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THE ECONOMIC RECOVERY ACT OF 1981 AND TAX POLICIES FOR COMMERCIAL SOLAR ENERGY APPLICATIONS

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ABSTRACT

This report outlines key tax policies relevant to commercial solar energy applications. Included are certain changes in depreciation rules and small business federal income tax percentages that were part of the recently enacted Economic Recovery Tax Act of 1981. Also, the regulations for business investment and energy tax credits are explained. An example of the effects of the new depreciation schedule on a solar industrial process heat system is given.

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I. Introduction

The Economic Recovery Tax Act of 1981 represents one of the most sweeping changes in taxation policy in recent history. The tax cut legislation is designed to increase savings and investment. The legislation includes the Accelerated Cost Recovery System (ACRS) which essentially replaces the useful life depreciation rules that have been used over the last fifty years or so. The ACRS reduces the impact of inflation by significantly accelerating the recovery of capital expenditures. This paper will outline the ACRS as it applies to commercial solar equipment and in broad terms address the impact the new law will have on the economic feasibility of solar energy for businesses. This paper will also explain the investment tax credit and the reduction of the income tax rate for small businesses. In addition, the business energy tax credits available to solar and related renewable energy producing or conserving equipment are described.

II. The Accelerated Cost Recovery System

The Accelerated Cost Recovery System (ACRS) represents a major change in tax accounting for capital expenditures. Depreciation rules before the ACRS were based on the "useful life" concept, whereby the asset was depreciated over its useful life according to one of three depreciation methods (straight line, declining balance, and sum-of-the-years-digits). ACRS removes the direct link between useful life and depreciation recovery period. Under ACRS, depreciable assets qualify to be depreciated over one of four recovery periods, either three years, five years, ten years, or fifteen years. The useful life of the asset is a factor in determining which recovery period is used, but it is not the critical factor in determining how many years the asset can be depreciated. Salvage value is also disregarded in computing ACRS allowances.

To qualify for recovery deductions under ACRS, capital expenditures must be for "recovery property," or tangible property used in a business or held for the production of income. Strict definitions can be found in the Internal Revenue Code. ACRS applies only to recovery property placed in service by the taxpayer during or after 1981. There are different depreciation allowance schedules for property placed in service during 1981-1984, 1985, and after 1985. These schedules are listed in Tables 1, 2,and 3.

Table 1. DEPRECIATION SCHEDULE FOR PROPERTY PLACED IN SERVICE, 1981-1984

	The applicable percentage for the class of property is:			
If the recovery year is:	3-year	5-year	10-year	15-year Public Utility
1	25	15	8	5
2	38	22	14	10
3	37	21	12	9
4		21	10	8
5		21	10	7
6			10	7
7			9	6
8			9	6
9			9	6
10			9	6
11				6
12				6
13				6
14				6
15				6

Table 2. DEPRECIATION SCHEDULE FOR PROPERTY PLACED IN SERVICE IN 1985

	The applicable percentage for the class of property is:			
If the recovery year is:	3-year	5-year	10-year	15-year Public Utility
1	29	18	9	6
2	47	33	19	12
3	24	25	16	12
4		16	14	11
5		8	12	10
6			10	9
7			8	8
8			6	7
9			4	6
10			2	5
11				4
12				4
13				3
14				2
15				1

Table 3. DEPRECIATION SCHEDULE FOR PROPERTY PLACED IN SERVICE AFTER 1985

If the recovery year is:	The applicable percentage for the class of property is: 3-year	5-year	10-year	15-year Public Utility
1	33	20	10	7
2	45	32	18	12
3	22	24	16	12
4		16	14	11
5		8	12	10
6			10	9
7			8	8
8			6	7
9			4	6
10			2	5
11				4
12				3
13				3
14				2
15				1

Through discussions with the Internal Revenue Service and readings of the Internal Revenue Code and Economic Recovery Tax Act of 1981: Law and Explanation by Commerce Clearing House, Inc., and from Economic Recovery Tax Act of 1981: An Analysis of the New Legislation, by Arthur Young and Company, it appears that solar water heaters for commercial operations such as car washes, laundromats, motels and solar industrial process heat equipment apply for the 5-year recovery period. There exist some questions as to solar equipment for heating and cooling of commercial buildings, since heating and cooling equipment is generally considered a structural component, not an integral part of the business, and therefore does not apply for the 5-year recovery period.

III. An Example

In order to illustrate the effects of the ACRS on the economics of solar industrial process heat applications, an example is presented in Tables 4, 5, 6, and 7. The net effect of the new depreciation schedule is shown in Table 4 by the change in two indicators of financial attractiveness, net present value and internal rate of return. The assumptions for this example are given in Table 5, and detailed cash flows are presented in Tables 6 (Old depreciation rules) and 7 (ACRS rules). When the ACRS depreciation method is used, the cash flow is improved in the early years.

