that the City actively encourage and support local start-up businesses that want to pursue this model – provided that they can make a strong case to show steady demand under a tighter energy regime, and a net savings in vehicle trips and miles driven as compared to the current situation of each resident making their own trips.

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11 Presentation to US DoE: “Electric Drive Vehicle Demonstration and Vehicle Infrastructure Evaluation”, June 9, 2010: [http://www1.eere.energy.gov/vehiclesandfuels/pdfs/merit\\_review\\_2010/veh\\_sys\\_sim/vssarravt066\\_karner\\_2010\\_p.pdf](http://www1.eere.energy.gov/vehiclesandfuels/pdfs/merit_review_2010/veh_sys_sim/vssarravt066_karner_2010_p.pdf)

## 5 – Municipal Services – Water, Sewer, Garbage

### ***Strengths***

- all of Nevada City's fresh water is gravity-fed, and treatment can continue without electricity
- all of Nevada City's sewage is gravity-fed (though pumps and blowers are needed for treatment)

The energy and complexity savings due to these facts is incredible. Nevada City does not use any pumps or lift stations for transport of either fresh water or wastewater. For comparison, Sebastopol, California (2000 pop. 7,774), which shares the Laguna wastewater treatment plant with Santa Rosa, Cotati, and Rohnert Park, used 148.1kWh (kilowatt-hours) in FY 2005-2006 to power its own sewage lift stations at a cost of \$19,000<sup>1</sup> – plus maintenance costs (parts as well as labor).

- 'micro-hydro' turbine on wastewater outflow offsets about 5% of the plant's electricity needs (there was a learning curve to getting this system operational, mainly involving solving the problems of cavitation buildup and debris in the stream; now, however, the system is robust)
- freshwater treatment plant is already modular, and can be downsized easily in the event of population decline
- Nevada City has no disproportionately large single-customer water consumers, making water treatment a more stable, predictable, and well-diversified consumer of resources
- Nevada City 'owns its watershed,' i.e. does not have to purchase water for most of the year

### ***Vulnerabilities***

- aerobic digesters at wastewater plant do not allow for biogas capture<sup>2</sup>
- western county trash removal is currently outsourced

### ***A Word About Water***

Assertions about Nevada City's fractured rock geology and lack of local aquifer to be recharged have brought up the question of the relative importance of water conservation efforts in town as compared to other areas with local aquifers. In addition, the argument has been made that the best way to prevent downstream suburban sprawl is to use more water here in western Nevada County so that there is less surplus available for downstream sale.

While a complete discussion is beyond the scope of this document, the consensus is that conservation is of the highest importance, regardless of Nevada City's geology or concerns about downstream users.

Nevada City's watershed dries up every year during the summer, for a period of at least a few months. For that period of time, the City buys untreated water from NID (Nevada Irrigation District).

Discussions have brought up the point that it may be more optimal to shut down the Nevada City water treatment plant and instead buy treated water from NID for the entire year. Again, a complete discussion of that question is beyond the scope of this report – but, staff does recommend that City Hall keep an open mind towards continually finding the most optimal and resilient solutions in this regard.

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<sup>1</sup> “Charting a Path for a New Energy Future for Sebastopol” (Apr. 2007) – Section E, pp. 37-39

<sup>2</sup> Discussion of aerobic vs. anaerobic digestion: [http://en.wikipedia.org/wiki/Sewage\\_sludge\\_treatment](http://en.wikipedia.org/wiki/Sewage_sludge_treatment)

## Current Municipal Service Figures

### Fresh water treatment plant

- **Typical demand:** ~0.4 MGD (million gallons per day)
- **Peak demand:** ~1.5 MGD
- **Electricity usage:** 120,450 kWh/yr (kilowatt-hours per year)
- **Chemical usage:** see Table 5.1
  - **NOTE:** Chlorine is by far the highest priority of these chemicals. Muriatic acid, lime, and alum are primarily used to reduce turbidity, which is frequently already low enough in the untreated water.

Chemical	Shipped From	Miles	Amount per year	Cost per year
Chlorine	Sparks, NV	88	24-28 150-lb. cylinders	\$4,200
Muriatic Acid	Sparks, NV	88	24 gallons	\$1,000
Lime	AZ / TX / MS	600-1800	5000 lb.	\$1,800
Alum	SF bay area	~130	4500 gallons	\$5,000

*Table 5.1: Nevada City fresh water treatment plant chemical usage*

### Wastewater treatment plant

- **Permitted capacity:** 0.69 MGD (million gallons per day)
- **Typical sunny-day flow:** 0.35 – 0.45 MGD
- **Electricity usage:** 669,600 kWh/yr
  - **NOTE:** of that, 26,000 kWh/yr is generated on-site by micro-hydro at the outflow
- **Natural Gas usage:** 1,314 therms per year
- **Diesel usage:** 150-200 (minimum) gallons per year
- **Chemical usage:** see Table 5.2

Chemical	Shipped From	Miles	Amount per year	Cost per year
Polymer	Richmond, CA	131	3,500 lb.	\$6,000
Chlorine	Stockton, CA	108	6 1-ton cylinders	\$3,300
Sulfur Dioxide	Stockton, CA	108	6 1-ton cylinders	\$3,300
Sodium Hydroxide	West Sacramento, CA	64	990 gallons	\$17,100
Calcium Hydroxide	West Sacramento, CA	64	36,000 lb.	\$2,700

*Table 5.2: Nevada City wastewater treatment plant chemical usage*

### Garbage removal service

As of May 2010, Waste Management prefers not to disclose the amount of diesel used in local garbage service. Waste Management in western Nevada County only uses conventional diesel.

### **Recommendations for Immediate Action**

<b>Recommendation</b>	<b>COST</b>	<b>BENEFIT</b>	<b>ACCEPTANCE</b>	<b>CONTROL</b>
<b>5.1 – find incentives to reduce trash</b>				
<b>5.1a – REDUCE: pay-as-you-throw incentives</b>				
<b>5.1a1 – increase the 'mini can' discount</b>	<b>L</b>	<b>H</b>	<b>M</b>	<b>L</b>
<b>5.1a2 – advertise the 'mini can' option</b>	<b>L</b>	<b>L</b>	<b>H</b>	<b>L</b>
<b>5.1b – REUSE: promote Swap Shop / Flea Markets</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>L</b>
<b>5.1c – RECYCLE: recycle bank / incentive-based</b>	<b>L</b>	<b>H</b>	<b>M</b>	<b>M</b>
<b>5.2 – investigate reduced trash pickup frequency</b>	<b>L</b>	<b>H</b>	<b>L</b>	<b>H</b>
<b>5.3 – investigate dedicating one digester tank to food waste, to make finished compost</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>M</b>
<b>5.4 – promote graywater usage</b>	<b>L</b>	<b>H</b>	<b>M</b>	<b>M</b>
<b>5.5 – investigate water catchment</b>	<b>L</b>	<b>H</b>	<b>M</b>	<b>M</b>
<b>5.6 – enforce state water conservation regulations</b>	<b>M</b>	<b>M</b>	<b>H</b>	<b>H</b>
<b>5.7 – require water conservation retrofits on change of ownership</b>	<b>M</b>	<b>M</b>	<b>L</b>	<b>H</b>
<b>5.8 – educate on water conservation</b>	<b>L</b>	<b>L</b>	<b>H</b>	<b>H</b>
<b>5.9 – investigate water / wastewater treatment chemical supply chain vulnerability</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>H</b>
<b>5.10 – investigate FOG (Fats/Oil/Grease) conversion to biodiesel at wastewater plant</b>	<b>M</b>	<b>H</b>	<b>H</b>	<b>H</b>
<b>5.11 – investigate biosolids gasification</b>	<b>M</b>	<b>H</b>	<b>H</b>	<b>H</b>
<b>5.12 – optimize blower usage at wastewater plant</b>	<b>M</b>	<b>M</b>	<b>H</b>	<b>H</b>
<b>5.13 – investigate hybrid/EV public works vehicles</b>	<b>H</b>	<b>M</b>	<b>L</b>	<b>H</b>
<b>5.14 – develop a backup plan to get City employees to work without private cars</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>M</b>
<b>5.15 – develop and maintain a prioritized list of essential City services and budget items</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>H</b>

#### **5.1 – find incentives to reduce trash**

Reliable garbage removal service is a centerpiece of 'orderly mainstream society'. It is key to maintaining civil order, overall morale, and public health. Garbage removal service is also massively dependent on cheap, abundant liquid fuel, usually diesel. Reducing the amount of trash offers the quickest and biggest payoff in terms of lowering this vulnerability.

Nevada County's garbage and recycling pickup services are currently operated by Waste Management, Inc., a nationwide company based in Houston. Waste Management is contracted by the County, and also sends bills to individual customers directly.

As of May 2010, Waste Management prefers not to disclose the amount of diesel used in local trash pickup service. Waste Management in western Nevada County only uses conventional diesel. For comparison, Maribyrnong Australia (an inside-the-beltway urban neighbor of Melbourne) estimates the fuel used in trash pickup service is about eleven times as much as the amount of fuel used for all other municipal services combined (maintenance, public works, fleet services, etc.)<sup>3</sup>.

After collection from homes and businesses, garbage trucks deliver all of the western county's garbage to the McCourtney Road Transfer Station, southwest of Grass Valley (a landfill that filled up many years ago) where it is crushed, put into trucks, and hauled to a remote landfill.

Some of the green waste is trucked long distances to biomass power plants in other counties. In addition to liquid fuels required for this service, it is also a lost opportunity to keep local jobs and local energy.

At the time of the writing of this report, the contract situation for management of the transfer station and for the green waste processing is very dynamic. Expect updates on this report's companion website and in the local news.

