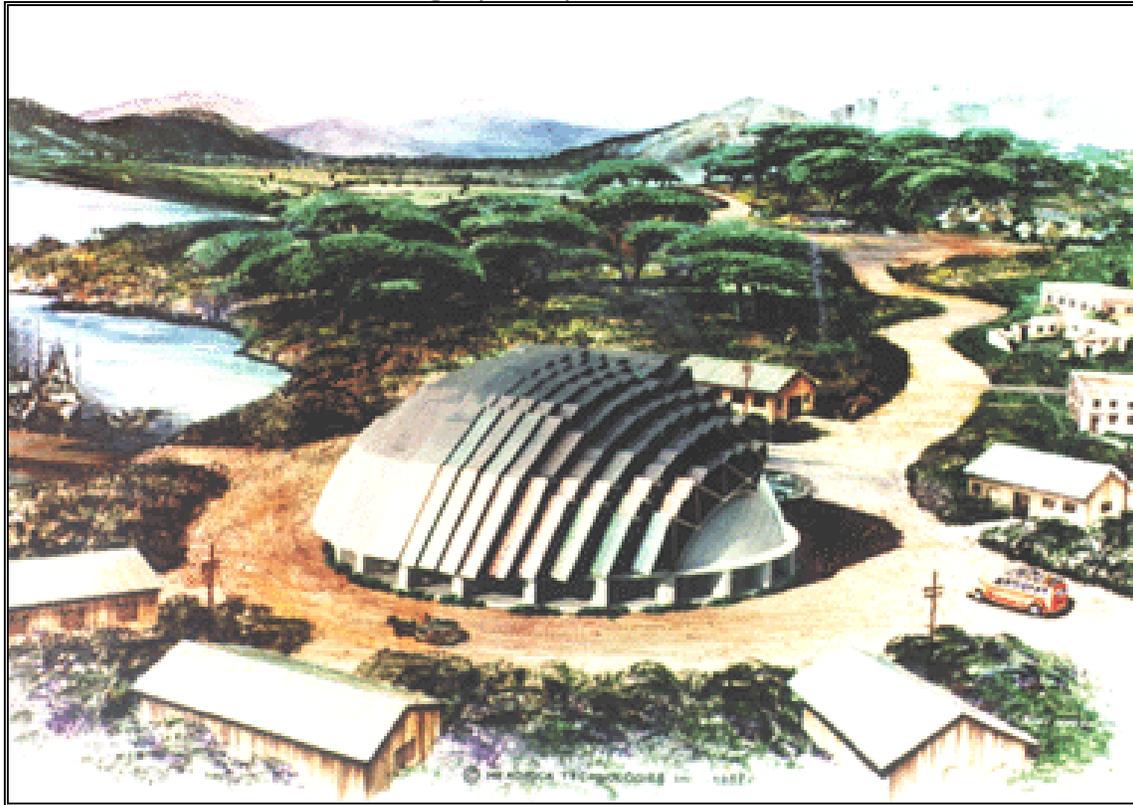


CHAPTER 5 1993

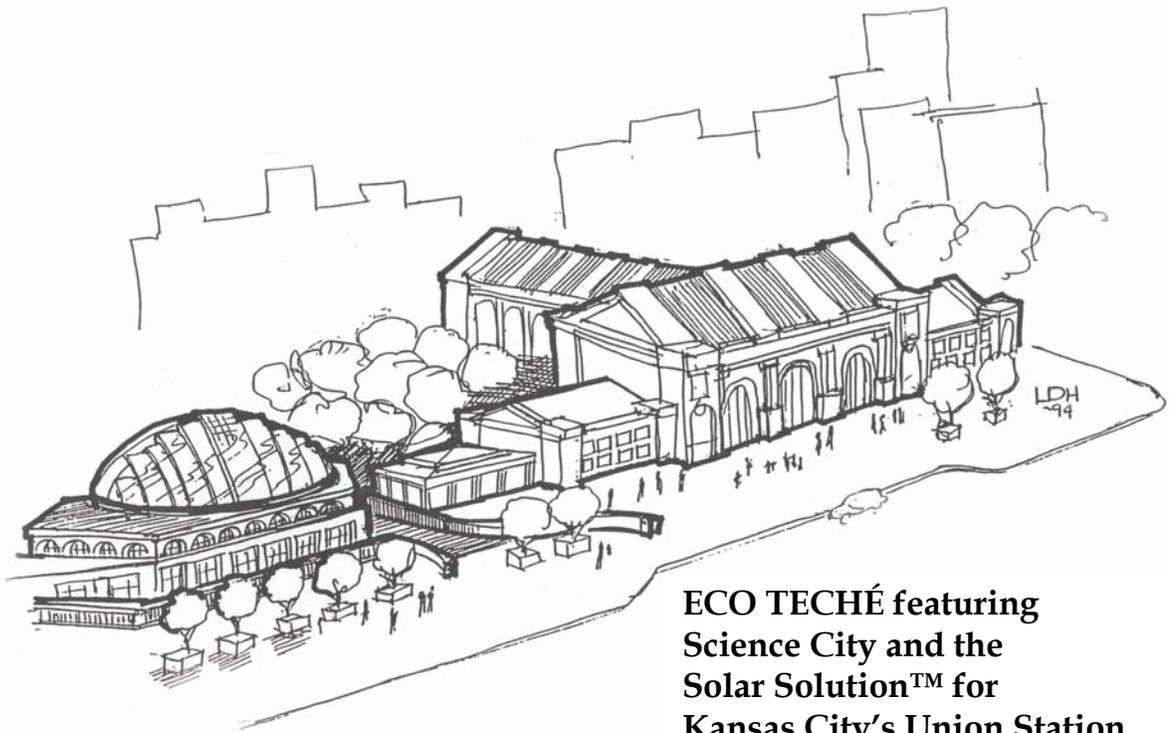
The Advent of the Headrick Solar-Voltaic Dome™ Power Station
Lt. Colonel Richard T. Headrick, USAF (ret)
drawing by Gary Headrick 1988



The Solar Chimney discussed in Chapter 4 was interesting, but it was too large and impractical for an urban site. In researching the topic, I found an engineering firm in Stuttgart, Germany that had built a Solar Chimney in Manzares, Spain. I called and talked to them about the project in 1993. The German engineers I contacted about their Solar Chimney in Spain suggested what they described as the most efficient solar photovoltaic array in the world and referred us to Lt. Colonel Richard T. Headrick who had engineered and patented the Solar-Voltaic Dome™ in 1986. The drawing here designed by his nephew Gary Headrick shows the hemi-dome used by a fishing village to immediately refrigerate and thereby increase the catch of the day. As a native of sunny Southern California Colonel Headrick had developed an appreciation for the potential of solar building-integrated photovoltaic [BI-PV] technology. When I first called him from a Techline Studio in Kansas City we talked for over an hour. He immediately offered to send a model for talks and workshops.

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He contracted me as the exclusive marketing agent for his Solar-Voltaic Dome™ and sent the model within the next week. In a short time I had transformed the ECO TECHÉ redevelopment plan to incorporate a prototype while assuring his name was attached to his invention renaming it the Headrick Solar-Voltaic Dome™ Power Station. This solar array would produce up to four times the amount of a typical field array on an acre. With 12.5% polycrystalline modules it would generate a Megawatt hour of electricity on the average daily for Kansas City's Union Station.

