

**Council Meeting: October 20, 2009****SUBJECT: 2009-0071** Determine Appropriate Review Standards for Alternative Energy Sources (Study Issue)**REPORT IN BRIEF**

Community members are becoming more interested in using alternative energy sources to reduce their carbon footprints. These technologies offer both opportunities and challenges for the community, and this report explores possible controls that would not unreasonably restrict the use of these technologies and at the same time protect the community. The Sunnyvale Municipal Code (SMC) and the City's permitting process have been refined for the installation of solar energy systems, but the code does not specifically address other alternative energy technologies.

This study is an extension of the City's recent activities regarding sustainable policies and regulations. The purpose of the study is to identify emerging and mature alternative energy technologies (including wind energy, biodiesel, fuel cells and geothermal energy); to determine aesthetic and safety issues associated with each; and to develop appropriate review standards for the installation of those technologies that may soon be seen in the City (Attachment A). The study is focused on small, noncommercial energy systems for on-site generation and use only. The study does not include allowing large alternative energy power plants in the City.

Staff recommends adopting an ordinance (Attachment B) that creates standards and permitting requirements for the installation of small wind energy conversion systems. Although the City is a better candidate for solar energy than wind, wind energy technology is quickly developing, allowing slower wind speeds to operate, and can be used in conjunction with a solar energy system for increased efficiency. The proposed ordinance includes different permitting requirements for each zoning district, containing more stringent conditions for residentially zoned properties and properties adjacent to residential uses. It includes a required setback equal to the total height of the wind turbine and tower from all property lines and a requirement to meet the City's operational noise restrictions.

Because of the foreseen dangers of the process, staff recommends prohibiting the manufacture of biodiesel on residential property until the process can be performed more safely. The attached ordinance would only prohibit the home production of biodiesel, and would not prohibit the use of biodiesel on residential property.

Staff does not recommend adopting additional regulations specifically for fuel cells or geothermal heating and cooling systems. Existing codes are sufficient to review their installation.

On September 28, 2009, the Planning Commission considered the study issue and voted unanimously to recommend the Council adopt the staff recommendations with additional direction for staff to further study home biodiesel production and to develop guidelines and regulations for such use (see minutes in Attachment G). The Planning Commission also recommended some minor modifications to the draft ordinance, including clarification of permit requirements for small wind energy systems located in a Heritage District or on a heritage building, and to modify a design requirement for wind system towers to be a monopole instead of specifying the allowable construction material. Staff has incorporated these modifications into the attached draft ordinance.

The goal of the proposed ordinance is to encourage and support alternative energy sources without sacrificing community concerns about aesthetics and safety.

## **BACKGROUND**

The City has taken a leadership role in environmental stewardship, including:

- The creation of development incentives for the use of sustainable building features in the City's industrial zoning districts;
- The creation of sustainable building requirements for Moffett Park in 2004;
- Recent code amendments to promote the use of solar energy on private property (RTC 07-409 and RTC 08-287); and
- The creation of citywide sustainable building requirements that will be effective January 1, 2010 (RTC 09-081).

Residents and businesses have shown a greater interest in generating their own alternative energy and using cleaner-burning fuels from renewable sources. This interest is partly a result of legislative activity at the state level to promote the use of alternative energy:

- The California Energy Commission's *Emerging Renewables Program* offers buydown incentives to encourage the siting of small, reliable alternative energy generating systems (solar, wind and fuel cells), that can be used on residential buildings and small businesses. Applications to qualify for the buydown program require the installation of certified equipment established by the California Energy Commission.
- In 2001, a bill was passed to standardize permitting requirements for small wind energy systems outside of urbanized areas (AB 1207) to

ensure that local agencies do not unreasonably restrict their installation. This law was repealed in 2006 and it did not apply to the City since the City does not include any non-urbanized areas.

- In 2006, Assembly Bill (AB) 1811 was passed, authorizing the California Air Resources Board and the California Energy Commission to spend \$25 million for the purposes of incentivizing the use and production of alternative fuels.

## **EXISTING POLICY**

### **COUNCIL POLICY 3.5.1: ENERGY**

The City of Sunnyvale finds that the preservation of natural resources through the use of energy efficient activities is of great importance to the citizens and businesses of Sunnyvale. It is the purpose of this Energy Policy to:

- Promote economic development
- Maintain a healthy environment
- Maximize limited natural resources

It is the policy of the City of Sunnyvale that the City will:

- Promote the development of alternative energy resources and support the enhancement of existing technologies
- Reduce energy consumption through Land Use and Community Design Policies
- Support Federal, State, and other Local agency energy-related legislation when consistent with this policy
- Support efforts to provide affordable, reliable, diverse, safe, and environmentally acceptable power to the citizens and businesses of Sunnyvale

## **COMMUNITY VISION OF THE GENERAL PLAN**

**Goal III. Environmental Sustainability:** To promote environmental sustainability and remediation in the planning and development of the city, in the design and operation of public and private buildings, in the transportation system, in the use of potable water, and in the recycling of waste.

The City will seek opportunities to utilize “green” practices in its operation and delivery of services, and encourage residents and businesses to adopt such practices. These might include reduced use of non-renewable energy, reduced emissions of greenhouse gases, greater recycling of waste and use of recycled materials, reduced per capita use of potable water, green building design, and reduced storm water runoff.

## **LAND USE AND TRANSPORTATION ELEMENT**

**Policy C4.4:** Encourage sustainable industries that emphasize resource efficiency, environmental responsibility, and the prevention of pollution and waste.

### **DISCUSSION**

Presently, solar energy is the most widely used alternative energy conversion system in the City. Like many communities, Sunnyvale has established requirements for the installation of these private solar energy systems. There are, however, other forms of alternative energy that are developing rapidly. These include small wind energy systems, as well as biodiesel and fuel cells. Staff has recently received inquiries from members of the community to install wind energy conversion systems on private property. Although staff has received only speculative inquiries, it was realized that there are currently no codes or guidelines to review the installation of such systems or other alternative energy technology.

It is recognized that Sunnyvale is not an appropriate setting for large power generation or distribution plants, so the focus of this study is to develop review standards for small, noncommercial alternative energy conversion systems for on-site generation and use. These systems could be located with any type of land use, including residential, commercial or industrial property. This study does not address how to attract alternative energy systems production and research companies to the City.

This study proposes a general framework for the review of alternative energy systems, and it can be amended or expanded as the technology matures and grows.

This report identifies and discusses the following:

- Emerging and mature alternative energy technologies (wind energy, biodiesel, fuel cells and geothermal energy);
- Possibilities and issues associated with each technology; and
- Standards to use in reviewing their installation.

### **Wind Energy**

Wind energy technology is the process by which turbines are used to convert kinetic energy in the wind into mechanical power or electricity. Wind energy is considered to be a clean, renewable energy source and produces no air or water pollution. Wind energy is more commonly associated with large, dense, commercial-scale wind farms towering over and dominating landscapes (such as the Altamont Pass wind farm); however, wind energy technology is quickly evolving and is now commercially available for small-scale personal use. There is potential for wind energy systems for both residential and non-residential

properties, the difference being the size, type, and number of turbines in the system.

A small wind energy system consists of a wind turbine, a tower and associated control or conversion equipment. There are two types of wind turbine designs:

- Horizontal axis wind turbine (HAWT), which is the traditional type and resembles a giant fan or pinwheel; and
- Vertical axis wind turbine (VAWT), which proponents claim to be the “urban” solution with a more quiet and compact, cylindrical design.

Wind turbines are traditionally mounted on a free-standing tower, but can also be mounted on a building. Examples of wind turbines (residential and commercial/industrial applications) are shown in Attachment C.

How to appropriately review small wind energy system installations is becoming a pressing issue for many jurisdictions. Small wind energy was one of the top three planning issues requested from the American Planning Association’s (APA) Planning Advisory Services (PAS) last year, and they are currently engaged in a project to partner with the U.S. Department of Energy’s National Renewable Energy Laboratory (NREL) and the American Wind Energy Association (AWEA) to produce a guidebook that is expected to be published in spring 2011.

Staff contacted the cities of Santa Cruz and Berkeley in addition to the cities within Santa Clara County and found that none have specific development standards for wind energy systems. Many cities rely on existing regulations for accessory structures, which typically have a height limit of 15 feet, measured from the ground. Some of the consulted cities have received preliminary inquiries to install wind turbines, but none have been installed. The City of San Francisco just recently established a process for permitting small wind systems. More information about small wind energy systems can be found in Attachment C.

### **Issues**

Wind potential – In order for a typical small horizontal-axis wind turbine to be cost-effective, minimum annual average wind speeds of approximately 10-12.5 miles per hour (known as Class 2 winds) to 12.5-14 miles per hour (Class 3) are necessary. Taller towers (100 feet or higher) may be necessary for the system to be effective in Class 2 winds. According to NREL and other wind resource maps, only Class 1 (0-10 miles per hour) to Class 2 wind speeds typically occur in the San Francisco South Bay Area. This means that Sunnyvale’s potential for wind energy is fairly low. The area where the City’s Water Pollution Control Plant, however, has greater potential than the rest of the City as it borders the bay and experiences faster wind speeds. A popular CEC-certified HAWT model rated at 1 kW could produce an average energy

output of 4 kWh per day at a wind speed of 10 mph at a single-family residence, compared to a solar photovoltaic system rated at 1 kW, which would produce an average of 5 kWh per day.

Although the City's wind resource may not be enough for the more common HAWT to operate at its peak, the wind industry is growing and newer models requiring lower wind speeds, and subsequently lower tower heights, to operate efficiently are emerging. Current VAWT models will typically have a lower average energy output calculation than a typical HAWT, but proponents claim that a VAWT may actually produce more energy in real-world applications, especially in a more urban setting where variable wind conditions exist. HAWTs need to constantly re-orient themselves to the wind, losing efficiency in the process, while VAWTs can harness wind from any direction. Residents and business owners may also choose to use wind energy as a supplement to solar energy in a solar-wind hybrid energy conversion system.

*Aesthetics and siting* – For most locations, wind speed increases with height; therefore wind turbines tend to be very tall, or located on higher elevations to be effective. The typical wind turbine model (HAWT) is required to be at least 20 feet taller than the tallest obstacle within a radius of about 200-300 feet. Suggested standards for non-urbanized areas include a minimum lot size of one acre to assure clearance of wind obstacles and to minimize visual impacts to neighboring properties. Guidelines from the AWEA and examples from other cities and counties could be used in developing standards and guidelines specifically tailored to Sunnyvale.

*Noise* – There are two types of noise sources from a small wind energy system: one is from the generator inside the turbine where kinetic energy is converted to electricity; and the other is from the aerodynamic noise of the rotating blades. Wind turbine noise levels vary depending on the model, rated capacity, and wind speeds. Those who have studied noise levels of wind turbines have had difficulty accurately measuring noise levels, since it is hard to discern between noise that is actually produced by the wind turbine and background noise produced by the wind, trees, cars, etc. Background sounds also tend to increase as wind speed increases, and may sometimes even mask the noise produced by a wind turbine. Tests performed by NREL at the National Wind Technology Center in 2003 showed that the traditional HAWT models are typically rated at 40-65 dbA (about the same noise level as a conversation) measured from 100 feet away. These models varied between 75-100 dbA at the base of the turbine. Some current models contain better sound insulation built into the device. VAWTs are claimed to have lower noise levels than HAWTs. Installation of any of these systems would be subject to the City's noise regulations.

*Safety* – The California Building Code and California Electrical Code contain provisions to ensure the safe installation of free-standing or roof-mounted wind turbines. Applications for the installation of wind turbines should be required to show sufficient detail in drawings and engineering analysis to show compliance with all applicable codes. Structures should meet the most stringent wind requirements, requirements for worst seismic class and the weakest soil class.

*Other* – Attachment C contains information on other factors relating to wind energy, including electronic interference, Federal Aviation Administration (FAA) requirements and other environmental impacts. Typically, small wind energy systems have minimal or no impacts associated with these associated factors.

### **Ordinance**

Staff has prepared an ordinance to allow small wind energy conversion systems in all zoning districts in the City and establishes permitting requirements and standards that address the issues discussed above (see Attachment B). The proposed ordinance was developed from a combination of examples of regulations and guidelines from other cities, the American Wind Energy Association and AB 1207, and tailored to the community's aesthetic, noise and safety concerns. The City's existing Wireless Telecommunication Facilities Code was also chosen as a reference for establishing design standards for wind turbines because they are similar in structure and have similar aesthetic concerns.

