

ELEMENT I ENERGY

GOAL: Promote energy conservation and the use of renewable energy sources throughout the City in a cost effective way.

Description of Energy and Energy Sources

Energy is defined as anything that makes it possible to do work and cause movement against resistance. The use of energy depends upon the availability of sources and development of the technological skill to use them.

Energy sources can be categorized as nonrenewable or renewable. Nonrenewable energy sources cannot be restored, whereas, renewable sources can be harnessed indefinitely. Examples of nonrenewable sources are petroleum fuels and natural gas. Renewable energy sources include solar, wind, hydroelectric, and geothermal steam.

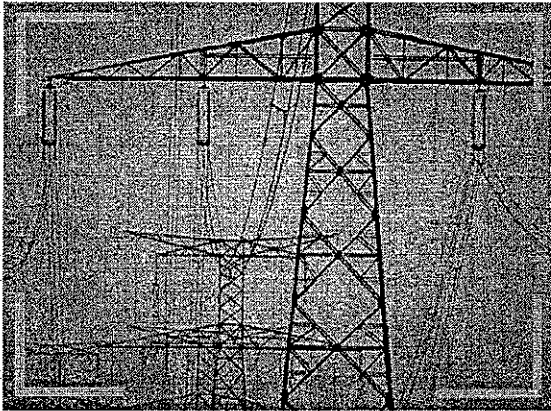
Nonrenewable energy sources are subject to price fluctuation and interruptions in supply. In addition, air pollution, water pollution and acid rain are some examples of the by-products produced from converting petroleum fuel to energy. These by-products are not associated with most renewable sources. Substituting renewable for nonrenewable sources and conserving energy will reduce the chance of a future energy crisis and will result in a cleaner environment. This conservation can be accomplished through reduced consumption, increased efficiency and changes in individual behavior.

This element provides a basis for long-range energy planning. In addition, it summarizes information on energy supply and demand. The associated state and local objectives, when implemented, will result in efficient energy consumption by the City and its residents, businesses, and industries.

Existing Conditions

Supply: The primary supplier of retail natural gas to Irvine is the Southern California Gas Company (SCG). The primary supplier of retail electricity to Irvine is the Southern California Edison Company (SCE).

On March 31, 1998, the electricity generation market was deregulated creating the ability for other providers to supply electricity. However, as of June 1998, SCE remains the primary supplier for the City of Irvine. Electricity can be generated from a combination of oil, natural gas, hydroelectric, nuclear, or renewable sources (wind and solar). Future energy sources which may decrease the area's reliance on fossil fuels include solar, wind, and geothermal energy. Operational wind turbines in the Coachella Valley provide a small portion of the region's electricity needs.



Consumption: Irvine's energy is consumed by residential, commercial, industrial, agricultural and transportation uses. The commercial sector is the largest energy (electricity) consumer in Irvine. Natural gas is mostly consumed by the residential sector. Lighting and space heating are the principal end users of electricity and natural gas in the residential and commercial sectors.

Transportation is the only major end user of liquid fuels.

Trends

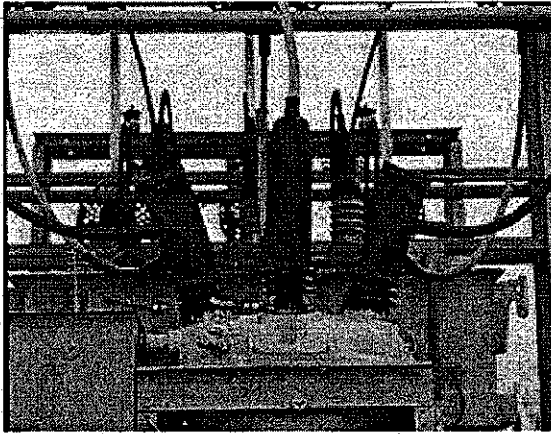
Supply: This Element assumes that the existing mix of energy supply will continue through the 1990s. Some renewable energy sources, such as solar water heating, will replace existing sources but will not significantly change the future mix of Irvine's supply.

The natural gas industry was deregulated in 1994. Now, large users are commonly supplied by companies other than The Gas Company while residents are still served by The Gas Company. Price fluctuations do occur but the volatility is tempered by the ability to stockpile natural gas. It can be stored underground in natural rock formations, above ground in tanks, or in transmission and distribution systems.

The electricity industry in California was restructured effective March 1998. All consumers can now purchase power directly. Most of the smaller users (residents and small businesses) received an automatic 10 percent reduction in rates effective January 1, 1998. As the electricity market evolves, pricing is expected to become more volatile as it reacts to fluctuating demand and other market factors. The fact that electricity cannot be stored and must be used immediately will contribute to its price volatility. This makes the market for electricity very different from that for natural gas.