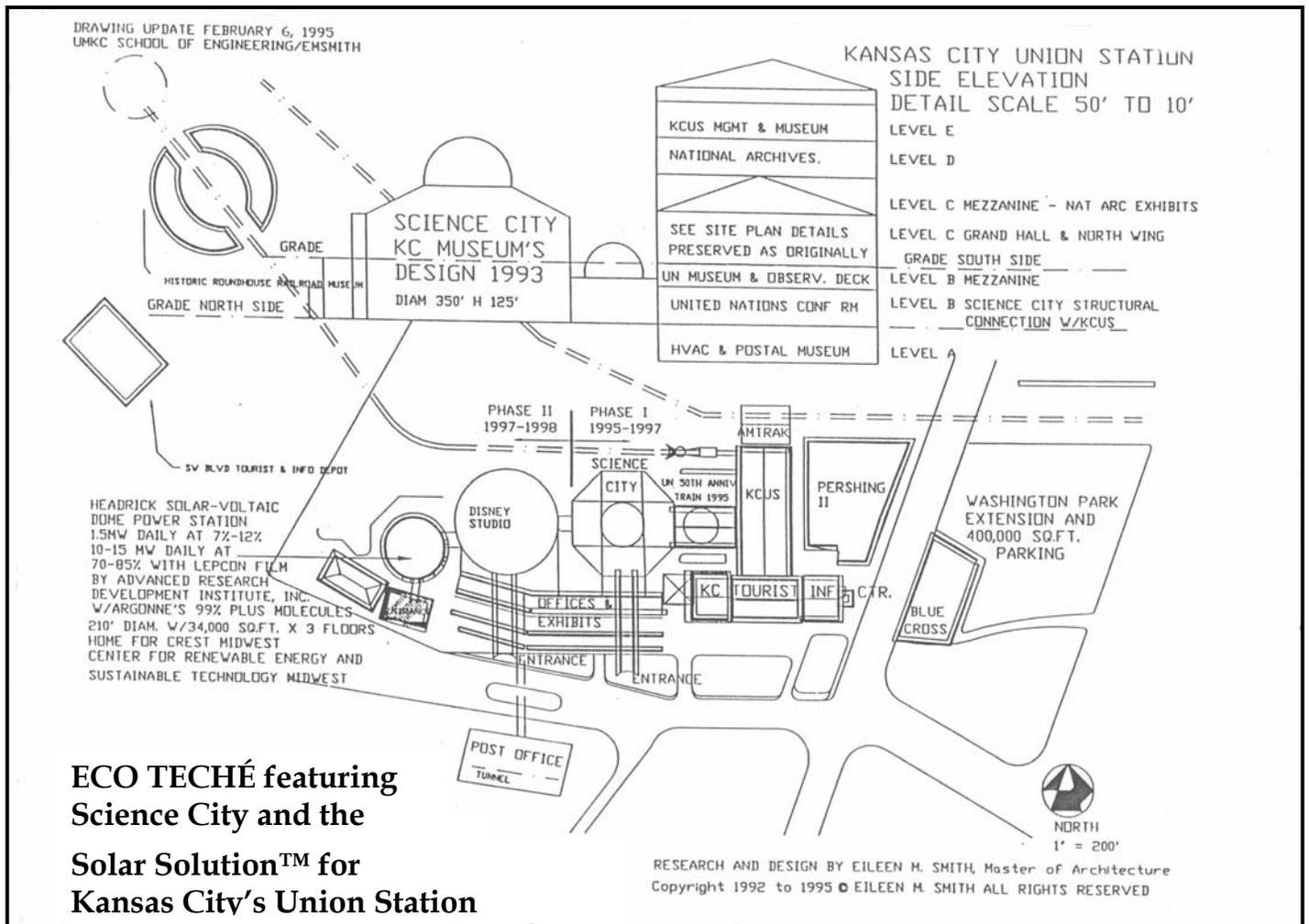


**ECO TECHÉ featuring
Science City and the
Solar Solution™ for
Kansas City's Union Station
Free-hand Sketch by L.D. Herman**

The redevelopment design incorporates several unique features including an indoor moving sidewalk similar to airport walks behind the building to lead under the street to a new parking structure east of KCUS. The parking structure would expand the park at the same grade level as the front of KC Union Station. The park entrance would be directly across the street north from the Westin Crown Center. The 1.3 million SF redevelopment plan includes seven museums, the reopening of the North Wing waiting room, restaurants, a tunnel with an aquarium and an energy history museum with a prototype of the Headrick Solar-Voltaic Dome™ Power Station.

1.3 Million SF Site Plan for ECO TECHÉ at Kansas City's Union Station

Carriage Museum ~ Harvey House Restaurant ~ North Wing Waiting Room
 Walt Disney Animation Studio Museum ~ Science City ~ Postal Museum
 Headrick Solar-Voltaic Dome™ Power Station and Midwest Energy Museum
 United Nations Conference Center ~ National Archives of Midwest Region