The cliché 'Reduce, Reuse, Recycle' actually holds critical importance in its sequence of 'R's', and is a completely valid checklist in itself. From the National Resources Defense Council<sup>4</sup>:

"'Reduce' means using fewer resources in the first place. This is the most effective of the three R's and the place to begin... Reusing keeps new resources from being used for a while longer, and old resources from entering the waste stream... Recycling is the 'R' that has caught on the best. Partly, this is because there are so many curbside recycling programs today (8,660 as of 2006, according to the EPA)."

Note that reusing and recycling, especially curbside pickup, are also heavily dependent on liquid fuels. Reducing is the only "R" that is not dependent on liquid fuels.

### **5.1a – REDUCE: find ways to increase 'pay-as-you-throw' incentives**

The most effective way to reduce the volume and weight of trash that must be hauled away is to provide financial incentives. Only a few specific incentives are mentioned here; the Task Force recommends that City Hall remain open to new incentive options in the future.

#### **5.1a1 – investigate ways to increase the 'mini can' discount**

'Mini can' (20 gallons) weekly service is available from Waste Management, but the rate is only \$1.25 to \$3.58 less per month than a regular garbage can (32 gallons).<sup>5</sup> Since the volume of trash in the can is only one factor in determination of the total cost of garbage pickup service, it is not too surprising that the 'mini can' discount is small. However, the potential diesel savings of widespread 'mini can' usage could be significant. The City could investigate increasing this price gap, possibly by assessing fuel surcharges for the larger can, in order to incentivize more residents to sign up for the 'mini can'.

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3 Peak Oil Contingency Plan - Maribyrnong City Council, p. 55

4 <http://www.nrdc.org/thisgreenlife/0802.asp>

5 <http://www.wastemanagement.com/Templates/FAC3196/rates.asp>



**5.1a2 – advertise the 'mini can' option**

Regardless of the discount rates, many residents may already want a smaller trash can for other reasons (limited available space; environmental concern; a desire to develop good habits; etc.) – but may simply be unaware that this option exists. The City could advertise this option through its various outlets (front desk at City Hall; in the water bills; in the agenda posting case in front of City Hall; on the website; at council meetings; etc.).

**5.1b – REUSE: promote Swap Shop / Flea Markets**

Some of the currently available swap shops and flea markets:

- Habitat for Humanity ReStore
- Classified ads in the Union
- Craig's List – craigslist.com
- NevCoMax – part of CalMAX (California Materials Exchange)
- KVMR Flea Market
- KNCO Swap Shop
- 3 City public bulletin boards
- public bulletin boards offered by some store owners
- community email lists: NECCOBB; Sierra Madres y Padres; Local Food Coalition; others
- community swap events
- garage sales
- word of mouth

Possible methods of direct promotion from City Hall could include:

- letters of support or MOUs
- 'cheat-sheets' for City Hall staff to provide quick telephone or in-person referrals
- postings on the bulletin board at City Hall
- mention of these services in water bills
- generating a periodic list of a few of the more interesting swap shop items processed recently
- consolidation of the swap-shop options, or even of the item listings, into a central clearinghouse, possibly hosted on the City's web page

**5.1c – RECYCLE: investigate funding mechanisms for recycling incentives, possibly including a 'recycle bank'**

There are already businesses making use of locally recycled / upcycled / downcycled<sup>6</sup> materials. Since these may be essential parts of the economy when outside goods are not as abundant or cheap, the City should investigate options to spread these ideas to other local businesses.

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6 “Donwycycling and Upcycling” - <http://www.greenlivingtips.com/articles/371/1/Downcycling-and-upcycling.html>

California's CRV (Cash Refund Value) program<sup>7</sup> has done a lot to incentivize recycling of beverage containers. What can be done locally to further incentivize recycling, especially if tighter economy causes raiding / depletion of the Beverage Container Recycling Fund which pays the CRV?

## **5.2 – investigate reduced trash pickup frequency**

Would this actually be a net benefit? The Task Force recommends that City Hall investigate whether other cities / regions have tried this, and whether it has had the desired effect of a net reduction in fuel usage.

This plan would probably need to be accompanied by, or implemented after, serious trash reduction measures (5.1, 5.1a/b/c). For example, reduced pickup frequency for the same total amount of trash would likely result in more trucks required per scheduled pickup, and longer amount of time that trash is left out, resulting in a greater threat to public health and an increased likelihood of illegal dumping.

## **5.3 – investigate dedicating one wastewater digester tank to compost production**

If a spare wastewater digester tank is available or becomes available, it may be a prime location for large-scale composting of locally collected food scraps or other biomass. For further discussion of the economic advantages of local compost production, see the Food section of this report.

If the City decides to look into this opportunity, the Task Force recommends close collaboration with local community groups that are already looking into the local compost production question. These groups have valuable information about what has been tried, what has worked, and what hasn't, in and around Nevada City.

## **5.4 – promote graywater usage**

In August 2009, modifications to the California Plumbing Code eliminated the need for graywater permits in many cases, mainly when the water comes from washing machines. This was primarily a measure to reduce effects of a continuing drought and to reduce aquifer draw-down. There is a list of criteria that must be met to qualify for the non-permit status.<sup>8</sup>

While local jurisdictions may adopt regulations to make the code more restrictive, neither Nevada County nor Nevada City have any such regulations as of May 2010.

The full text of Chapter 16A of the California Plumbing Code, “Nonpotable Water Reuse Systems”<sup>9</sup>, details all of the requirements and exclusions.

A good summary of the graywater code is here:<sup>10</sup>

“The idea of using graywater - defined in California as the wastewater from showers, bathroom sinks and washing machines - isn't a novel one. But [in August, 2009], California followed Arizona, Texas and other states in adopting new graywater standards. Officials with the state

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7 [calrecycle.ca.gov](http://calrecycle.ca.gov)

8 <http://www.oasisdesign.net/greywater/law/california/currentcode/#washer>

9 [http://www.hcd.ca.gov/codes/shl/Preface\\_ET\\_Emergency\\_Graywater.pdf](http://www.hcd.ca.gov/codes/shl/Preface_ET_Emergency_Graywater.pdf)

10 “State revises standards for reusing wastewater”, San Francisco Chronicle, Sept. 18, 2009

Department of Housing and Community Development, which oversees graywater, changed the state code in the wake of recent legislation calling for a re-evaluation of graywater use and Gov. Arnold Schwarzenegger's June [2009] proclamation of a statewide drought.

“Whereas California property owners previously were required essentially to install costly mini leach fields (those are usually associated with septic systems) and obtain pricey permits, the new codes allow residents to install basic, relatively inexpensive graywater systems themselves with no permits.”

The Task Force recommends that the City keep an open dialog with local watershed protection groups, other local nonprofits, and local contractors in case any local graywater restrictions become necessary.

For now, the City could advertise these graywater options through water bill inserts, postings at City Hall, referrals to local nonprofits and local contractors, etc.

### **5.5 – investigate water catchment options**

If favorable, consider buying catchment containers now as they will likely get more scarce/expensive in a constrained energy regime. Water catchment containers are often made of plastic, and are large and bulky, and therefore expensive to transport.

The key question to investigate here is whether home-scale (or larger) rainwater collection would be a useful solution for Nevada City, given the rainy season and regular summer droughts in our area: how long would stored water at home or municipal scale be usable? Water stored in large regional reservoirs is treated before being sent to consumers.

### **5.6 – enforce state-level water conservation regulations**

Where current buildings and water consumers are out of compliance with state water conservation requirements, the City could develop a plan for retrofitting those customers as equitably and as quickly as possible. The deciding factor is how proactive the City wants to be in this regard.

### **5.7 – require water conservation retrofits on change of ownership**

Does the increased sales burden (i.e. decreased property value or increased hassle due to needed retrofits) outweigh the water savings benefits? Is there an effective way to subsidize these changes, possibly through AB811 or similar funding mechanisms?

### **5.8 – education on water conservation**

Education could be provided not only for homeowners, but also for businesses (especially landscaping businesses). Acceptance of the education may be better if it is couched in terms of 'preparing your home/business for a time of less available water' rather than simply encouraging voluntary conservation. The City can also support the efforts of community groups to educate the public on water conservation techniques.

### **5.9 – investigate water / wastewater treatment chemical supply chain vulnerability**

Nevada City is a relatively small consumer of some of the chemicals that are needed to treat both fresh water and wastewater. In generally tighter economic times brought on, in part, by the effects of Peak Oil, compounded by our remote location from supply centers of these chemicals, and compounded again by the fact that we are a relatively small consumer (based on low population), our supply chain may be extremely vulnerable.

Nevada City could enter a joint buying agreement with other nearby steady consumers of these same chemicals. This would decrease the likelihood of the suppliers 'dropping' Nevada City as a customer due to the vulnerabilities above.

As of early 2009, East Bay Municipal Utility District (EBMUD) had been looking into switching from chemical treatment to ultraviolet (UV) irradiation due to the vulnerabilities mentioned above.<sup>11</sup> But, the electricity needs of UV treatment are massive. For example, the Laguna wastewater treatment plant in Santa Rosa, California, with a capacity of 21 million gallons per day, uses 2.2 megawatts all day every day to run the UV lamps.<sup>12</sup>

### **5.10 – investigate FOG (Fats/Oil/Grease) conversion to biodiesel at the wastewater plant**

FOG are captured and converted to biofuels at some wastewater treatment plants. Uncaptured FOG in wastewater streams can also lead to blockages, backups, and spills. In addition to looking into energy recapture from FOG, the City could help distribute FOG information to restaurant owners and other businesses likely to produce high levels of FOG.<sup>13</sup>

Other options to eliminate FOG from the wastewater stream can also be very beneficial to the economy and to the local energy question; some local restaurants already voluntarily contribute to local reuse of restaurant FOG waste and food waste for local farms and for local biodiesel production.