Table 4. IMPACT OF ACCELERATED COST RECOVERY SYSTEM (ACRS) ON SOLAR IPH EXAMPLE

Indicators of Financial Value
- Net Present Value
- Internal Rate of Return

Net Present Value*

Discount Rate	Solar IPH Example with: Straight-Line Depreciation	New Rules-ACRS
10%	$25,416	$31,641
15%	3,183	10,426
20%	-6,362	1,262

* The higher the Net Present Value, the more attractive the investment is. The discount rate is the company's cost of capital or opportunity cost for using funds in one project versus another. Given a company's discount rate, any investment with a positive Net Present Value is financially attractive.

Internal Rate of Return (IRR)**

	Solar IPH Example with: Straight Line Depreciation	New Rules-ACRS
IRR	16.2%	21.2%

** The internal rate of return is essentially compound interest in reverse, in that it discounts the cash flows arising from an investment at an interest rate at which they exactly equal the present value of the initial investment. Internal rates of return should be compared among similar investments with equal periods of economic evaluation.

Table 5. ASSUMPTIONS FOR SOLAR IPH EXAMPLE

Solar IPH System Cost	$100,000
Amount of Equity Financed (Down Payment)	30,000
Loan Interest Rate	17%
Loan Period	10 years
Solar IPH System Life/Economic Evaluation Period	20 years
Federal 10% Investment plus 15% Business Energy Tax Credits	25%
Annual Natural Gas Savings	800 MMBtu
Current Cost of Natural Gas	$5.50/MMBtu
Projected Price Increases for Natural Gas*	
Years 1 to 10	20.5%
Years 11 to 20	17.5%
Operations and Maintenance (O&M) Expense (% of System Cost)	0.02%
Projected Increases in O&M Expense (Annual %)	12.2%
Corporate Federal Income Tax Rate	46%
Depreciation Recovery Period: Old Rules, Straight Line	10 years
New Rules, ACRS	5 years

* Source: Chase Econometrics, "Energy Analysis Quarterly," May 1981.

Table 6. AFTER-TAX CASH FLOW FOR IPH EXAMPLE WITH OLD RULES

Year	Loan Payment	Tax Savings	O & M Expense	Fuel Savings	Old Law: Straight Line Depreciation	Net Annual Cash Flow	Cumulative Net Cash Flow
0	-30,000*	25,000**				- 5,000	- 5,000
1	-15,026	5,474	- 920	2,024	4,600	- 3,848	- 8,848
2	-15,026	5,230	-1,032	2,439	4,600	- 3,789	-12,637
3	-15,026	4,944	-1,158	2,939	4,600	- 3,701	-16,338
4	-15,026	4,609	-1,299	3,541	4,600	- 3,575	-19,913
5	-15,026	4,217	-1,458	4,267	4,600	- 3,400	-23,313
6	-15,026	3,759	-1,635	5,142	4,600	- 3,161	-26,474
7	-15,026	3,223	-1,835	6,195	4,600	- 2,842	-29,316
8	-15,026	2,595	-2,059	7,467	4,600	- 2,422	-31,738
9	-15,026	1,863	-2,311	8,997	4,600	- 1,877	-33,615
10	-15,026	1,004	-2,593	10,842	4,500	- 1,173	-34,788
11			-2,909	12,739		9,830	-24,958
12			-3,264	14,969		11,705	-13,253
13			-3,662	17,588		13,926	673
14			-4,109	20,665		16,557	17,230
15			-4,610	24,283		19,673	36,903
16			-5,172	28,532		23,360	60,263
17			-5,803	33,525		27,722	87,985
18			-6,511	39,392		32,881	120,866
19			-7,306	46,286		38,980	159,846
20			-8,197	54,386		46,189	206,035

Table 7. AFTER-TAX CASH FLOW FOR IPH EXAMPLE WITH NEW ACRS

Year	Loan Payment	Tax Savings	O & M Expense	Fuel Savings	New Law: ACRS	Net Annual Cash Flow	Cumulative Net Cash Flow
0	-30,000*	25,000**				- 5,000	- 5,000
1	-15,026	5,474	- 920	2,024	6,900	- 1,548	- 6,548
2	-15,026	5,230	-1,032	2,439	10,120	1,731	- 4,817
3	-15,026	4,944	-1,158	2,939	9,660	1,359	- 3,458
4	-15,026	4,609	-1,299	3,541	9,660	1,485	- 1,973
5	-15,026	4,217	-1,458	4,267	9,660	1,660	- 313
6	-15,026	3,759	-1,636	5,142		- 7,761	- 8,074
7	-15,026	3,223	-1,835	6,196		- 7,442	-15,516
8	-15,026	2,595	-2,059	7,467		- 7,022	-22,538
9	-15,026	1,863	-2,311	8,997		- 6,477	-29,015
10	-15,026	1,004	-2,593	10,842		- 5,773	-34,788
11			-2,909	12,739		9,830	-24,958
12			-3,264	14,969		11,705	-13,253
13			-3,662	17,588		13,926	673
14			-4,109	20,666		16,557	17,230
15			-4,610	24,283		19,673	36,903
16			-5,172	28,532		23,360	60,263
17			-5,803	33,525		27,722	87,985
18			-6,511	39,392		32,881	120,865
19			-7,306	46,286		38,980	159,846
20			-8,197	54,386		46,189	206,035

