EXPERT WITNESS REPORT

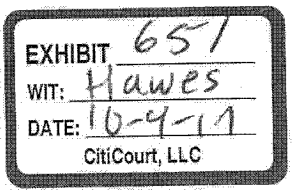
OF KURT O. HAWES, JD, MBA

United States of America

v.

RaPower-3, LLC, International Automated Systems, Inc., LTB1, LLC, R. Gregory Shepard, Neldon Johnson, and Roger Freeborn

United States District Court for the District of Utah
Civil No. 2:15-cv-00828 DN



INTRODUCTION

This report sets forth the opinions that I have formed after reviewing transaction documents, online materials, and other information related to the sale of solar lenses ("Solar Lenses") from RaPower-3, LLC ("RaPower") to customers and the subsequent lease of those Solar Lenses by customers to LTB1, LLC ("LTB1") or any other lessee. Additionally, I visited the site where the Solar Lenses are installed and discussed the various issues with management of RaPower.

In rendering this opinion, I reviewed the documents set forth in Schedule A, as well as the statutes, regulations, and other legal authorities cited herein.

I may find it appropriate to revise or supplement my opinions, analysis, and conclusions stated herein in the future.

My Curriculum Vitae is attached hereto as Exhibit A. I am charging the rate of $300.00 per hour for my work as an expert witness on this case.

OPINIONS RENDERED

OPINION #1: I would recommend to my clients that Solar Lenses purchased from RaPower and subsequently leased for use in an Alternative Energy System qualify as "energy property" as defined in Section 48 of the Internal Revenue Code ("IRC")[1] and entitle any purchaser to the energy tax credit under Section 48.

OPINION #2: I would recommend to my clients that credits taken for Solar Lenses purchased be taken in the year that they are leased, as the Solar Lenses are placed in service in the year the Solar Lenses are held out for lease, which for most purchasers is the same year the Solar Lenses are purchased.

[1] All statutory references are to the Internal Revenue Code 26 U.S.C., unless otherwise noted.

OPINION #3: Depending on the specific facts of a client's situation, I would recommend that my clients should consider themselves materially participating in a leasing business if they leased the Solar Lenses purchased from RaPower to LTB1, or any other lessee.

OPINION #4: As a consequence of Opinion #3, I would recommend that my clients claim depreciation on their income tax returns for lenses used in their leasing businesses.

BASIS FOR OPINIONS

OVERVIEW

In preparing this report, I reviewed and analyzed several transaction documents used by RaPower to sell and lease solar lenses to purchasers ("Purchaser(s)" or "Taxpayer(s)"), including 1) the RaPower Equipment Purchase Agreement, 2) the Operation and Maintenance Agreement, and 3) the "Placed in Service" letter delivered to Purchasers.[2] In addition, I visited the site where the Solar Lenses are installed or will be installed to generate energy, including electricity. My understanding and assumptions with respect to the sale, purchase, and lease of Solar Lenses are as follows:

The Solar Lenses were purchased by Purchasers that are individuals residing in or entities organized in the United States and neither tax-exempt nor governmental entities. The Solar Lenses were purchased pursuant to a RaPower Equipment Purchase Agreement, substantially similar to the agreement attached hereto as Exhibit B (the "Purchase Agreement"). The Solar Lenses were manufactured by International Automated Systems, Inc. ("IAS") or one of its affiliates and consist of thin-film solar lenses that focus the sun's energy, which energy is

[2] RaPower has employed different versions of the Purchase Agreement, the O&A Agreement and the "Placed in Service" Letter between 2010, the alleged commencement date pursuant to the Complaint, 2015, the year the Complaint was filed, and up through today. I have reviewed all versions of these documents. Although there are several changes between the documents, those changes do not materially affect the essential aspects of the transactions I have described herein. Thus my analysis and opinions would apply to all transactions and purchasers regardless when they purchased and leased their Solar Lenses.

collected and transmitted to produce heated steam for power generation, applied directly in concentrated fashion to photovoltaic solar cells to produce a more constant source of electricity, and other uses related to the generation of energy.

According to the Purchase Agreement, the purchase price ("Purchase Price") for each Solar Lens was Three Thousand Five Hundred Dollars ($3,500). As a down payment on the Purchase Price, Purchasers pay a certain portion of the Purchase Price upon execution of the Purchase Agreement, and then pay the remainder of the Purchase Price in substantially equal annual installment payments over a period of thirty years (the "Installment Payments") with applicable interest. In some instances, if a Purchaser failed to lease the Solar Lenses on a long-term lease, the remaining balance owed on the Purchase Price would become immediately due and payable to RaPower.

Each Solar Lens was new when purchased, and no other person had used the Solar Lenses for any purposes prior to their sale to a Purchaser under a Purchase Agreement. In addition, no person is believed to have claimed any credits under IRC §§ 45 or 48 or received a §1603 grant with respect to the Solar Lenses prior to a Purchaser buying the Solar Lenses. All of the Solar Lenses on which energy credits were claimed were installed in the United States in Millard County, Utah.

Generally on or about the date when Purchasers entered into a Purchase Agreement, they also entered into an Operation and Maintenance Agreement substantially similar to the agreement attached hereto as Exhibit D (the "O&M Agreement") with LTB1, LLC, (the "Operator") to oversee the operation and maintenance of the Solar Lenses. The Operator is a for-profit commercial enterprise that is not related to either RaPower or Purchaser through common ownership. The Operator also leases from RaPower or an affiliate of RaPower the towers in which the Solar Lenses are or will be installed, receivers to collect the energy from the Solar

Lenses, and certain other equipment relating thereto (collectively, the "Alternative Energy System"). The Operator is responsible for performing the services described in the O&M Agreement, including collection of all income generated from the operation of the Solar Lenses, including any revenue generated from the use or sale of thermal energy or electric power generated using the Solar Lenses (the "Gross Revenue"). The Operator is entitled to retain, as compensation, an amount equal to the Gross Revenue minus an annual rental payment as set forth in the O&M Agreement (the "Rental Payment"). The Rental Payment is a fixed amount (typically $150 per Solar Lens per year), not a function of the net profits generated by the Solar Lenses.

Under the Purchase Agreement, RaPower warranted the Solar Lenses for a period of 35 years and was responsible for all costs and work related to the maintenance, repair, or replacement of all components of the Alternative Energy System, including the Solar Lenses. At first, Solar Lenses leased by Purchasers were installed on several towers at a research and development site to test the strength of the Solar Lenses, the array patterns and attachment mechanisms, and other issues related to the efficient functionality of the Solar Lenses and the Alternative Energy System. Over the years, the Operator has developed manufacturing processes and construction techniques to reduce the risk of damage to the Solar Lenses and other equipment in the Alternative Energy System. Currently, Solar Lenses are being installed at a new installation site on approximately 200 towers.

The Purchaser also has the option to earn a commission through a multilevel marketing arrangement with RaPower. The Purchaser has the option of entering into a bonus, or referral contract, which guarantees that the Purchaser will earn a small percentage, multiplied by the number of Solar Lenses owned by the Purchaser, of the first billion dollars in sales earned by IAS, in exchange for the Purchaser allowing his or her lenses to be used for marketing purposes. The Purchaser might choose to structure his or her lens leasing business through a sole proprietorship,

a limited liability company, a C corporation, an S corporation, or any other legal business entity that is neither tax-exempt nor a governmental entity.