### **5.11 – investigate biosolids gasification to recapture energy**

'Biosolids' is another term for the waste sludge left over at the end of the wastewater treatment process. There is plenty of information on the Internet about proposed use of biosolids for fertilizer. Typically, the most common problem with that idea has been heavy metals, pharmaceuticals, and other toxins that remain in the biosolids after treatment; however, as of press time, Nevada City biosolids have been tested and shown almost no detectable toxins.

Gasification of biosolids to turn turbines and produce electricity, or to be used as transportation fuel, are two possible options to make better use of this resource. Rather than attempting to find the best possible option for turning biosolids from a liability into an asset, this report only suggests that the City should keep abreast of new options for biosolids reuse as they develop. Since other municipalities around the world are faced with the same problem, it is expected that the pace of news in this respect will accelerate in the near future.

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11 "Berkeley Energy Descent 2009-2020: Transitioning to the Post Carbon Era – Final Report," p. 22

12 "Charting a Path for a New Energy Future for Sebastopol" (Apr. 2007) – Section E, p. 37

13 Example: <http://www.oracwa.org/Pages/intro.htm>

### 5.12 – optimize blower usage at wastewater plant

Currently, the 50hp air blower at the wastewater treatment plant runs continually at full throttle. As in other aerobic sewage treatment operations, the blower is needed to oxygenate the sewage up to a certain optimal level of dissolved oxygen. The fact that there is currently no closed-loop feedback system to monitor the dissolved oxygen level and then turn the blower throttle higher or lower accordingly (i.e. a 'cruise control') results in a significant waste of electricity, and higher electric bills.

The City could 'run the numbers' to see whether the addition of a closed-loop feedback system, including dissolved oxygen measuring equipment, blower speed control equipment, and the 'brains' to tie it all together, would be cost-effective. The Task Force encourages the City to keep the vulnerabilities of higher electricity demands in mind when completing that equation.

In addition, the Task Force encourages the City to remain open to other wastewater oxygenation systems as they become available on the market. One such option, which may or may not be applicable to Nevada City, is the SolarBee.<sup>14</sup>

### 5.13 – investigate hybrid/EV public works vehicles

Grants have been made available in the past to procure hybrid and electric vehicles for municipal services. Most require cost-shares on the part of the City. Note Grass Valley's purchase of hybrids for the City fleet in late 2008.<sup>15</sup> While hybrids and electric vehicles are not a solution to Peak Oil, they can be an important tool to decrease the City's vulnerabilities to more expensive or less available liquid fuels.

### 5.14 – develop a backup plan to get City employees to work without private cars

When gas prices spike high enough to impact the average citizen, then they will also by definition impact the average City employee. City Hall staff, public works crews, police, firefighters and more all share this vulnerability.

City Hall could encourage workers to think about and to develop their own backup plan for getting to work when they cannot afford to fill their own gas tank. Market forces will of course spawn more carpooling, ridesharing, and other inventive options for getting to work, but, City employees have a special priority here: if local government shuts down due to stranded staff, ripple effects will be felt through the local economy in very short order.

### 5.15 – develop and maintain a prioritized list of essential City services and budget items

If the City already has such a list, then the Task Force suggests updating it as appropriate in light of vulnerabilities to a more constrained energy regime, specifically based on several items throughout this report. The list of items that will affect the essential services and essential budget item priority list will be continually changing. At print time of this report, some suggestions are as follows:

- decrease the priority of electricity to the fresh water treatment plant

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<sup>14</sup> <http://wastewater.solarbee.com> In addition, SolarBees have apparently seen enough widespread municipal use in the past several years that a web search for 'solarbee' may provide leads to some useful case studies

<sup>15</sup> "Greening the fleet" - The Union, September 16, 2008 - <http://www.theunion.com/article/20080916/NEWS/109169988>

- decrease the priority of muriatic acid, lime, and alum supplies to the fresh water treatment plant

### **Recommendations for Triggered Action**

The actual triggers for these actions are not defined here. Defining and identifying the triggers will be an ongoing, collaborative, feedback-oriented process, and cannot be predicted in this report. The only sure definition for these triggered actions is that they should not be implemented until the energy regime becomes constrained to the point that they become viable options.

#### **5.T1 – reduce garbage routes to street-ends only, or other centralized pickup spots**

Care would need to be taken to find the right compromise in this plan: if the garbage removal service is degraded too much, household garbage will end up in ditches or just stacked on the side of the road. Maybe a neighborhood resident who needs to drive anyway could be contracted to pick up trash and take it down the street to the centralized pickup spot.

#### **5.T2 – begin neighborhood composting / worm composting of food waste**

Consult closely with local food and sustainability nonprofits in the design of this plan, in order to find the most optimal method that can be started in a fairly short time frame. Note that any efforts to start neighborhood composting or worm composting before the trigger will make the triggered action much easier and more effective.

## 6 – Home and Building Energy Use

The best return on investment (ROI) in terms of converting our energy infrastructure is to be gained from retrofitting our existing building stock to be more efficient. This realization is the motivation for radical changes proposed for our building codes and practices, and for the financial incentives that are continually being considered and implemented from many state and federal sources including the California Public Utility Commission (CPUC) and the California Energy Commission (CEC).

The goal of work in this field is to improve the comfort, safety, health, and efficiency of buildings while decreasing energy use. A good retrofit job accomplishes all of these goals at the same time.

Because a high percentage of every dollar spent on energy leaves the local community, energy spending is a drain on the local economy. Because energy efficiency building retrofits have a high ROI compared to other energy transformation measures, and because most of the dollars spent making buildings more energy efficient are spent locally, reducing energy use in buildings offers economic benefits that few other public or private initiatives can match.

For example, if 2,000 households currently spend a hypothetical average of \$50 per month on utility bills, then efficiency measures leading to a modest 40% average energy reduction would result in a \$480,000 yearly savings to local residents. This could be thought of as a direct, local economic stimulus package that continues every year in perpetuity.

### **Strengths**

- several local buildings have already been retrofitted for energy efficiency
- proven local market for energy retrofits has supported at least one local energy retrofit company since 2006
- energy retrofit training for contractors has been offered locally since 2008
- energy audits have been done on all City-owned facilities
- prototype energy retrofit has been done on one City-owned building (412 Commercial St.)
- community groups (APPLE, SiGBA) are actively promoting and educating about these goals
- strong local PV (solar photovoltaic) industry
- solar on City Hall; micro-hydro at wastewater plant
- California Building Performance Contractors Association (CBPCA) has a local office
- abundance of local biomass that is not yet being used to its full potential

### **Vulnerabilities**

Note that each of the following vulnerabilities is also a huge potential economic opportunity:

- aging housing stock (many old Victorian Gold-Rush-era homes) is less efficient and more difficult to retrofit

- small population makes us ineligible for some funding opportunities
- Nevada City has no spare money for staff time to put towards chasing energy funds
- shortage of trained energy retrofit contractors, despite local training opportunities

### **Recommendations for Immediate Action**

<b>Recommendation</b>	<b>COST</b>	<b>BENEFIT</b>	<b>ACCEPTANCE</b>	<b>CONTROL</b>
<b>6.1 – identify shovel-ready energy retrofit projects</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>H</b>
<b>6.2 – create a job position to chase energy funds</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>H</b>
<b>6.3 – advertise and promote the needed sequence/priority of actions: 1) Conservation; 2) Efficiency; 3) Renewables</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>H</b>
<b>6.4 – compile and publicize up-to-date local energy resource lists</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>M</b>
<b>6.5 – investigate / promote untwisting fluorescent tubes in commercial buildings</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>L</b>
<b>6.6 – begin a dialog with Sierra College regarding local retrofit and Building Performance training</b>	<b>L</b>	<b>L</b>	<b>H</b>	<b>L</b>
<b>6.7 – incorporate Building Performance practices into the permitting process</b>				
<b>6.7a – revise building permit regulations</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>H</b>
<b>6.7b – provide energy efficiency resource lists to permit-pullers</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>L</b>
<b>6.8 – request that the County and GV incorporate Building Performance practices into permitting</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>L</b>
<b>6.9 – develop a working group with County building officials to meet California efficiency goals</b>	<b>M</b>	<b>H</b>	<b>L</b>	<b>L</b>
<b>6.10 – work with local Habitat for Humanity to develop low-income housing retrofit program</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>L</b>
<b>6.11 – lobby the County/State to create a carbon tax that offsets property tax dollar-for-dollar</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>
<b>6.12 – inquire with Cal. Energy Commission regarding school-specific energy efficiency incentives and rebates</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>H</b>
<b>6.13 – arrange with PG&amp;E to get monthly City-wide electric and gas consumption figures</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>H</b>



### **6.1 – identify shovel-ready energy retrofit projects**

The past several years have seen many funding opportunities for municipal level energy retrofit projects (see recommendation 6.2). While many of these funding opportunities have already come and gone, the apparent trend is that more opportunities will surface over time.

The Task Force strongly urges the City to identify and track a list of 'shovel-ready' projects that could be implemented on fairly short notice when funding becomes available. Some hypothetical examples of items for this list might include installing solar panels on more downtown buildings, upgrading to more efficient lighting or HVAC systems in City buildings, or installing daylighting in local schools.

### **6.2 – create a job position to chase energy funds**

Beginning in late 2008, and extending through 2009 and at least the first half of 2010, large amounts of federal and state money became available for municipal projects in the field of energy efficiency and energy retrofit work and training. While the American Recovery and Reinvestment Act of 2009 (ARRA) provided much of the funding, it was not the only funding source.

In early 2010, the American Council for an Energy-Efficient Economy (ACEEE) published a relatively quick guide to these federal opportunities, with multiple examples from cities that have already made use of the funds.<sup>1</sup> The national group ICLEI - Local Governments for Sustainability and the California Energy Commission also published online resource guides for California-specific related funding opportunities.<sup>2,3</sup>

While many of the ARRA-funded programs will have largely or entirely run their course by the time this report is published, others are just getting underway. The resources above continue to be valuable sources of information and examples, and many of those agencies can be counted on to help in the funding search.

