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Survey and Analysis of Small Business and Minority Business Enterprise Participation in Solar Energy Procurement Activity

July 1978



**U.S. Department of Energy
Assistant Secretary for Energy Technology
Division of Solar Technology**

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60, 61, 62, 63, 64

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July 1978



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**U.S. Department of Energy
Assistant Secretary for Energy Technology
Division of Solar Technology
Washington, D.C. 20545**

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SURVEY AND ANALYSIS OF
SMALL BUSINESS AND MINORITY BUSINESS ENTERPRISE
PARTICIPATION IN SOLAR ENERGY PROCUREMENT ACTIVITY

1.0 INTRODUCTION

1.1 Purpose and Scope

This report represents the findings of Small Business and Minority Business Enterprise participation in Solar Energy Programs as a result of procurement actions by the Department of Energy, Division of Solar Technology (DST), and subcontract actions by Solar Technology prime contractors for Fiscal Year 1977. This report also provides information about awards made to Small Business/Minority Business Enterprise (SM/MBE) by other Federal Agencies during the same period.

The major findings of this survey are presented in the following executive summary. Additionally, subsequent sections provide a more detailed description of Solar Energy and other Government Agency procurement, the methodology of soliciting, recording and processing survey data used as basis for this report, and appendices containing sample survey forms and other supporting information.

1.2 Executive Summary

The primary findings of this survey indicate that \$27.0 million of a total \$255.4 million Solar Energy outlay, for FY 77, was allocated to Small Business in the form of prime contracts. Additionally, \$148.4 thousand was allocated to Minority Business Enterprise in the form of prime contracts. Another \$13.3 million was subcontracted to Small Business/Minority Business Enterprise (SB/MBE) by prime contractors during this period. This represents a total of \$40.3 million Solar Energy dollars contracted and subcontracted to SB/MBEs or 15.8% of the \$255.4 million Solar Energy outlay during Fiscal Year 1977. The \$40.3 million represents an increase of 73% compared to FY 76 (including TQ).

Figure 1-1 breaks down the total \$255.4 million Solar Energy outlay into recipient prime contractor categories. The shaded areas represent the \$13.3 million subcontracted to Small Business and Minority Business Enterprise by the various prime contractor categories during the same period. The results were derived from a 53% sample of the \$255.4 million outlay.

Figure 1-1 Federal Funding for Solar Energy in Fiscal Year 1977
(in millions of dollars)

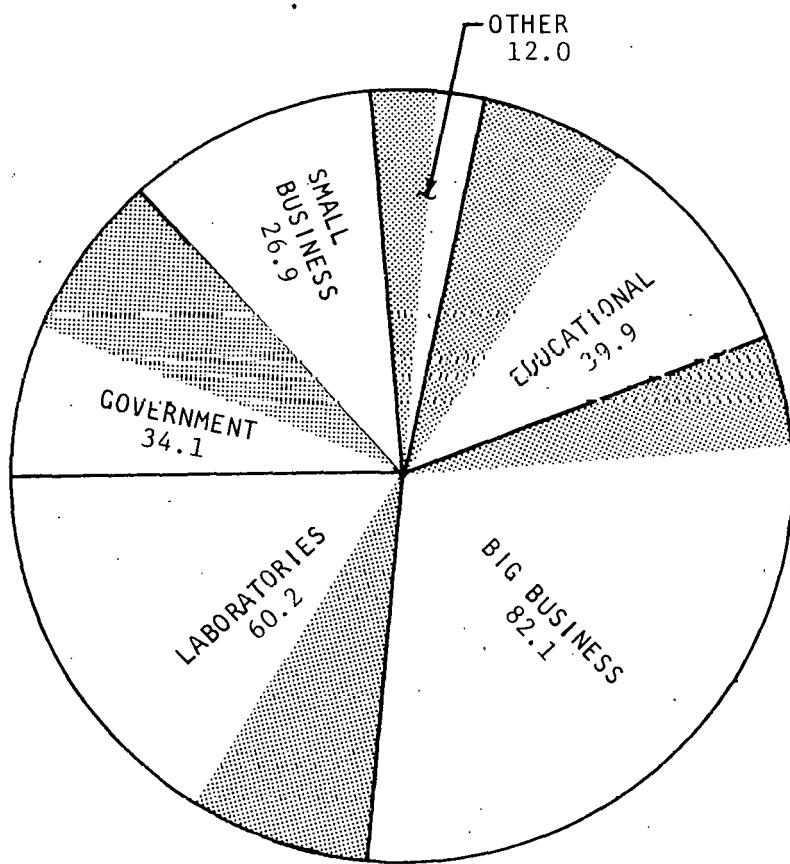


Figure 1-2 breaks out the recipients of Solar-Energy subcontracted dollars in terms of subcontractor category. Figure 1-3 expands on the Small Business portion of Figure 1-2 by indicating the sources of Solar Energy dollars subcontracted to SB/MBE.