BASIS FOR OPINION #1:
SOLAR LENSES QUALIFY AS ENERGY PROPERTY, AND PURCHASERS ARE THEREFORE ELIGIBLE FOR AN ENERGY CREDIT UNDER IRC SECTION 48

The energy credit under IRC § 48 is part of the business investment credit set forth in IRC § 46 and deductible against a taxpayer's taxes under IRC § 38. The energy credit is calculated based on the "energy percentage of the basis of each energy property placed in service during [the] taxable year." Thus, in order for Solar Lenses to qualify for the energy credit, they must be "energy property" that is "placed in service" during the taxable year for which the credit is claimed.

Energy Property[3]

Under IRC §§ 48(a)(3) and 50(b) and with respect to solar energy property, "Energy Property" is any property that satisfies the following six requirements:[4]

- The property must be qualified energy property.[5]
- The construction, reconstruction, or erection of the property must be completed by the taxpayer,[6] or acquired by the taxpayer if the original use of the property begins with the taxpayer.[7]
- The property must be property with respect to which depreciation or amortization is allowable.[8]
- The property must meet the applicable performance and quality standards.[9]

[3] As most tax practitioners do, I relied heavily for the legal analysis herein on BNA's *Tax Practice Series* ¶3140.03.B Energy Property, Deborah K. Delano, CPA and James Edward Maule, Esq.
[4] IRC §48(a)(3); Reg. §1.48-9
[5] IRC §48(a)(3)(A)
[6] IRC §48(a)(3)(B)(i)
[7] IRC §48(a)(3)(B)(ii)
[8] IRC §48(a)(3)(C)
[9] IRC §48(a)(3)(D)

- The property must not be part of a facility the production from which is taken into account in computing the credit for electricity produced from certain renewable resources.[10]

- The property must not be property for which the taxpayer received a grant in lieu of the energy credit.[11]

There is no evidence that the Solar Lenses fail under the final two requirements – i.e. (i) they are not part of a facility the production from which is taken into account in computing a credit under IRC § 45, and (ii) that taxpayers received grants in lieu of the energy credit. The analysis below will therefore focus on the first four statutory requirements.

Solar Energy Property

Qualified Energy Property includes solar energy property,[12] which is equipment that uses solar energy to generate electricity, to heat, cool, or provide hot water for use in a structure, or to provide solar process heat.[13] Solar energy property specifically does not include property used to generate energy for heating swimming pools.[14] It includes equipment and materials, as well as parts related to the function of that equipment, that use solar energy directly to perform these functions, generally through the "use of equipment such as collectors (to absorb sunlight and create hot liquids or air), storage tanks (to store hot liquids), rockbeds (to store hot air), thermostats (to activate pumps or fans which circulate the hot liquids or air), and heat exchangers (to utilize hot liquids or air to create hot air or water)."[15] "Solar energy property includes equipment that uses solar energy to generate electricity, and includes storage devices, power conditioning equipment, transfer equipment, and parts related to the functioning of those items. In general, this process

[1010] IRC §48(a)(3)(D) (additional language) (essentially limiting taxpayers to taking either the §48 energy credit or the §45 credit for electricity produced from certain renewable resources)
[11] IRC §48(d)(1)
[12] Treas. Reg. § 1.48-9(d)(1)
[13] IRC § 48(a)(3)(A)(i); Treas. Reg. § 1.48-9(d)(1).
[14] *Id.*
[15] Treas. Reg. § 1.48-9(d)(1).

involves the transformation of sunlight into electricity through the use of such devices as solar cells or other collectors. However, solar energy property used to generate electricity includes only equipment up to (but not including) the stage that transmits or uses electricity."[16] "Equipment that uses solar energy beyond the distribution stage is eligible only if specially adapted to use solar energy."[17]

It is not necessary for solar energy property to comprise a completely functional solar system in order to qualify for the credit. The Tax Court has held that solar energy property is any equipment that uses solar energy to generate electricity, to heat, cool, or provide hot water for use in a structure, or to provide solar process heat, and includes parts solely related to the functioning of such equipment.[18] Thus, an incomplete system made up of qualifying parts, such as collectors, storage tanks, thermostats, heat exchangers, etc., can qualify for the credit.

To qualify as solar energy property under IRC § 48, the Solar Lenses must therefore either generate electricity; heat, cool, or provide hot water for use in a structure; or provide solar process heat. The Solar Lenses qualify on at least two fronts: they will generate electricity—either through thermal generation or coupled with photovoltaic panels—but at a minimum they will also provide solar process heat through concentrating the sun's energy for use in generating electricity. The statute requires only one or the other, and therefore producing solar process heat is enough to qualify the Solar Lenses as solar energy property.

In addition, because under *Cooper v. Commissioner*, a completely functional solar system (i.e. electrical generation system) is not necessary before equipment may qualify as solar energy property, the fact that the Solar Lenses were used in research and development of a functional solar system is enough to qualify them as solar energy property. Like many tax credits, the energy credit

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[16] Treas. Reg. § 1.48-9(d)(3).
[17] Treas. Reg. § 1.48-9(d)(5).
[18] *See Cooper v. Comm'r*, 88 T.C. 84 (1987)

is generally designed to incentivize inventors, entrepreneurs and investors not only to implement current technologies in the generation of energy, but to seek to develop new technologies.[19] Such development appears to be the case with the Solar Lenses.

Acquisition and Original Use

Next, the Solar Lenses must either be (i) constructed, reconstructed or erected by the taxpayer, or (ii) acquired by the taxpayer if the original use of such property commences with the taxpayer.[20] Property is deemed acquired when reduced to physical possession or control of the taxpayer[21], and original use means the first use to which the property is put, whether or not such use corresponds to the use of such property by the taxpayer.[22]

Purchasers acquire ownership and control of the Solar Lenses under the Purchase Agreement, and none of the Solar Lenses are used by any other person prior to their acquisition by a Purchaser. The Solar Lenses were therefore acquired by Purchasers and put to their original use by Purchasers and thus satisfy this requirement of classification as energy property

Allowable Depreciation

To qualify as Energy Property, the Solar Lenses must qualify for depreciation.[23] Property qualifies for depreciation within the meaning of IRC § 48(a)(3) "if the property is of a character subject to the allowance for depreciation under section 167 and the basis (or cost) of the property is recovered through a method of depreciation, including, for example, … methods of depreciation which measure the life of the property in terms of years."[24]

As described in Opinion 4, below, the Solar Lenses are of a character subject to allowance

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[19] *See* IRS, Announcement 79-99, 1979-28 I.R.B. 36 (guidelines announced regarding the energy credit "are necessary to carry out the Congressional intent *of encouraging investment in energy property*").
[20] IRC §48(a)(3)(B).
[21] Reg. §1.48-2(b)(6).
[22] Reg. §1.48-2(b)(7)
[23] IRC §48(a)(3)(C)
[24] Reg. §1.48-1(b)(1)

for depreciation under IRC § 167, and a Purchaser's basis in the Solar Lenses will be recovered through a method of depreciation.