New funding sources will become available in the future. It is in the City's best interest to be ready to thoroughly investigate new funding opportunities as they become available, and apply those funding opportunities to selections from the list of shovel-ready projects developed in recommendation 6.1.

Task Force staff can attest that this is a larger job than can be expected of any volunteers. During times when the City cannot afford to pay for an employee to fill this job description, one solution may be to hire a fund-chaser on a commission-only basis.

### **6.3 – advertise and promote the needed sequence/priority of actions: 1) Conservation, 2) Efficiency, 3) Renewables**

Home-scale renewable energy systems do not make good economic or environmental sense until all conservation measures (turning off the light switch; simply using less) and then efficiency measures (proper weatherization; more efficient light bulbs, windows, and appliances) have been put in place first. The sequence of actions (conservation first, followed by efficiency, followed by renewables) is

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1 “Energy Efficiency Program Options for Local Governments under the American Recovery and Reinvestment Act of 2009” - <http://www.aceee.org>

2 “ICLEI Guide to Recovery Act Opportunities in California” - <http://www.icleiusa.org/action-center/financing-staffing/iclei-guide-to-recovery-act-opportunities-in-california>

3 “California Economic Recovery Energy-Related Programs” - <http://www.energy.ca.gov/recovery>

absolutely critical to achieve a net City-wide reduction in electricity and natural gas demand.

The City could help distribute literature to this effect, compiled by local community groups from best-management information on the topic that is already widely available.

There is a wealth of information available on each of these three topics – the task here would be to compile the most effective literature in the most effective format for our residents. While APPLE-NC and other community groups can help with the selection or creation of appropriate literature, the up-to-date resource list items from recommendation 6.4 will factor in as well.

During the summer and fall of 2010, many businesses and residences in western Nevada County were refitted with PG&E SmartMeters. Many residents and business owners may not be aware of what the SmartMeters do, or of the potential for significant energy savings by making use of the information provided by the SmartMeters<sup>4</sup>. Specifically, PG&E can provide pamphlets describing the best use of SmartMeter data, and the ways to access it online, to be included in City water bill mailings. Other public education options can be explored over time.

#### **6.4 – compile and publicize up-to-date local energy resource lists**

Local community groups are constantly compiling and updating lists of local energy resource lists. The Task Force recommends that the City provide links to these lists as they are updated.

Types of entries in the lists:

- local energy retrofit contractors
- local energy retrofit material suppliers
- tips for making the best local energy-efficiency choices, based on local climate
- local energy audit resources, including free preliminary home and business audits from PG&E
- lending library locations for auditing and retrofit equipment, such as PG&E's Pacific Energy Center<sup>5</sup>

In addition, local and state efficiency rebate options that become available from time to time, and would need periodic updates, would be key additions to these resource lists. These are just a few of the current and upcoming options that might be appropriate for this type of resource list:

- PG&E's On-Off 0% efficiency upgrade financing, in testing at press time
- Property-Assessed Clean Energy (PACE) options, including AB811 options such as mPower Placer<sup>6</sup> which is still accepting non-residential applications at press time<sup>7</sup>
- California Energy Commission's Cash For Appliances program<sup>8</sup>

The City could help distribute this literature and web resource information through the usual routes

<sup>4</sup> <http://www.pge.com/smartmeter>

<sup>5</sup> <http://www.pge.com/myhome/edusafety/workshopstraining/pec>

<sup>6</sup> <http://mpowerplacer.org>

<sup>7</sup> In the summer of 2010, federal repayment priority concerns from lending agencies Freddie Mac and Fannie Mae have put at least a temporary damper on many of these options; this may change in the future.

<sup>8</sup> <http://www.cash4appliances.org>

(table at City Hall, included in water bills, posted on web page, etc.).

### **6.5 – investigate / promote untwisting fluorescent tubes in commercial buildings**

Often called 'de-lamping', this idea is not as uncommon as it might sound. Most fluorescent fixtures, especially in commercial buildings (often recessed into drop-ceiling) have two or more bulbs per fixture. It is actually very common for office buildings and schools to have much more fluorescent lighting available than what is necessary. Over-illumination with artificial light also has been shown to have negative health impacts.<sup>9</sup>

As of April 2010, the Sierra Business Council is also looking into a new 'de-lamp' program with PG&E.

Untwisting one or more of the bulbs (enough so they do not make electrical contact and do not turn on, but not enough so that they drop from the fixture) may potentially be a quick and easy way to achieve significant energy savings. However, data to back up this assertion has been very difficult to find. Task Force staff sees an opportunity to do some simple electrical testing on this topic that could provide valuable information to other communities.

There are a few variables that need to be explored at any building where this approach is being investigated, to see if it is a good option for the building:

- OSHA, ADA, or other minimum lighting regulations
- other illumination needs, such as showcasing of retail products
- construction of the ballast and other parts of the fixture

In a hypothetical office building with 100 2-bulb fixtures, running 8 hours per day, 250 days per year, untwisting one bulb per fixture (depending on the ballast construction, and accounting for some continued electrical losses) could save over 5,000 kWhr per year, or about \$850 at current rates.

After collecting more data on this option, the City could help inform local businesses about these potential energy savings, and the potential benefits – monetary and otherwise. The City would still need to make it clear that the responsibility for determining the appropriateness of this solution is left to the building manager, i.e. that the City is only passing along some information on a possible opportunity to cut costs.

### **6.6 – begin a dialog with Sierra College regarding local retrofit and Building Performance training**

Western Nevada County has a large contingent of building contractors. As of print time for this report, a long-term lull in the building market has created a prime opportunity to retrain and re-skill a largely idled construction trade work force. Training programs for Building Performance retrofits, i.e. remodeling buildings to be more efficient and more functional, have been taking off around the country. Sierra College could be encouraged to offer a Building Performance training program locally.

Several other regional groups have been investigating these types of training options. The Task Force recommends that the City work with Sierra College to use best management practices to bring these training opportunities to our area. APPLE-NC, Sierra Green Building Association (SiGBA), California

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9 <http://en.wikipedia.org/wiki/Overillumination>

Building Performance Contractors Association (CBPCA), and other groups can help in this process.

## **6.7 – incorporate Building Performance practices into the permitting process**

The permit process may provide one of the only chances to do an outside review of Building Performance practices before the building or addition is put in place. The decisions made about Building Performance at the permitting stage can have extremely long-lasting implications, so an extra investment of energy and due diligence here can be leveraged to achieve tremendous energy savings over the lifetime of the project.

### **6.7a – revise building permit regulations**

Currently, an 'Architectural Review' must be completed for these types of projects in Nevada City:

- New construction, whether within or outside of the Historical District
- Alterations to buildings within Historical District
- An addition of new floor area that is greater than 25% of the existing, conditioned living area of the residence.

The City's Architectural Review application packet could be modified to enforce certain energy consumption guidelines for the new construction or alterations. Some examples:

- List any electrical devices (lights, appliances, air conditioning units, etc.) that will be added, modified, or replaced during the project.
- Provide data and/or intent of sufficient effort to show that the energy consumption per foot of the entire building, after the project is complete, will be lower than it is right now, and will also meet the CEC and CPUC guidelines for 2020.
- Require a review of the application by one or more third-party organizations (such as PG&E) that can make recommendations to optimize energy savings and building performance, if the review can be made in a timely manner.

More broadly, there are some 'benchmarking' energy performance guidelines that cities will need to comply with in the near future, including AB1103, AB32, a Governor's Executive Order, and the California Green Building Initiative.

While not the only solution, PG&E's Automated Benchmarking Service<sup>10</sup> provides historical as well as automatically updated monthly consumption data for US EPA's ENERGY STAR Portfolio Manager. Incorporating these and other Building Performance practices into the permitting process, as well as implementing recommendation 6.9, will go a long way towards compliance.

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10 PG&E Benchmarking information <http://www.pge.com/mybusiness/energysavingsrebates/analyzer/benchmarking>

**6.7b – provide energy efficiency resource lists to permit-pullers**

Any lists made available by recommendation 6.4 should also be handed directly to permit applicants. In addition, the permit applicants could be directed to City staff and/or local community groups including APPLE for a personal discussion regarding the available efficiency options.

**6.8 – request that the County and Grass Valley offer Building Performance resource info to permit-pullers**

The City could write letters to the County and to Grass Valley, encouraging them to do the same as recommendation 6.7 wherever applicable. After the City has had some experience and feedback with the results of recommendation 6.7, another round of letters could be sent to the County and to Grass Valley, so that they could learn from - and build on - Nevada City's experiences, both good and bad.

**6.9 – develop a working group with County building officials to meet California efficiency goals**

California has already set some very high energy efficiency standards and mandates, and as the energy markets and the energy regime get tighter in the future, those standards will probably be raised out of necessity. Ironically, since energy inputs are required to perform the retrofits to meet the efficiency standards, it is much more cost-effective to implement the standards sooner rather than later.

The Task Force recommends that the City capture this proactive attitude towards meeting state efficiency standards by forming a working group in conjunction with the County to determine the best ways to implement those standards locally. Including the County will not only widen the geographic scope of these changes, but will bring additional experience and brainstorming into the mix.

One possible method of implementation may be the use of “performance-based mandates”. An example of this type of mandate might be for the County and cities to simply set a target efficiency level, perhaps in terms of energy consumption per square foot, and let the project developers figure out how to reach that target.

**6.10 – work with local Habitat for Humanity to develop low-income housing retrofit program**

Habitat for Humanity already has a good selection of energy efficient building information online.<sup>11</sup> Habitat has been making energy-efficient building, and retrofitting, a part of its mission for many years.

The Task Force recommends that the City open an ongoing dialog with the local chapter of Habitat for Humanity to explore energy retrofit project opportunities in our area.

