



# Metropolitan Energy Commission Tucson - Pima County

<http://www.tucsonmec.org>



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## Annual Report 2000

### Introduction:

As the Tucson metropolitan region enters the 21st Century, the community is presented with an array of unprecedented challenges and opportunities. Since the mid-1990s, the population of the area has grown an average four percent annually. This represents a doubling of total population in eighteen years, and a growth rate which has significant effects on most sectors of our local economy. During the past decade, energy has consumed about ten percent of total annual economic spending. Measures to reduce energy consumption have multiplier effects generating ongoing economic dividends, including increasing personal income, business profit, local tax-base and job creation.

The Tucson-Pima County Metropolitan Energy Commission (MEC) presents this Millennium Annual Report to inform the general public about our activities and to invite all groups in the community to join us in promoting strongly informed energy choices in the future.

### The Commission:

MEC is an appointed, volunteer civic commission, jointly established in 1980 by the City of Tucson and Pima County to serve the community on energy matters. During the past twenty years, the Commission has actively educated the public on a variety of topics, analyzed technical issues, commented on energy legislation, conducted strategic planning, issued recommendations to the public, private, and nonprofit sectors, developed community support, and sponsored many energy-related community activities and projects.

### The Mission:

Since mid-1994, MEC has focused on its mission to act as a catalyst for sustainable energy development in the community. The Commission believes that sustainability is the only feasible approach to rapid regional population growth because it balances the requirements for economic development with environmental integrity and social needs. MEC has supported and promoted many sustainable initiatives through seed grants and partnerships with other organizations to meet the need of the community for more sustainable approaches to

development and quality of life. MEC has successfully leveraged its modest \$20,000 annual budgets to begin to make sustainability a part of everyday life in the community.

### **Community Energy Performance:**

According to the Tucson-Pima County Energy Assessment Update published by MEC in February 2000, there's good news and bad news on Tucson's energy front.

The Good News- Tucson consumed almost 9 percent less energy per capita in 1998 than it did in 1992. This decrease saved the metro economy almost \$150 million in 1998 and compares favorably with energy consumption in the rest of Arizona which remained largely unchanged during the same six-year period. This overall energy decrease was primarily the result of lower energy consumption in residential, commercial and institutional buildings. The Commission contributed to this effect by fostering increased public awareness and supporting codes and standards for energy efficiency in buildings.

The Bad News - Though overall energy use per capita is declining, higher transportation energy use points to the challenge for new community solutions to transportation needs. Improvements in transportation energy consumption will reduce greenhouse gases, contribute to more healthy air quality, conserve non-renewable resources and generate significant economic benefits. Currently, more than \$1 billion, or 70 percent of the total \$1.5 billion spent on energy annually, leaves the Tucson metro area. Costs are in energy payments, particularly for oil, gasoline and electricity.

The Good News - The Commission is refocusing its efforts toward larger energy issues in the transportation and growth sectors, while continuing to monitor and support the implementation of proven building energy- efficiency standards. For every ten percent of reduced energy consumption annually, Tucson saves \$100 million for other needs and investment. This is the Commission's primary challenge and opportunity.

### **Civano and the Greater Tucson Solar Village Program:**

The Commission's first visionary initiative was a sustainable development project, the Tucson Solar Village Project, now being commercially built as the Community of Civano. With support from the Arizona Energy Office's Oil Overcharge Restitution Fund, MEC led a twelve-year participatory planning and design process. After reviewing other sustainable development projects, such as Village Homes in Davis, California, MEC was able to show significant economic opportunities in sustainable development. The potential of solving multiple problems through this approach convinced city leaders to implement Civano in 1994. MEC also argued that a sustainable design model could be adapted throughout the city and thereby benefit existing community residents. MEC proposed in 1994 that a Greater Tucson Solar Village Program could assist individuals, businesses and organizations to adopt sustainable energy practices throughout the area. The Solar Village effort has led to many community benefits, [among them including sustainable building codes, international attention on Tucson as a

"solar capital" and sustainable development leader, and establishment of the Tucson Institute for Sustainable Communities and the Southern Arizona Green Builder Alliance.]