**ECO TECHÉ featuring
 Science City and the
 Solar Solution™ for
 Kansas City's Union Station**

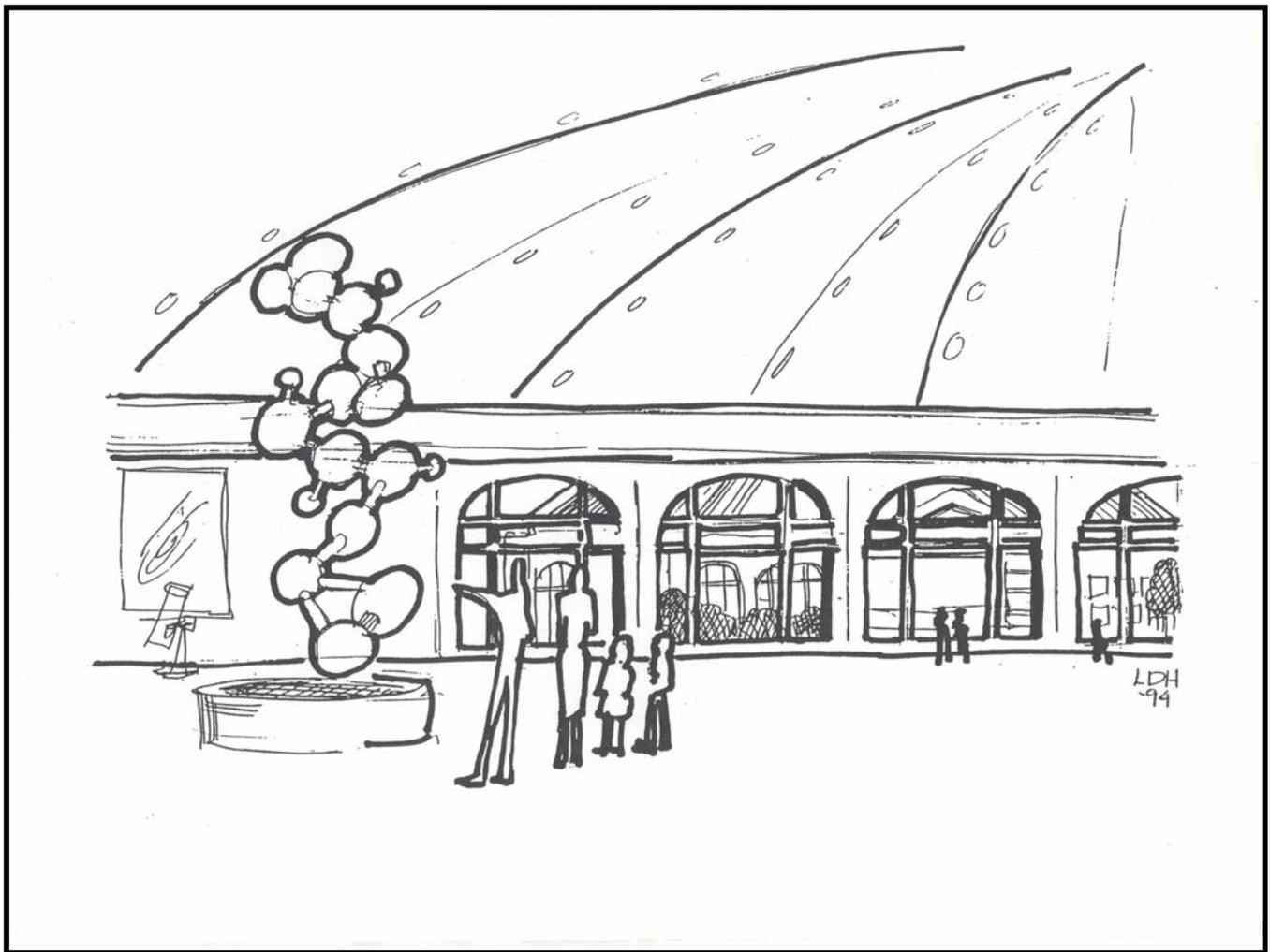
Facilities for drawing provided by:

Drawing table via
 Goldblatt Architects

AutoCAD lab via Dr. Don Smith
 Engineering Department
 University of Missouri at Kansas City

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The dome interior is designed to serve as a museum of renewable energy technology. Working exhibits demonstrating historic and new renewable energy technologies are incorporated throughout the redevelopment to reduce energy costs for KCUS and to educate the public. Renewable energy inventors and manufacturers would contract to place their technology prototypes on display. Even at that time, I had the idea that consumer education and exposure to renewable energy technologies would begin to redirect the energy industry. Government agencies were not, and are not facilitating the needed consumer education demonstrations as we discover in the next chapters. Earth Day comes only once a year. With the growing need for electricity industry transformation, consumers need a week each year to share policy and technology information. Consumers will wisely spend a few hours a week on renewable energy technologies study.