Performance and Quality Standards

Energy Property must satisfy certain performance standards, if any, prescribed by the Service in regulation and which are in effect at the time the property is acquired.[25] But performance standards are only required to be met if the standards have been set by the Service; if no standards have been set, a taxpayer "need not wait until quality and performance standards are issued before making commitments to acquire property which may be eligible for the business energy credit."[26]

On October 26, 2015, the Service issued a request for comments on definitions of Section 48 property and in particular on "the definition of certain equipment using solar energy."[27] Specifically, the Service requested comment on "[w]hether only property that actually produces electricity may be considered energy property or whether property such as storage devices and power conditioning equipment may also be considered energy property."[28] It is clear that the Service is considering applying the energy credit to non-electrical or non-heat producing property, or at the very least that it has been applied to such property in the past so long as it is part of an electrical or heat producing system.

Because no performance standards have been set that would apply to the Solar Lenses, there is no threshold level of electricity or heat that must be produced by the Alternative Energy System before the Solar Lenses can qualify as energy property.

Disqualifying Use

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[25] IRC §48(a)(3)(D)
[26] IRS, Announcement 79-99, 1979-28 I.R.B. 36
[27] Notice 2015-70, I.R.B 2015-43
[28] *Id.*

IRC § 50(b) disqualifies certain property as energy property if the property is used (i) predominantly outside of the United States,[29] (ii) predominantly to furnish lodging or in connection with the furnishing of lodging,[30] (iii) by certain tax-exempt organizations,[31] (iv) by a United Sates governmental entity,[32] or (v) by a foreign person or entity.[33] None of these disqualifications would apply to the Solar Lenses.

The Solar Lenses purchased by Purchasers are and will be installed in Millard County, Utah and thus in the United States. Neither are they capable of furnishing lodging or in connection with furnishing lodging. So far as I have been made aware, none of the Purchasers or the Operator are either tax-exempt organizations, governmental entities, or foreign persons, and the O&M Agreement would prevent the Solar Lenses from being used by or assigned to such entities without the express written consent of the Purchaser. Thus the Solar Lenses are not disqualified under IRC § 50(b) as energy property.

Sale and Leasing

Having determined the Solar Lenses qualify under IRC § 48 for a tax credit, whether the Purchaser can claim the energy credit depends in part on the structure of the purchase and lease transactions; that is, whether the sales and lease transactions under a Purchase Agreement and O&M Agreement vests and maintains ownership to the Solar Lenses in a Purchaser and, therefore, makes a Purchaser the party entitled to claim the credit.

First, it must be determined whether a sale occurred under a Purchase Agreement. Various factors are considered in determining whether a transaction constitutes a sale or a lease for tax purposes. The Service has stated that determining whether a transaction constitutes a sale or a

[29] IRC § 50(b)(1).
[30] IRC § 50(b)(2)
[31] IRC § 50(b)(3)
[32] IRC § 50(b)(4)(A)(i)
[33] IRC § 50(b)(4)(A)(ii)

lease "depends upon the intent of the parties as evidenced by the provisions of the agreement, read in light of the facts and circumstances existing at the time the agreement was executed."[34] Although "no single test, or any special combination of tests, is absolutely determinative" of whether a transaction is deemed a sale, if several conditions are present, and in the absence of evidence to the contrary, the transaction will show an intent to be treated as a "purchase and sale rather than as a lease or rental agreement."[35]

One condition indicating a sale is that "[p]ortions of the periodic payments are made specifically applicable to an equity to be acquired by the lessee."[36] Under a Purchase Agreement, a Purchaser is obligated to make payments after the down payment on the remainder of the Purchase Price over a period of 30 years. However, the Operator under an O&M Agreement is not obtaining any equity interest in the Solar Lenses, and no part of any Rental Payments are meant to transfer equity to the Operator.

A sale transaction may also be indicated when "[s]ome portion of the periodic payments is specifically designated as interest or otherwise readily recognizable as the equivalent of interest."[37] The Purchase Agreement designates a portion of the Installment Payments as interest at a specific rate. On the contrary, no portion of the Rental Payments under an O&M Agreement are designated or attributable as interest.

Finally, a third condition outlined by the Service indicating a sale is that "[t]he lessee will acquire title upon the payment of a stated amount of 'rentals' which under the contract he is required to make."[38] In this instance, a Purchaser obtains title to the Solar Lenses under the Purchase Agreement, but does not transfer title to the Operator under the O&M Agreement at any

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[34] Rev. Rul 55-540
[35] *Id.*
[36] *Id.*
[37] *Id.*
[38] *Id.*

point during the lease term.

Under all three conditions, the circumstances indicate that the lease arrangement under the O&M Agreement was a true lease and not a sale of some sort. Moreover, the Purchase Agreement indicates the intention of the parties that the transactions be treated for tax purposes as a sale of Solar Lenses to a Purchaser, which are then subsequently and simultaneously leased to the Operator under an O&M Agreement. As described in a similar transaction in *Cooper v. Commissioner*, "there were bona fide sales of equipment" where, among other things, i) legal title of the solar equipment passed, ii) all the profits produced from the rental of the systems were received (at least constructively) by the buyers, iii) the seller neither used the equipment nor retained physical possession of it, and iv) the parties treated the transaction as a sale.[39] For similar reasons, I believe that a sale of Solar Lenses occurs under a Purchase Agreement.

Once a sale of Solar Lenses occurs under a Purchase Agreement, it must then be determined that the Solar Lenses were leased, rather than sold, under an O&M Agreement. Some of the factors discussed above relate to this issue. In *Cooper*, the court looked at several considerations that would be relevant to such an inquiry: 1) "whether the lessor expected to own an asset with a meaningful residual value at the expiration of the lease term,"[40] 2) "whether the lessor had an equity interest in the leased property,"[41] and 3) "whether the lessor retained any risk of economic loss with respect to the property or any potential for economic gain."[42] This is more generally stated as whether the lessor retained the benefits and burdens of ownership.[43]

The Court in *Cooper* also recognized that the existence of tax benefits accruing to the lessor, the absence of significant positive net cash flow during the lease term, rental payments

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[39] 88 T.C. 84, 105 (1987)
[40] *Id.* at 106 (citing references omitted).
[41] *Id.* (citing references omitted).
[42] *Id.* (citing references omitted).
[43] *See generally Frank Lyon Co. v. United States,* 435 U.S. 561 (1978)

geared to the cost of interest and mortgage amortization, and the existence of nonrecourse financing had "minimal significance" to determining the characterization of a lease.[44] Moreover, "[t]he fact that a lease is part of a package put together by an orchestrator is not fatal to a finding that a lease existed, provided petitioners acquired substantial nontax interests."[45]

Similar to the transactions in *Cooper*, I believe a lease under an O&M Agreement would be considered a lease rather than a sale. The Operator possesses no equity or ownership rights in the Solar Lenses, and Purchasers could, upon the expiration of their leases with LTB, repossess the Solar Lenses for use in any way they desired. For these and other reasons discussed below regarding the profit-motive of a Purchaser, I would recommend to a client that a lease under an O&M Agreement is just that: a lease.

Amount of Credit

IRC § 48(1) states that the amount of the energy credit is calculated based on the basis of each energy property placed in service during the relevant taxable year. "The basis of property [generally is] the cost of such property."[46] For Purchasers under a Purchase Agreement, I would recommend that the initial basis amount be the Purchase Price of $3,500. Individual facts and circumstances may vary with each Purchaser that could adjust the basis, but based on the Purchase Agreement I reviewed, the parties to such an agreement would agree on $3,500 as the cost, and therefore set the initial cost basis of each Solar Lens at that amount.