Consumption: Irvine's future energy consumption has been evaluated based on two scenarios: a) the "base case" assumes that the existing energy consumption pattern continues without conservation and that the

energy consumption increases in proportion to the change in building stock and/or population growth; b) the "conservation case" assumes that energy conservation measures are implemented and nonrenewable sources are replaced by renewable ones. The principal actions being taken in the conservation case are the strong enforcement of the State of California Code of Regulations, Title 24, "Energy Building Regulations" and this element's objectives and policies. The state regulations are strictly enforced in the City of Irvine.



Identification of Issues

1. How can the City mitigate the impact of rising energy costs for natural gas and electricity for Irvine's residents, businesses, industries, and municipal operations?
2. How can the City reduce its vulnerability to price fluctuations and supply and increase the use of locally available resources?
3. How might the City influence regional policies such as transportation planning to serve local residents and businesses more effectively?
4. How can the City inform the public of existing and future potential energy programs and regulations?
5. In what ways might the City encourage public acceptance of energy retrofit programs?
6. How can the City maintain its services to protect the public health and safety during energy shortages?
7. What services can the City provide to implement energy programs and promote the use of renewable energy sources?

Response To Issues

The following objectives and policies respond to the identified issues:

OBJECTIVE I-1: ENERGY CONSERVATION

Maximize energy efficiency through land use and transportation planning.

The following policies support Objective I-1:

Policy (a): Consider the following or comparable design features, to the extent feasible, in developments at time of concept plan, subdivision, or development review:

- Encourage optimum solar access, natural ventilation and energy efficient landscaping.
- Encourage east/west alignment for local streets and building orientation which maximizes solar access, natural ventilation, and which minimizes conflicts with the solar access of adjacent structures or properties.
- Encourage energy-efficient landscaping (water conserving plants, indigenous vegetation, and use of on-site water run-off) consistent with the City's Sustainability and Landscaping Ordinance.
- Encourage, as part of required landscape plans, plant types and irrigation systems which minimize

water usage and provide cooling opportunities during summer and minimize conflicts with solar access during winter.

- Encourage cluster residential development when feasible.
- Encourage south slope utilization in hillside development.
- Require cut-off or directional lighting fixtures to be used to direct light only to desired areas and to reduce glare.

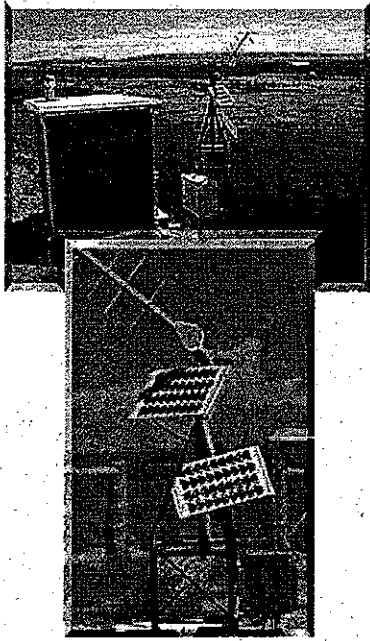
Policy (b): Encourage and promote incorporation of energy conservation measures. The measures should be developed in conjunction with the applicant and may include:

- Active solar water and/or space heating.
- Passive design features for heating and cooling.
- Use of energy efficient devices.

Policy (c): Encourage development of shared energy facilities in major commercial projects where cost effective, such as:

- Heating/cooling system.
- Solar water heating.
- Photovoltaic (e.g., solar panel).

Policy (d): Develop guidelines establishing architectural and aesthetic controls for solar devices. Guidelines should provide reasonable controls while maintaining cost effectiveness of devices or systems.



Policy (e): Facilitate the participation of industries in the following conservation programs where cost effective:

- Cogeneration (process heat/steam/electricity).
- Reclaiming waste products (biomass, solid waste, waste water).
- Recycling (aluminum, paper, glass and steel).
- Carpooling.
- Mass Transportation.

Policy (f): Require developers of major commercial or industrial facilities who develop a transportation management plan to address such measures as:

- Flex time and/or shifting work schedules to avoid peak traffic.
- Employee carpools and vanpools.
- Preferential and free parking for carpools and vanpoolers.
- Ridesharing programs.

- Shuttle services from regional transportation (e.g., rail/bus) stations to final destination.
- Subsidies for transit passes.
- Locker room facilities for employees (e.g., for bicyclists).

Policy (g): Promote use of alternative modes of transportation by the following programs:

- Encourage use of regional public transportation (e.g., rail service) by:
 1. Supporting the development of regional transportation stations in Irvine.
 2. Making schedules available at City Hall and other public agencies.
 3. Requesting Orange Transportation Authority (OCTA) to establish and provide information on bus connection for regional transportation passengers.
- Encourage use of the bus system by working with OCTA to provide:
 1. Bus circulation between residential, commercial and industrial uses.
 2. More efficient transfers between bus routes.
 3. Posted schedules at bus stops.
 4. Widely distributed bus schedules.
 5. Shuttle services from regional transportation stations to final destination.

- Encourage use of public transit and ridesharing by promoting and participating in public information programs aimed at schools, sports clubs and other institutions and organizations.

Policy (h): Continue implementing the City program to synchronize traffic signals.