Headrick Solar-Voltaic Dome Power Station and Energy Museum
Free-hand Sketch by L.D. Herman 1994



Office of the Mayor

Emanuel Cleaver II, Mayor

29th Floor, City Hall
414 E. 12th St.
Kansas City, Missouri 64106-2778

(816) 274-2595
Fax: (816) 274-1991

September 16, 1993

Ms. Eileen Smith

Dear Ms. Smith:

On behalf of the City of Kansas City, Missouri, it is a pleasure for me as Mayor to express my enthusiasm for your interest in the revitalization of Kansas City's Union Station.

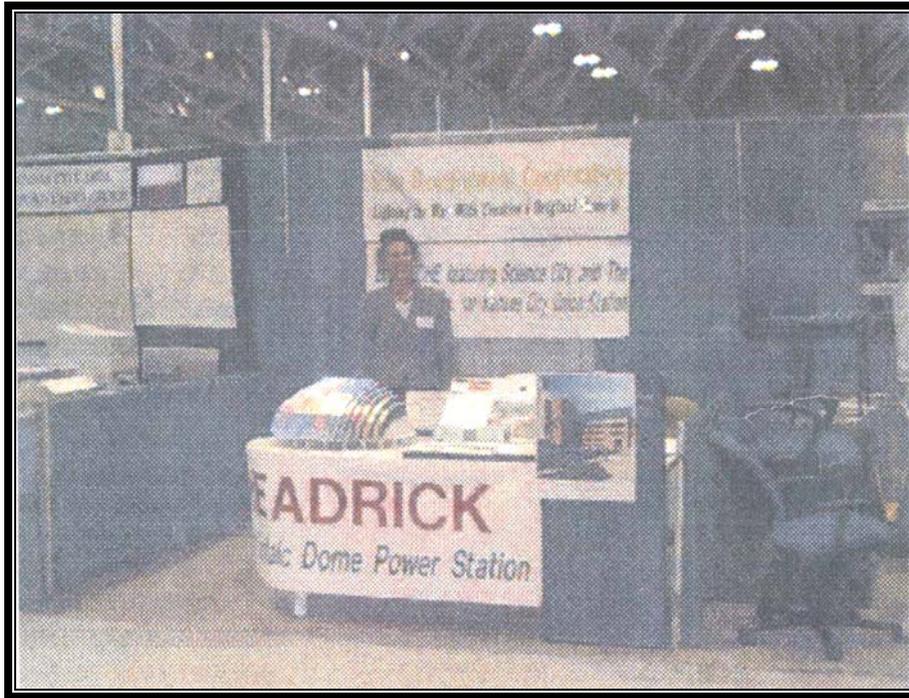
As you know, the City of Kansas City, Missouri, does not currently own the Station or the property on which it sits. The City is involved in sensitive legal negotiations for the settlement of our legal actions against the Canadian owners, Trizec.

Nevertheless, the City appreciates the ideas, plans and efforts of concerned citizens like yourself who like the City, care very much for the historic Union Station. When the City reaches a settlement on the Station, we will immediately mobilize revitalization efforts. At that time, the City will examine your energy proposal, Eco Tech, and the numerous others to determine the best and most effective use of Union Station.

We encourage your continued efforts in developing a viable plan for the revitalization of Kansas City's Union Station.

Sincerely,

Emanuel Cleaver II
Mayor



Kansas City Bartle Hall Electronics Exhibition

The week the model of the *Solar-Voltaic Dome™* arrived there was a technology exhibition at Bartle Hall. My friends at Techline Studios had introduced me to an interested group at the Christian Science Church in Kansas City. An engineer that designed exhibit signs provided the banners for my booth at the technology exhibition. Techline Studios provided a tabletop with a rounded end that was ideal for the dome model.

A sales agent at the Solarex Corporation provided me a solar module and photographs of solar projects shortly after we met in 1993 to use at exhibits. The exhibit was very well received and numerous people indicated that building an energy history museum with the Solar-Voltaic Dome™ adjacent to the elegant and historic steam plant renovated as a working museum at Union Station would be a tremendous asset to Kansas City. The Solarex Corporation, Temcor, the Hines Corporation, Conrad Schmidt Studios and Lt. Colonel Richard T. Headrick were our core team. The Mid-Regional Division of the National Archives wrote to Mayor Cleaver indicating an interest in relocating from 95th street to Union Station. The Harvey Girls¹³⁶ organization wanted an authentic restoration of the restaurant. ECO TECHE consisted of a plan for seven museums and a United Nations Conference Center, a Carriage Museum and an authentic restoration of the North Wing.