An analysis of the comparative data from both FY 76 (including TQ) and FY 77 in the interim report issued in January 1978 was based on a sample size of approximately 15% of total awards. This smaller sample indicated a trend which, on extrapolation, gave a percentage projection for total Solar Energy dollars received by SB/MBEs to approximate FY 76's percentage. The actual survey was based on a sample size of approximately 53% of total Solar Energy dollars. The primary factor causing the disparity between the interim and final percentages

Figure 1-2
Recipients of Solar Energy
Subcontracted Dollars
(in millions)

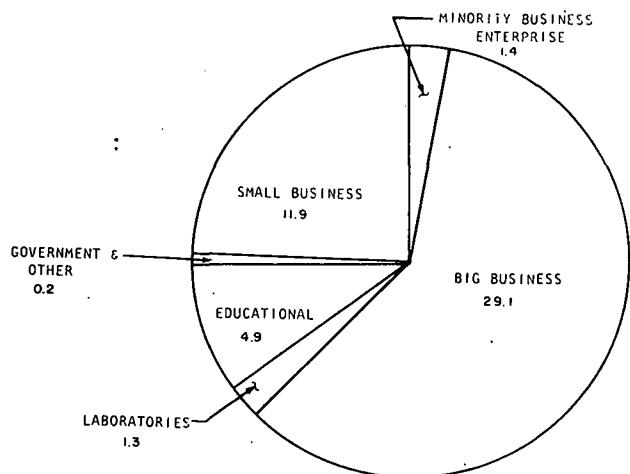
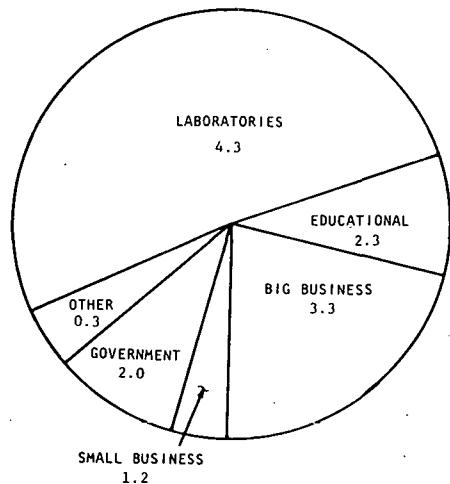


Figure 1-3
Sources of Solar Energy Dollars
Subcontracted to SB/MBE
(in millions)