The proposed ordinance contains the following:

- Establishes different permitting requirements depending on the type of wind turbine supporting structure (building-mounted or free-standing tower) and the total height for each zone;
- Stricter conditions on sites that are zoned, or adjacent to, residential, since these areas are more sensitive to the issues described above;
- Requirement to meet the City's noise regulations;
- Restricts each property, if one acre or less, to just one small wind turbine structure to minimize impacts (if a property is larger than one acre, additional structures could be allowed through a conditional use permit);
- A provision to allow applicants to request exceptions to height requirements upon showing proof of substantial wind obstruction at the allowable height, but does not allow deviations from other requirements such as setbacks if a height exception were granted to ensure safety hazards are avoided;
- Zoning incentives for wind and solar energy system installations.

## **Alternatives**

- 1A. Adopt an ordinance to allow and establish regulations for small wind energy conversion systems in all zoning districts under Title 19 of the Sunnyvale Municipal Code. See Attachment B for the proposed draft ordinance addressing aesthetics, noise, safety, height, setbacks and permitting requirements for small wind energy systems.
- 1B. Postpone the adoption of an ordinance addressing small wind energy systems until clearer guidelines for wind energy implementation are published, which is anticipated in 2011.
- 1C. Prohibit small wind energy systems in the City.

## **Recommendations for Wind Energy**

Staff recommends Alternative 1A. The City could wait several years until guidelines are published, but interim regulations are desirable for systems that may be proposed before then. Although the City is not an exceptional wind resource, wind energy technology is quickly developing to operate efficiently at lower wind speeds and heights, therefore making it possible for these devices to appear in more urbanized areas. If adopted, staff would revisit the ordinance when the guidebook is published or if other significant developments in the technology occur.

## **Biodiesel**

Biodiesel is a clean-burning, alternative fuel produced from renewable resources, such as soybean oil, waste vegetable oil (e.g. fryer grease), or other vegetable oils or animal fats. Although there are other alternative fuels that exist such as bioethanol, biodiesel is quickly gaining more popularity because its pure form can be used in diesel engines without requiring any modifications. Biodiesel can also serve as a substitute or compliment to home heating oil.

## **Issues**

The use of biodiesel as an alternative fuel has rapidly increased in recent years. A great deal of resources about biodiesel and how to produce it at home can be found easily on the web. Private classes on how to produce your own biodiesel are also held throughout the Bay Area.

*Safety* – Because highly flammable materials and high heat are involved, the biodiesel production process can be very dangerous, especially when done in a private home without the proper facilities or proper handling. There are currently no state or City codes that explicitly regulate residential biodiesel production for personal use.

Manufacture of biodiesel on residential property to sell *commercially* is prohibited per the City's home-based business regulations (SMC 19.42.010). In

addition, there are state licensing and tax requirements to legally transport large quantities of waste vegetable oil and/or sell biodiesel commercially, which can be very cost-prohibitive for an individual.

Local fire marshals are very concerned with the growing trend of home biodiesel production as documented fires caused by individuals producing their own biodiesel are increasing throughout California and the nation. There is currently no documentation of biodiesel production activity in Sunnyvale, but this could increase in the near future. The Department of Public Safety's (DPS) Fire Bureau of Special Operations (specializing in fire protection and hazardous materials) strongly advises against allowing home biodiesel production. Storage of biodiesel, or even its individual "ingredients" which can be easily obtained, can be compared to common residential storage of petroleum diesel, gasoline or other toxic chemicals such as paint. It is the process of combining the chemicals and the presence of very high heat that increases the risk of accident. There are also concerns about odor and soil contamination.

### Siting

Commercial processing and manufacture of biodiesel (which is of a much lower risk than processing and manufacture of crude oil to produce gasoline or motor oil) could be allowed in the City's industrial areas, specifically in the M-3 Zoning District (General Industrial) with the approval of a conditional use permit. The City's hazardous materials unit would be able to regulate and permit a business who wished to manufacture biodiesel in the M-3 Zoning District using the California Fire Code, SMC Title 20 and other state codes. A business wishing to sell commercial biodiesel (no onsite production) would be considered an automobile service station use, which is conditionally permitted in all commercial and industrial zoning districts.

### **Alternatives**

- 2A. Adopt an ordinance to expressly prohibit home biodiesel production on residentially zoned properties under Title 19 of the Sunnyvale Municipal Code (see Attachment B), and to monitor technology and revisit the subject when significant developments occur.
- 2B. Direct the Department of Public Safety to further study the subject of home biodiesel production for personal use and develop guidelines and regulations for such use.
- 2C. Take no action and do not regulate biodiesel on residentially zoned properties.

### **Recommendations for Biodiesel**

Staff recommends Alternative 2A.

**Fuel Cell Technology**

Fuel cell technology produces electricity without combustion by combining oxygen from the air and hydrogen extracted from any one of a number of suitable hydrogen-containing fuels, such as natural gas, propane, landfill gas or liquefied petroleum gas, with low or zero emissions (see Attachment D for example photos). A fuel cell works similar to a battery, but does not run down or require recharging. As long as a constant flow of fuel is supplied (which can be connected to the building's natural gas line), the fuel cell will produce electricity. Fuel cell technology is claimed to be highly efficient, resulting in lower fuel usage. Pure water and heat are the only resulting byproducts of the electrochemical process. The resulting heat can be used to provide hot water or space heating. Fuel cell technology can also be applied to power vehicles.

Fuel cells are currently not commercially available for small-scale residential use, although they are available for large-scale power production such as for hotels or large companies. A few fuel cell generators for backup power have been installed in the City, and there is currently one company in the City that specializes in the research and development of fuel cell technology. Researchers and developers of the technology predict that the fuel cell may be commercially available for residential applications within five years.

**Issues**

Aesthetics – Current models for large-scale production are very large (see Attachment D). Models that use other fuel sources besides pure hydrogen require exhaust vents, and are typically installed outside. SMC 19.38.020 requires all exterior mechanical, electrical or other type ground- or roof-mounted equipment to be screened from view from adjoining streets or property.

Companies involved in the research and development of residential fuel cells have created a prototype that has a rated capacity of 5-7kW (which is enough to power a typical 2,000-square-foot home) and is the size of a small freezer chest. These units can be installed either in a basement or more likely outside, in which case it would be subject to the City's screening requirements to address aesthetic concerns. Any mechanical equipment, such as heating or air conditioning units, taller than 18 inches from grade are also required to meet the side and rear yard setbacks of the zoning district of the property it is located (SMC 19.48.100).

Noise – Fuel cell technology requires no combustion or moving parts, and is therefore relatively quiet. Sources state that current fuel cell prototypes (with a rated capacity of 1 kW up to 250 kW) operate at a noise level of 60 dBA, measured between three to four feet away. This noise level could be higher than the allowed nighttime limit of 50 dBA as measured on adjacent residential property lines. The source of noise in a fuel cell system is typically from the

associated equipment such as air pumps or fans. It may be necessary for these units to be located further away from property lines than required by setback requirements in order to meet the City's noise standards.

*Safety* – The City's Building Safety Division would review the proposed installation of a fuel cell on residential property using the California Building Code and the California Electrical Code.

### **Alternatives**

- 3A. Do not adopt additional regulations specifically for fuel cells. Review proposed installations using existing California Building Code, California Electrical Code and Zoning regulations (regarding mechanical equipment screening, setback and noise requirements).
- 3B. Prohibit fuel cells on residential property within the City.

### **Recommendations for Fuel Cell Technology**

Staff recommends Alternative 3A.

### **Geothermal Energy**

Geothermal energy uses the internal heat naturally generated by the Earth's core for heating and cooling and to produce electricity. Private, small-scale residential and non-residential applications of geothermal energy take the form of a heating/cooling system, more commonly known as a ground source heat pump (GSHP) system (see Attachment E for examples). GSHP systems take advantage of the earth's temperature beneath the surface, which remains fairly constant year-round. In addition to heating and cooling, GSHPs can also provide hot water. A GSHP system includes three components:

- A "loop", which is a series of pipes buried in relatively shallow ground near the building and circulates fluid that absorbs heat from, or relinquishes heat to, the surrounding soil;
- A heat pump, which transfers the heat to the building, or reverse for cooling, and is located inside the building; and
- Duct work that distributes the heated or cooled air throughout the building.

Because shallow ground temperatures are relatively constant throughout the country, GSHP systems can be effectively used almost anywhere. The composition and properties of soil and rock, lot size and location of underground utilities or sprinkler systems, however, may affect the feasibility of a GSHP system.

Geothermal heating and cooling equipment is commercially available and can be installed by any qualified heating, ventilation and air conditioning (HVAC)

system contractor. Staff believes that these systems are more likely to be installed with the construction of a new building, and not a retrofit of an existing building. Zoning development standards are not required for review of installation. The Building Safety Division would review and permit installations of geothermal heating/cooling systems using the California Building Code, California Electrical Code and certified manufacturer's installation requirements. To staff knowledge, no such systems have been installed in the City.

### **Alternatives**

- 4A. Do not adopt additional regulations specifically for geothermal heating and cooling systems. Review proposed installations using existing regulations.
  
- 4B. Prohibit geothermal heating and cooling systems on residential property within the City.

### **Recommendations for Geothermal Energy**

Staff Recommends Alternative 4A.

### **FISCAL IMPACT**

If the City Council selects an option to amend the Code and allow permitting of small wind energy systems (Miscellaneous Plan Permit or Use Permit), additional staff hours would be required to review new application. Staff does not expect to receive a large number of applications to install wind energy systems, but the number may increase as the technology develops.

### **PUBLIC CONTACT**

Public contact was made by posting the Council agenda on the City's official-notice bulletin board outside City Hall, at the Sunnyvale Senior Center, Community Center and Department of Public Safety, and in the *Sunnyvale Sun*; and by making the agenda and report available at the Sunnyvale Public Library, the Office of the City Clerk and on the City's Web site. Notices for the public hearings were also sent to neighborhood associations and other members of the public interested in the subject.

Staff held an outreach meeting on June 25, 2009 to obtain community feedback regarding the study. Notices were sent to the same mailing list for those interested in the creation of the sustainable building requirements ordinance, neighborhood associations, local "green" advocacy groups and individuals who have expressed interest in sustainable policy. The meeting had four attendees. In general, the audience was very receptive to allowing other forms of alternative energy systems in the City, as long as reasonable standards and guidelines are in place to review their installations. Some attendees felt that the permitting requirements staff is proposing for

industrial/commercial properties should be less restrictive because aesthetics is a lesser concern for those properties.

The Planning Commission reviewed this study at the public hearing held on September 28, 2009.

### **ENVIRONMENTAL REVIEW**

A Negative Declaration has been prepared in accordance with California Environmental Quality Act provisions and City guidelines (Attachment F). The Negative Declaration has been filed with the Santa Clara County Clerk-Recorder's Office for review and comment.

### **ALTERNATIVES**

#### **Wind Energy:**

- 1A. Adopt an ordinance to allow and establish regulations for small wind energy conversion systems in all zoning districts under Title 19 of the Sunnyvale Municipal Code. See Attachment B for the proposed draft ordinance addressing aesthetics, noise, safety, height, setbacks and permitting requirements for small wind energy systems.
- 1B. Postpone the adoption of an ordinance addressing small wind energy systems until clearer guidelines for wind energy implementation are published, which is anticipated in 2011.
- 1C. Prohibit small wind energy systems in the City.

#### **Biodiesel:**

- 2A. Adopt an ordinance to expressly prohibit home biodiesel production on residentially zoned properties under Title 19 of the Sunnyvale Municipal Code (see Attachment B), and to monitor technology and revisit the subject when significant developments occur.
- 2B. Direct the Department of Public Safety to further study the subject of home biodiesel production for personal use and develop guidelines and regulations for such use.
- 2C. Take no action and do not regulate biodiesel on residentially zoned properties.

#### **Fuel Cell Technology:**

- 3A. Do not adopt additional regulations specifically for fuel cells. Review proposed installations using existing California Building Code, California Electrical Code and Zoning regulations (regarding mechanical equipment screening, setback and noise requirements).
- 3B. Prohibit fuel cells on residential property within the City.

**Geothermal Energy:**

- 4A. Do not adopt additional regulations specifically for geothermal heating and cooling systems. Review proposed installations using existing regulations.
- 4B. Prohibit geothermal heating and cooling systems on residential property within the City.

**RECOMMENDATION**

***Planning Commission Recommendation:***

The Planning Commission voted unanimously to recommend the Council adopt staff's recommendations with some minor modifications to the proposed ordinance and the addition of Alternative 2B. Members of the public expressed concerns about the vague wording of the proposed wind energy system design requirements. Because there are so many variations in wind energy systems, and it is still developing, the proposed design requirements allow flexibility instead of being too prescriptive and possibly excluding certain designs. The Planning Commission recommended some modifications to the proposed ordinance, which staff has incorporated, to clarify permit requirements for wind systems located in a Heritage District or on a heritage building, and to replace the requirement that wind system towers be made of tubular steel with the broader requirement that it be of a monopole design. Two of the four speakers were opposed to the proposed prohibition of home biodiesel production. The Commission recommended the activity be prohibited, but that this prohibition be lifted when guidelines and regulations are established. The minutes of this hearing are located in Attachment G.