BASIS FOR OPINION #2:
SOLAR LENSES ARE PLACED IN SERVICE WHEN THEY ARE PURCHASED BY THE PURCHASER

Solar energy property must be "placed in service" in order to qualify for the energy

[44] *Cooper v. Comm'r* at 105 (citing *Estate of Thomas v. Comm'r*, 84 T.C. 412 (1985)).
[45] *Id.*
[46] IRC § 1012(a)

credit.[47] With respect to all the purchasers of Solar Lenses from RaPower, those purchasers have leased the Solar Lenses to LTB1 for use in an Alternative Energy System. Property is placed in service when it is "placed in a condition or state of readiness and availability for a specifically assigned function."[48] With respect to leased property, the Tax Court has determined that a lessor of solar energy property is deemed to have placed the property in service when it is first held out for leasing to others in a profit-motivated leasing venture,[49] although "it is not necessary that the property actually be used during the taxable year in the taxpayer's profit-motivated venture. It is sufficient that the property be available for use."[50]

Purchasers hold the Solar Lenses out for lease when they enter into the O&M Agreement. For most, if not all Purchasers, that occurred on or about the same date they signed the Purchase Agreement. Therefore, the Solar Lenses will be available for lease as soon as they are manufactured and Purchasers acquire them. Because Purchasers hold the Solar Lenses out for lease on or about the date they acquire the Solar Lenses, the Solar Lenses are generally placed in service on the acquisition date even if they ultimately will not be actually leased and installed until a later time.

BASIS FOR OPINION #3:
A PURCHASER COULD MATERIALLY PARTICIPATE IN A BUSINESS BY LEASING LENSES PURCHASED FROM RAPOWER

Whether an individual Purchaser materially participates in a trade or business is a highly fact sensitive analysis.[51] Contrasted with the discussion of Section 48, above, which is dependent upon an analysis of the Solar Lenses and the agreements entered into by the Purchaser as

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[47] IRC § 48(a)(1)
[48] Reg. § 1.46-3(d)(1)(ii)
[49] *Cooper v. Comm'r* at 114 relying on *Waddell v. Comm'r*, 86 T.C. 848 (1986) (taxpayers executed distribution agreements simultaneously with the purchase, showing that the equipment was available for lease at the time of purchase even though it was not actually leased until more than a year later).
[50] *Waddell v. Comm'r*, 86 T.C. 848, 897 (1986) (citing references omitted).
[51] *See Comm'r v. Groetzinger*, 480 U.S. 23, 36 (1987).

described above, the analysis in this section is dependent upon each unique Purchaser's circumstances. The analysis depends first on whether the Purchaser's activities constitute a trade or business and, second, upon whether the Purchaser materially participates in that business. I will address item each in turn.

Trade or Business.

Generally, "[t]here shall be allowed as a deduction all the ordinary and necessary expenses paid or incurred during the taxable year in carrying on any trade or business …"[52] Specific to this case, IRC § 167 allows for depreciation deductions for "exhaustion, wear and tear" of property used in a "trade of business, or "of property held for the production of income."[53] Although IRC § 162, § 167, and their related treasury regulations do not contain a definition of "trade or business," the United States Supreme Court, in *Commissioner v. Groetziner*, has stated "that to be engaged in a trade or business, the taxpayer must be involved in the activity with continuity and regularity and … the taxpayer's primary purpose for engaging in the activity must be for income or profit. A sporadic activity, a hobby, or an amusement diversion does not qualify."[54] This has been referred to as the "primary purpose" standard.[55]

According to IRS Publication 334, Tax Guide for Small Business, for use in preparing 2016 Returns, "[a] trade or business is generally an activity carried on to make a profit. The facts and circumstances of each case determine whether or not an activity is a trade or business. You do not need to actually make a profit to be in a trade or business as long as you have a profit motive."

Depending on the circumstances, leasing Solar Lenses to a third party would qualify as a

[52] IRC § 162(a). See also IRC §§ 183(a) and 212.
[53] IRC § 167(a).
[54] *Groetzinger* at 35.
[55] *Misko v. Comm'r*, T.C.M. (CCH) 15, 17 (2005).

"trade or business" as defined by the Court in *Groetzinger* because an individual Purchaser could 1) engage in the activity for profit and 2) do so with continuity and regularity. In this section I will discuss only the profit motive because the "continuity and regularity" aspect is addressed within the material purpose analysis, below.

For Purchasers who choose to operate their lens leasing business as a sole proprietor, an S corporation, or a single-member LLC, Treas. Reg. § 1.183-2(b) contains nine objective factors that are used to determine whether an activity is engaged in for profit, which will be addressed in more detail, below. However, if the Purchaser chooses to operate his or her lens leasing business through a C corporation, IRC § 183 does not apply. In this situation, a Purchaser must look to the "primary purpose" standard described in *Groetzinger*. In applying *Groetzinger*, courts have looked at whether the Purchaser's activity was a "hobby masquerading as a business," such as raising animals.[56] In an equipment leasing case, the United States Tax Court also considered whether the leased equipment was purchased for personal use.[57] Based on the authority I have examined, I would advise a client who operated a lens leasing business through a C corporation that the business should qualify as a "trade or business" for tax purposes so long as the client was not pursuing the business as a hobby and so long as the client was not going to personally use the Solar Lenses.

For other clients who might operate their lens leasing business as a sole proprietor, for instance, I would consider the nine factors found in Treas. Reg. § 1.183-2(b) in considering the Purchaser's unique circumstances, with the understanding that "[n]o one factor is determinative in making this determination."[58] The nine factors, applied to a client considering a lens leasing

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[56] *Misko* at 18 (citing *Cornfeld v. Comm'r*, 797 F.2d 1049, 1052 (D.C. Cir. 1986) and *Bessenyey v. Comm'r*, 379 F.2d 252 (2d Cir. 1967)).
[57] *Id.*
[58] Treas. Reg. § 1.183-2(b).

business organized as a sole proprietor, are as follows:

1. *"Manner in Which the Taxpayer Carries On The Activity.* The fact that the taxpayer carries on the activity in a businesslike manner and maintains complete and accurate books and records may indicate that the activity is engaged in for profit."[59] A Purchaser who keeps records of his or her lens leasing business could meet this factor. To satisfy this factor, I would recommend that the Purchaser keep records of amounts paid as down payments for Solar Lenses, commissions earned, money expended to visit the manufacturing facilities and installation site for the lenses, and/or logs of time spent researching and analyzing the energy market.

2. *"The Expertise Of the Taxpayer Or His Advisors.* Preparation for the activity by extensive study of its accepted businesses, economic, and scientific practices, or consultation with those who are expert therein, may indicate that the taxpayer has a profit motive where the taxpayer carries on the activity in accordance with such practices."[60] An individual Purchaser might satisfy this factor by studying equipment leasing practices or by consulting with his or her attorney and/or accountant.