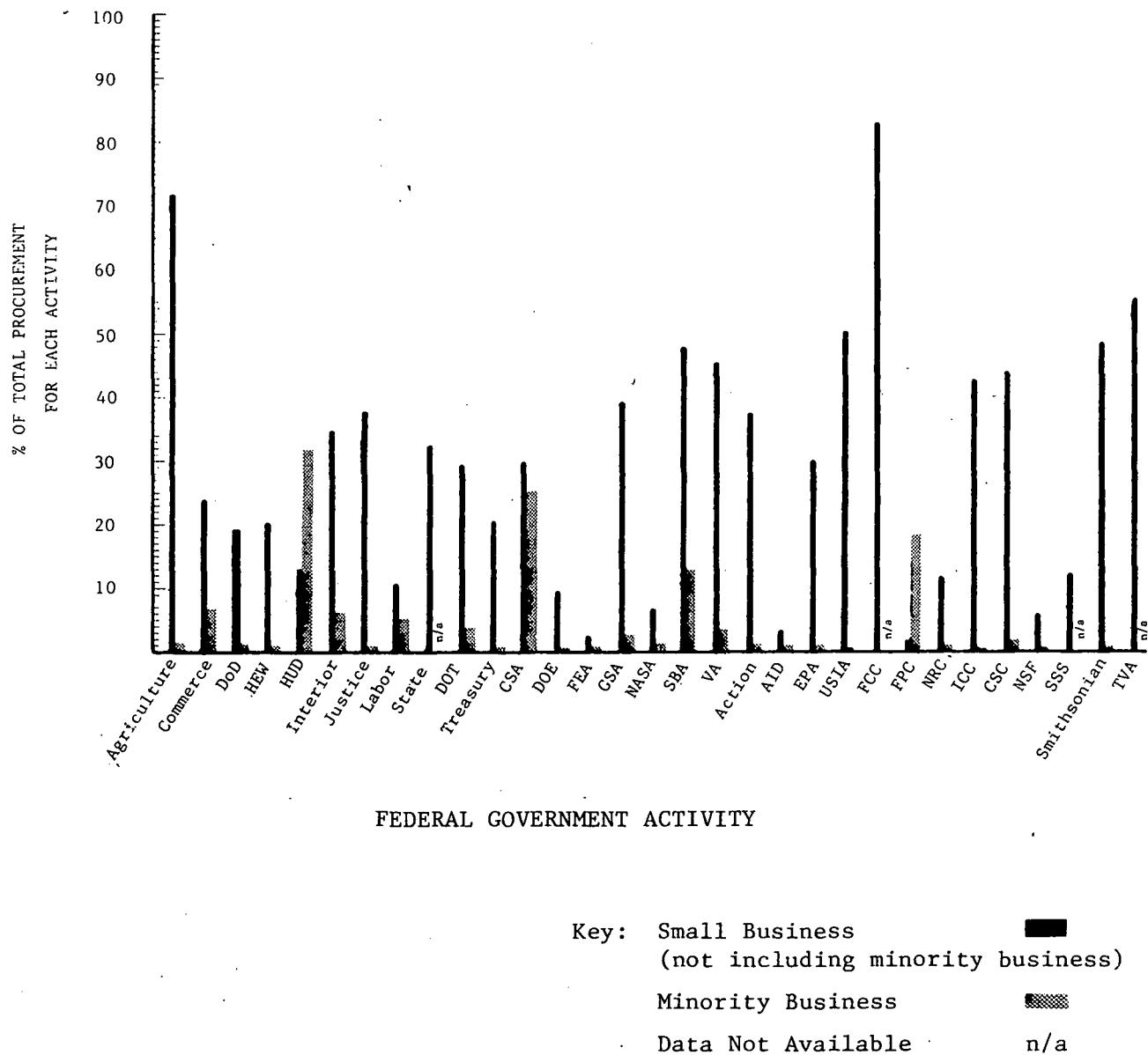
Note: The total Solar Energy dollars flowing to SB/MBE, as indicated in this report, are comprised of Solar Energy SB/MBE prime contract dollar outlays for Fiscal Year 1977, and Solar Energy dollars subcontracted to SB/MBE by prime contractors during the same period. Because of the inherent time lag between Solar Energy prime-contract outlays and subsequent subcontract outlays, some of the subcontracted dollars will, of necessity, come from previous fiscal periods. The problem however is, to a certain extent, eliminated by the fact that some of the Fiscal Year 1977 prime contract outlays will not be subcontracted until the subsequent FY period.

of SB/MBE participation as reported was the significantly higher level of awards to big businesses at the subcontract level which apparently was the result of larger new programs and more advanced phases of existing programs.

However, the fact of the matter is that Solar Energy dollars received by SB/MBEs on the prime and subcontract levels have increased by 73% when compared to FY 76. In terms of prime contract dollars the increase has been a dramatic 303% which is a strong indication of DST's intent to increase the participation by SB/MBEs in solar energy activities. It should also be noted that as a result of another study performed by an 8.a contractor (Contract No. EG-77-C-01-4055) for DST in the area of photovoltaics, DST is moving forward, without delay, to implement recommendations contained in that study which will not only further increased SB/MBE participation but also provide technological assistance to SB/MBE's. It is anticipated that these actions will, over the long term, result in a significantly higher participation by SB/MBEs in terms of not only dollars and percentages of total dollars but also in technological contributions. A temporary reduction in terms of percentage of total Solar Energy dollars awarded to SB/MBEs will continue in the near future due to the transfer of solar heating and certain other activities out of DST to other DOE groups effective FY 78.