¹³⁶ *Harvey Girls*, The Harvey Girl Historical Society, 2001-2004 <http://www.oerm.org/pages/Harveygirls.html>
Fred Harvey Civilizing the Old West, July 24, 2003 <http://www.harveyhouses.net/>

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Hardwick ENGINEERING & ASSOCIATES *Established 1964*

PLANNING • CIVIL & STRUCTURAL ENGINEERING • BUILDING DESIGN & SURVEYING

October 18, 1993

RECEIVED
OCT 19 1993

Ans'd.....

Sheng-Hsiung Yu, Deputy Director
Power Development Department
Taiwan Power Company
242 Roosevelt Rd., Section 3
Taipei, Taiwan 10763

REFERENCE: PRELIMINARY PROPOSAL FOR
HEADRICK SOLAR VOLTAIC DOMES

Dear Mr. Yu:

We thank you for your kind letter dated October 4, 1993. Along with the inventor of the Solar-Voltaic Dome (Patented and Trade Mark Registered) who is Lt. Col. Richard T. Headrick, we have prepared a response which may assist you in correctly evaluating our product and what it might accomplish for Taiwan Power Company.

1. We are acutely aware of the fact that solar power cannot at this time compete with conventional, coal burning power generation or hydro-electric plants. To assume that it ever will be able to compete is arguable. Could we have been competitive, we would have built an operating solar dome years ago when the invention was first patented.

Some major revisions took place about 1985 which resulted in new patents. More recently, a major technical break-through was discovered by the inventor and was incorporated in the design we are proposing to you. At the urging of the Department of Energy, many companies were having a look at solar as a back-up for a possible oil embargo or stiff price increase from the OAS. Had this occurred, or if it ever occurs, the Department of Energy wanted to have available the technology to go to this and other alternative fuels. A part of the urgent development programs was directed, with considerable success, to solar power cells and wind-driven generators. These have more or less faded out because, even at their inception, their principal benefit was that of a tax umbrella.

Our Solar-Voltaic Dome was highly recognized and endorsed by the Clean Energy Research Institute under Dr. Nejat Veziroglu at the University of Miami (Copy of letter enclosed).

PAGE 1

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846 Williamston Street • Suite # 104 • P.O. Box 2065 • Vista, California 92083 (619) 630-5300 FAX 758-9996

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2. In order to properly evaluate solar power, it should be clearly understood that the cost baseline for generating electricity is nearly zero for probably the first fifty years. The electricity is free from the sun. The maintenance is very low and simple. Therefore, it is unfair to compare cost unless it based on amortization of the power plant. You are certainly aware of this factor with your involvement in nuclear power plants. Here, the cost of electricity is comparatively low but the long-time carry-forward cost of the very complex and expensive atomic plant may have an added in total cost that is substantially higher than your coal fired conventional plants. To this analysis, we believe that with the comparatively low cost of our solar dome plants, we are probably vastly less costly than your atomic energy including amortization, now.

Because of this, we suggest that your comparative tests which you project, will be to determine the best efficiency level of the solar voltaic cells (for wattage output) compared to the cost of manufacture. In this analysis, we are not in competition for the simple reason that we, also, want to use the most efficient cells and encourage Taiwan Power to develop their own cell manufacture with which we would be delighted to employ in the solar dome systems. So, there should be other factors in which we can offer certain uniqueness in our invention, far out-performing any other system, while using exactly the same solar voltaic cells.

3. Specifically, we show a great advantage in "packing density". In the United States, this term indicates the peak wattage of electricity that may be generated by an array system from a square acre of land (being 43,560 square feet). The Southern California Edison Company solar experiments in Hesperia, California, produce 60 KW (peak) per acre. Using the ARCO-Solar cells that were employed in that experiment, we can produce almost 360 KW per acre. This is the difference in the array technology, not in cell efficiency which cancels out if two array systems are using the same cells. Technically, our array system, is by a wide margin, the very highest "packing density" in the history of solar voltaic energy.

4. The combination of high packing density and the dome which is a part of the tracking mechanism, utilizes the outside of the dome, not the inside. It, then follows that if there is a valid, profit making use for the dome, this "revenue stream" must also be taken into account positively in evaluating the comparative cost of the solar generated electricity. For your Ecological Theme Park development, you will probably want to have a convention hall to round out the technical attractiveness and uniqueness of the park. The combination of income from the sale or "voiding" the cost of used electricity in the dome as well as renting the dome for scientific meetings, all serve to make the cost of electricity competitive. I am sure that Dr. Veziroglu and his Clean Energy Institute would be delighted to have one of their Pacific Rim

PAGE 2

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conventions there. To demonstrate that the dome is actually generating its own electricity, would enhance and give strong justification for the convention location. We would recommend that the dome should be the first building in place on the site and that the scientific world should be well informed as to what it is and what it produces. Please remember that the project requires substantial lead-time.