**6.11 – lobby the County/State to create a carbon tax that offsets property tax dollar-for-dollar**

This concept of a 'revenue-neutral carbon tax' has been proposed in various areas around the country, with mixed levels of success.<sup>12</sup> The basic concept is that carbon producers are taxed, but that tax revenue is returned to the market directly, typically in the form of tax breaks in other areas – in this case,

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<sup>11</sup> [http://www.habitat.org/env/energy\\_bulletins.aspx](http://www.habitat.org/env/energy_bulletins.aspx)

<sup>12</sup> <http://www.carbontax.org/>

property tax breaks.

Any type of carbon tax plan like this would probably not be implementable at the City scale, but the City can still have direct impact by lobbying the County and the State to adopt a tax of this form. The Task Force recommends that, if and when a strong local consensus is reached, the City send letters of support to the County and the State encouraging adoption of this type of carbon tax.

### **6.12 – inquire with Cal. Energy Commission regarding school-specific energy efficiency incentives and rebates**

The Task Force recommends that the City request local community groups to explore school energy retrofit planning and funding options. As part of that research, community groups may recommend that the City send a formal letter of inquiry about these planning and funding options to the California Energy Commission and any other state or federal agencies that may be able to provide assistance.

Currently, the California Energy Commission's 'Bright Schools' program and PG&E's 'School Energy Efficiency' program may provide some assistance. For example, if certain criteria are met, PG&E will do an in-depth energy audit of the school, prioritize a list of projects at the school, help determine the return-on-investment of these projects, and may be able to help with the bidding process. These programs do not, however, directly provide funding to carry out the projects. Once a prioritized list of projects is developed, more players including school district superintendents should be brought into the fold to help find funding sources.

### **6.13 – arrange with PG&E to get monthly City-wide electric and gas consumption figures**

Investigate with PG&E the availability of detailed electric and gas consumption, broken down in a geographical area (city limits), and, if possible, also by whatever customer categories do not violate any privacy concerns. Acquire the numbers as frequently as possible, and publicize them in various venues: the City web page, the Task Force web portal, etc.

This data may be available through a standardized request to PG&E's "Green Communities" program:

#### **Access to Energy Usage Data**

We'll provide your city or county with its energy usage data in a simplified electronic format to help it complete GHG inventories, set GHG-reduction targets and develop climate action plans. See our [GHG Data Fact Sheet](http://www.pge.com/includes/docs/pdfs/mybusiness/energysavingsrebates/incentivesbyindustry/government/ghg_data_fact_sheet.pdf)<sup>13</sup> to see what kind of data we provide and find out how to request the data you need.

Once this data is available on an ongoing basis, the Task Force recommends that the City work with local media outlets to publicize reductions (or increases) in City-wide energy use, and to publicize the relationship between energy consumption and local economic well-being. This publicity can help make energy conservation a value that is adopted and espoused by local residents.

<sup>13</sup> [http://www.pge.com/includes/docs/pdfs/mybusiness/energysavingsrebates/incentivesbyindustry/government/ghg\\_data\\_fact\\_sheet.pdf](http://www.pge.com/includes/docs/pdfs/mybusiness/energysavingsrebates/incentivesbyindustry/government/ghg_data_fact_sheet.pdf)

# Appendix A – Energy Scarcity Resolution

## RESOLUTION NO. 2008-58

### A RESOLUTION OF THE CITY COUNCIL OF NEVADA CITY

#### IN SUPPORT OF A COMMUNITY ENERGY SOLUTIONS TASK FORCE

**WHEREAS**, the City of Nevada City, its citizens and businesses depend on oil and natural gas for their economic welfare and essential activities; and,

**WHEREAS**, a growing body of energy industry experts believe that the world has arrived at, or will soon arrive at "Peak Oil" , which is the point in time when the maximum rate of production enters terminal decline.

**WHEREAS**, there is currently no combination of alternative sources that can provide the amount and type of energy that we get from oil and natural gas; and,

**WHEREAS**, actions to mitigate the effects of energy decline and scarcity are largely the same as actions to comply with the climate change protection mandates found in California's AB-32 and SB-375; and,

**WHEREAS**, actions that lessen our dependence on fossil fuels can also create and preserve local jobs and the local economy;

**NOW, THEREFORE, BE IT RESOLVED**, by the City Council of the City of Nevada City that the City Council acknowledges the unprecedented global and local challenges of Peak Oil and related energy scarcity and in order to preserve tax base and remain economically solvent and competitive in the face of Peak Oil and related energy uncertainty, will continue to foster and encourage projects that reduce its dependence on oil, natural gas, and other non-local energy sources such as solar, wind power, bio-mass, hydro, etc.

**BE IT FURTHER RESOLVED** that the City Council endorses and encourages the creation of an Energy Solutions Advisory Task Force (ESATF) to assess the vulnerabilities to diminishing global and local supplies of oil and natural gas, and to recommend local mitigation strategies; the City Council agrees that a local task force be created, organized, and led by local community groups to develop detailed assessments of the economic and societal implications of oil and natural gas depletion for the residents, businesses, and government of Nevada City; and

**BE IT FURTHER RESOLVED** that the local task force be represented by members from local business, local government, public utilities, local community groups, the community at large, and subject-area experts as needed to seek examples from successful domestic and international programs already in effect that have helped produce more vibrant, more economically sustainable, and less energy-dependent communities and to provide the City with an interim report by April 1, 2009 and a final report by August 1, 2009, detailing suggested energy resilient strategies to be reviewed and considered by the City Council for possible adoption.

**ADOPTED** at the regular meeting of the City Council of the City of Nevada City on the 22nd day of October, 2008 by the following vote:

AYES: Senum, Bergman, McKay, Harris

NOES: Coffman





## Appendix B – Brief Introduction to Peak Oil

APPLE-NC has reviewed several 'Peak Oil Primers' and believes that the one offered below, from EnergyBulletin.net, a project of the Post Carbon Institute, is the most appropriate for this report.

Before getting to the primer, APPLE-NC would like the reader to keep these points in mind:

1. **Peak Oil is completely pervasive.** Oil is the foundational enabler that directly affects all sectors of our economy, and most actions in our day-to-day lives. Some of these relationships are immediately obvious; many are more abstract, or even hidden.
2. **Peak Oil is primarily an economic concern,** and not primarily an environmental concern. Peak Oil deals directly with the question of supply-chain security. Secondary questions, however, necessarily span a much wider range of topics.
3. **Peak Oil is not a politically partisan concern.** All Americans are affected in roughly the same manner, regardless of political affiliation, or of which political party is in power.

The remainder of this appendix is a direct copy of the Peak Oil Primer web page at <http://www.EnergyBulletin.net/primer> and is reprinted with permission from the authors.

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### 1. Peak Oil primer

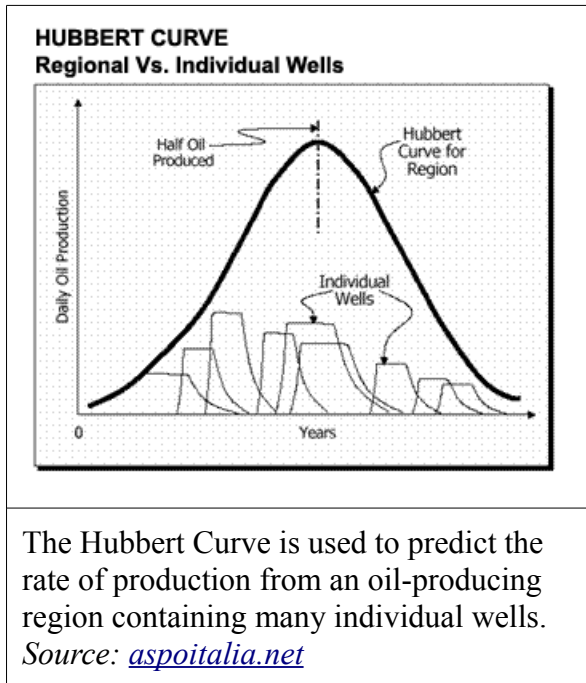
#### ***What is Peak Oil?***

*Peak Oil* is the simplest label for the problem of energy resource depletion, or more specifically, the peak in global oil production. Oil is a finite, non-renewable resource, one that has powered phenomenal economic and population growth over the last century and a half. The rate of oil 'production', meaning extraction and refining (currently about 85 million barrels/day), has grown almost every year of the last century. Once we have used up about half of the original reserves, oil production becomes ever more likely to stop growing and begin a terminal decline, hence 'peak'. The peak in oil production does not signify 'running out of oil', but it does mean the end of cheap oil, as we switch from a buyers' to a sellers' market. For economies leveraged on ever-increasing quantities of cheap oil, the consequences may be dire. Without significant successful cultural reform, severe economic and social consequences seem inevitable.

#### ***Why does oil peak? Why doesn't it suddenly run out?***

Oil companies have, naturally enough, extracted the easier-to-reach, cheap oil first. The oil pumped first was on land, near the surface, under pressure, light and 'sweet' (meaning low sulfur content) and therefore easy to refine. The remaining oil is more likely to be off-shore, far from markets, in smaller fields and of lesser quality. It therefore takes ever more money *and energy* to extract, refine and transport. Under these conditions, the rate of production inevitably drops. Furthermore, all oil fields eventually reach a point where they become economically, and energetically, no longer viable. If it takes the energy of a barrel of oil to extract a barrel of oil, then further extraction is pointless, no matter what the price of oil.