Figure 1-4 provides a summary of other Federal Government procurement activities, during Fiscal Year 1977, in respect to total procurement and SB/MBE procurement. This information is provided to facilitate the evaluation of Solar Energy procurement activities in respect to those of other Federal Government Organizations.

Figure 1-4 Summary of Federal Government Procurements
for Fiscal Year 1977 in Respect to SB/MBE



2.0 SURVEY OF PROCUREMENT ACTIVITIES

2.1 Survey Overview

This section provides the findings of a study, of Solar Energy procurement activities, during Fiscal Year 1977, based on the Special Monthly Report for Solar Energy and the Department of Energy Status of Obligational Authority Report, a January 1978 telephone survey of prime contracts listed therein, and on an earlier mail survey commenced in January 1978. This information is supplemented with a tabulation of other Federal government procurement activities in respect to Small Business/Minority Business Enterprise (SB/MBE).

2.2 Solar Energy Procurement

2.2.1 Recipients of Solar Energy Prime Contract Dollars

Table 2-1 is a breakdown of Solar Energy dollar outlays for Fiscal Year 1977.

Table 2-1

Recipients of Solar Energy Prime Contract Dollars (FY 77)			
Contract Recipient Category	Number of Prime Contracts Awarded-FY 77	Total Solar Energy Outlay (FY 77 & TQ)	Percent Total Outlay
Government	123	\$34,152,608	13.37%
Laboratories	138	60,233,807	23.59
Big Business	206	82,147,459	32.17
Educational	215	39,869,697	15.61
Other	38	11,913,854	4.67
Small Business	146	26,892,751	10.53
Minority Business	005	148,432	0.06
TOTALS	871	\$255,358,608	100 %

These dollar outlays are derived from the Department of Energy Status of Obligational Authority Report for Fiscal Year 1977 for Solar Energy, with the exception of the laboratories, and are adjusted to reflect corrections resulting from communications with various contracting officers or other cognizant prime contractor representatives.

2.2.2 Recipients of Solar Energy Subcontract Dollars

Table 2-2 is a breakdown of Solar Energy subcontracted dollars, by category for Fiscal Year 1977, as reported by Solar Energy prime contractors by submitted survey and subsequent telephone conversations, and as reported by laboratories from a letter survey.

Table 2-2

Recipients of Solar Energy Subcontract Dollars		
Category Receiving Subcontract Dollars	Solar Energy Subcontract Dollars Received (by Category)	Percent of Total Total Subcontract Dollars
Educational	\$ 4,912,938	10.0%
Laboratories	1,320,874	2.7
Small Business	11,910,620	24.4
Minority Business	1,430,435	2.9
Big Business	29,088,694	59.5
Government	112,848	0.2
Other	138,429	0.3
TOTALS	\$48,914,838	100.0%

2.2.3 Sources of SB/MBE Solar Energy Subcontract Dollars

Table 2-3 is a breakdown of the sources of Solar Energy dollars subcontracted to Small Business/Minority Business Enterprise, during Fiscal Year 1977, as reported by Solar Energy prime contractors in the survey and by laboratories in letter responses.

Received responses from Sandia, Oak Ridge, and Battelle Laboratories in a total amount of \$13.5 million. Based on this the results for the total laboratory survey were obtained.

Table 2-3

Sources of Solar Energy Dollars Subcontracted to SB/MBE		
Category Subcontracting to SB/MBE	Solar Energy Dollars Subcontracting to SB/MBE	Percent of Total Dollars Subcontracted to SB/MBE
Government	\$1,965,897	14.7%
Big Business	3,348,508	25.1
Other	293,985	2.2
Laboratories	4,272,402	32.0
Educational	2,287,996	17.2
Small Business	1,172,267	8.8
TOTALS	\$13,341,055	100.0%

2.3 Other Federal Government Procurement

Table 2-4 provides a summary of Federal Government Procurements in respect to Small Business and Minority Business for Fiscal Year 1977.

This table summarizes Federal Government procurement by Federal Departments, selected administrations, agencies, commissions, and other government activities. The data presented in these tables was obtained from Small Business Reports, General Services Administration procurement summaries, and from telephone calls to appropriate Government Activities.

NOTE: In these tables, percentages are rounded off to the nearest tenth of one percent. Any percentage indicated as 0.1 should be interpreted as 0.1% or less. In those cases where data was not available, the indicator "n.a." has been entered into the table.