5. We, too, are carefully considering what may be some break-throughs, such as copper indium diselenide solar cell technology, and through the period of construction would help you to explore some promising new techniques. We feel (along with Switzerland) that solar power should be used wherever possible which, in the case of Taiwan Power Company, would reduce the noon energy shortages that Taiwan is experiencing at air conditioning times.

Thus, if you really want to evaluate solar, Taiwan Power Company could start with a "test facility" which has the proven, high efficiency packing density, and then, try different cells on that test-bed. We have not heard of photo cell production in Taiwan and have wondered about that. If our statement is true, then, now is the time to contract for the system to be constructed. Another unique feature of the HEADRICK-SOLAR-VOLTAIC DOME is the ability to quickly replace cells if more efficient technology is found.

Our solar dome will become a world-wide landmark to the scientific world and will attract a wide range of scientific bodies to examine it and to witness, in person, its highly instrumented performance while sitting in its wonderfully air-conditioned interior, watching a wide range of projected video technical reports from the scientific community. For that reason, we are proposing three domes, the convention hall would be the largest, 210 ft. in diameter. The second would be 105 ft. diameter. The smaller 52.5 ft. diameter dome will not actually have a dome enclosure, but an open framework exactly duplicating the patented geometry of the larger domes. This smaller dome could be placed on top of a tower as a working symbol of solar technology.

Our proposal was apparently given to you by Mr. S. C. Lu, President, Ty-Hsing Engineering Consultants, inadvertently. It was a "rough draft" preliminary inter-office review of form and content and was incomplete. We needed certain additional information from our suppliers which we essentially have now and have included in this updated current document.

With the suggestion that our 210 ft. diameter dome might become the "test-bed" for your outlined investigation of solar capabilities, we emphasize that we will employ the most efficient cells currently available, in a unique package including all cabling and modular bases for the solar panels and will be test proven to function

PAGE 3

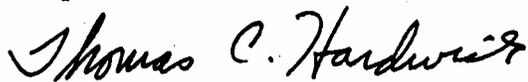
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within proposed outlines of electrical output. From that point, the solar cells may be interchanged quickly and easily during the evaluation by Taiwan Power Company or whatever contract agency is conducting the evaluation.

We are sending you our Cover Letter and Preliminary Proposal by FAX. In addition, we will mail our Preliminary Proposal to you today along with materials provided by Temcor.

Thank you for your consideration. Please allow us to elaborate on any portion of these remarks which you might select.

Respectfully,



Thomas C. Hardwick, P.E.

cc: Mr. Shing Ching Lu, President, IY-Hsing Engineering Co., Inc
Lt. Col. Richard T. Headrick, Inventor
Mr. David Schweninger, President, Ride & Show Engineering, Inc.
✓ Mr. Robert W. Dagenais, Regional Sales Mgr, TEMCOR

Design Decisions ~ Program Notes June 1993

Oh, Beauty
How do I measure thee . . .
Without a proper guide
What meager price we place upon thee
In formulas of modern commerce
Your elements are rarely weighed
Amid the Ivory Towers
Accounting -space -quantity -height
And untried labor bound by
Standardized codes.

Oh, Beauty
How do I measure thee . . .
In care -in prayer -in quality
In comfort and in harmony
bound together by a code of love.

Beauty is not measured
So much when it is near
For it brings comfort -contentment
And throughout the year good cheer.

Tiz when Beauty is missing
its value tips the scales.