### **M. King Hubbert – the first to predict an oil peak**



In the 1950s the well known U.S. geologist M. King Hubbert was working for Shell Oil. He noted that oil discoveries graphed over time tended to follow a bell shape curve. He supposed that the rate of oil production would follow a similar curve, now known as the Hubbert Curve (see figure). In 1956 Hubbert predicted that production from the US lower 48 states would peak between 1965 and 1970. Despite efforts from his employer to pressure him into not making his projections public, the notoriously stubborn Hubbert did so anyway. In any case, most people inside and outside the industry quickly dismissed the predictions. As it happens, the US lower 48 oil production did peak in 1970/1. In that year, by definition, US oil producers had never produced as much oil, and Hubbert's predictions were a fading memory. The peak was only acknowledged with the benefit of several years of hindsight.

No oil producing region fits the bell shaped curve exactly because production is dependent on various

geological, economic and political factors, but the Hubbert Curve remains a powerful predictive tool.

In retrospect, the U.S. oil peak might be seen as the most significant geopolitical event of the mid to late 20th century, creating the conditions for the energy crises of the 1970s, leading to far greater U.S. strategic emphasis on controlling foreign sources of oil, and spelling the beginning of the end of the status of the U.S. as the world's major creditor nation. The U.S. of course, was able to import oil from elsewhere. Mounting debt has allowed life to continue in the U.S. with only minimal interruption so far. When global oil production peaks, the implications will be felt far more widely, and with much more force.

### **What does Peak Oil mean for our societies?**

Our industrial societies and our financial systems were built on the assumption of continual growth – growth based on ever more readily available cheap fossil fuels. Oil in particular is the most convenient and multi-purposed of these fossil fuels. Oil currently accounts for about [43% of the world's total fuel consumption](#) [PDF], and [95% of global energy used for transportation](#) [PDF]. Oil and gas are feedstocks for plastics, paints, pharmaceuticals, fertilizers, electronic components, tyres and much more. Oil is so important that the peak will have vast implications across the realms of war and geopolitics, medicine, culture, transport and trade, economic stability and food production. Significantly, for every one joule of food consumed in the United States, around [10 joules of fossil fuel energy](#) have been used to produce it.

### **The 'Hirsch Report'**

A U.S. Dept. of Energy commissioned study “[Peaking of World Oil Production: Impacts, Mitigation and](#)

[Risk Management](#)” [PDF] was released in early 2005. Prepared by Science Applications International Corporation (SAIC), it is known commonly as the Hirsch Report after its primary author [Robert L. Hirsch](#). For many months the report, although available on the website of a [Californian High School](#), remained unacknowledged by the DOE. The executive summary of the report warns that:

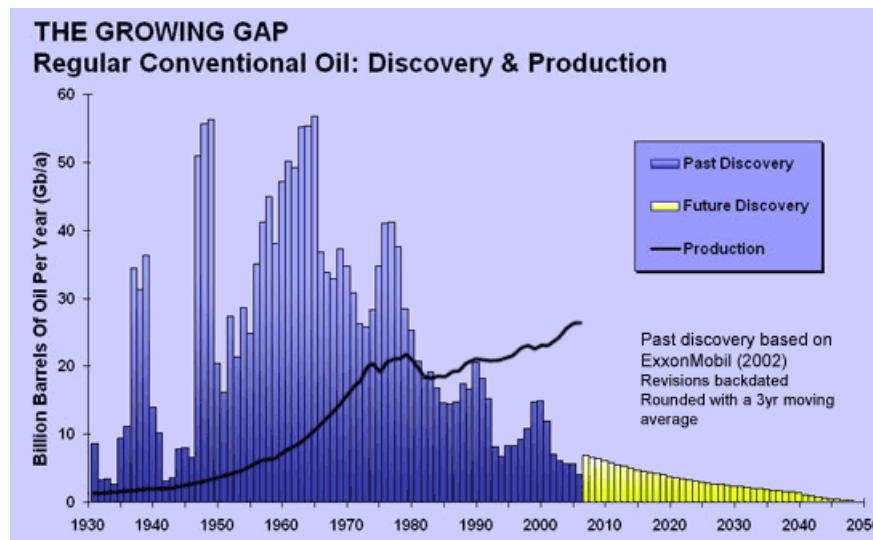
as peaking is approached, liquid fuel prices and price volatility will increase dramatically, and, without timely mitigation, the economic, social, and political costs will be *unprecedented*. Viable mitigation options exist on both the supply and demand sides, but to have substantial impact, they must be initiated *more than a decade* in advance of peaking. [Emphasis added.]

A later paper by Hirsch recommends the world urgently begin spending [\\$1 trillion per year](#) in crash programs for at least a decade, preferably two, before peaking. Obviously, nothing like the kind of efforts envisaged have yet begun. Hirsch was not asked to speculate on when the peak was likely to occur.

### ***So when will oil peak globally?***

Later in life M. King Hubbert predicted a global oil peak between 1995 and 2000. He may have been close to the mark, except that the geopolitically induced oil shocks of the 1970s slowed the growth of our use of oil.

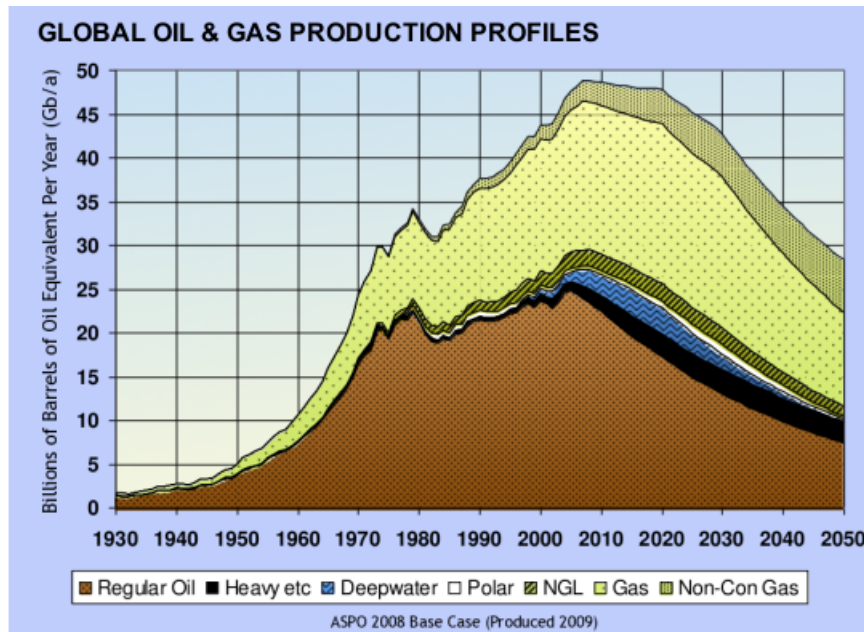
As represented in the following figure, global oil discovery peaked in the late 1960s. Since the mid-1980s, oil companies have been finding less oil than we have been consuming.



Source: [www.aspo-ireland.org](http://www.aspo-ireland.org)

Of the 65 largest oil-producing countries in the world, up to [54 have passed their peak of production](#) and are now in decline, including the USA in 1970, Indonesia in 1997, Australia in 2000, the UK in 1999, Norway in 2001, and Mexico in 2004. Hubbert's methods, as well as other methodologies, have been used to make various projections about the global oil peak, with results ranging from 'already peaked', to the more optimistic 2035. Many of the official sources of data used to model oil peak such as OPEC

figures, oil company reports, and the USGS discovery projections, upon which the international energy agencies base their own reports, can be shown to be frighteningly unreliable. In November 2009, the International Energy Agency's World Economic Outlook report stated that oil and gas liquids were not expected to peak until 2030, at significantly higher levels than today, however this was met by rebukes from internal whistleblowers who argued that the figures are more political than scientific. In response to the questionable reliability of IEA reports, several notable scientists have attempted independent studies, most famously, Colin Campbell and associates with the Association for the Study of Peak Oil and Gas (ASPO).



Source: [www.aspo-ireland.org](http://www.aspo-ireland.org)

**Already peaked?** ASPO's latest model suggests that regular conventional oil reached an all-time peak in 2005. If heavy oil, deep-water, polar and natural gas liquids are considered (the 'all-liquids' category), the model suggests that this peak too is behind us, in 2008. Combined oil and gas is expected to have peaked globally simultaneously in 2008.

Other notable researchers such as Princeton University Professor Emeritus Kenneth Deffeyes, senior advisor to the Iranian National Oil Company A. M. Samsam Bakhtiari, UK Petroleum Review editor Chris Skrebowski, energy banker and former advisor to US President G.W. Bush Matthew Simmons and various researchers published The Oil Drum, have all projected similar peaks within the 2005-2011 range using much varied methodology. A 2007 survey suggests that their perspective has become the consensus among informed observers and industry insiders [PDF].

Other sources supporting the view that global crude oil has already peaked globally include a study by the German government-sponsored Energy Watch Group, oil billionaire T. Boone Pickens, and the former head of exploration and production at Saudi Aramco, Sadad al-Huseini, and the Wikipedia hosted Oil Megaprojects database. As of January 2010, the peak of all-liquids production was July 2008.

***Decline rates***

Whether or not we've passed the peak, a more significant question may be: What will be the future rate of decline of oil production? Some form of coordinated adaptation might be possible if the annual drop in available oil was no more severe than 1-2% per year. Whereas 10% or more would soon implode the global economy. Most models project decline rates of 2-4%.

***Exports***

Nations dependent on imports are likely to find that their access to oil will fall at a far sharper rate than the global decline rate. During shortages, higher oil prices stimulate the economy of exporting nations which increases their internal consumption. Combined with a national peak in oil production, exports from any particular nation can drop to zero [disturbingly quickly](#).

***Natural gas peak***

The effects of natural gas peak are relatively localized. This is due to the enormous economic and energetic expense of liquefying and transporting natural gas as a compressed liquid. Both European and North American natural gas production have likely [already peaked](#), so these regions are facing the extra severity of a dual energy crisis.