While the original focus was to demonstrate beneficial uses of solar energy, the Civano vision also includes conservation of energy, water, managed waste and mixed-use development and land-use which encourages more pedestrian circulation and building stronger community interaction. The Metropolitan Energy Commission played a primary role in the adoption of those design criteria and guidelines.

Civano is now under construction. The Civano Neighborhood Center and Phase One of the 820 acre development is one year old, with approximately 85 homes constructed and 40 families living at the village as of mid-2000. The Commission continues to monitor the project and provide technical guidance on energy requirement compliance (Memorandum of Understanding, including the Sustainable Energy Standard (SES)).

Work done by several members of The Commission resulted in a standard of compliance that modifies the Model Energy Code, now called the International Energy Conservation Code (IECC) for developers and builders. The standard, named the "Sustainable Energy Standard" by the Tucson/Pima County Building Code Committee, requires improved building energy efficiency by at least 50 percent over the IECC and is available to anyone outside of Civano. Its wide adoption is strongly promoted by The Commission.

### **Sustainable Energy Standard:**

The Sustainable Energy Standard (SES) provides technical guidelines allowing other developments, (new and retrofit) to incorporate Civano performance guidelines for energy conservation, water use and waste into more general building projects. The Sustainable Energy Standard has been adopted by the City of Tucson for all City-owned buildings (to be built or renovated). The new East Side Service Center housing the Ward Four office was the first to use the SES standard as a design guideline.

The SES has been updated to the new International Energy Conservation Code (IECC) and will be made available to the public through the City's plans examination process for voluntary use by anyone who wants to build to a higher standard pending final approval by the City Council. The U.S. Department of Energy has provided support to continue development of the Sustainable Energy Standard as a design tool.

### **Activities:**

The Commission has undertaken other activities in addition to the Solar Village Project. MEC completed a Metropolitan Tucson Energy Assessment in December 1994 and in 1996 prepared the Community Strategic Energy Plan. This community plan is designed as an ongoing and future-oriented, action-focused process, which mobilizes and empowers the community toward effective energy development and management. Following approval by the Mayor and Council, and the Board of Supervisors, MEC continues to implement the plan. During the past year the Commission played an organizing role and involved the community in several ways by providing to the City of Tucson and Pima County

- \* A network for energy-related groups, business and community organizations,
- \* A support resource for citizens and government officials; and
- \* A clearinghouse for energy information, issues and events.

### **Energy Assessment Update:**

MEC commissioned Dr. Helmut J. Frank to update the 1994 Metropolitan Energy Assessment to determine local energy trends and whether the Commission's efforts were paying off. Published by MEC in February 2000, the Tucson-Pima County Energy Assessment Update shows changes in local energy consumption by energy use sector and energy source between 1992 and 1998. Even, during a period when the local population grew by 17.6 percent, per capita consumption decreased by 9 percent. In addition to the \$150 million saved by the community, this reduced energy consumption prevented more than 4 million tons of carbon dioxide and other greenhouse gases and 400 million gallons of evaporated water being released into the atmosphere in 1998.

While residential and commercial buildings sectors accounted for nearly all of the energy savings, the industrial and transportation energy-use sectors showed increased per capita consumption between 1992 and 1998. This was due primarily to increased industrialization, construction, and more vehicle trips driven. Even though gas mileage for passenger cars has improved, there are more trucks, vans and sports utility vehicles (SUVs) on the road, all of which get much lower gas mileage. Petroleum use in Tucson increased to 51% of total energy consumed in 1998. Petroleum prices have increased dramatically in recent years: crude oil prices tripled and the cost of jet and diesel fuel more than doubled. Gasoline is now more than 70 percent higher in price than a year ago.

Dr. Frank, a consultant to the commission and professor emeritus of economics at the University of Arizona explained that other energy trends bode well for the community. The solar energy industry is beginning to take off in Tucson and energy-efficiency related businesses are beginning to create many new jobs in the metro area. Also, according to Dr. Frank, energy-related exports to developing countries holds promise for the local economy.