3. *"The Time And Effort Expended By the Taxpayer in Carrying On The Activity.* The fact that the taxpayer devotes much of his personal time and effort to carrying on an activity, particularly if the activity does not have substantial personal or recreational aspects, may indicate an intention to derive a profit. ... The fact that the taxpayer devotes a limited amount of time to an activity does not necessarily indicate a lack of profit motive where the taxpayer employs

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[59] Treas. Reg. § 1.183-2(b)(1). The remainder of this section states: "Similarly, where an activity is carried on in a manner substantially similar to other activities of the same nature which are profitable, a profit motive may be indicated. A change of operating methods, adoption of new techniques or abandonment of unprofitable methods in a manner consistent with an intent to improve profitability may also indicate a profit motive."

[60] Treas. Reg. § 1.183-2(b)(2) The remainder of this section states: "Where a taxpayer has such preparation or procures such expert advice, but does not carry on the activity in accordance with such practices, a lack of intent to derive profit may be indicated unless it appears that the taxpayer is attempting to develop new or superior techniques which may result in profits from the activity."

competent and qualified persons to carry on such activity."[61] Some Purchasers might spend a great deal of time promoting the sale of lenses in an effort to expand the commission-based side of the business, while others might spend little or no time on sales. Some Purchasers might spend a great deal of time and effort understanding leasing businesses or solar energy. While yet others might spend time traveling to the manufacturing and installation site to monitor the business and the progress of the companies from whom the Purchaser expects to generate income, including International Automated Systems (from whom the Purchaser expects to earn a percentage of profits) and the Operator. Based on these potential activities, a Purchaser could satisfy this factor.

4. *"Expectation That Assets Used in Activity May Appreciate in Value.* The term 'profit' encompasses appreciation in the value of assets, such as land, used in the activity. Thus, the taxpayer may intend to derive a profit from the operation of the activity, and may also intend that, even if no profit from current operations is derived, an overall profit will result when appreciation in the value of land used in the activity is realized since income from the activity together with the appreciation of land will exceed expenses of operation...."[62] Assuming that the Solar Lenses are used in an Alternative Energy System, then it is possible that the Solar Lenses used in the Purchaser's business could increase in value over time.

5. *"The Success Of The Taxpayer In Carrying On Other Similar or Dissimilar Activities.* The fact that the taxpayer has engaged in similar activities in the past and converted them from unprofitable to profitable enterprises may indicate that he is engaged in the present activity for profit, even though the activity is presently unprofitable."[63] Some Purchasers may own other equipment leasing businesses or engage in other entrepreneurial activities successfully.

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[61] Treas. Reg. § 1.183-2(b)(3). The omitted portion of this section states, "A taxpayer's withdrawal from another occupation to devote most of his energies to the activity may also be evidence that the activity is engaged in for profit."

[62] Treas. Reg. § 1.183-2(b)(4).

[63] Treas. Reg. § 1.183-2(b)(5).

As with the other factors, whether a Purchaser could meet this factor is dependent on his or her specific circumstances.

6. *The Taxpayer's History Of Income Or Losses With Respect To The Activity.* A series of losses during the initial or start-up stage of an activity may not necessarily be an indication that the activity is not engaged in for profit. However, where losses continue to be sustained beyond the period which customarily is necessary to bring the operation to profitable status such continued losses, if not explainable, as due to customary business risks or reverses, may be indicative that the activity is not being engaged in for profit."[64] Although an individual Purchaser would likely not realize profit from the leasing activity itself, he or she could potentially realize a profit from the commission portion of selling Solar Lenses. Additionally, based on the information provided, the Purchaser anticipates that as soon as the Solar Lenses are used in a system that generates revenue, the Purchaser will begin to realize profits from rent collections within that same year.

7. *The Amount Of Occasional Profits, If Any, Which Are Earned.* The amount of profits in relation to the amount of losses incurred, and in relation to the amount of the taxpayer's investment and the value of the assets used in the activity, may provide useful criteria in determining the taxpayer's intent. … Moreover, an opportunity to earn a substantial ultimate profit in a highly speculative venture is ordinarily sufficient to indicate that the activity is engaged in for profit even though losses or only occasional small profits are actually generated."[65] The

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[64] Treas. Reg. § 1.183-2(b)(6). The remainder of this section reads: "If losses are sustained because of unforeseen or fortuitous circumstances which are beyond the control of the taxpayer, such as drought, disease, fire, theft, weather damages, other involuntary conversions, or depressed market conditions, such losses would not be an indication that the activity is not engaged in for profit. A series of years in which net income was realized would of course be strong evidence that the activity is engaged in for profit."

[65] Treas. Reg. § 1.183-2(b)(7). The omitted portion of this section reads: "An occasional small profit from an activity generating large losses, or from an activity in which the taxpayer has made a large investment, would not generally be determinative that the activity is engaged in for profit. However, substantial profit, though only occasional, would generally be indicative that an activity is engaged in for profit, where the investment or losses are comparatively small."

combination of the anticipated rental payments from the Operator and payments on bonus contracts does provide the Purchaser with "an opportunity to earn a substantial ultimate profit," however speculative it might be considered, satisfying this factor.

8. The Financial Status Of The Taxpayer. The fact that the taxpayer does not have substantial income or capital from sources other than the activity may indicate that an activity is engaged in for profit. Substantial income from sources other than the activity (particularly if the losses from the activity generate substantial tax benefits) may indicate that the activity is not engaged in for profit especially if there are personal or recreational elements involved."[66] Whether this factor can be met is highly dependent on the circumstances of the individual Purchaser. Until the Purchaser receives rental payments and bonus payments, however, it is likely that the losses from the activity will generate substantial tax benefits, making it less likely that Purchasers could satisfy this individual factor.

9. Elements Of Personal Pleasure or Recreation. The presence of personal motives in carrying on of an activity may indicate that the activity is not engaged in for profit, especially where there are recreational or personal elements involved. On the other hand, a profit motivation may be indicated where an activity lacks any appeal other than profit...."[67] Although some Purchasers may be interested in purchasing Solar Lenses because they are interested in investing in renewable energy, some might be interested in purchasing Solar Lenses only for the potential long-term return from rents and bonuses, or from the more immediate potential for commission

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[66] Treas. Reg. § 1.183-2(b)(8).

[67] Treas. Reg. § 1.183-2(b)(9). The remainder of this section reads, "It is not, however, necessary that an activity be engaged in with the exclusive intention of deriving a profit or with the intention of maximizing profits. For example, the availability of other investments which would yield a higher return, or which would be more likely to be profitable, is not evidence that an activity is not engaged in for profit. An activity will not be treated as not engaged in for profit merely because the taxpayer has purposes or motivations other than solely to make a profit. Also, the fact that the taxpayer derives personal pleasure from engaging in the activity is not sufficient to cause the activity to be classified as not engaged in for profit if the activity is in fact engaged in for profit as evidenced by other factors whether or not listed in this paragraph."

income.

Based on the foregoing, it is possible that a sole proprietor Purchaser could satisfy some, none, or all of the nine objective factors. As stated in Reg. §1.183-2(a), it is not necessary that the taxpayer's expectation of a profit be reasonable, only that "the facts and circumstances … indicate that the taxpayer entered into the activity, or continued the activity, with the objective of making a profit. In determining whether such an objective exists, it may be sufficient that there is a small chance of making a large profit." Based on this analysis, I would recommend to my clients that they are entering into a trade or business "for profit," as defined in IRC § 183 so long as their individual situations satisfy at least one of the nine factors.

Material Participation.