***Financial collapse and oil peak***

After several years of rapid growth, the global crude price began falling in lockstep with financial markets in 2008, a fact which may have both contributed to – and masked – a concurrent global oil production peak. The oil industry has been running on a treadmill since 2005 with production staying essentially flat. Capital for oil infrastructure investments, which might have seen new production continue to offset declines for a few more years yet, has withered.

Conversely, the financial collapse itself was triggered in part by the approach of Peak Oil: higher commuting costs due to soaring oil prices set off the 'exurb' house price collapse in the US and put stress on mortgage repayments, leading to the subsequent collapse of the mortgage-backed securities bubble and further financial unraveling. But this was merely a trigger event. In the long run, Peak Oil poses far more fundamental challenges to our dominant economic systems which are predicated on perpetual growth.

***But it's just oil and gas – there are other fossil fuels, other energy sources, right?***

To evaluate other energy sources it helps to understand the concepts of [Net Energy](#), or the [Energy Returned On Energy Invested ratio](#) (EROEI). One of the reasons our economies have grown so abundant so quickly over the last few generations is precisely because oil has had an unprecedentedly high EROEI ratio. In the early days of oil, for every barrel of oil used for exploration and drilling, up to 100 barrels of oil were found. More recently, as oil recovery becomes more difficult, the ratio has become significantly lower. Certain alternative energy 'sources' may actually have EROEI ratios of less than one, such as many methods of industrially producing [biodiesel](#) and [ethanol](#), or extracting oil from shale. That is, when all factors are considered, you probably need to invest more energy into the process than you get back.



[Hydrogen](#), touted by many as a seamless solution, is actually an energy carrier, but not an energy source. Hydrogen must be produced using an energy source such as natural gas or nuclear power. Because of energy losses in transformation, the hydrogen will always contain less energy than was invested in it.

Some alternatives such as wind, solar thermal and hydro-power may have much better EROEI, however their potential expansion may be limited by various physical factors. Even in combination it may not be possible to gather from renewable sources of energy anything like the rate and quality of energy that industrial society is accustomed to. Peak Oil author [Richard Heinberg](#) uses the metaphor that whereas fossil fuels are akin to a massive inheritance, one spent rather drunkenly, renewables are much more like a hard-won energy wage.

For certain tasks, such as air travel, no other energy source can readily be substituted for oil in large quantities. As noted by the Hirsch reports, alternative energy infrastructures require long periods of investment, on the scale of decades, to be widely implemented. We may be already leaving the period of cheap energy before we have begun seriously embarking on this task.

*It's worth noting briefly that any EROEI study is complex and different methods of accounting can come up with vastly different results, so any net energy study might be viewed with some suspicion. We may not know with total certainty the usefulness of any renewable energy technologies until the hidden fossil fuel energy subsidies are finally removed.*

## 2. Further information

**Peak Oil and climate change:** If Peak Oil merely threatens industrial civilisation, climate change promises to destabilize the planetary biosphere. The two issues are integrally related, and solutions to Peak Oil can also address climate change. Consider how we might [bridge Peak Oil and climate change activism](#). David Holmgren has begun integrating Peak Oil and climate change into a global [scenario planning framework](#).

**Peak coal:** Recent studies suggest that we may reach 'peak coal' much [sooner than previously thought](#). Chris Vernon rounds up five recent reports to that effect over at [The Oil Drum: Europe](#).

**Peak everything:** [Peak Everything](#) is the name of a book by Peak Oil author Richard Heinberg. Globally we have already passed peaks or are soon to be facing them in [copper](#), [phosphorous](#), [fish catches](#), [grain production](#), [per capita fresh water](#) and [uranium](#) to name but a few. This is no coincidence, we have been consuming the world's resources at an unprecedented rate. The human population, which has risen in lockstep with fossil fuel production, will likely peak more or less in sync with these fuels.

**Oil and food production:** Essays [The Oil We Eat](#) by Richard Manning, and [Eating Fossil Fuels](#) by Dale Allen Pfeiffer both look at modern agricultures' dependence on fossil fuels. Both are highly recommended.

### Audio and video:

[Global Public Media](#) – essential interviews on Peak Oil and environmental issues (Now integrated into Energy Bulletin.)

[Peak Oil?](#) – a 44-minute TV special from Four Corners (Australia), viewable online (July 2006)

[The End of Suburbia](#) and [A Crude Awakening](#) – two excellent Peak Oil documentaries purchasable on DVD.

### Research and reference articles:

[ASPO](#) – original research from The Association for the Study of Peak Oil & Gas

[ASPO Ireland](#) – the Irish branch of ASPO through which Colin Campbell now publishes the ASPO monthly newsletter (Note: In April 2009 Colin published his 100th and final newsletter, his task of bringing the concept of Peak Oil into public light achieved.)

[ASPO-USA publishes about three good articles every week \(many of which are republished here\)](#)

[The Oil Depletion Analysis Centre \(ODAC\)](#) in the UK has a good website that is frequently updated

[The Oil Drum](#) – the breaking edge of community Peak Oil research

[DieOff.com](#) – an alarming but scholarly archive of research. The original Peak Oil website.

#### **News and commentary:**

[The Oil Drum](#) the daily Drum Beat is a collation of news stories

[Peak Energy](#) Australian Big Gav's aggregation and commentary on energy-related news

[Gristmill](#) – environmental news and articles, with an increasing emphasis on energy, sustainability and climate

[Resource Insights](#) – Kurt Cobb publishes intelligent Peak Oil informed commentary on a broad range of issues.

[Casaubon's Book](#) – several essays and how-to articles each week from author, mother and farmer Sharon Astyk

James Kunstler's blog – Peak Oil commentary with a special focus on cultural decline. See both [www.kunstler.com](#) and [jameshowardkunstler.typepad.com](#)

[Crisis Energética](#) – Peak Oil news in Spanish

#### **Mailing lists:**

[RunningOnEmpty3](#) – a group for Peak Oil beginners

[EnergyResources](#) – the original Peak Oil focused email list

[RunningOnEmpty2](#) – a more solutions, self-sufficiency focused list

[groups.yahoo.com/group/EnergyRoundTable](#) – a group emphasizing discussion and politics

There are numerous local mailing lists too, many on yahoo can be found at this link:

[groups.yahoo.com/search?query=peak%20oil&ss=1](#)

*More links, including books to read:* An excellent list of links is maintained here:

[www.dynamiclist.com/?worldview/peakoil](#)

### **3. What can be done?**

Many people are working on preparations for Peak Oil at various different levels, but there is probably no cluster of solutions which do not involve some major changes in lifestyles, especially for the global affluent. Peak Oil presents the potential for quite catastrophic upheavals, but ultimately also some more hopeful possibilities: a chance to address many underlying societal problems, and the opportunity return to simpler, healthier and more community-oriented lifestyles.

**The Community Solution to Peak Oil.** Many excellent resources are available through the website of this Ohio-based organization "dedicated to the development, growth and enhancement of small local communities... that are sustainable, diverse and culturally sophisticated." The Community Solution have

hosted several recent grassroots Peak Oil conferences, and have developed an important film, [The Power of Community: How Cuba Survived Peak Oil](#), documenting how this country has relatively successfully adapted to a political oil peak after the collapse of the Soviet Union.

[www.communitysolution.org](http://www.communitysolution.org)

**Permaculture:** Permaculture is a 'design science' which can allow us to live in relative abundance with minimal resource use. Permaculture principles and practice can be applied to functionally redesigning social systems, built environments, ecological and agricultural practices during the post-peak era. David Holmgren's 2001 book, *Permaculture: Principles and Pathways Beyond Sustainability*, deals explicitly with the global oil peak and proposes permaculture as the best set of strategies for dealing with what he terms 'energy descent'.

[www.permacultureactivist.net](http://www.permacultureactivist.net)

[www.permacultureinternational.org](http://www.permacultureinternational.org)

[www.holmgren.com.au](http://www.holmgren.com.au)

**Transition Towns:** Several communities around the world have begun their own preparations for Peak Oil, and are documenting the process. The [Kinsale Energy Descent Action Plan](#) out of rural Ireland is the world's first local action plan for Peak Oil, dealing with broad issues relating to peak, including health, education, tourism and youth issues. The plan and its initiator Rob Hopkins have inspired the [Transition Towns](#) movement of Peak Oil preparing towns, focused in Europe. In the US, local organizers within the town of Willits, California have begun work on the [Willits Economic Localization Project \(WELL\)](#). Many other communities around the world are embarking along similar paths.

[www.transitionculture.org](http://www.transitionculture.org) - Rob Hopkins' blog

[www.transitiontowns.org](http://www.transitiontowns.org)

[www.willitseconomiclocalization.org](http://www.willitseconomiclocalization.org)

**Oil Awareness Meet Ups** is a grass roots awareness-raising network helping people meet up and discuss Peak Oil. Join or start a meet-up in your neighborhood.

[oilawareness.meetup.com](http://oilawareness.meetup.com)

### **Local Currencies and Steady State Economics:**

*Local Currencies:* [Richard Douthwaite](#), a 'recovering economist', has proposed a number of alternative monetary systems to deal with energy decline and the associated monetary crises which might arise post-peak. Local currencies like LETS are in operation around the planet already (although LETS itself may be somewhat problematic). Experiment now with local currencies to help survive economic crises.

[The Foundation for the Economics of Sustainability \(FEASTA\)](#) has some of Richard Douthwaite's publications available for free online, including entire books as well as masses of other excellent research and articles by other writers, relating not just to economics and local currencies, but to various aspects of sustainability.

See also: [www.communitycurrency.org/resources.html](http://www.communitycurrency.org/resources.html)

**Intentional Communities:** Intentional Community (IC) is an inclusive term for ecovillages, cohousing, residential land trusts, communes, student co-ops, urban housing cooperatives and other related projects and dreams... ICs represent one of the sanest ways of dealing with energy peak.