OFFICE	TOTAL	SMALL BUSINESS	%	MINORITY BUSINESS	%	MINORITY GRANTS
DEPARTMENTS						
Agriculture	\$ 507,385,000	\$ 362,890,000	72.0	\$ 6,346,000	1.3	-0-
Commerce	327,056,000	78,867,000	24.0	22,517,000	7.0	\$ 256,000
Defense	n.a.	n.a.		228,917,000		-0-
Health, Education, Welfare	1,538,018,000	313,725,000	20.0	9,004,000	0.6	-0-
Housing & Urban Development	282,322,000	37,998,000	13.5	89,631,000	31.7	1,363,000
Interior	1,376,104,000	482,252,000	35.0	83,359,000	6.1	1,343,000
Justice	214,577,000	81,551,000	38.0	1,379,000	0.6	-0-
Labor	141,495,000	15,203,000	10.7	7,706,000	5.4	-0-
State	42,955,000	13,934,000	32.4	n.a.		-0-
Transportation	1,114,992,000	323,404,000	29.0	39,975,000	3.6	-0-
Treasury	248,037,000	50,989,000	20.5	820,000	.03	-0-
ADMINISTRATIONS						
Community Services	2,609,000	804,000	30.8	735,000	28.1	30,121,900
Energy Research & Development	6,825,365,000	676,051,000	9.9	28,954,000	0.4	-0-
Federal Energy	846,962,000	22,557,000	2.7	463,000	.05	-0-
General Services	1,991,334,000	790,777,000	39.7	57,695,000	2.9	-0-
National Aeronautics & Space	3,229,917,000	222,695,000	6.8	32,266,000	1.0	-0-
Small Business Administration	12,875,000	6,228,000	48.4	1,690,000	13.0	-0-
Veterans	1,400,727,000	650,435,000	46.4	49,216,000	3.5	-0-
AGENCIES						
Action	10,021,000	3,760,000	37.5	142,000	1.4	-0-
International Development	377,999,000	12,126,000	3.2	5,126,000	1.4	-0-
Environmental Protection	246,859,000	75,440,000	30.5	2,800,000	1.1	32,000,000
United States Information	29,118,000	14,699,000	50.5	40,000	0.1	-0-
COMMISSIONS						
Federal Communications	5,125,000	4,242,000	82.7	n.a.	-0-	-0-
Federal Power	2,135,000	31,000	1.4	384,000	18.0	-0-
Interstate Commerce	5,993,000	2,557,000	42.6	18,000	0.3	-0-
Nuclear Regulatory	22,744,000	3,200,000	14.0	250,000	1.1	-0-
United States Civil Service	5,898,000	2,582,000	43.8	143,000	2.4	-0-
OTHER INDEPENDENT ESTABLISHMENT						
National Science Foundation	128,015,000	6,876,000	5.3	16,000	.012	-0-
Selective Service	342,000	41,000	11.9	n.a.	-0-	-0-
Smithsonian Institute	21,168,000	10,154,000	47.9	42,000	0.2	-0-
Tennessee Valley Authority	3,235,805,000	1,799,477,000	55.6	n.a.	-0-	-0-

Table 2-4 CIVILIAN EXECUTIVE AGENCY PROCUREMENTS FISCAL YEAR 1977

3.0 SURVEY METHODOLOGY

3.1 Survey of Solar Energy Procurement

This report of Solar Energy procurement activities is based on data derived from survey forms mailed to contractors listed in the Special Monthly Report for Solar Energy, dated 8 October 1977. This data has been augmented with additional data derived from the above listing for Fiscal Year 1977, Department of Energy files, laboratory letter responses, and other related sources to produce the information as presented by this report. It should be noted that these results were obtained by using a survey sample of 53% of the total prime contract and award dollars. This contains a representative cross-section of the survey population.

Totaling all the tabulations received by telephone, mail, and the Department of Energy Special Monthly Report, and comparing them with the Department of Energy Obligatory Authority report, it was found that there was a discrepancy of eighteen million dollars. It was decided to extrapolate this amount and allocate it proportionately to all areas surveyed for this report based on the sample specified.

The survey commenced with a revision of the data collection form (Ref. Appendix A). This form provided spaces for contractors to enter the various information required to produce the needed results. Pertinent data relative to each contractor, listed in the Special Monthly Report for Solar Energy, was transferred to individual survey forms. The forms were mailed to the respective contractors in January 1978.