*Down Payment
**Tax Credit

IV. Investment Tax Credits

The eligibility requirements for the investment tax credit have also been changed from the useful life concept to the ACRS recovery period. For eligible 15-year public utility, 10-year, or 5-year property, 100 percent of the investment qualifies for the investment credit. For 3-year recovery property, only 60 percent of the investment qualifies for the credit.

The regular investment credit percentage is 10 percent of the cost of the investment. There is a limitation on the amount of investment tax credit that can be claimed in a particular year, based on the amount of tax liability. A company can claim 10% of the investment cost as tax credit, or $25,000 plus 80% of the company's tax liability in 1981 over $25,000, whichever is less. This percentage is increased to 90% in 1982 and thereafter. Any unused tax credit can be an investment tax credit carryback 3 years or carryover 7 years.

V. Reductions in Corporate Tax Rates

Incentives for small businesses were included in the Act in the form of reductions in the corporate tax rates for the bottom two corporate taxable income brackets (below $50,000). The reductions begin after 1981.

Taxable Income	Old Law	New Law	
	1981	1982	1983 and after
$ 0 - 25,000	17%	16%	15%
25,001 - 50,000	20	19	18
50,001 - 75,000	30	30	30
75,001 - 100,000	40	40	40
100,001 +	46	46	46

The maximum tax for a corporation with taxable income of $50,000 in 1981 would be $9,250, in 1982 it would equal $8,750, and in 1983 and thereafter the tax would be $7,750.

VI. Business Energy Tax Credits

The business energy tax credits described here relate to solar energy equipment, although the tax credits are not specifically part of the Economic Recovery Tax Act of 1981. The explanation is provided in order to present a clear picture of the entire taxation matter as related to solar commercial development.

The tax credits available to businesses for investments in energy producing or conserving equipment vary according to the type of property. Strict definitions determine what equipment qualifies for which property class, and the following descriptions are general in nature. Also, only the property classes that apply to solar energy equipment are described.

- Alternative Energy Property

  Property that uses one of the alternative fuels, or is used to produce alternative fuels from an alternative substance, is alternative energy property. Alternative fuels generally refers to fuels derived from sources other than oil or natural gas.

Type of Property	Credit	Acquired on or after	Placed in service before
General rule	10%	Oct. 1, 1978	Dec. 31, 1982
Geothermal equipment	15%	Jan. 1, 1980	Dec. 31, 1985
Ocean thermal property	15%	Jan. 1, 1980	Dec. 31, 1985
Biomass property	10%	Oct. 1, 1978	Dec. 31, 1985

- Solar or Wind Energy Property

  Equipment that uses solar or wind energy to generate electricity, heat, cool, or provide hot water for use in a structure as well as solar-generated process heat for industrial, commercial or agricultural purposes. This property includes only active systems.

  Credit: 15%
  Expenditure before: 1986
  Placed in Service before: 1986

- Hydroelectric Generating Property

  Applies to qualifying investments in small-scale hydroelectric property, beginning January 1, 1980, and ending December 31, 1985, with a three-year additional period for projects for which an application has been docketed by the Federal Energy Regulatory Commission before 1986.

  Credit: 11% for sites with less than 25 MW

  As capacity increases from 25 to 125 MW, the credit is phased out. Between 25 and 100 MW, the qualified investment is reduced by a fraction equal to 25 divided by the total installed capacity up to 100 MW. As total capacity rises from 100 to 125 MW, the credit is phased out entirely.

- Cogeneration Equipment

  Applies to property that is an integral part of a system for using the same fuel to produce both qualified energy and electricity at an industrial or commercial facility, and the property must result in an increase in the capacity of the system.

  The system must not use oil, natural gas, or a product of oil or natural gas as a fuel, or, if it uses such fuels for startup, backup, or flame stabilization purposes, such fuels must not comprise more than 20 percent of the fuel consumed by the system.

  Credit: 10%
  Available: through 1982

VII. Summary

The tax policy changes incorporated in the Economic Recovery Tax Act of 1981 improve the economic attractiveness of commercial solar equipment, but the changes improve the attractiveness of all capital investment opportunities as well. The relative situation between solar and conventional systems will not change significantly until solar system costs come down and/or conventional fuel prices rise further. Also, the slight reduction in corporate income tax rates for small businesses will not significantly change the attractiveness of solar systems for commercial enterprises.