[www.ic.org](http://www.ic.org)

[gen.ecovillage.org](http://gen.ecovillage.org)

[www.cohousing.org](http://www.cohousing.org)



**The Oil Depletion Protocol:** is a global framework for distributing the world's remaining oil reserves more equitably than free market forces would allow, to avoid resource wars, profiteering and economic collapse. Help promote it:

[How to avoid oil wars, terrorism, and economic collapse](#) by Richard Heinberg  
[Oil Depletion Protocol website](#)

**Tradable Energy Quotas (TEQs)** are a system for rationing fuel which includes everyone – individuals, industry and the government – and which enables users to sell any rations they do not use.  
[www.teqs.net](http://www.teqs.net)

**Lobbying:** Lobby governments to spend now on renewable energy and improving agricultural practices. Many facts are summarized in the following 'convince sheet' by Bruce Thomson: [gretchange.org/ov-thomson,convince\\_sheet.html](http://gretchange.org/ov-thomson,convince_sheet.html)

Your [feedback is welcome](#).



*Most of the Peak Oil Primer was written by former EB Editor Adam Grubb.*

*Last updated 23 Feb 2010 by [Adam](#)*

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*Energy Bulletin is a program of [Post Carbon Institute](#), a nonprofit organization dedicated to helping the world transition away from fossil fuels and build sustainable, resilient communities.*

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**Source URL:** <http://energybulletin.net/primer>



## Appendix C – Prioritized List of Recommendations

The recommendations in this document are difficult to prioritize. In this appendix, the Task Force staff attempts to weigh the need to know where to begin against the fact that the economic and energy regimes of the day are constantly changing, making any estimates extremely difficult and not very accurate.

For up-to-date priority estimates, as well as the latest details on any recommendation that the City begins to pursue, the Task Force strongly encourages use of the web portal and direct consultation with APPLE-NC and other local community groups.

The following tables, taken directly from the tables in the body of this report, will hopefully serve as a very generalized first-guess prioritization of the recommendations that the City could pursue. One key factor in determining these priorities is the combination of low-cost, high-benefit, high-public-acceptance, and high-level-of-control (L/H/H/H) rankings – all of which are debatable estimates.

### Food

Recommendation	COST	BENEFIT	ACCEPTANCE	CONTROL
<b>1.1b – support NCFM expansion to year-round: request County to allow permit-free tunnels</b>	L	H	H	M
<b>1.1c – foster City Hall relationship w/local farmers – ask how City Hall can support them</b>	L	H	H	M
<b>1.1d2 – allow chickens / small livestock</b>	L	M	M	H

### Emergency Preparedness

Recommendation	COST	BENEFIT	ACCEPTANCE	CONTROL
<b>2.3a – document fuel usage by agency</b>	L	M	M	H
<b>2.3b – develop a fuel supply allocation plan</b>	L	H	H	H
<b>2.3c – develop and maintain a list of emergency fuel supply agreements, locations, and contacts</b>	L	H	M	H
<b>2.5a – identify local emergency management resources (human resources as well as supplies)</b>	L	H	M	H

### Local Economy

Recommendation	COST	BENEFIT	ACCEPTANCE	CONTROL
<b>3.1 – support “Buy Local” initiatives</b>	L	H	M	M
<b>3.6 – organize “energy summit” for local business</b>	L	M	H	H
<b>3.7 – work with APPLE Center on green job support</b>	L	H	H	H

### Transportation

Recommendation	COST	BENEFIT	ACCEPTANCE	CONTROL
4.1 – reprioritize land use decisions by integrating transportation issues in all planning	L	H	M	H
4.3g – consider converting car parking to bike parking / 'bike corrals'	L	H	H	H
4.6 – appoint a committee to investigate local use of alternative fuels	L	H	H	H

### Municipal Services

Recommendation	COST	BENEFIT	ACCEPTANCE	CONTROL
5.3 – investigate dedicating one digester tank to food waste, to make finished compost	L	H	H	M
5.9 – investigate water / wastewater treatment chemical supply chain vulnerability	L	H	H	H
5.15 – continually develop / modify a prioritized list of essential City services and budget items	L	H	H	H

### Home and Building Energy Use

Recommendation	COST	BENEFIT	ACCEPTANCE	CONTROL
6.2 – create a job position to chase energy funds	L	H	H	H
6.3 – advertise / promote the needed sequence/priority of actions: 1) Conservation, 2) Efficiency, 3) Renewables	L	H	H	H
6.12 – inquire with Cal. Energy Commission regarding school-specific energy efficiency incentives and rebates	L	M	H	H
6.13 – arrange with PG&E to get monthly City-wide electric and gas consumption figures	L	M	H	H

## Appendix D – Alliance for a Post-Petroleum Local Economy of Nevada County (APPLE-NC)

*Alliance for a Post-Petroleum Local Economy is a grassroots group concerned about the repercussions of higher priced or less available oil and natural gas in Nevada County.*

APPLE is a local, nonpartisan citizen forum to develop practical solutions for the challenges ahead. Our vision is of a more self-reliant, sustainable local economy which is localized – the opposite of globalized: we produce locally what we consume locally, as much as possible.

APPLE-NC was formed in 2005 by Nevada County residents concerned that both the public and local officials were not yet informed about a looming crisis: the loss of our affordable supplies of oil and gas, the very fuel that makes our modern civilization and personal well-being possible.

APPLE sponsored many educational events in its first five years, including talks by Peak Oil experts and well-attended community meetings on how fossil fuel use affects our food supply, water access, air quality, transportation options, health care, and importantly, our local economy.

APPLE has attracted substantial support from Nevada County citizens, building an e-mail list of 1,400 members along with a growing paid membership. Various City and County officials have participated in APPLE's community meetings, and in 2009, a Task Force, suggested by APPLE, was formed by Nevada City's government to look into coming energy uncertainty and propose steps the City could take to help mitigate the impact of higher cost or more scarce fossil fuel supplies.

APPLE was initially an 'outpost' of the Post Carbon Institute<sup>1</sup>, has since joined on as an official 'node' of the Relocalization Network, and most recently has registered as an official Transition Town<sup>2</sup>. These national and international networks give strength in numbers, and illustrate that APPLE is just one of hundreds of groups around the globe looking at these same questions.

In September 2009, APPLE opened its first physical headquarters in downtown Nevada City, the APPLE Center for Sustainable Living. Through the efforts of a dedicated team of volunteers, led by Executive Director Mali Dyck, APPLE has been able to increase public awareness of what a sustainable lifestyle looks like, how to achieve it, and how taking those steps in one's own life can contribute to our collective security. The Center has also showcased the opportunities to take those steps beyond an individual scale and into the community, the cities, the region, and beyond.

Supporting community gardens and local farms is perhaps the most popular and successful of APPLE's many activities.

APPLE's Board of Directors cooperates with and encourages not only local food groups, but also local economic development projects, alternative transportation advocates, energy efficiency programs, and a number of local businesses that are quickly forming the infrastructure of a new, more sustainable local economy.

Contact: [www.apple-nc.org](http://www.apple-nc.org) [info@apple-nc.org](mailto:info@apple-nc.org) 530-478-1700

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<sup>1</sup> Post Carbon Institute – <http://www.postcarbon.org/>

<sup>2</sup> Transition Network (International) – <http://transitionnetwork.org/> Transition USA – <http://transitionus.org/>



## **Appendix E – Local Food Coalition (LFC)**

Local Food Coalition's mission ([www.localfoodcoalition.org](http://www.localfoodcoalition.org)): "Working together to support local farmers, preserve local farms and farmland, and ensure a local food supply in the western Nevada County area."

The Local Food Coalition is not an organization per se. Instead it is an informal network of agricultural organizations and agencies, farmers and ranchers, community non-profits, businesses, and individuals. The purpose is to facilitate communication, coordination, and collaboration among all the sectors of our community that care about local agriculture and local food production. The Local Food Coalition emerged from the first Come Home To Eat event in March 2006 (see History of the Local Food Movement in western Nevada County for more details).

The means of communication are an e-mail list and a website, plus a LOT of meetings and personal communication. A core group of dedicated volunteers handles the coordinating and administrative functions.

### ***Participants in the network:***

#### **Farmers, ranchers, and other ag producers:**

There are 80-100 ag producers selling to the public. Most of them are members of Nevada County Grown. You can see a list of them and their contact info on the Nevada County Grown website ([nevadacountygrown.org](http://nevadacountygrown.org)). Most are listed in the 2009 Farm Guide.

#### **Agricultural and resource agencies:**

- Agricultural Advisory Commission (AAC)
- Agricultural Commissioner
- Nevada County Resource Conservation District (NCRCD)
- Natural Resources Conservation Service (NRCS)
- UCCE Farm Advisors

#### **Agriculture/food/land-related organizations:**

- Biodynamic Farming Association
- Foothill Fibers Guild
- Farmers/Growers Markets:
  - Mill Street (Grass Valley) Thursday Night Farmers Market

- Nevada City Saturday Farmers Market
- Nevada County Certified Growers Markets
- Live Healthy Nevada County Food & Nutrition Action Committee<sup>1</sup>
- Master Gardeners
- Nevada County Beekeepers Association
- Nevada County Farm Bureau
- Nevada County Grown
- Nevada County Land Trust
- Northern Sierra Winery Association
- Sierra Permaculture Guild
- Slow Food of Nevada County
- Weston A. Price Foundation, Gold Country Chapter

**Businesses:**

There are numerous businesses in the communication network. Many support the Farm Guide with advertising, and actively support local farmers in other ways.

**Other community non-profits whose mission has as ag/food/land component:**

- Alliance for a Post-Petroleum Local Economy (APPLE) / APPLE Center for Sustainable Living
- Sierra Nevada Deep Ecology Institute (SNDEI)
- Think Local First – Nevada County Foothills

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<sup>1</sup> Working on improving school lunches, developing school gardens, and making farm-to-school connections.