A copy of the Survey and Analysis of Small Business and Minority Business Enterprise Participation in Solar Energy Procurement Activity, February 1977, DSE/4033-1, was sent with the package as well as a letter of instruction.

Data received from contractors was separated into categories based on the type of contract activity.

When information was not supplied, or additional information was needed, telephone contact was made and the information was taken over the telephone.

At the conclusion of the survey the information was organized and tabulated to derive the information provided in this report.

3.2 Survey of Federal Government Procurement

The information provided in Figure 1-4 and Table 2-4 was derived from the General Services Administration (GSA) and Small Business Administration (SBA) Reports and other sources as indicated below:

- a. Procurement by Civilian Executive Agencies, Part I - Total Prime Procurement, and Part II - Statistics on Selected Types of Procurement, Period October 1, 1976 - September 30, 1977 (GSA-Wash DC78-2434).
- b. Summary of Federal Funding for Minority Business Development, Table for Fiscal Year 1977 (SBA).

The above GSA documents, Procurement by Civilian Executive Agencies, are derived from compilations of Forms 37 submitted to GSA. These documents list: total procurements, percent of total, and statistics on selected types of procurement. The above SBA documents include a summary of Federal Funding for Minority Business Development. It was assumed that minority business is small business and therefore is included in the GSA listing (a) above. The total small business shown in Table 2-4 is derived by subtracting minority business dollars as listed in (b) above (not including loans and grants) from small business as listed in (a) above.

APPENDIX A

SAMPLE SURVEY FORMS

SUBCONTRACT SURVEY

ENERGY RESEARCH AND DEVELOPMENT
ADMINISTRATION
DIVISION OF SOLAR ENERGY

PRIME CONTRACTOR DATA

NAME AND ADDRESS	CONTRACT NUMBER AND PERIOD OF PERFORMANCE	CONTRACT AMOUNT	CONTRACT DESCRIPTION
ENERGY DEVELOPMENT ASSOC MADISON HEIGHTS MICHIGAN	EY-70-C-02-2966 CH9 BIG BUSINESS	06/01/76 10/31/78 620,000 320,000	RESEARCH AND DEVELOPMENT AIMED AT DESIGN AND DEVELOPMENT OF ZINC-CHLORINE BATTERIES FOR APPLICATION TO ELECTRIC UTILITIES AND ELECTRIC VEHICLES

SUBCONTRACTOR DATA

SUBCONTRACTOR NAME AND ADDRESS	SUBCONTRACT/P.O. NO. AND PERIOD OF PERFORMANCE	SUBCONTRACT AMOUNT		TYPE COMPANY		BASIS OF AWARD		TYPE OF AWARD		DESCRIPTION OF WORK		
		AMOUNT (DOLLARS)	ACTUAL	ESTIMATED	SMALL BUSINESS	MINORITY BUSINESS	OTHER	COMPETITIVE	SOLE SOURCE	FIXED PRICE	LOST RE- BIDDABLE	
Auto Dynamics - Madison Hgts. Mich (313) 584-1700	# 6972	\$ 170,000		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	develop & manufacture battery cells
Gulf & Western Manufacturing Co K12 7600	# 28011	\$ 394,000		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	developing power & motor for vehicles
	actual	\$ 237,414										
	Spent - last fiscal yr. 77			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

COMPLETED BY

NAME	TITLE	TELEPHONE NO.	DATE
Bill Headland	Mngr. Finance & Admin.	313-583-9434	1/19/78 AB

SUBCONTRACT SURVEY

PRIME CONTRACTOR DATA

ENERGY RESEARCH AND DEVELOPMENT
ADMINISTRATION
DIVISION OF SOLAR ENERGY

NAME AND ADDRESS	CONTRACT NUMBER AND PERIOD OF PERFORMANCE	CONTRACT AMOUNT	CONTRACT DESCRIPTION
COTTER II / VAUGHN & Assoc 4125 CARLISLE Blvd, N.E. ALBUQUERQUE, N.M. 87107	DATA 63-76-C-0002 7 AUG 75 -	1,015,990	USAR CENTERS - SEAGOVILLE, TX, ALBUQUERQUE, NM, & GREENWOOD MS