***Staff recommendation:***

- **Alternative 1A**, to adopt the proposed ordinance found in Attachment B to establish development standards and permitting requirements for small wind energy systems;
- **Alternative 2A**, to adopt the proposed ordinance (Attachment B) to prohibit biodiesel production in residential zones;
- **Alternative 3A**, to use existing Zoning and building/electrical codes to review proposed installations of fuel cells;
- **Alternative 4A**, to use existing Zoning and building/electrical codes to review proposed installations of geothermal heating/cooling systems; and
- Direct staff to monitor the changes in alternative energy technology and return to Council to consider possible amendments to the City's regulations if significant changes suggest that modifications are desirable.

Reviewed by:

Hanson Hom, Director, Community Development Department  
Prepared by: Rosemarie Zulueta, Assistant Planner

Approved by:

Gary M. Luebbbers  
City Manager

**Attachments**

- A. Study Issue Paper
- B. Draft Ordinance with Code Amendments to Title 19
- C. More Information on Small Wind Energy Systems
- D. Photo Examples of Fuel Cells
- E. Photo Examples of Geothermal Heat Pump Systems
- F. Negative Declaration
- G. Minutes of Planning Commission Hearing on September 28, 2009

Proposed 2009 Council Study Issue

## CDD-45 Determine Appropriate Review Standards for Alternative Energy Sources

<b>Lead Department</b>	Community Development
<b>Element or Sub-element</b>	Land Use and Transportation Element and Community Design
<b>New or Previous</b>	New
<b>Status</b>	Pending      History   1 year ago   None      2 years ago   None

### 1. What are the key elements of the issue? What precipitated it?

As interest in becoming more sustainable increases (and fuel prices rise) standards to become more "green" have evolved. There is more interest by residents and businesses to generate their own alternative energy. Several technologies are currently known, such as solar energy, and the issues, impacts and design impacts are understood and accepted. Other methods are emerging, including wind turbines, geothermal and bio-fuel.

Staff has recently been asked by members of the community about installing wind turbines on single family residential and industrial properties. The zoning code does not specifically address these uses nor provide performance standards for their use. Concerns about safety, noise and effects on birds are the initial issues.

This study would review possible types of alternative energy systems, determine the community concerns about aesthetics and environmental impacts, and prepare guidelines to use in reviewing those types of applications. Also, zoning code revisions would be made to define the uses, specifically detail how these applications would be reviewed and any findings necessary.

### 2. How does this relate to the General Plan or existing City Policy?

#### **Council Policy 1.1.9: Sustainable Development and Green Buildings**

It is the policy of the City to encourage new and remodeled development within the City to incorporate sustainable design principles in the following disciplines:

- Sustainable Sites
- Water Efficiency
- Energy and Atmosphere Materials and Resources
- Indoor Environmental Quality

#### **LAND USE AND TRANSPORTATION ELEMENT**

*Policy C4.4* Encourage sustainable industries that emphasize resource efficiency, environmental responsibility, and the prevention of pollution and waste.

### 3. Origin of issue

**Council Member(s)**  
**General Plan**

City Staff Planning  
 Public  
 Board or Commission none

- 4. Multiple Year Project? No Planned Completion Year 2009
- 5. Expected participation involved in the study issue process?

Does Council need to approve a work plan? No  
 Does this issue require review by a Board/Commission? Yes  
 If so, which?  
 Planning Commission  
 Is a Council Study Session anticipated? No  
 What is the public participation process?  
 Outreach to commercial, industrial and residential developers, businesses and residents as well as the standard public notification process.

6. Cost of Study

Operating Budget Program covering costs  
 242- Land Use Planning  
 Project Budget covering costs  
 Budget modification \$ amount needed for study  
 Explain below what the additional funding will be used for

7. Potential fiscal impact to implement recommendations in the Study approved by Council

Capital expenditure range None  
 Operating expenditure range \$500 - \$50K  
 New revenues/savings range \$500 - \$50K  
 Explain impact briefly  
 New procedures and levels of review may be offset by fees.

8. Staff Recommendation

Staff Recommendation For Study

If 'For Study' or 'Against Study', explain  
 The alternative energy field is growing more every day, and the cost is being reduced so individual property owners can afford to add them to their properties. Along with these uses, appropriate standards and review procedures are needed in order to better serve the community.

9. Estimated consultant hours for completion of the study issue

Managers	Role	Manager	Hours
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**ATTACHMENT**  $\Delta$

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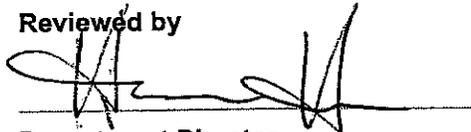
Lead	Ryan, Trudi	Mgr CY1:	20	Mgr CY2:	0
		Staff CY1:	200	Staff CY2:	0
Support	Fatapour, Ali	Mgr CY1:	5	Mgr CY2:	0
		Staff CY1:	30	Staff CY2:	0
Interdep	Berry, Kathryn	Mgr CY1:	10	Mgr CY2:	0
		Staff CY1:	0	Staff CY2:	0
Interdep	Campbell, Coryn	Mgr CY1:	5	Mgr CY2:	0
		Staff CY1:	20	Staff CY2:	0
Interdep	Lord, Patricia	Mgr CY1:	10	Mgr CY2:	0
		Staff CY1:	0	Staff CY2:	0

Total Hours CY1: 300

Total Hours CY2: 0

Note: If staff's recommendation is 'For Study' or 'Against Study', the Director should note the relative importance of this Study to other major projects that the Department is currently working on or that are soon to begin, and the impact on existing services/priorities.

Reviewed by



Department Director

1/13/09  
Date

Approved by



City Manager

1/14/09  
Date

**Addendum**

**A. Board / Commission Recommendation**

**Issue Created Too Late for B/C Ranking**

<b>Board or Commission</b>	<b>Rank</b>	<b>Rank 1 year ago</b>	<b>Rank 2 years ago</b>
Arts Commission			
Bicycle and Pedestrian Advisory Committee			
Board of Building Code Appeals			
Board of Library Trustees			
Child Care Advisory Board			
Heritage Preservation Commission			
Housing and Human Services Commission			
Parks and Recreation Commission			
Personnel Board			
Planning Commission		1 of 10	

**Board or Commission ranking comments**

**B. Council**

**Council Rank** (no rank yet)  
**Work Plan Review Date** (blank)  
**Study Session Date** (blank)  
**RTC Date** (blank)  
**Actual Complete Date** (blank)  
**Staff Contact**

## ORDINANCE NO. \_\_\_\_\_

**AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF SUNNYVALE AMENDING CERTAIN SECTIONS OF CHAPTERS 19.12 (DEFINITIONS), 19.18 (RESIDENTIAL ZONING DISTRICTS), 19.32 (BUILDING HEIGHTS, LOT COVERAGES AND FLOOR AREA RATIOS), 19.38 (REQUIRED FACILITIES), AND 19.56 (SOLAR ACCESS) OF TITLE 19 (ZONING) OF THE SUNNYVALE MUNICIPAL CODE RELATING TO ALTERNATIVE ENERGY SYSTEMS**

THE CITY COUNCIL OF THE CITY OF SUNNYVALE DOES ORDAIN AS FOLLOWS:

SECTION 1. CHAPTER 19.12 AMENDED. Section 19.12.240 of Chapter 19.12 (Definitions) of Title 19 (Zoning) of the Sunnyvale Municipal Code is hereby amended to read as follows:

**19.12.240. “W”**

(1) “Warehousing” means the storage of inventory items or materials comprising the principal stock in trade of an affected use, within an enclosed structure, provided that at least ninety percent of the floor area designed for warehouse use shall be designed, physically suited, and actually used for storage. Areas used for storage of office supplies, equipment, and materials used incidentally to a nonwarehouse use shall not be considered a warehouse use.

(2) “Wind energy system” means a private, non-commercial wind energy conversion system consisting of one wind turbine, a supporting structure and associated control or conversion equipment specifically designed to convert kinetic wind energy to electric power to reduce onsite consumption of utility power, and has a rated capacity that does not exceed the allowable rated capacity under the Emerging Renewables Program administered by the California Energy Commission. A wind energy system that exceeds the allowable rated capacity under the Emerging Renewables Program or that is used for commercial purposes shall be prohibited in all zones.

(a) “Wind energy system, height” means the vertical distance measured from the lowest point along the base of the tower to the highest point of the tower, the wind turbine or the tip of the wind turbine blade at its highest point, whichever is greatest.

(b) “Wind energy system, tower” means the support structure of the wind turbine. The tower can be freestanding or mounted on a building.

(c) “Wind turbine” means a device consisting of blades and associated mechanical and electrical conversion components mounted on a tower and used to convert wind energy into electric power.

(3) “Wireless telecommunication facility” or “telecommunication facility” means a facility that transmits and/or receives electromagnetic signals, including antennas, microwave dishes, parabolic antennas, directional antennas and other types of equipment for the transmission or reception of such signals, towers or similar structures supporting the equipment, equipment buildings, shelters, cabinets, parking area, and other accessory development.

SECTION 2. CHAPTER 19.18 AMENDED. Table 19.18.030 of Chapter 19.18 (Residential Zoning Districts) of Title 19 (Zoning) of the Sunnyvale Municipal Code is hereby amended to read as follows:

**TABLE 19.18.030**

**Permitted, Conditionally Permitted and Prohibited Uses in Residential Zoning Districts**

In the table, the letters and symbols are defined as follows:

- P** = Permitted use
- MPP** = Miscellaneous Plan Permit required
- UP** = Use Permit required
- SDP** = Special Development Permit required
- N** = Not permitted, prohibited

<b>RESIDENTIAL ZONING DISTRICTS</b>	<b>R-0/R-1</b>	<b>R-1.5</b>	<b>R-1.7/PD</b>	<b>R-2</b>	<b>R-3</b>	<b>R-4</b>	<b>R-5</b>	<b>R-MH</b>
<i>1. Residential through 6. Temporary Uses [Text unchanged]</i>								
<b>7. Other Uses</b>								
<b>A.</b> Administrative, professional and medical offices, and medical clinics	UP	UP	UP	UP	UP	UP	UP	N
<b>B.</b> Adult business establishments	N	N	N	N	N	N	N	N
<b>C.</b> Electric distribution substations	UP	UP	SDP	UP	UP	UP	UP	UP
<b>D.</b> Electric transmission substations	N	N	N	N	N	N	N	N
<b>E.</b> Massage establishments	N	N	N	N	N	N	N	N
<b>F.</b> Public service buildings and accessory uses	UP	UP	SDP	UP	UP	UP	UP	UP
<b>G.</b> Public utility buildings and service facilities	UP	UP	SDP	UP	UP	UP	UP	UP
<b>H.</b> Recycling centers	N	N	N	N	N	N	UP	N
<b>I.</b> Storage of materials, supplies or equipment used for nonresidential purposes	N	N	N	N	N	N	N	N
<b>J.</b> Storage of materials or equipment between the face of the main building and a street-unless fully screened from view <sup>5</sup>	N	N	N	N	N	N	N	N
<b>K.</b> Any use which is obnoxious, offensive or creates a nuisance	N	N	N	N	N	N	N	N
<b>L.</b> Automobile/vehicle repair <sup>7</sup>	N	N	N	N	N	N	N	N
<b>M. <u>Manufacture of biodiesel fuel</u></b>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>

**Footnotes**

1. For use by owner and/or operator only.
2. For use by mobile home park occupants only.
3. Maximum of two dwelling units per parcel.
4. Processing requirements vary, see Chapter 19.40.
5. Does not apply to vehicles which are currently licensed and operable. Screening must meet requirements of Chapter 19.46.
6. Required to comply with setback, height, and lot coverage requirements of underlying zone.
7. Automobile/vehicle repair may only be allowed pursuant to Section 19.18.050

SECTION 3. CHAPTER 19.32 AMENDED. Section 19.32.030 of Chapter 19.32 (Building Heights, Lot Coverages and Floor Area Ratios) of Title 19 (Zoning) of the Sunnyvale Municipal Code is hereby amended to read as follows:

**19.32.30. Building heights—Increased—When.**

Towers, spires, chimneys, machinery penthouses not exceeding twenty-five percent of the roof area on which the penthouse is located, scenery lofts, cupolas, water tanks, telecommunications facilities, wind turbines and towers, high bay test facilities, and similar architectural and utility structures, including equipment screening, and necessary mechanical appurtenances, may exceed the maximum building height in any zoning district by a maximum of twenty-five feet, unless otherwise permitted pursuant to Chapter 19.54 (Wireless Telecommunication Facilities) or Chapter 19.56 (Alternative Energy Systems). Provided however, that no such architectural or utility structure, equipment screening, or necessary mechanical appurtenance shall be erected, maintained, or located between the face of the main building and any public street, nor in any required side or rear yard.