### **Electric Utility Restructuring:**

The rules for electric restructuring (retail electric competition) in the state of Arizona have been put into place. MEC has monitored the ongoing efforts of the Arizona Corporation Commission (ACC) and provided input at public forums. To date, competition in the Southern Arizona area is virtually nonexistent. The original Solar Portfolio Standard (SPS) was not included in the restructuring rules.

### **Environmental Portfolio Standard:**

The original SPS was pulled from the restructuring rules and a similar standard was introduced as a new docket called the Solar and Environmentally Friendly Portfolio Standard. Under the Environmental Portfolio Standard, which was finally adopted, electric suppliers, including the incumbent utilities, must provide a percentage of their electricity from renewable and environmentally friendly resources. The percentage begins at 0.2% on 1/1/01 and increases to 1.1% in 2004. The 1.1% remains in effect until 2012. Continuation of the portfolio after 12/31/04 is dependent upon an as yet to be decided

cost/benefit relationship. The ACC staff will form a working group to make a recommendation to the ACC regarding an acceptable cost/benefit point. The portfolio will be funded through funds collected by the utilities under existing rates as well as by a surcharge. The commission will continue to monitor the new regulations and advise policy makers as needed.

### **MEC Web Site (tucsonmec.org):**

MEC's web site was implemented in 1998 and provides local and global access so that anyone can find out what MEC is doing and learn about Tucson and energy issues. Information on the site includes sustainable building codes, innovative homes, the community strategic energy plan, calendar of events, local information resources and a database of sustainable building technologies, methods and case examples. With over 57,000 visits in the first three months, MEC continues to reach a large number of people all over the world who are interested in the sustainable approaches developing here in Tucson. Web monitoring shows heavy interest in innovative Tucson buildings and techniques. Please check our site (<http://tucsonmec.org>). We are continually improving this site so it contains information useful for all users.

### **Implementation of the Community Strategic Energy Plan:**

Since the publication and distribution of the Community Strategic Energy Plan in 1996, MEC has hosted several community focus groups to explore changing community priorities and to identify more effective ways of reaching our four strategic goals. As stated in the Plan, these are:

1. Increase community benefits by more efficient energy use;
2. Improve the energy supply;
3. Protect against the negative impacts of energy use;
4. Work together to achieve a desirable energy future.

The results of the community dialogues indicated that the most important issues were solar industry development, transportation alternatives, mixed-use land development, desert-adapted landscaping, building design and construction, sustainable development, and environmental protection.

Implementation strategies most often identified were community cooperation, information and education, public examples and demonstration projects, public policy and planning, building codes and zoning regulations, financial and regulatory incentives, and awards and recognition. In addition to specific strategies, the groups identified a need for a more comprehensive approach to energy issues in general by all stakeholders in the community. MEC is using this information to guide future activities and help make our website become a more effective tool for decision-making on energy choices.

The recent Tucson-Pima County Energy Assessment Update indicates that the Strategic Plan is beginning to show positive results. The Update also demonstrates that further implementation efforts are needed to ensure that Tucson's growing future is a sustainable one and that future energy choices become opportunities for implementing better technologies which produce multiple benefits for the entire community.

## **Energy Awards Program:**

Collaboration between the Metropolitan Energy and Education Commissions started the Energy Education Awards in 1996 to foster energy education and awareness in the greater Tucson community. Bekki Booth from Tucson Electric Power Company received the 1999 Energy Education Award for her voluntary work promoting energy efficiency with Habitat for Humanity of Tucson. Suzanne Maly, a science teacher in Tucson Unified School District, also received a 1999 Energy Education Award for her work promoting solar energy at Safford Magnet Middle School. Dr. Helmut Frank received the 2000 Energy Education Award for a lifetime of achievement in energy education, including college teaching, research, and community service.

The annual Southern Arizona Energy Awards were jointly developed in 1997 by the Southern Arizona Chapter, Association of Energy Engineers (AEE); the Tucson Chapter, American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE); and the Tucson-Pima County Metropolitan Energy Commission (MEC). Their purpose is to both recognize the commercial and residential buildings which have achieved excellence in design, implementation, and energy utilization, and also those individuals responsible for the projects. Global Solar received the 1999 Commercial Award and the "Otro Lado" Project designed and built by David Taggett received the 1999 Residential Award. The Sierra Vista Library, the City of Tucson's Southeast Service Center and the Satori Elementary School received the 2000 Commercial Award and Ron Carswell tied with Rick and Theresa Riess/Dave Taggett to receive the 2000 Residential Award.