SUBCONTRACTOR DATA

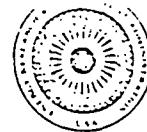
SUBCONTRACTOR NAME AND ADDRESS	SUBCONTRACT/P.O. NO. AND PERIOD OF PERFORMANCE	SUBCONTRACT AMOUNT AMOUNT (DOLLARS)	TYPE COMPANY			BASIS OF AWARD		TYPE OF AWARD		DESCRIPTION OF WORK	
			ACTUAL	ESTIMATED	SMALL BUSINESS	MINORITY BUSINESS	OTHER	COMPETITIVE	SOLE SOURCING	FIXED PRICE	
BRIDGES & PAXTON CONSULTING ENGINEERS, Inc. 213 TRUMAN ST. N.E. ALBUQUERQUE, NM	7 AUG 75	181,249	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	MECH. DESIGN TO PROPOSE SOLAR HEATING, COOLING & DOMESTIC HOT WATER SYS. FOR 3 USAR'S & SOLAR SYSTEM CHECKOUT AFTER CONSTRUC- TION COMPLETION
UHL & LOPEZ ENGRS, INC PO Box 8887 ALBUQUERQUE, N.M.	7 AUG 75	34,308	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ELEC. DESIGN FOR THREE USAR'S UTILIZING SOLAR HEATING, COOLING AND DOMESTIC HOT WATER SYSTEMS.
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

COMPLETED BY

NAME	TITLE	TELEPHONE NO.	DATE
FT. WORTH DISTRICT CORPS OF ENGINEERS		817/334-3514	3 MAR 78

SUBCONTRACT SURVEY

ENERGY RESEARCH AND DEVELOPMENT
ADMINISTRATION
DIVISION OF SOLAR ENERGY



PRIME CONTRACTOR DATA

NAME AND ADDRESS	CONTRACT NUMBER AND PERIOD OF PERFORMANCE	CONTRACT AMOUNT	CONTRACT DESCRIPTION
Georgia Institute of Technology Atlanta, GA 30332	EV-76-C-05-5018 36 months (1/1/76-12/31/78)	\$741,848	Development and Evaluation of a 400 KWth Solar Steam Generating Plant and Test Facility in the United States

SUBCONTRACTOR DATA

SUBCONTRACTOR NAME AND ADDRESS	SUBCONTRACT/P.O. NO. AND PERIOD OF PERFORMANCE	SUBCONTRACT AMOUNT AMOUNT (DOLLARS)	SUBCONTRACT AMOUNT		TYPE COMPANY			BASIS OF AWARD		TYPE OF AWARD		DESCRIPTION OF WORK
			ACTUAL	ESTIMATED	SMALL BUSINESS	MINORITY BUSINESS	UNITS	COMPETITIVE	SOLE SOURCE	FIXED PRICE	COST RE- IMBURSEMENT	
ANSALDO Societa Generale Elettromeccanica - DIM/GENT Via N. Lorenzi 8 16152 Genova Cornigliano, Italy	E-(40-1)-5018-S/C1 7 months (4/21/76-11/15/76)	\$290,000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Solar Steam Generating Test Facility
Saggus, Vaught, Spiker and Howell Architects and Engineers 3355 Lenox Road Atlanta, GA 30326	Professional Service Contract dated 11/1/77 3 months (11/1/77-1/31/78)	\$11,000	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Detailed Design of a Tower for the Solar Test Facility
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

15

COMPLETED BY

NAME	TITLE	TELEPHONE NO.	DATE
Nancy S. McHan	Contract Administrator Office of Contract Administration	(404) 894-4819	January 20, 1978

SUBCONTRACT SURVEY

ENERGY RESEARCH AND DEVELOPMENT
ADMINISTRATION
DIVISION OF SOLAR ENERGY

PRIME CONTRACTOR DATA

NAME AND ADDRESS	CONTRACT NUMBER AND PERIOD OF PERFORMANCE	CONTRACT AMOUNT	CONTRACT DESCRIPTION
MASSACHUSETTS UNIV OF AMHERST MASSACHUSETTS	EG-77-S-02-4238 CNO EDUCATIONAL	02/15/77 02/14/78 183,771 183,771	A CONTINUED EVALUATION OF COMPACT HEAT EXCHANGERS FOR OTEC APPLICATIONS