SECTION 4. CHAPTER 19.38 AMENDED. Section 19.38.020 of Chapter 19.38 (Required Facilities) of Title 19 (Zoning) of the Sunnyvale Municipal Code is hereby amended to read as follows:

**19.38.020. Screening of equipment.**

(a) General requirements.

(1) ~~All~~Except as otherwise provided in subsection (b) and (c), exterior mechanical, electrical or other type equipment, whether installed on the ground, roof or walls shall be screened from view from adjoining streets or property.

(2) - (5) [Text unchanged.]

(b) Mechanical, electrical or other type equipment. All roof, wall or ground mounted mechanical, electrical or other type equipment which exceeds sixteen inches in any dimension shall be screened except:

(1) - (9) [Text unchanged.]

(10) Wind energy systems as determined by Chapter 19.56

(c) [Text unchanged.]

SECTION 5. CHAPTER 19.56 AMENDED. Chapter 19.56 (“Solar Access”) is hereby amended of Title 19 (Zoning) of the Sunnyvale Municipal Code is hereby amended to read as follows:

**Chapter 19.56.**

**SOLAR ACCESS/ALTERNATIVE ENERGY SYSTEMS**

**19.56.010. Solar Energy Systems—Permitted use.**

**19.56.020. ~~Solar envelope~~Solar Energy Systems—Impairment of solar access by structures.**

**19.56.030. ~~[Reserved]~~Solar Energy Systems—Conditions of tentative map.**

**19.56.040. ~~Solar envelope—Conditions of tentative map~~Solar Energy Systems—Variances.**

- 19.56.050** ~~Installation of solar devices, collectors and/or solar energy systems~~Solar Energy Systems—Accommodation for solar energy systems.
- 19.56.060** ~~Variances~~Wind Energy Systems—Purpose and intent.
- 19.56.070** ~~Incentives for installation of solar energy systems~~Wind Energy Systems—Permitted use.
- 19.56.080** ~~Accommodation for solar energy systems~~Wind Energy Systems—Design requirements.
- 19.56.090.** Wind Energy Systems—Permits.
- 19.56.100.** Wind Energy Systems—Exemptions.
- 19.56.110.** Wind Energy Systems—Deviations to height.
- 19.56.120.** Wind Energy Systems—Abandonment of use.
- 19.56.130.** Wind Energy Systems—Indemnity and liability for damages.
- 19.56.140.** Installation of solar energy systems and wind energy systems in commonly-held areas.
- 19.56.150.** Incentives for installation of alternative energy systems.

**19.56.010.** Solar Energy Systems--Permitted use.

The use of solar energy systems and active and passive solar collectors for the purpose of providing energy to the structure upon which they are placed, whether as a part of such a structure or incidental thereto, is a use which may be established without the necessity for any discretionary land use approval, within all zoning districts, notwithstanding any provision of this title to the contrary.

**19.56.020.** ~~Solar envelope~~Solar Energy Systems—Impairment of solar access by structures.

(a) No building permit shall be issued for any construction, the effect of which when completed would be to interfere with solar access to the rooftop of any structure or to any preexisting active solar collector on nearby property. Solar access means the absence of shadows blocking or reducing exposure to the sun to an extent greater than ten percent daily during the hours between nine a.m. to three p.m., Pacific Standard Time, throughout any solar cycle. Nothing contained herein shall require modification to any structure, the shade pattern of which would impair solar access to rooftops or active solar collectors established later in time.

(b) The provisions of this chapter shall not apply to structures or uses within the DSP zoning district.

**19.56.030.** ~~[Reserved]~~Solar Energy Systems—Conditions of tentative map.

Each tentative subdivision map approved pursuant to the procedures set forth in Title 18 of this code shall be conditioned so as to prohibit new construction of structures that would interfere with passive or active natural heating or cooling opportunities available to structures capable of being built on adjoining parcels, in accordance with all site development and zoning regulations in effect at the time of such approval. No such conditions shall be imposed, however, which would result in reducing allowable residential unit densities or the percentage of lot area which may be occupied by a building or structure under those applicable land use regulations in effect at the time such a tentative subdivision map is filed. Positive conditions, covenants and restrictions shall be provided as a part of each tentative map. Adverse conditions, covenants and

restrictions shall not be included therein, and, to the extent that they may be contained in subdivision documents approved prior to the effective date of this chapter, they are hereby declared to be contrary to the public welfare and to the public policies set forth herein.

**19.56.040. ~~Solar envelope—Conditions of tentative map~~ Solar Energy Systems—Variances.**

~~Each tentative subdivision map approved pursuant to the procedures set forth in Title 18 of this code shall be conditioned so as to prohibit new construction of structures that would interfere with passive or active natural heating or cooling opportunities available to structures capable of being built on adjoining parcels, in accordance with all site development and zoning regulations in effect at the time of such approval. No such conditions shall be imposed, however, which would result in reducing allowable residential unit densities or the percentage of lot area which may be occupied by a building or structure under those applicable land use regulations in effect at the time such a tentative subdivision map is filed. Positive conditions, covenants and restrictions shall be provided as a part of each tentative map. Adverse conditions, covenants and restrictions shall not be included therein, and, to the extent that they may be contained in subdivision documents approved prior to the effective date of this chapter, they are hereby declared to be contrary to the public welfare and to the public policies set forth herein.~~

(a) Variances may be granted from restrictions imposed by this title on the height, setback and location of structures, in the public interest, upon a showing by the applicant, made pursuant to the procedures set forth in Chapter 19.84:

(1) That the proposed construction or alteration is necessary for the purpose of placing or constructing an active or passive solar collector as defined herein;

(2) That the proposed design complies in all material respects with the provisions of Title 16 of this Code;

(3) That the proposed construction or alteration has been designed, located, and screened in a manner calculated to minimize adverse visual, audible, and other effects on surrounding properties; and

(4) That the granting of such a variance will not be materially detrimental to the public welfare.

(b) Applications for variances from the regulations imposed by this chapter shall be considered in accordance with the standards and procedures set forth in Chapter 19.84.

**19.56.050 ~~Installation of solar devices, collectors and/or solar energy systems~~ Solar Energy Systems—Accommodation for solar energy systems.**

~~A letter from the owners association approving the application shall be submitted for installation of solar energy systems in commonly held areas where the owners association is responsible for maintenance and repairs in condominium or other common interest developments.~~

To accommodate the installation of solar energy systems, including systems located on top of parking structures, the maximum height may be increased by two feet, and required setbacks for front, side and rear yards may be reduced by up to one foot upon application and approval of a miscellaneous plan

permit granted at the discretion of the director of community development pursuant to Chapter 19.82.

**19.56.060. ~~Variances~~Wind Energy Systems—Purpose and intent.**

~~(a) Variances may be granted from restrictions imposed by this title on the height, setback and location of structures, in the public interest, upon a showing by the applicant, made pursuant to the procedures set forth in Chapter 19.84:~~

~~\_\_\_\_\_ (1) That the proposed construction or alteration is necessary for the purpose of placing or constructing an active or passive solar collector as defined herein;~~

~~\_\_\_\_\_ (2) That the proposed design complies in all material respects with the provisions of Title 16 of this Code;~~

~~\_\_\_\_\_ (3) That the proposed construction or alteration has been designed, located, and screened in a manner calculated to minimize adverse visual, audible, and other effects on surrounding properties; and~~

~~\_\_\_\_\_ (4) That the granting of such a variance will not be materially detrimental to the public welfare.~~

~~\_\_\_\_\_ (b) Applications for variances from the regulations imposed by this chapter shall be considered in accordance with the standards and procedures set forth in Chapter 19.84.~~

The purpose and intent of this chapter is to provide a uniform and comprehensive set of standards for the development, siting and installation of wind energy systems. The regulations contained herein are designed to protect and promote public health, safety, community welfare and the aesthetic quality of the city as set forth within the goals, objectives and policies of the general plan and the city-wide design guidelines, while at the same time providing for the safe, effective and efficient use of wind energy systems to reduce the onsite consumption of utility supplied electricity and reduce dependence on nonrenewable energy sources.

**19.56.070. ~~Incentives for installation of solar energy systems~~ Wind Energy Systems —Permitted use.**

~~(a) To provide incentives for the installation of solar energy systems, lot coverage may be exceeded by up to one percent, and/or floor area ratio or the threshold triggering design review may be exceeded by up to one percent, as the case may be, upon approval of a miscellaneous plan permit granted at the discretion of the director of community development and subject to subsection (b) below:~~

~~(b) For single-family residential, the incentives provided in subsection (a) above for solar energy system installations shall be based on providing a minimum solar energy system size of 1.5 kW or a minimum of fifty gallons for hot water systems. For all other uses, the incentive shall be based on a minimum system size of ten percent of the anticipated or average electrical energy use.~~

Wind energy systems, as defined in Section 19.12 of this code, shall be a permitted and conditionally permitted conditional accessory use to any permitted principal use as set forth in Table 19.56.090 and subject to all of the following requirements:

(a) Number of Systems. For properties with a lot size of one acre or less, no more than one wind energy system shall be permitted. For property sizes

of more than one acre, two or more wind energy systems may be conditionally permitted with approval of a use permit.

(b) Setback. The minimum setback from all property lines to the base of the tower shall be equal to the height of the wind energy system, as defined in Section 19.12.

(c) Noise. Wind energy systems shall comply with the noise requirements set forth in Section 19.42.030.

(d) Approved Wind Turbines. The system shall use a wind turbine that has been approved by the California Energy Commission as qualifying under its Emerging Renewables Program or has been certified by a national program recognized and approved by the California Energy Commission. The applicant shall present proof of qualification or certification of the wind turbine.

(e) Electrical Wires. All onsite electrical wires associated with a wind energy system shall be located within the tower and underground, except where necessary to connect the system with a public utility company transmission line.

(g) Braking Systems. All systems shall be designed with braking, governing, or feathering systems to prevent uncontrolled rotation, over-speeding, and excessive pressure on the support structure, rotor blades and system components.

(h) Lighting. Exterior lighting on any tower or turbine associated with the wind energy system shall not be allowed except that which is specifically required by the Federal Aviation Administration.

(i) Compliance with Federal Aviation Administration. All wind energy systems shall comply with applicable Federal Aviation Administration rules and regulations. The applicant shall present proof of compliance with Federal Aviation Administration rules and regulations.

(j) Electromagnetic Interference. The system shall be operated such that no disruptive electromagnetic interference is caused to off-site telecommunications, surveillance or other similar systems. If it has been demonstrated that a system is causing such disruptive interference, the system operator shall promptly eliminate the disruptive interference or cease operation of the system.

(k) Signs. All signs on any structure or component associated with a wind energy system that is visible from any public road shall be prohibited, except for the manufacturer's or installer's identification, appropriate warning signs, or owner identification.

(l) Utility Notification. No small wind energy system shall be installed until evidence has been given that the utility company has been informed of the customer's intent to install an interconnected customer-owned wind energy system.

**19.56.080 ~~Accommodation for solar energy systems~~ Wind Energy Systems—Design requirements.**

~~To accommodate the installation of solar energy systems, including systems located on top of parking structures, the maximum height may be increased by two feet, and required setbacks for front, side and rear yards may be reduced by up to one foot upon application and approval of a miscellaneous plan permit granted at the discretion of the director of community development pursuant to Chapter 19.82.~~

In addition to all other requirements set forth in this chapter, all small wind energy systems shall meet the following design requirements:

(a) Based on potential aesthetic impact, the order of preference for a wind energy system tower is: building mounted, then freestanding. If a freestanding tower is proposed, the application must include an explanation as to why other facility types are not being considered.

(b) All systems shall be designed to minimize the visual impact to the greatest extent feasible, considering technological requirements, by means of placement and camouflage, to be compatible with existing architectural elements and building materials, and other site characteristics.

(c) Towers shall be of a monopole design and shall be self-supporting without the use of guy wires or other similar features.

(d) Colors and materials for small wind energy systems shall be chosen to minimize visibility. Facilities shall be painted using colors to match or blend with the primary background.