Several Transportation Energy Awards also began in 1999, jointly sponsored by the Metropolitan Energy Commission, Tucson Regional Clean Cities Coalition, Pima County Department of Environmental Quality and Pima Association of Governments. Sun Tran, the City of Tucson's transit operator, received the 1999 Clean Cities Award for its success in promoting alternative fueled fleet vehicles. Southwest Gas and the Blue Flame Propane Company both received the 2000 Clean Cities Awards.

Bonnie Bedillion (Ratheon) won the 1999 Blue Skies Award for the most energy saved and pollution reduced during the annual Pima County Clean Air Challenge. Ms. Bedillion rode the bus during the two week challenge period, and saved over 1,200 trip miles, 60 gallons of gasoline, and 48 pounds of pollution.

The 2000 Blue Skies Award included two winners: Mary Casey (bus rider) from Raytheon and Gregory Tenney (bicycle rider) from the City of Tucson. Mary saved 1080 miles during the 2-week event, 54 gallons of gasoline, and 43 pounds of air pollution. Greg saved 55 miles, but travels exclusively by bicycle 365 days a year, since he doesn't own a car. So on an annual basis, he would save 1,375 miles, 69 gallons of gasoline, and 55 pounds of pollution.

There were over 6,000 participants in the recent Bike Fest and Clean Air Challenge activities and close to 1,000 sent in their entry forms for the prize drawing. According to the information on the entry forms, participants saved over 132,000 total miles and over 5,300 pounds of air pollution.

## **Leveraged Funds:**

### **FY 1998-1999:**

During FY 1998-99, MEC utilized an \$18,200 budget from the City and County to leverage \$304,017 additional energy investments in the Tucson Metropolitan Area. MEC funded projects and leveraged funds included:

- Solar/Renewable Energy Adventure in cooperation with the University of Arizona Environmental Research Laboratory (\$12,335),
- Women for Sustainable Technologies Conference (\$6,100),
- 1998 Innovative Home Tour (\$10,000),
- 1999 Energy Awards (\$1,500),
- University of Arizona Daedalus Solar Car Team (\$80,000),
- Arizona Student Solar Competition (\$4,725),
- Photovoltaics for Schools Project in cooperation with the Tucson Unified School District and Tucson Coalition for Solar (\$139,357), and
- Million Solar Roof grant in cooperation with the Tucson Coalition for Solar (\$50,000).

### **FY 1999-2000:**

During FY 1999-00, MEC supported community education efforts with funds totaling \$10,136 to leverage \$619,950 additional energy investments in the Tucson Metropolitan Area. MEC funded projects and leveraged funds included:

- Tucson Unified School District in cooperation with the Tucson Coalition for Solar, funding for the Photovoltaics for Schools Program (MEC funding in FY 1998-99 - \$2,000, received a \$100,000 grant from the U. S. Department of Energy).
- Tucson Unified School District, funding for 5 compressed natural gas (CNG) school buses (MEC provided a letter of support, Arizona Energy Office grant and other matching funds - \$480,534).
- Tucson Institute for Sustainable Communities, funding for community events calendar and poster session (MEC funding - \$840, Other matching funds - \$2,050).
- Tucson Institute for Sustainable Communities, funding to support the Southern Arizona Green Builder Alliance and business plan (MEC funding - \$2,000, Other matching funds - \$13,000).
- Emerald Resource Solutions, funding for the Evolution Workshop series (MEC funding - \$2,500, Corporate donations & class fees - \$4,600).
- 2000 Energy Awards (MEC funding - \$1,796, Other matching funds from AEE, ASHRAE, Metropolitan Education Commission, Pima County Department of Environmental Quality & Pima Association of Governments - \$13,966).
- Women for Sustainable Technologies, funding to support the "Moving Towards Sustainability" conference scheduled for Oct. 7, 2000 (MEC - \$3,000), other matching funds - \$5,800.