SUBCONTRACTOR DATA

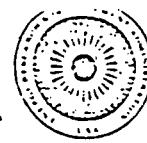
SUBCONTRACTOR NAME AND ADDRESS	SUBCONTRACT/P.O. NO. AND PERIOD OF PERFORMANCE	SUBCONTRACT AMOUNT AMOUNT (DOLLARS)	TYPE COMPANY			BASIS OF AWARD	TYPE OF AWARD	DESCRIPTION OF WORK
			ACTUAL	ESTIMATED	SMB BUSINESS			
ALPHALAVA ENERGY SYSTEM SOUTH DEERFIELD, MASS		BB \$15,000.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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COMPLETED BY

NAME JOHN McGOWAN DR. DUANE CROMACK	TITLE PROF. MECHANICAL ENGR.	TELEPHONE NO. 413-545-2756	DATE 3/23/78
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SUBCONTRACT SURVEY

ENERGY RESEARCH AND DEVELOPMENT
ADMINISTRATION
DIVISION OF SOLAR ENERGY

PRIME CONTRACTOR DATA

NAME AND ADDRESS	CONTRACT NUMBER AND PERIOD OF PERFORMANCE	CONTRACT AMOUNT	CONTRACT DESCRIPTION
Ayres Associates 1180 South Beverly Drive, #600 Los Angeles, California 90035	E(29-2)-3756 8/15/76 - 2/15/77 SMALL BUS.	\$62,420.00	Optimize design of Skytherm southwest passive system to determine economic commercialization.

SUBCONTRACTOR DATA

SUBCONTRACTOR NAME AND ADDRESS	SUBCONTRACT/P.O. NO. AND PERIOD OF PERFORMANCE	SUBCONTRACT AMOUNT (DOLLARS)	TYPE COMPAK			BASIS OF AWARD	TYPE OF AWARD	DESCRIPTION OF WORK				
			AMOUNT	ACTION	ESTIMATED	SMALL BUSINESS	MINORITY BUSINESS	OTHER	COMPETITIVE	SOLE SOURCE	FAIR PRICE	LISTED IN DIRECTIVE
Richard Hunter, AIA 619 South Bonnie Brae Street Los Angeles, California 90057	Contract letter dated 10/15/76 12/10/76-7/8/77	6,332.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Architectural Services - Construction Documents
Phillip W. B. Niles Route 2, Box 714 R Arroyo Grande, California 93420	Contract letter 10/25/76 12/10/75-7/7/77	2,100.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Solar Consultant - Instrumentation and Data Acquisition Plan
Martin J. Siegel 743 Schumacher Drive Los Angeles, California 90048	Contract letter dated 1/19/77 1/19/77-1/26/77	600.00	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Engineering Services - Design of drive system for roof panels.
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

COMPLETED BY

NAME	TITLE	TELEPHONE NO.	DATE
<i>J. Marx Ayres</i> J. Marx Ayres	President	(213) 553-5285	January 20, 1978

APPENDIX B

SMALL BUSINESS DEFINITION

A concern organized for profit qualifies as a small business if it meets the following criteria, even though it may be owned or controlled by a non-profit entity of any size.

If a concern does not fit an industry classification in the following listing, it is to be considered small busines if its number of employees is 500 or less:

<u>INDUSTRY</u>	<u>THREE YEAR AVG. ANNUAL RECEIPTS</u>	<u>NO. EMPLOYEES</u>
Construction -----	\$12 million	
Dredging -----	\$9.5 million	
Machinery (rebuilding or repairing) -----		500
Concrete and stone manufacturing -----		750
Fabricated metal products -----		500
Machinery (except electrical)		
a. Farm -----		500
b. Construction -----		750
c. Pumps -----		500
d. Air conditioning and heating -----		750
Electrical machinery		
a. Power distribution -----		750
b. Motors and generators -----		1000
c. Industrial controls -----		750
d. Other elec. industrial -----		500
Transportation Equipment		
a. Motor vehicles -----		1000
b. Parts and accessories -----		500
c. Truck trailers -----		500
d. Railroad equipment -----		750
e. Tanks and components -----		1000
Measuring, Control, etc. Instruments -----		500
Engineering (other than marine) -----	\$7.5 million	
Custodial services -----	\$4.5 million	
Computer services -----	\$4 million	
Hospitals -----	150 beds (excl. cribs, etc.)	
Grain storage -----	1 mil. bushels & \$1.5 million	
Trade contractors -----	\$5 million	
Food franchises -----	\$1 million	

Source: SBA Rules and Regulations, Part 121