(e) All facilities shall be designed so as to be resistant to and minimize opportunities for unauthorized access, climbing, vandalism, graffiti, and other conditions which would result in hazardous conditions, visual blight or attractive nuisances.

(f) A freestanding structure, shall not be located in any required front, side or rear yard, nor shall they be located between the face of a building and a public street, bikeway or park, except for approved building-mounted systems located on existing or new permitted structures in accordance with this section.

#### **19.56.090. Wind Energy Systems–Permits.**

The provisions of this chapter identify and prescribe specific procedures and requirements for the filing, processing and consideration of the installation of wind energy systems. These provisions shall be used in conjunction with the general requirements and procedures identified in Chapter 19.98 including requirements and procedures for applications, fees, notification, appeals, conditions of approval, modifications, expiration, extensions and revocations.

The type of permit required for wind energy systems, and any applicable exemptions, are set forth in Table 19.56.090.

**Table 19.56.090**

**Permits Required For Wind Energy Systems**

<b><u>Wind Energy Systems Permits Zoning Districts</u></b>	<b><u>Exemptions</u></b>	<b><u>Miscellaneous Plan Permits</u></b>	<b><u>Minor Use Permits</u></b>	<b><u>Major Use Permits</u></b>
<p><b><u>Residential</u></b>  <u>R-0, R-1, R1.5, R1.7, R-2, R-3, R-4, R-5, RMH, DSP (residential blocks)</u></p> <p><b><u>Commercial and Office</u></b>  <u>C-1, C-2 C-3, C-4, O, DSP (office and mixed use blocks)</u></p>	<p><b><u>For all properties:</u></b>  <u>1) Wind turbine with a diameter of 39” or less; building-mounted system with height of no more than 15 feet above the structure ridgeline; and is not located in a heritage district or on a heritage building.</u></p>	<p><u>1) Building-mounted system with a height of no more than 15 feet above the structure ridgeline, including otherwise exempted wind energy systems located in a heritage district or on a heritage building</u></p>	<p><b><u>For all properties:</u></b>  <u>1) Building-mounted system with a height of more than 15 feet above the structure ridgeline but not more than 65 feet, as measured from existing grade</u></p> <p><b><u>For properties with nonresidential uses:</u></b>  <u>1) Freestanding system up to 65 feet in height</u></p>	<p><u>1) Requests for height deviations pursuant to Section 19.56.110</u></p>
<p><b><u>Industrial</u></b>  <u>M-S, M-3, MP-I, MP-TOD, MP-C</u></p> <p><b><u>Public Facilities</u></b>  <u>PF</u></p>	<p><u>Same as for residential and commercial zoning districts.</u></p>	<p><u>1) Building-mounted system with a height of no more than 15 feet above the structure ridgeline</u></p> <p><u>2) Freestanding system<sup>1</sup> up to 65 feet in height if located more than 1,000 feet from the right-of-way of a freeway, expressway or arterial street</u></p>	<p><u>1) Building-mounted system with a height of more than 15 feet above the structure ridgeline</u></p> <p><u>2) Freestanding system<sup>1</sup> &gt; 65 feet but &lt; 90 feet high and located more than 1,000 feet from the right-of-way of a freeway, expressway or arterial street</u></p>	<p><u>1) Freestanding system<sup>1</sup> of any height located less than 1,000 feet from the right-of-way of a freeway, expressway or arterial street</u></p> <p><u>2) Freestanding system<sup>1</sup> equal to or &gt; 90 ft. high</u></p> <p><u>3) Requests for height deviations pursuant to Section 19.56.110</u></p>

<sup>1</sup>Freestanding (not building-mounted) wind energy systems shall be restricted to a maximum height of sixty-five (65) feet when located adjacent to residentially zoned properties.

**19.56.100. Wind Energy Systems—Exemptions.**

Installation of any wind energy system identified in Table 19.56.090 as exempt which complies with all applicable provisions of Title 16 of this code (Building and Construction) and which does not pose a threat to the safety of any person does not need a land use permit. The building official is authorized to determine whether special measures may be required to ensure that the wind energy system will not pose a threat to public safety, including, but not limited to, compliance with electrical and fire code requirements, and secure installation.

**19.56.110. Wind Energy Systems—Deviations to height.**

The planning commission may allow a deviation from the height limits defined in Table 19.56.090 only, subject to compliance with the following requirements:

(a) The applicant shall demonstrate proof of substantial wind obstruction preventing maximum efficiency of the wind energy system at the maximum allowable height.

(b) The applicant shall include a visual impact analysis of the proposed wind energy system as installed, which shall include, at a minimum, a photographic simulation and any visual screening incorporated into the development that is intended to lessen the system's visual prominence.

(c) The proposed device shall satisfy all other requirements set forth in Section 19.56.070 and 19.56.080, including the required setback.

**19.56.120. Wind Energy Systems—Abandonment of use.**

A wind energy system which is not used for twelve (12) consecutive months shall be deemed abandoned and shall be dismantled and removed from the property at the expense of the property owner.

**19.56.130. Wind Energy Systems—Indemnity and liability for damages.**

(a) The small wind energy system operator shall defend, indemnify, and hold harmless the city or any of its boards, commissions, agents, officers, and employees from any claim, action or proceeding against the city, its boards, commissions, agents, officers, or employees to attack, set aside, void, or annul, the approval of the project when such claim or action is brought within the time period provided for in applicable state and/or local statutes. The city shall promptly notify the provider(s) of any such claim, action or proceeding. The city shall have the option of coordinating in the defense. Nothing contained in this stipulation shall prohibit the city from participating in a defense of any claim, action, or proceeding if the city bears its own attorney's fees and costs, and the city defends the action in good faith.

(b) Operators shall be strictly liable for any and all sudden and accidental pollution and gradual pollution resulting from their use within the city. This liability shall include cleanup, intentional injury or damage to persons or property. Additionally, operators shall be responsible for any sanctions, fines, or other monetary costs imposed as a result of the release of pollutants from their operations. "Pollutants" means any solid, liquid, gaseous or thermal irritant or contaminant, including smoke, vapor, soot, fumes, acids, alkalis, chemicals, and waste. "Waste" includes materials to be recycled, reconditioned or reclaimed.

**19.56.140. Installation of solar energy systems and wind energy systems in commonly-held areas.**

A letter from the owners association approving the application shall be submitted for installation of solar energy systems and wind energy systems in commonly-held areas where the owners association is responsible for maintenance and repairs in condominium or other common interest developments.

**19.56.150. Incentives for installation of solar and wind energy systems.**

(a) To provide incentives for the installation of solar, wind or solar-wind hybrid energy systems, lot coverage may be exceeded by up to one percent, and/or floor area ratio or the threshold triggering design review may be exceeded by up to one percent, as the case may be, upon approval of a miscellaneous plan permit granted at the discretion of the director of community development and subject to subsection (b) below.

(b) For single-family residential, the incentives provided in subsection (a) above for the installation of solar, wind or solar-wind hybrid energy systems shall be based on providing a minimum monthly energy output of 270 kWh or a minimum of fifty gallons for solar hot water systems. For all other uses, the incentive shall be based on a minimum system size of ten percent of the anticipated or average electrical energy use.

**SECTION 6. CONSTITUTIONALITY; SEVERABILITY.** If any section, subsection, sentence, clause or phrase of this Ordinance is for any reason held to be invalid by a court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of this ordinance. The City Council hereby declares that it would have passed this ordinance, and each section, subsection, sentence, clause and phrase thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases be declared invalid.

**SECTION 7. CEQA.** The City Council finds, pursuant to Title 14 of the California Code of Regulations, that this ordinance and the Negative Declaration have been prepared and are in compliance with the requirements of CEQA and hereby adopts the Negative Declaration.

**SECTION 8. EFFECTIVE DATE.** This ordinance shall be in full force and effect thirty (30) days from and after the date of its adoption.

**SECTION 9. POSTING AND PUBLICATION.** The City Clerk is directed to cause copies of this ordinance to be posted in three (3) prominent places in the City of Sunnyvale and to cause publication once in The Sun, the official newspaper for publication of legal notices of the City of Sunnyvale, of a notice setting forth the date of adoption, the title of this ordinance, and a list of places where copies of this ordinance are posted, within fifteen (15) days after adoption of this ordinance.

Introduced at a regular meeting of the City Council held on \_\_\_\_\_, 2009, and adopted as an ordinance of the City of Sunnyvale at a regular meeting of the City Council held on \_\_\_\_\_, 2009, by the following vote:

AYES:

NOES:

ABSTAIN:

ABSENT:

ATTEST:

APPROVED:

\_\_\_\_\_  
City Clerk  
Date of Attestation: \_\_\_\_\_

\_\_\_\_\_  
Mayor

SEAL

APPROVED AS TO FORM AND LEGALITY:

\_\_\_\_\_  
David E. Kahn, City Attorney

**More Information on Small Wind Energy**

- The California Energy Commission offers cash incentives to promote the installation of grid-connected small wind systems through the *Emerging Renewables Program*.
- Residential wind turbines have been installed in at least 47 of the 50 states, but the majority of the units have been installed in the Northeast and Midwest.
- The number of wind systems installed in California is not known, but around six have been installed within County of Santa Clara jurisdiction near San Jose and Morgan Hill.
- The City of Berkeley, CA installed a wind turbine on city property (Berkeley Marina) which is 34 feet tall, but do not have specific zoning regulations for small wind turbine systems on private property.
- The Mayor of San Francisco appointed a task force focused on promoting wind power in April 2008 and issued an executive order three months later to expedite permitting and limit costs for small wind projects. San Francisco currently has six small wind energy installations on both residential and nonresidential property, including a 45-foot tall HAWT on a home in the Mission District and a pair of six-foot tall, 22-inch diameter VAWTs in the Castro District (see below).
- In 2001, AB 1207 was passed to standardize permitting requirements to ensure that local agencies do not unreasonably restrict the ability of homeowners, farms and small businesses to install small wind energy systems outside of urbanized areas. The statute contained conditions for the siting of small wind energy systems, which included: one-acre minimum lot size; maximum height of 65 feet for sites between one and five acres; a setback equal to the total height of the system; a maximum noise level of 60 dBA as measured at the closest neighboring inhabited dwelling; and other design safety requirements. Although the law (Government Code § 65892.13) was repealed in 2006, a new bill (AB 45, Blakeslee) has been introduced to readdress local ordinances governing small wind energy systems outside of urbanized areas. AB 45 would not apply to the City because the City does not include any non-urbanized areas. However, its provisions serve well as starting guidelines for the City in creating review standards for small wind energy systems.
- The American Wind Energy Association published *Permitting Small Wind Turbines: A Handbook* in 2003, which contained guidelines on determining best practices for siting wind turbines based on counties' and residents' experiences from regulations set by AB 1207. The handbook is based on the parameters established by AB 1207, and serves more for counties and less urbanized areas.

- Other counties and cities throughout the state and nation, including the County of Santa Clara, have small wind energy systems regulations similar to those of AB 1207. Some allow certain systems by right, like the City of Chicago, Illinois which allows rooftop wind energy systems as accessory structures within all districts provided they are set back at least 20 feet from the front building line and do not project more than 15 feet above the roof or top of parapet.