The Corporate Malfeasance of Deloitte and Touché

DEVELOPMENT CORRIDOR(S) ANALYSIS
GRAND/MAIN/BROADWAY
COUNTRY CLUB



DCAnalysis Team
Professional Planning Services

Lead Firm
Deloitte & Touche, Kansas City
Steve Gurwell, Principal
Real Estate Development/Economic Assessment

Project Coordinator
Eileen M. Smith, M.Arch., Realtor
Alternative Development Analysis - Management Consultant

Geographic Information Systems
M. J. Harden Associates, Inc.
Kelly Cobb, Project Manager
Database Development and Automated Mapping

Corridor Development Appraiser
Herman Johnson Company Since 1963 MBE
Community Development Forecasting
Outstanding Leadership Award 1986

Land Planning & Landscape Architecture
Tuttie-Ayers-Woodward Company
Larry Schall, P.E., Principal
Allen Cooksey, Landscape Architect
Transportation & Land Surveying Specialists

Public Participation & Education
Phillips-West, Incorporated MBE/WBE
Carrie Stapleton-Jones, President
Public Relations and Promotions

Urban Design and Planning Analyst
Dr. Nolan M. Ellison, Ph.D.
Director & Professor of Urban Affairs-UMKC in the
L.P. Cookingham Institute of Public Affairs

15 Local and National Consultants
Experts & Community Advisory Panel
Mart Lee-Director of Southtown Council
Charles Delgado-Hispanic Chamber of Commerce

Requirements For Qualifications
Prepared For and In Cooperation With
The City of Kansas City, Missouri and KCATA ANDEIS

City of the Future, About 1850

Suppression is often quite subtle and tyranny is rarely discussed openly. That is why it is often deeply rooted before responsible intervention takes place. Shown here is the cover I designed in response to a *request for qualifications* [RFQ] for a research project to evaluate a proposed light rail plan for Kansas City in 1993. Deloitte and Touché took the lead and contracted to pay me \$2,500 as project coordinator to develop a team and write up the RFQ. The Monday, after our submission, I called Steve Gurwell the VP I was working with at D & T to schedule a time to pick up my check. The team I had compiled was excellent and our chances looked promising. He congratulated me on a job well done. It appeared in that moment that the comments few companies that had declined indicating they would not work with Deloitte and Touché due to their unethical and anti-environmental business practices were unfounded. One of those companies was a large engineering firm that had not been paid by D & T on a mass-transit building

project for the Bart in San Francisco. I told him I would be downtown at 1 pm to pick up the \$2,500 check and started to sign off. Mr. Gurwell cleared his throat a bit, took a deep breath and then said he hoped I wouldn't mind working with he and *his* team, [which had taken me some time to compile], knowing he wasn't going to pay me a penny for my work. Needless to say I was a bit confused at that statement and asked what he meant by that. He said, "You did an excellent job. We're just not going to pay you". I smiled and indicated it was a bit early for me on Monday morning and that his comment may be more humorous by early afternoon. I reminded him there was \$1,200 reimbursables outstanding at Kinko's. They had given us until Tuesday to cover the costs based on his promise that D & T would pay. He indicated it was not a joke, and that I didn't need to bother to come to their office. He claimed the bill at Kinko's was not his concern.

When I arrived at the office the same lady who assisted me in copying the RFQ I provided on Friday welcomed me with a smiling face and congratulated me for putting together such an expert team and RFQ. She indicated Mr. Gurwell had left for a meeting out of the building. I told her about our conversation and she was shocked. She said he had intended to pay me on Friday and indicated she would get the check paid out within twenty-four hours and apologized for the delay. By the end of the week, Kinko's was nearly as irritated as I was. I was further challenged because my car had broken down Tuesday from a faulty head gasket. For the first time since I had gotten my first car a 1955 Delta '88 in 1970 for my 16th birthday, I was without a car. I called and made an appointment with the CEO early the next week. He insisted I just didn't know how to do business. I asked him what he would do under the circumstances. He cleared his throat and then offered to pay me \$30 for a taxi fare home. That was hardly 1% of the amount D & T owed me. I called the team members to alert them.

Dunn and Bradstreet were quite supportive and an agent contacted an attorney for me to sue if need be. In researching the problem, I discovered that many corporations cut millions off contract expenses by not paying small businesses what they owe them. Contract or not, it is often difficult to collect. I also discovered that interestingly Real Goods was one of D&T's clients. I hired an attorney who wrote and inquired about why they were not paying their bill. Steve Gurwell arrogantly wrote a letter back praising my work stating I had done a superb job, but he was not going to pay me or Kinko's. The attorney filed a legal complaint demanding payment. The Court case was scheduled for October 1993. About a week before the hearing, the lawyer wrote a letter with a return address of St. Paul, Minnesota indicating he had withdrawn from the case because he had suddenly been hired by a prestigious law firm in his hometown. The judge indicated he would put the case on hold until counsel could be retained.