Assuming that a Purchaser's business of leasing Solar Lenses constitutes a trade or business, as described above, then the next step is to determine whether the Purchaser materially participates in the business. Under IRC § 469(h)(1), "A taxpayer shall be treated as materially participating in an activity only if the taxpayer is involved in the operations of the activity on a basis which is—regular, continuous, and substantial."[68] "Participation" generally means "any work done by an individual (without regard to the capacity in which the individual does the work) in connection with an activity in which the individual owns an interest at the time the work is done."[69] An individual materially participates in an activity "if and only if" the individual meets

[68] The exceptions to this rule related to certain working interests in oil and gas properties (*see* IRC § 469(c)(3)) will not be addressed in this report. Although a lens leasing business is the rental of tangible personal property and, therefore, is per se a passive activity under IRC § 469(c)(2) and (j)(8), for purposes of this opinion, I assume that the activity qualifies for the incidental activity exception as described in Temp. Treas. Reg. § 1.469-1(T)(e)(3)(vi)(C)(1)–(3) because I assume that the taxpayer 1) owns an interest in the trade or business, 2) the lenses will predominantly be used in the trade or business during the taxable year, and 3) the gross rental income from the lenses for the taxable year will be less than 2 percent of the lesser of (i) the unadjusted basis of the lenses and (ii) the fair market value of the lenses. *See Misko* at 19 (the equipment leasing business in question qualified for incidental activity exception conditions and, therefore, the lens leasing business was a nonrental activity, not to be treated as per se passive under IRC § 469).

[68] Temp. Treas. Reg. § 1.469-5T(a)(1).

[69] Treas. Reg. § 1.469-5(f).

any one of seven tests described in Temporary Treas. Reg. § 1.469-5T.[70] As described below, various tests might apply to an individual Purchaser depending on his or her unique circumstances. The activity of a Purchaser's spouse is also considered in determining whether the Purchaser meets one of the seven tests.[71] "The extent of an individual's participation in an activity may be established by any reasonable means. Contemporaneous daily time reports, logs, or similar documents are not required if the extent of such participation may be established by other reasonable means."[72]

The application of the seven material participation tests is highly fact sensitive.[73] Therefore, an individual Purchaser might satisfy the requirements of one or more of the material participation tests in myriad ways depending on this or her particular circumstances. What follows is a broad discussion of each test and how each might or might not apply to Purchaser participating in a Solar Lens leasing business.

1. The 500 Hour Rule. A taxpayer materially participates in an activity if he does so "for more than 500 hours" during a taxable year.[74] Some Purchasers participating in a lens leasing

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[70] Temp. Treas. Reg. § 1.469-5T(a).

[71] IRC § 469(h)(5). "In the case of any person who is a married individual (within the meaning of section 7703) for the taxable year, any participation by such person's spouse in the activity during the taxable year (without regard to whether the spouse owns an interest in the activity and without regard to whether the spouses file a joint return for the taxable year) shall be treated, for purposes of applying section 469 and the regulations thereunder to such person, as participation by such person in the activity during the taxable year." Temp. Treas. Reg. § 1.469-5T(f)(3). *See also Montgomery v. Comm'r*, 105 T.C.M.(CCH) 1865, 1867 (2013).

[72] Temp. Treas. Reg. § 1.469-5T((f)(4).

[73] When examining whether a taxpayer meets any of the seven material participation tests, the United States Tax Court carefully scrutinizes the individual circumstances of each taxpayer and the credibility of the evidence before it. *See, e.g., Montgomery v. Comm'r*, 105 T.C.M. (CCH) 18651867–1868 (2013) (finding material participation based on taxpayer's credible testimony even though reports and logs not kept); *Hailstock v. Comm'r*, 112 T.C.M. (CCH) 200 (finding material participation based on taxpayer's "convincing" "narrative summary") (2016); *Coastal Heart Medical Group, Inc. v. Comm'r*, 109 T.C.M. (CCH) 1424, (2015) (finding no material participation where taxpayer's testimony was "exaggerated and self-serving" and "vague" and where taxpayer provided inadequate documentary support); *Lamas v. Comm'r* (109 T.C.M. (CCH) 1299 (2015) (finding material participation based on detailed analysis of testimony of multiple witnesses and corroborating phone records); and *Bartlett v. Comm'r*, 106 T.C.M. (CCH) 102, 105 (2013) (finding no material participation where, although witnesses were credible, evidence was "riddled with contradictions" and weight of evidence did not support taxpayer's claims).

[74] Temp. Treas. Reg. § 1.469-5T(a)(1).

business could meet this rule depending on their level of involvement in the business. For instance, one Purchaser might make several visits to the lens manufacturing and installation site, spend a few hours a week researching how the Solar Lenses will be used and operated by the Operator, and a few hours a week involved in multilevel marketing activities, which could total 500 hours during a taxable year.

2. *Substantially All Participation is by the Taxpayer.* A Purchaser materially participates in an activity if his or her "participation in the activity for the taxable year constitutes substantially all of the participation in such activity of all individuals (including individuals who are not owners of interests in the activity) for such [taxable] year."[75] As in *Misko v. Commissioner*, 90 T.C.M. (CCH) 15, 20 (2005), this "test is particularly relevant" to many of the potential Purchasers who might be interested in operating a lens leasing business. In *Misko*, the taxpayer operated an equipment leasing business, whereby the taxpayer individually purchased equipment that was then leased to the taxpayer's law firm. In that case, the Tax Court found that the taxpayer materially participated in the business under this second material participation test found in Temp. Treas. Reg. § 1.469-5T(a)(2). Assuming that the Purchaser I am advising intends to exclusively manage the lens leasing business, I would advise the Purchaser that he or she would "meet[] this safe harbor test and thus satisfy[y] the material participation standard."[76]

3. *More than 100 Hours of Participation by Taxpayer, if No Other Individual Participates More.* A taxpayer materially participates in an activity if he or she does so "for more than 100 hours during the taxable year, and such individual's participation in the activity for the taxable year is not less than the participation in the activity of any other individual (including individuals who are not owners of interests in the activity) for such year."[77] The analysis here is similar to

[75] Temp. Treas. Reg. § 1.469-5T(a)(2).
[76] *Misko* at 20.
[77] Temp. Treas. Reg. § 1.469-5T(a)(3).

the first test because I assume that an individual Purchaser could personally spend at least 100 hours during a year on his or her lens leasing business, without the help of any other individual, by doing things such as visiting the site, researching how the Solar Lenses will be used, and participating in multilevel marketing activities for some amount of time each week during a taxable year.

4. *Significant Participation Activities.* A taxpayer materially participates in an activity if "[t]he activity is a significant participation activity (within the meaning of paragraph (c) of this section) for the taxable year, and the individual's aggregate participation in all significant participation activities during such year exceeds 500 hours."[78] An activity is a "significant participation activity" under Temp. Treas. Reg. §1.469-5T(c) if the activity would not otherwise qualify for material participation under the other six tests and if the taxpayer spends more than 100 hours participating in the activity. Depending on the individual Purchaser's circumstances, this test could apply if he or she spends at least 100 hours participating in the activity, but is otherwise not qualified to meet other material participation tests, perhaps because other people are involved in the lens leasing business. However, if the Purchaser participates in other 100-plus-hour passive activities, which, in the aggregate, total more than 500 hours, I would advise the Purchaser that he could satisfy this test.