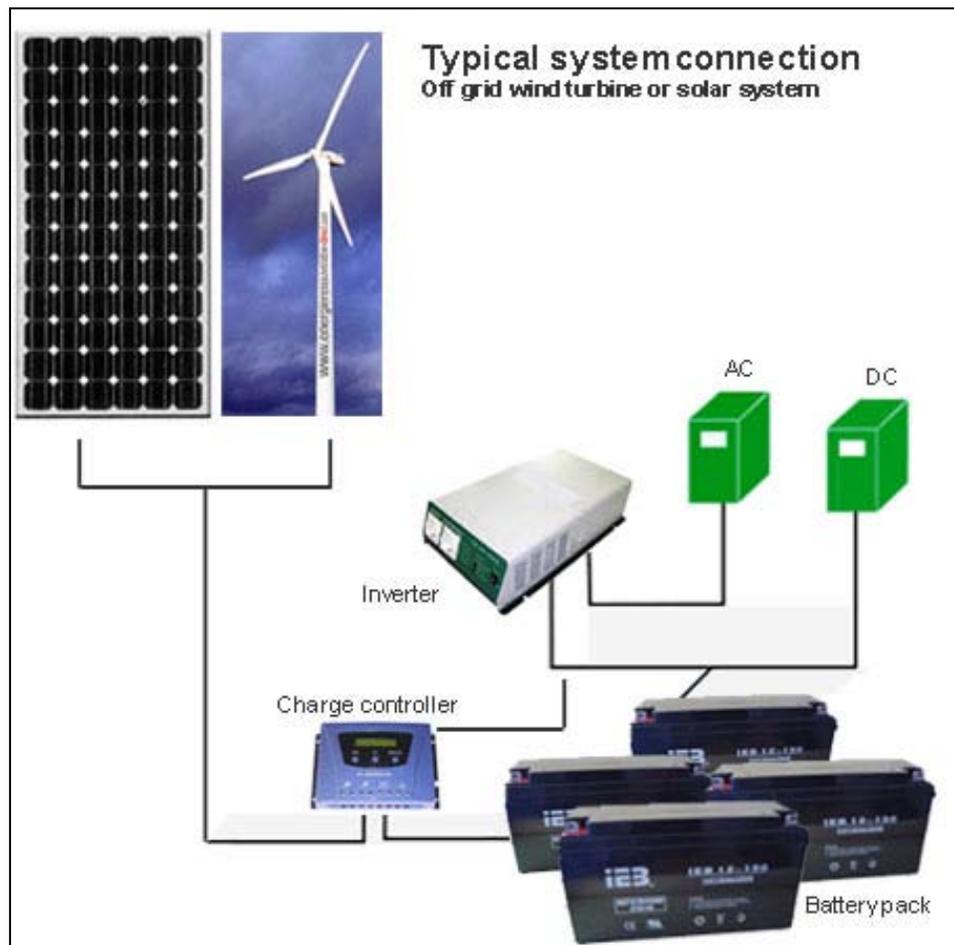
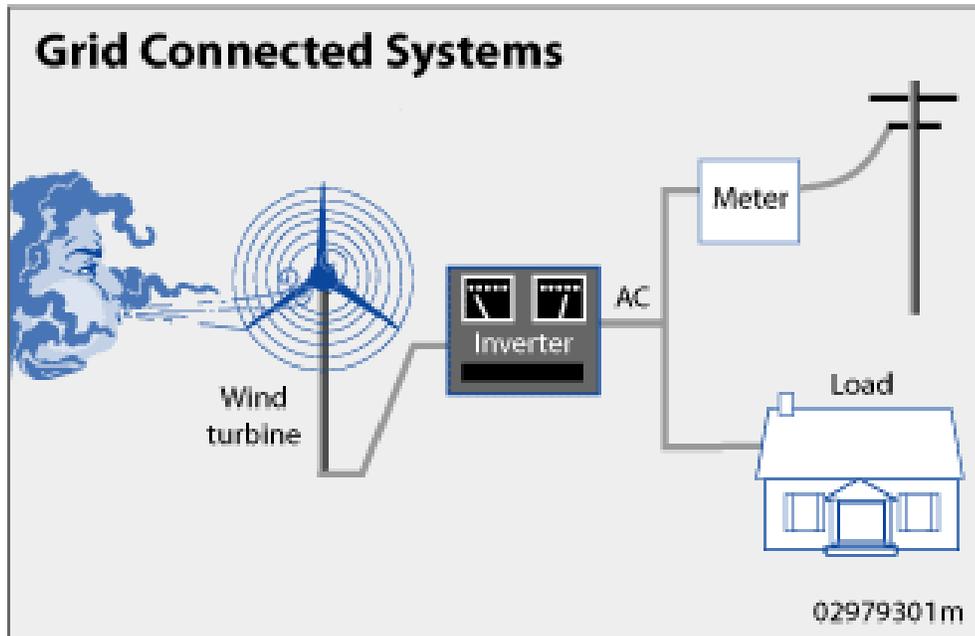
### **Other Identified Factors**

- ***Electronic interference*** – There is a concern that wind turbines may cause interference or “chopping up” of television, telecommunications or radio signals. Blade material can play a big role in the interference of electronic signals. Experimental wind turbines with metal blades installed in the 1970s caused interferences with such signals. Most wind turbine blades today are made of glass fiber-reinforced-plastic, a material that is claimed to not interfere with electronic signals as metal would.
- ***Federal Aviation Administration (FAA) Requirements*** – The FAA generally does not have requirements for structures less than 200 feet in height, which is the height that only large commercial-scale wind farm turbines could rise up to. The FAA prohibits small aircraft pilots from flying lower than 1000 feet and pilots cannot drop lower than 500 feet when approaching a runway. Small wind turbines would only be affected by FAA regulations if sited adjacent to an airport. The only runway within the area is Moffett Field. Although it is likely that small wind energy system applications would not be regulated by the FAA, applicants should still show proof of compliance with FAA regulations.
- ***Other Environmental Impacts*** – There has been much controversy surrounding the one of the largest and oldest wind farms located at the Altamont Pass in the San Francisco East Bay Area. The Altamont Pass is within a migration route and the fast-spinning blades of the large turbines, especially the older models, tend to appear invisible to birds. These factors have resulted in a large number of bird fatalities.

In the environmental impact analysis of the Moffett Towers project in the northern area of the City, it was discovered that the non-native grassland near the project area was a habitat for the burrowing owl, which is classified as a special-status wildlife species. There was also a sighting of the sharp-shinned hawk, which is a State species of special concern, but it was determined that the high human presence in the area and lack of dense canopy cover makes the area unsuitable for nesting by the species. More common species birds and other wildlife were sighted in the City's wetlands north of the City's developable land area.

Small wind turbines are generally not tall enough to interfere with bird migration patterns and are not installed in dense enough configurations to create a “windwall” effect for birds. Proponents of wind energy also argue that smokestacks, power lines radio/TV towers, vehicles and pollution have been the cause of far greater numbers of bird fatalities. The National Audubon Society expressed support for AB 1207 which required the siting and operation of a small wind energy system outside of urbanized areas as a “use by right” if it met specified requirements. In a letter from the Legislative Director of Audubon to Assemblyman Longville, author of AB 1207, it was stated that the death toll caused by small-scale wind turbines would be similar to the deaths caused by other stationary objects that birds routinely fly into, but not near the numbers caused by large wind farms. Wind turbine designs are evolving as a response to save avian life, which is one reason why VAWTs are gaining popularity as they tend to appear more solid to birds when spinning.

▪ Typical Installations



**Commercial/Industrial (Non-Residential) Applications**

***Horizontal Axis Wind Turbines***



**Commercial/Industrial (Non-Residential) Applications**

***Vertical Axis Wind Turbines***



Wind turbines



**Residential Applications**

**Horizontal Axis Wind Turbines**



Horizontal wind turbine on residential property in San Francisco's Mission District

**Residential Applications**

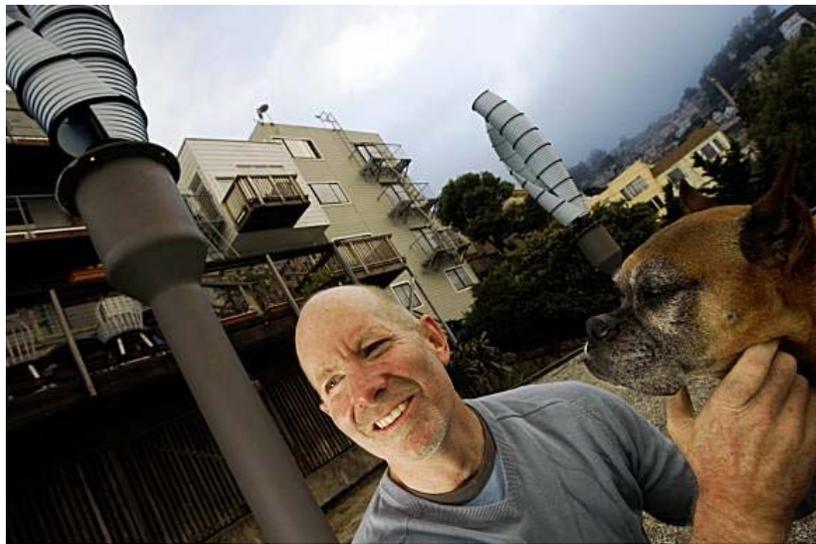
**Vertical Axis Wind Turbines**



Chicago, IL



Eric Luse / The Chronicle



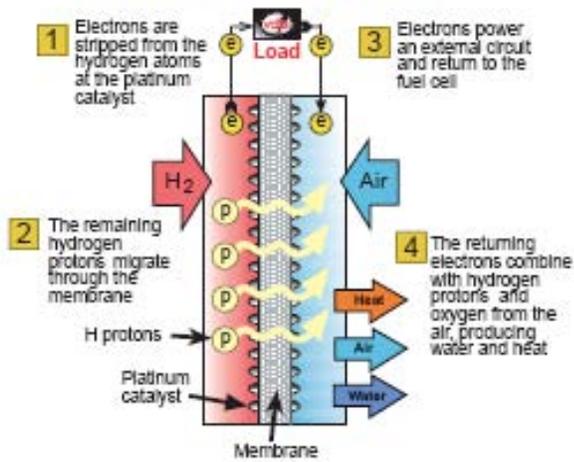
Eric Luse / The Chronicle

Two vertical axis wind turbines on residential property in San Francisco's Castro neighborhood

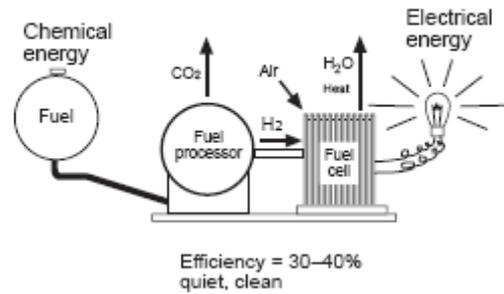
Residential Applications



How a Fuel Cell Works



Fuel Cell Generator



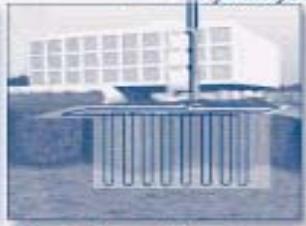
Commercial Applications:



Wells to groundwater



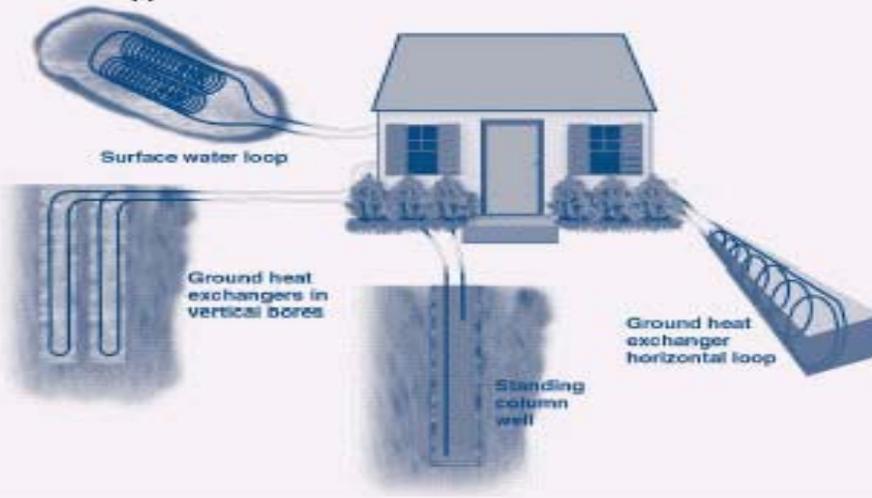
Surface water loops



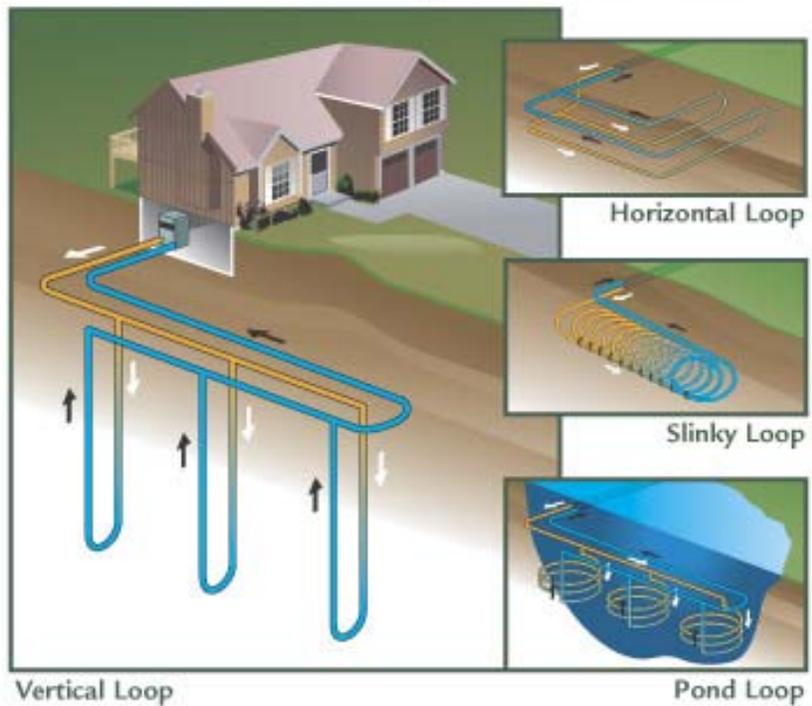
Matrix of ground heat exchangers in vertical bores

Optional cooling tower for hybrid systems

Residential Applications:



Geothermal Energy for the Home





PLANNING DIVISION  
 CITY OF SUNNYVALE  
 P.O. BOX 3707  
 SUNNYVALE, CALIFORNIA 94088-3707

File#: 181 8/28/2009

ATTACHMENT F  
 Page 1 of 17  
 File Number: 2009-0071  
 No. 09-11

**NOTICE OF INTENT TO ADOPT  
 NEGATIVE DECLARATION**

This form is provided as a notification of an intent to adopt a Negative Declaration which has been prepared in compliance with the provisions of the California Environmental Quality Act of 1970, as amended, and Resolution #193-86.