Policy (i): Monitor the federal, state, regional, other local governments, the utility companies, Irvine Ranch Water District (IRWD), and other private and public agencies energy programs and regulations and:

- Explore opportunities and limitations on use of renewable sources.
- Obtain information and technical assistance for energy programs.
- Implement federal and state energy programs.
- Support continuation of tax credits for alternative renewable sources and conservation measures.
- Allocate available federal funds and grants such as Community Development Block Grant (CDBG) for energy programs for low income and senior housing development.
- Inform developers and the general public of recent available energy programs, regulations, technical, and economic data (e.g., cost effectiveness).

OBJECTIVE I-2: RETROFIT PROGRAMS

Promote energy savings in buildings constructed prior to 1978.

The following policies support Objective I-2:

Policy (a): Encourage voluntary retrofit energy programs for residential, commercial and industrial buildings including energy conservation measures such as:

- Residential retrofit measures.
 1. Ceiling and wall insulation.
 2. Weather stripping, sealing and caulking.
 3. Low flow shower head.
 4. Water heater tank insulation.
 5. Duct insulation.
 6. Air conditioning recycling devices.
 7. Computer controlled thermostats.
- Commercial retrofit measures.
 1. Ceiling and wall insulation.
 2. Weather stripping, sealing and caulking.
 3. Shading controls (e.g., overhangs).

4. Lighting controls.
5. Thermostat controls (summer and winter).
6. Optimum heating, ventilation, and air conditioning (HVAC) scheduling.

- Industrial retrofit measures.

1. Operating and maintaining equipment at peak performance.
2. Maintaining furnaces.
3. Adjusting lighting.
4. Plugging leaks in heating and cooling process.

Policy (b): Support the voluntary retrofit energy programs through the following:

- Providing an energy efficiency rating system for identifying the needed type of retrofit measures.
- Provision of information to the chamber of commerce, real estate brokers, building contractors, homeowners, apartment owners and consumers on retrofit measures installation, cost-effectiveness, financing assistance, and other agencies energy programs.

Policy (c): Promote the voluntary residential retrofit energy program by encouraging homeowners associations to do the following:

- Purchase bulk solar systems and conservation materials.

- Sponsor buying clubs, cooperative or other suitable mechanism to purchase, install, and maintain retrofit measures.

Policy (d): Provide technical assistance for homeowners for the installation of active solar systems, such as information on optimal orientation and building code requirements.

Policy (e): Work closely with the utility companies and the chamber of commerce, schools and other public entities in support of energy reduction programs, and dissemination of information regarding these programs.

Policy (f): Consider increasing public information regarding energy programs by:

- Mailing energy consumption and conservation data to homeowners associations.
- Displaying energy information in local shopping area and community centers, City, and other public-libraries (e.g. UCI).
- Publishing energy information in local newspapers.
- Incorporating energy information in City schools, Irvine Valley College and UCI programs.

Policy (g): Provide homeowners associations and the general public with available information on:

- Renewable energy sources, conservation measures, technical and economic data (e.g. cost-effective analysis), and consumer protection issues and programs.

OBJECTIVE I-3: MUNICIPAL CONSERVATION

Maximize energy efficiency of the City's facilities and operations by use of recycled materials, renewable sources, and conservation measures.

The following policies support Objective I-3:

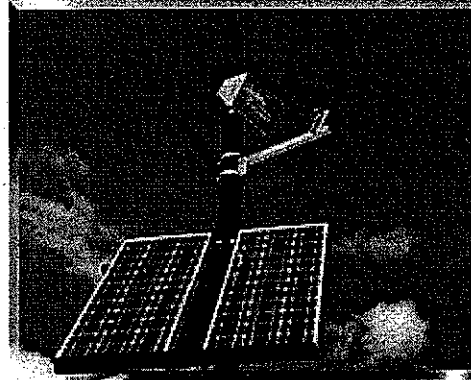
Policy (a): Management program to reduce energy consumption for municipal facilities and operations including:

- Public buildings and facilities.
- Street lighting.
- City vehicle fleet management.
- Appliance/equipment procurement.
- Employee energy awareness program.

Policy (b): Incorporate the commercial retrofit conservation measures in municipal facilities where feasible.

Policy (c): Use the following renewable sources for municipal facilities where cost effective:

- Solar water and pool heating.
- Photovoltaics (e.g., solar panels).
- Cogeneration.



Policy (d): Establish a fund for improving energy efficiency of municipal facilities, and reinvest up to 50 percent of energy savings for implementing the actions of this Energy Element.

Policy (e): Develop an energy plan coordinated with utilities, local and regional government agencies.

Policy (f): Consider establishing a City energy service/coordinator with adequate support to promote, implement and administer the Energy Element.

RELATED OBJECTIVE NUMBERS

Land Use Element - A-1, A-7
Circulation Element - B-3 through B-6
Housing Element - C-2
Noise Element - F-1
Public Facilities and Services Element - G-4
Integrated Waste Management Element - H-1
Growth Management Element - M-4, M-5