5. *Material Participation for Five out of Ten Years.* A taxpayer materially participates in an activity if the taxpayer "materially participated in the activity (determined without regard to this paragraph (a)(5)) for any five taxable years (whether or not consecutive) during the ten taxable years that immediately precede the taxable year."[79] Based on the depositions and other subpoenaed documents I reviewed in preparation for this report, I understand that some

[78] Temp. Treas. Reg. § 1.469-5T(a)(4).
[79] Temp. Treas. Reg. § 1.469-5T(a)(5).

Purchasers began purchasing and leasing lenses more than five years ago. Therefore, if I were advising a client who had done this, I would review his activity for each of the prior years to confirm whether it satisfied one of the other material participation tests. Assuming that it did, I would advise the client that this material participation test could be satisfied.

6. *Personal Service Activity for any Three Prior Years*. A taxpayer materially participates in an activity if it "is a personal service activity (within the meaning of paragraph (d) of this section), and the individual materially participated in the activity for any three taxable years (whether or not consecutive) preceding the taxable year."[80] The personal activities found in Treas. Reg. § 1.469-5T(d) are defined as "personal services" performed in "[t]he fields of health, law, engineering, architecture, accounting, actuarial science, performing arts, or consulting …" Because a lens leasing business is not a personal service activity as defined in the regulations, I would advise a Purchaser that he or she could not satisfy this test in establishing material participation.

7. *Facts and Circumstances*. A taxpayer materially participates in an activity if, "[b]ased on all of the facts and circumstances (taking into account the rules in paragraph (b) of this section), the individual participates in the activity on a regular, continuous, and substantial basis during such year."[81] Under paragraph (b), the taxpayer must participate for more than 100 hours during the taxable year, and no one besides the taxpayer may be paid for management services or participate more than the taxpayer.[82] "Material participation may be difficult to show under the facts and circumstances test, and probably requires establishing an unusually important type of involvement by the taxpayer, preferably accompanied by close to 500 hours of involvement."[83]

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[80] Temp. Treas. Reg. § 1.469-5T(a)(6).
[81] Temp. Treas. Reg. § 1.469-5T(a)(7).
[82] Temp. Treas. Reg. § 1.469-5T(b).
[83] Daniel N. Shaviro, 549-2nd T.M., *Passive Loss Rules*, Detailed Analysis, III. Identifying Passive Activities, B. Determining Whether an Activity Is Passive.

Given the difficulty of meeting this facts and circumstances test and the other quantitative tests available, I find it less likely, but not impossible, that a particular Purchaser would be able to meet the requirements of the facts and circumstances test.

Determining whether an individual taxpayer is materially participating in a leasing business is a fact specific analysis unique to each taxpayer. However, based on the above analysis of the tests looked at to determine material participation, I would recommend to any client of mine seeking to begin a Solar Lens leasing business with RaPower3 to consider themselves materially participating in that business so long as they meet one of these tests. It is probable that any Purchaser would qualify as materially participating under at least one of these tests.

BASIS FOR OPINION #4:
BECAUSE LEASING LENSES PURCHASED FROM RAPOWER QUALIFIES AS MATERIAL PARTICIPATION IN A TRADE OR BUSINESS, A PURCHASER SHOULD CLAIM RELATED DEPRECIATION ON TAX RETURNS

As stated in the section describing the basis for my Opinion #1, above, one requirement for property to qualify is "energy property" within the meaning of IRC § 48 is that the property qualify for depreciation.[84] Treas. Reg. § 1.48-1(b)(1) clarifies that, "[a] deduction for depreciation is allowable if the property is of a character subject to the allowance for depreciation under section 167 …" Under IRC § 167(a), depreciation is allowed for property either (i) "used in the trade or business"[85] or (ii) "held for the production of income."[86]

Based on my determination that depending on an individual Purchaser's specific circumstances, his or her lens leasing business is a "trade or business" for the production of income, I would recommend that the Purchaser claim depreciation under IRC § 167.

[84] IRC § 48(a)(3)(C).
[85] IRC § 167(a)(1).
[86] IRC § 167(a)(2).

CONCLUSION

Based on the documents and law that I have reviewed, I would advise any client of mine that purchasing Solar Lenses under a Purchase Agreement with RaPower would qualify them to take the energy credit under IRC §§ 46 and 48 using an initial cost basis of the Purchase Price under the Purchase Agreement, which would most likely be $3,500. I would further advise my clients that they could claim the energy credit in the year they purchased the Solar Lenses so long as they signed an O&M Agreement or other lease agreement holding the Solar Lenses out for lease, thereby placing those lenses in service. Additionally, I would further advise my clients to claim depreciation on their taxes for the Solar Lenses purchased because they would be materially participating in a leasing business.

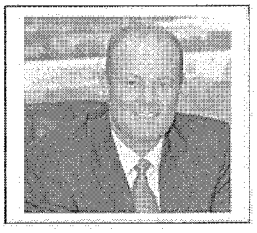
Dated the 15th Day of September, 2017

Kurt O. Hawes

Curriculum Vitae

Kurt O. Hawes, JD, MBA

Curriculum Vitae



Kurt O. Hawes, JD, MBA

1366 E. Murray Holladay Road
Salt Lake City, Utah 84117

Direct Line: 801-666-8410
Reception: 801-987-8302
Email: kurt@khaweslaw.com
Websites: www.khaweslaw.com

CV Summary

Kurt Hawes is an attorney, holding both JD and MBA degrees, and practicing law in the state of Utah specializing in tax matters, corporate and business law, government relations, and estate matters. Kurt has worked with small, medium, and large businesses as well and individual business owners. Kurt's professional experience comes from government employment – both at the Securities and Exchange Commission and clerking for a federal judge, working in law firms, and with privately held and public businesses. Kurt has served as the Chair for the Tax Section of the Utah State Bar and participates in local professional associations related to his practice. Kurt also presents at professional education seminars.

Professional Experience

Kurt is currently a partner as an attorney at the law firm of K. Hawes Associates, PLLC. Kurt's practice focuses on tax related matters, business and corporate matters, including formation, dissolution, sale/acquisition transactions, and interim transactions, government relations and lobbying, and trust and estate matters. After graduating from the J. Reuben Clark Law School at Brigham Young University, Kurt began his law career as a clerk with the law firm Clyde Snow & Sessions. From there, Kurt has practiced in large regional and small local law firms, as well as serving as general counsel for Washakie Renewable Energy, handling much of the tax audit defense and government relations for the company.

Kurt's experience includes providing diverse professional services in the following areas:

- Business/Individual Representation Before the IRS and Various State Taxing Agencies
- Tax Planning
- Partnership/Business Owner Disputes
- Joint Venture Agreements
- Business Agreements
- Trust and Estate Matters
- Government Relations and Lobbying
- Business Entity Formation and Compliance
- Tax Compliance
- Business Acquisition and Sales
- Non-profit Formation and Compliance
- Business Owner Agreements
- Trust Matters
- International Tax Matters
- Probate Matters

Professional Licenses, Admissions, and Affiliations

Attorney, Utah State Bar No. 09799
Admitted to Practice Before the Utah Supreme Court
Admitted to Practice Before the Utah Federal District Court
Admitted to Practice Before the United States Tax Court
Admitted to Practice Before the United States Supreme Court
Member, Utah State Bar
Former Chair and Officer (various positions), Tax Section of the Utah State Bar

Educational Background

J. Reuben Clark Law School, Brigham Young University, Juris Doctor
Kurt served as president of the Moot Court

Marriott School of Management, Brigham Young University, Master of Business Administration
Coursework emphasis in finance; Member of Beta Gamma Sigma Honor Society

University of Utah, B.A., French Studies

Kurt's degree granting institutions are listed above. However, Kurt has attended other learning institutions and has participated in various continuing education programs with emphasis in business, corporate, taxation, and estate matters.