**PROJECT TITLE:**

**Alternative Energy Systems Ordinance to amend Title 19 of the City of Sunnyvale Municipal Code.**

**PROJECT DESCRIPTION AND LOCATION (APN):**

**2009-0071: Determine Appropriate Review Standards for Alternative Energy Sources** – The City of Sunnyvale is studying potential changes to the Municipal Code regarding the installation of small, non-commercial alternative energy conversion systems. This study is an extension of the City's recent activities related to sustainable policies and regulations. The study includes wind energy, biodiesel, fuel cells and geothermal energy.

**WHERE TO VIEW THIS DOCUMENT:**

The **Negative Declaration**, its supporting documentation and details relating to the project are on file and available for review and comment in the Office of the Secretary of the Planning Commission, City Hall, 456 West Olive Avenue, Sunnyvale.

This **Negative Declaration** may be protested in writing by any person prior to 5:00 p.m. on **Tuesday, October 20, 2009**. Protest shall be filed in the Department of Community Development, 456 W. Olive Avenue, Sunnyvale and shall include a written statement specifying anticipated environmental effects which may be significant. A protest of a **Negative Declaration** will be considered by the adopting authority, whose action on the protest may be appealed.

**HEARING INFORMATION:**

A public hearing on the project is scheduled for:

**Monday, September 28, 2009 at 8:00 p.m. and Tuesday, October 20, 2009** in the Council Chambers, City Hall, 456 West Olive Avenue, Sunnyvale.

**TOXIC SITE INFORMATION:**

(No) listed toxic sites are present at the project location.

Circulated On August 28, 2009

Signed: Gerr Caruso  
 Gerr Caruso, Principal Planner

**Environmental Checklist Form**

Project Title	Alternative Energy Systems Ordinance
Lead Agency Name and Address	City of Sunnyvale P.O. Box 3707, Sunnyvale, CA 94088-3707
Contact Person	Rosemarie Zulueta
Phone Number	408-730-7437
Project Location	City-wide
Project Sponsor's Name	City of Sunnyvale
Address	456 W. Olive Avenue Sunnyvale, CA 94088
Zoning	City-wide (all zoning districts)
General Plan	City-wide (all general plan districts)
Other Public Agencies whose approval is required	None

**Description of the Project:** The City Council initiated a study to review possible types of alternative energy systems, determine the community concerns about aesthetics and safety issues, and to develop appropriate review standards for reviewing those types of applications. The study focuses on small, noncommercial energy systems for on-site generation and use only and does not include allowing large alternative energy power plants in the City. The study has resulted in the preparation of an ordinance that creates standards and permitting requirements for the installation of small wind energy conversion systems. The proposed ordinance includes different permitting requirements for each zoning district, containing more stringent conditions for residentially zoned properties and properties adjacent to residential uses in response to community concerns regarding aesthetics and safety. It includes a required setback equal to the total height of the system from all property lines and a requirement to meet the City's operational noise restrictions. The ordinance is located in Attachment A.

There is no construction directly related to this project therefore no physical changes to the environment would result. Further environmental review would be required for specific project applications exceeding certain thresholds as described in the proposed ordinance.

**Surrounding Uses and Setting:** This project is city-wide and pertains to all properties within the City.

**Other Public Agencies whose Approval is Required:** None.

**EVALUATION OF ENVIRONMENTAL IMPACTS**

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g. the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g. the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g. the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g. the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
3. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
4. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
5. "Negative Declaration: Potentially Significant Unless Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section 17, "Earlier Analysis," may be cross-referenced).
6. Earlier analysis may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063 (c) (3) (d). In this case, a brief discussion should identify the following:
7. Earlier Analysis Used. Identify and state where they are available for review.
8. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
9. Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project
10. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g. general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

**ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:**

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- Aesthetics
- Agricultural Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology/Soils
- Hazards & Hazardous Materials
- Hydrology/Water Quality
- Land Use/Planning
- Mineral Resources
- Noise
- Population/Housing
- Public Services
- Recreation
- Transportation/Traffic
- Utilities/Service Systems
- Mandatory Findings of Significance

**DETERMINATION:**

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed project MAY have a "potential significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

  
Signature

August 24, 2009

Date

Rosemarie Zulueta

City of Sunnyvale

Printed Name

For (Lead Agency)

	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source
<b>1. AESTHETICS.</b> Would the project:					
a. Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2, 17
b. Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2, 17
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2, 17, See Discussion
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2, 17
<b>2. AIR QUALITY:</b> Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:					
a. Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3, 111
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3, 111
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3, 111
d. Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3, 111
e. Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3, 111
<b>3. BIOLOGICAL RESOURCES:</b>					
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U. S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111, See Discussion

	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source
b. Have a substantially adverse impact on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111, See Discussion
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111, See Discussion
d. Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111, See Discussion
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	41, 111
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
<b>4. CULTURAL RESOURCES. Would the project:</b>					
a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
b. Cause a substantial adverse change in the significance of an archaeological resources pursuant to Section 15064.5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
d. Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
<b>5. LAND USE AND PLANNING. Would the project:</b>					
a. Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111

	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source
b. Conflict with an applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17
<b>6. MINERAL RESOURCES.</b> Would the project:					
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	19
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	19
<b>7. NOISE.</b> Would the project result in:					
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	16, 29, See Discussion
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	16, 29, See Discussion
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	16, 29, See Discussion
d. A substantially temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	16, 29, See Discussion
<b>8. POPULATION AND HOUSING.</b> Would the project:					
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
b. Displace substantial numbers of existing housing, necessitating the construction of	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111

	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source
replacement housing elsewhere?					
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
<b>9. PUBLIC SERVICES.</b> Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:					
a. Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
b. Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
c. Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
d. Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
e. Other services?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
<b>10. MANDATORY FINDINGS OF SIGNIFICANCE</b>					
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111, See Discussion
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of the past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111

**Environmental Checklist Form**

Project Number: 2009-0071  
 Alternative Energy Systems Ordinance  
 Project Address: City-wide  
 Applicant: City of Sunnyvale

	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
<b>11. GEOLOGY AND SOILS.</b> Would the project:					
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UBC, UPC, UMC, NEC, 108
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UBC, UPC, UMC, NEC, 108
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UBC, UPC, UMC, NEC, 108
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UBC, UPC, UMC, NEC, 108
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UBC, UPC, UMC, NEC, 108
b. Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UBC, UPC, UMC, NEC, 108
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UBC, UPC, UMC, NEC, 108
d. Be located on expansive soil, as defined in Table 18-a-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UBC, UPC, UMC, NEC, 108
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UBC, UPC, UMC, NEC, 108

	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source
<b>12. UTILITIES AND SERVICE SYSTEMS.</b> Would the project:					
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	20, 111
b. Require or result in construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	20, 111
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	20, 111
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	20, 111
e. Result in a determination by the wastewater treatment provider which services or may serve the project determined that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	20, 111
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	22
g. Comply with federal, state, and local statues and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	22
<b>13. TRANSPORTATION/TRAFFIC.</b> Would the project:					
a. Cause an increase in the traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111

	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source
b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
d. Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
e. Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
f. Result in inadequate parking capacity?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
g. Conflict with adopted policies or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12
<b>14. HAZARDS AND HAZARDOUS MATERIALS.</b>					
Would the project?					
a. Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UFC, UBC, SVMC
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UFC, UBC, SVMC
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UFC, UBC, SVMC
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UFC, UBC, SVMC
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UFC, UBC, SVMC

	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source
residing or working in the project area?					
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UFC, UBC, SVMC
g. Impair implementation of, or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UFC, UBC, SVMC
h. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UFC, UBC, SVMC
<b>15. RECREATION</b>					
a. Would the project increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13
<b>16. AGRICULTURE RESOURCES:</b> In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:					
a. Convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2, 111
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2, 111
c. Involve other changes in the existing environment which, due to their location or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2, 111

**Environmental Checklist Form**

Project Number: 2009-0071  
 Alternative Energy Systems Ordinance  
 Project Address: City-wide  
 Applicant: City of Sunnyvale

	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source
nature, could result in conversion of Farmland, to non-agricultural use.					
<b>17. HYDROLOGY AND WATER QUALITY. Would the project:</b>					
a. Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	24, 87
b. Substantially degrade groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	25
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	24
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or surface runoff in a manner which would result in flooding on- or off site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	24
e. Create or contribute runoff which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	24
f. Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	24
g. Place housing within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	111
h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	56

	Potentially Significant Impact	Less than Sig. With Mitigation	Less Than Significant	No Impact	Source
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	56
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	24

**Discussion:**

**1. c, Aesthetics:** The proposed ordinance was developed from a combination of examples of regulations and guidelines from other cities, the American Wind Energy Association and AB 1207, and tailored to the community's aesthetic, noise and safety concerns. The City's existing Telecommunication Facilities Code was also chosen as a reference for establishing design standards for wind turbines because they are similar in structure and have similar aesthetic concerns. The adoption of the proposed ordinance would not result in any direct aesthetic impacts to the built environment; however, subsequent projects could result in the existence of small wind turbines in the City, some of which could reach great heights. Each project will be evaluated individually to determine impacts to neighboring uses and further environmental review may be required, depending on the height and location of the wind energy system.

The ordinance does allow exemptions for building-mounted wind energy systems that meet the following criteria: 1) Does not project over 15 feet above the building's ridgeline; 2) Wind turbine has a diameter of 39 inches or less; and 3) Not located in a historic district or on a historic building. This criteria is similar the City's current standards for telecommunications facilities.

**3. a & d, Biological Resources:** Small wind turbines are generally not tall enough to interfere with bird migration patterns and are not installed in dense enough configurations to create a "windwall" effect for birds. The City is also not known to be within a migratory route. Proponents of wind energy also argue that smokestacks, power lines radio/TV towers, vehicles and pollution have been the cause of far greater numbers of bird fatalities. The National Audubon Society expressed support for AB 1207 which required the siting and operation of a small wind energy system outside of urbanized areas as a "use by right" if it met specified requirements. In a letter from the Legislative Director of Audubon to Assemblyman Longville, author of AB 1207, it was stated that the death toll caused by small-scale wind turbines would be similar to the deaths caused by other stationary objects that birds routinely fly into, but not near the numbers caused by large wind farms.

It has been discovered that the non-native grassland in the northern area of the City was a habitat for the burrowing owl, which is classified as a special-status wildlife species. There has also been a sighting of the sharp-shinned hawk, which is a State species of special concern, but it has been determined that the high human presence in the area and lack of dense canopy cover makes the area unsuitable for nesting by the species.

Design standards and discretionary permit requirements included in the proposed ordinance would also allow for additional review of potential environmental impacts. Design standards include prohibiting lattice towers and the use of guy wires, reducing potential perching or artificial habitats for birds and other wildlife.

**7. a-d, Noise:** Any permitted applications would be subject to the City's operational noise requirements, including more restrictive standards for properties adjacent to residentially zoned property. Applicants would have to choose small wind turbine models that are engineered to operate more quietly than older, more traditional models.

**10. a Mandatory Findings of Significance:** See discussion of **3. a & d Biological Resources** above.

**Rosemarie Zulueta**

Completed By

**8/24/09**

Date

**City of Sunnyvale General Plan:**

2. General Plan Map
3. Air Quality Sub-Element
4. Community Design Sub-Element
5. Community Participation Sub-Element
6. Cultural Arts Sub-Element
7. Executive Summary
8. Fire Services Sub-Element
9. Fiscal Sub-Element
10. Heritage Preservation Sub-Element
11. Housing & Community Revitalization Sub-Element
12. Land Use & Transportation Sub-Element
13. Law Enforcement Sub-Element
14. Legislative Management Sub-Element
15. Library Sub-Element
16. Noise Sub-Element
17. Open Space Sub-Element
18. Recreation Sub-Element
19. Safety & Seismic Safety Sub-Element
20. Sanitary Sewer System Sub-Element
21. Socio-Economic Sub-Element
22. Solid Waste Management Sub-Element
23. Support Services Sub-Element
24. Surface Run-off Sub-Element
25. Water Resources Sub-Element
26. **City of Sunnyvale Municipal Code:**
27. Chapter 10
28. Zoning Map
29. Chapter 19.42. Operating Standards
30. Chapter 19.28. Downtown Specific Plan District
31. Chapter 19.18. Residential Zoning Districts
32. Chapter 19.20. Commercial Zoning Districts
33. Chapter 19.22. Industrial Zoning Districts
34. Chapter 19.24. Office Zoning Districts
35. Chapter 19.26. Combining Zoning Districts
36. Chapter 19.28. Downtown Specific Plan
37. Chapter 19.46. Off-Street Parking & Loading
38. Chapter 19.56. Solar Access
39. Chapter 19.66. Affordable Housing
40. Chapter 19.72. Conversion of Mobile Home Parks to Other Uses
41. Chapter 19.94. Tree Preservation
42. Chapter 19.96. Heritage Preservation
- Specific Plans**
43. El Camino Real Precise Plan
44. Lockheed Site Master Use Permit
45. Moffett Field Comprehensive Use Plan
46. 101 & Lawrence Site Specific Plan
47. Southern Pacific Corridor Plan
- Environmental Impact Reports**
48. Futures Study Environmental Impact Report
49. Lockheed Site Master Use Permit Environmental Impact Report
50. Tasman Corridor LRT Environmental Impact Study (supplemental)
51. Kaiser Permanente Medical Center Replacement

- Center Environmental Impact Report (City of Santa Clara)
52. Downtown Development Program Environmental Impact Report
53. Caribbean-Moffett Park Environmental Impact Report
54. Southern Pacific Corridor Plan Environmental Impact Report

**Maps**

55. City of Sunnyvale Aerial Maps
56. Flood Insurance Rate Maps (FEMA)
57. Santa Clara County Assessors Parcel
58. Utility Maps (50 scale)

**Lists/Inventories**

59. Sunnyvale Cultural Resources Inventory List
60. Heritage Landmark Designation List
61. Santa Clara County Heritage Resource Inventory
62. Hazardous Waste & Substances Sites List (State of California)
63. List of Known Contaminants in Sunnyvale

**Legislation/Acts/Bills/Codes**

64. Subdivision Map Act
65. Uniform Fire Code, including amendments per SMC adoption
66. National Fire Code (National Fire Protection Association)
67. Title 19 California Administrative Code
68. California Assembly Bill 2185/2187 (Waters Bill)
69. California Assembly Bill 3777 (La Follette Bill)
70. Superfund Amendments & Reauthorization Act (SARA) Title III

**Transportation**

71. California Department of Transportation Highway Design Manual
72. California Department of Transportation Traffic Manual
73. California Department of Transportation Standard Plan
74. California Department of Transportation Standard Specification
75. Institute of Transportation Engineers - Trip Generation
76. Institute of Transportation Engineers Transportation and Traffic Engineering Handbook
77. U.S. Dept. of Transportation Federal Highway Admin. Manual on Uniform Traffic Control Devices for Street and Highways
78. California Vehicle Code
79. Traffic Engineering Theory & Practice by L. J. Pegnataro
80. Santa Clara County Congestion Management Program and Technical Guidelines
81. Santa Clara County Transportation Agency Short Range Transit Plan

82. Santa Clara County Transportation Plan
83. Traffic Volume Studies, City of Sunnyvale Public works Department of Traffic Engineering Division
84. Santa Clara County Sub-Regional Deficiency Plan
85. Bicycle Plan

**Public Works**

86. Standard Specifications and Details of the Department of Public Works
87. Storm Drain Master Plan
88. Sanitary Sewer Master Plan
89. Water Master Plan
90. Solid Waste Management Plan of Santa Clara County
91. Geotechnical Investigation Reports
92. Engineering Division Project Files
93. Subdivision and Parcel Map Files

**Miscellaneous**

94. Field Inspection
95. Environmental Information Form
96. Annual Summary of Containment Excesses (BAAQMD)
97. Current Air Quality Data
98. Chemical Emergency Preparedness Program (EPA Interim Document in 1985?)

99. Association of Bay Area Governments (ABAG) Population Projections
100. Bay Area Clean Air Plan
101. City-wide Design Guidelines
102. Industrial Design Guidelines

**Building Safety**

103. Uniform Building Code, Volume 1, (Including the California Building Code, Volume 1)
104. Uniform Building Code, Volume 2, (Including the California Building Code, Volume 2)
105. Uniform Plumbing Code, (Including the California Plumbing Code)
106. Uniform Mechanical Code, (Including the California Mechanical Code)
107. National Electrical Code (Including California Electrical Code)
108. Title 16 of the Sunnyvale Municipal Code

**Additional References**

109. USFWS/CA Dept. F&G Special Status Lists
110. Project Traffic Impact Analysis
111. Project Description
112. Project Development Plans
113. Santa Clara County Airport Land Use Plan
114. Federal Aviation Administration

**Planning Commission Minutes of September 28, 2009**

**2009-0071** Determine Appropriate Review Standards for Alternative Energy Sources (Study Issue) – RZ

**Rosemarie Zulueta**, Assistant Planner, presented the staff report. Ms. Zulueta commented that she had provided information to a Planning Commissioner who contacted her regarding section 19.56.030 in the proposed ordinance stating that the section was repealed in a recent code amendment, and that she and the Commissioner discussed development incentives for wind energy.

**Comm. Rowe** asked staff about wind energy systems, noise levels, and improving technologies. **Trudi Ryan**, Planning Officer, clarified that any wind system installed would need to comply with the noise regulations.

**Comm. Hungerford** asked staff about Attachment B, the proposed ordinance, section 19.12.240 regarding wind energy systems and Emerging Renewables Program. Staff discussed the kilowatt needs for the typical residence, and wind energy systems production. Comm. Hungerford referred to the proposed ordinance Chapter 19.56 and discussed with staff changes in terms and their location in the ordinance. Comm. Hungerford commented about the proposed ordinance, Table 19.18.030 and that he thought it was odd that biodiesel was included under K, "obnoxious, offensive or creates a nuisance", and thought maybe biodiesel should have a separate category. Staff said this could be done.

**Comm. Rowe** asked staff why incentives are needed to encourage alternative energy sources with staff explaining the proposed incentives are included to be consistent with what the City did with solar energy incentives.

**Comm. Klein** discussed with staff Electromagnetic Interference and measurements referring to Attachment B, page 7, item (j) with staff commenting that the sources consulted did not address measurements and that this ordinance is designed to be revisited when more established guidelines are published.

**Comm. Sulser** discussed biodiesel with staff. He said the staff recommendation is potentially banning new environmental technology. Ms. Ryan said conversations with the Hazardous Materials Division of Public Safety resulted in the recommendation to prohibit the production of biodiesel fuels, not the use of it. Staff said home biodiesel production is currently too dangerous.

**Chair Chang** discussed with staff the height allowances for wind turbine structures. Chair Chang asked about the language in section 19.56.040 regarding Solar Energy Systems and Conditions of the Tentative Map.

**Chair Chang opened the public hearing.**

**Mei-Ling Stefan**, a Sunnyvale resident, thanked staff for the recommendation of forbidding home production of biodiesel. Ms. Stefan discussed concerns about staff's recommendation, Alternative 1A under Wind Energy and said she cannot support this alternative. She said she supports the idea of outreach meetings to review standards as guidelines as they become available in the future.

**Jim Griffith**, a Sunnyvale resident, commented about vertical access wind turbines being preferable to horizontal turbines in an urban setting and said he does not see vertical access wind turbines addressed in the proposed ordinance. He said that he would like to see an order of preference specified for vertical over horizontal access aesthetics and the mention of the benefits of vertical turbines as protection to the bird population.

**Michael Flores**, a Sunnyvale resident, commented that his understanding is there are multiple ways of home biodiesel production. He said he would prefer to see Alternative 2B under Biodiesel section recommended to allow further study of the subject of home biodiesel production. Mr. Flores commented about the height of electrical systems and suggested there be some distinction of the height measuring of the poles and the types of poles.

**John Cordes**, a Sunnyvale resident, commented that he thinks Alternative 2B in the Biodiesel section of the report is the better recommendation. He discussed biodiesel and said he does not think it should be prohibited for personal use as it is a way to save money and a move towards cleaner technology. He also commented that the design guidelines are too vague and he would like clearer guidelines. He said he does not think residents should be told what their towers should be built with or limit the use of guy wires.

**Chair Chang closed the public hearing.**

**Ms. Ryan** commented to Chair Chang further information about section 19.56.040 regarding Solar Energy Systems and Conditions of the Tentative Map.

**Comm. McKenna** said she understands the concern about safety with biodiesel however, she likes the idea that this subject would be looked at in a future study. Ms. Ryan said that the recommendation is based on the Hazardous Materials Division and whether there could be a new study would be based on their workload. Ms. Ryan said a provision could be included with the current staff recommendation. Comm. McKenna discussed with staff horizontal versus vertical wind energy systems. Comm. McKenna asked staff to discuss the design



**Klein** offered a Friendly Amendment to modify the proposed ordinance, Table 19.56.100, adding requirements under the Miscellaneous Plan Permit column for Wind Energy Systems located in a Heritage District or on a heritage building. The maker of the motion accepted the Friendly Amendment. **Comm. Klein** offered a Friendly Amendment to modify the proposed ordinance, 19.56.090 (c), removing "Towers shall be constructed of tubular steel" and adding language that the tower shall be a monopole design, not specifying the composition of the tower. The maker of the motion accepted the Friendly Amendment.

**Comm. Hungerford** offered a Friendly Amendment to modify the proposed ordinance, Table 19.18.030, moving the language "including manufacture of biodiesel fuel" from 7.K to a separate category. The Friendly Amendment was acceptable to the maker and seconder of the motion.

**Comm. McKenna** said that she thinks this motion is a good recommendation on changing technologies and she knows this will be revisited again. She said she is pleased staff is looking at the newer technologies, and glad to approve this and pass it on to City Council.

**Comm. Klein** said this recommendation regarding wind power is a first stepping stone. He said he is glad staff would be revisiting the new technologies issue every couple of years and that alternative energy sources are one way a homeowner can decrease their reliance on a larger system, which improves Sunnyvale. He said the report was educational and he looks forward to the Planning Commission reviewing the first application for wind power.

**Comm. Rowe** said this was one of the more enjoyable sessions on Planning Commission as it involved the City, public and the Planning Commission. She said that this creates a living document that can be changed when necessary, as soon as is necessary, which is a good start.

**Chair Chang** said he would be supporting the motion. He said this is a moving target and as new regulations come from other cities and the Federal government reviews regulations, this issue can be revisited. He said he thinks it is good the Commission did not recommend a major prohibition on biodiesel as it would be good to have the capability with the safety concerns also addressed.

**ACTION:** Comm. McKenna made a motion on 2008-0071 to recommend that City Council: for Alternative 1A, to adopt the proposed ordinance found in Attachment B to establish development standards and permitting requirements for small wind energy systems; for Alternative 2A, to adopt the proposed ordinance (Attachment B) to prohibit biodiesel production in residential zones and adding Alternative 2B “directing the Department of Public Safety to further study the subject of home biodiesel production for personal use and develop guidelines and regulations for such use”; for Alternative 3A, to use existing Zoning and building/electrical codes to review proposed installations of fuel cells; for Alternative 4A, to use existing Zoning and building/electrical codes to review proposed installations of geothermal heating/cooling systems; and direct staff to monitor the changes in alternative energy technology and return to Council to consider possible amendments to the City’s regulations if significant changes suggest that modifications are desirable; to modify the proposed ordinance, Table 19.56.100, adding requirements under the Miscellaneous Plan Permit column for Wind Energy Systems located in a Heritage District or on a heritage building; to modify the proposed ordinance, 19.56.090 (c), removing “Towers shall be constructed of tubular steel” and adding language that the tower shall be a monopole design, not specifying the composition of the tower; to modify the proposed ordinance, Table 19.18.030, moving the language “including manufacture of biodiesel fuel” from 7.K to a separate category. Comm. Klein seconded. Motion carried, 6-0, with Vice Chair Travis absent.

**APPEAL OPTIONS:** This recommendation will be forwarded to City Council and is scheduled to be considered at the October 20, 2009 Council meeting.