Publications and Presentations

"Nexus," Tax Section, Utah State Bar, Salt Lake City, Utah, 2012

"The Taxability of Judgments," Utah State Bar Summer Conventions, Snowmass, Colorado, 2011

Seminar Presenter, "Utah Sales Tax," Lorman Educational Services, Salt Lake City, Utah, 2005-2010

Seminar Presenter, "Utah Property Tax", Lorman Educational Services, Salt Lake City, Utah, 2005-2009

SCHEDULE A

Documents Reviewed

Exhibit A – RaPower-3 Equipment Purchase Agreements

Exhibit B – Operation and Maintenance Agreements

Exhibit C – Placed in Service Letter

Exhibit D – Anderson Law Center Tax Opinion Letter, August 8, 2012

Exhibit E – Kirton & McConkie Tax Opinion Memorandum, October 31, 2012

Exhibit F – Bloomberg Law Tax Practice Series, ¶ 3140.03.B. *Energy Property*

Exhibit G – *Holy Grail of Solar Energy*, Neldon Johnson

Exhibit H – *New Solar Breakthrough May Compete with Gas*, www.iaus.com

(Not Attached) – Statutes, Rules, Cases, IRS Publications, additional legal analysis, and other legal or administrative authority cited in the opinion

(Not Attached) – Webpages, documents, and other information at www.rapower3.com

(Not Attached) – Pleadings, motions, deposition transcripts, and other documents filed in or relating to the applicable case, *US v. RaPower-3, LLC, et al.*, United States District Court for the District of Utah, Civil No. 2:15-cv-00828 DN

EXHIBIT A

RaPower-3 Equipment Purchase Agreement

This Equipment Purchase Agreement (the "Agreement") is entered into this day ~~2/9/2010 9:42:13 PM~~ by and between RaPower-3 LLC (the "Operator"), with principal offices at 4035 South 4000 West, Deseret, UT 84624, hereinafter referred to as "Seller", and

whose address is 957 Bryanston Cv Murray, UT. 123456

hereinafter referred to as "Purchaser".

BACKGROUND

1. Seller is the licensee of certain proprietary alternative energy technology, which technology relates to solar energy collection and which technology is utilized for the design and fabrication of certain components which are identified below and which are hereinafter collectively referred to as the "Alternative Energy System(s)".

2. Seller and Purchaser now desire to enter into an agreement whereby Seller will sell Purchaser the Alternative Energy System specifically described below.

AGREEMENT

NOW, THEREFORE, the parties hereto agree as follows:

1. Systems Purchased. Seller hereby sells to Purchaser and Purchaser hereby purchases from Seller the Alternative Energy System(s). The number of Alternative Energy Systems purchased by Purchaser from Seller under this Agreement shall be

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Seller shall furnish, deliver, install and startup the Alternative Energy System(s), at a site yet to be determined. When a site is selected, it shall be referred to as the "Installation Site".

2. **Documentation for Potential Tax Benefits.** Seller shall provide to Purchaser all required documentation relating to the Alternative Energy System and its components as requested by Purchaser for federal, state and local review of the Alternative Energy System for

potential tax benefits. However, Purchaser hereby expressly acknowledges that neither Seller nor any other person or entity affiliated with Seller has made representations to Purchaser regarding potential tax benefits of this Agreement to Purchaser and Purchaser has relied entirely on hi/her own analysis of potential tax benefits. Purchaser hereby waives any and all claims against Seller and its employees, agents, officers, affiliates and representatives relating to Purchaser's failure to receive any anticipated tax benefit.

3. **Payment Terms.** Purchaser shall pay to Seller the sum of $3,500 for each Alternative Energy System purchased, hereinafter referred to as the "Purchase Amount" for the purchase of the Alternative Energy System. This includes the cost of delivery, installation and startup, as well as the cost of warranty work performed during the warranty period described below. The Total Purchase Amount shall be paid in accordance with the following schedule:

Option1:

Initial Down Payment in the amount of $1,050 (one thousand fifty dollars) for each Alternative Energy System purchased, which shall be paid at the time this agreement is entered into.

Option 2:

Initial Down Payment in the amount of $1,050 (one thousand fifty dollars) for each Alternative Energy System purchased, which shall be paid with a one-time payment of $105 (equal to 10% of the down payment) at the time this Agreement is entered into. The balance of $945 for each Alternative Energy System is to be paid on or before June 30, 2012.

Option 3:

Initial Down Payment in the amount of $1200 (One Thousand Two Hundred Dollars) for each Alternative Energy Systems purchased, which shall be paid in monthly installments of $100 (One Hundred Dollars) per system purchased.

The Installation Date shall be defined as the date the Alternative Energy Equipment has been installed and begins to produce revenue. After the Alternative Energy Equipment has been installed and producing revenue for a five (5) year period, annual payments will begin. The annual payment will be as follows. Thirty Annual Installments in the amount of $82.00 (Eighty-two dollars) for each Alternative Energy System purchased, hereinafter referred to as "Annual Installments," shall be paid to Seller, the first Installment being due five years following the Installation Date and the last Installment being due Twenty-Nine years thereafter,

the Thirty-Five year period from the Installation Date to a date one year following the due date of the last Installment, shall be referred to hereinafter as the "Installment Period" and the schedule of Installment payments shall be referred to hereafter as the "Installment Schedule."

4. **Operations and Management Company.** The Alternative Energy System shall be placed in operation only at and operated only at the Installation Site, and shall be operated and managed for the Installment Period by an independent Operations and Management Company hereinafter referred to as "Operations and Management Company". In the event that Operations and Management Company shall cease to operate and manage the Alternative Energy System for any reason during the Installment Period, a Substitute Operations and Management Company approved by Buyer shall be employed to operate and manage the Alternative Energy System. The Substitute Operations and Management Company must be expressly approved by Buyer.

5. **Failure to Pay.** In the event that Purchaser fails to pay any of the Annual Installments or any portion thereof, when due, interest shall accrue on the overdue amount at the rate of one and one-half percent (1-1/2%) per month until paid. If Purchaser fails to pay any Annual Installment or any portion thereof when due or within a thirty (30) day grace period thereafter, Seller may immediately, upon written notice to Purchaser, enter the Installation Site and repossess the Alternative Energy System and any and all of the components thereof. In such event, Seller shall be entitled to recover its attorney fees, court costs, arbitration costs, collection costs, repossession fees and expenses incurred in repossessing the Alternative Energy System and any components thereof. In the event that Purchaser voluntarily relinquishes the Alternative Energy System to Seller, and thereby minimizes the expense to Seller in repossessing the Alternative Energy System, Seller agrees not to report Purchaser to any credit agencies for Purchaser's default, and Purchaser shall receive a credit against the balance owed under the Installment Schedule in an amount equal to the value of the Alternative Energy System as established by an independent, qualified appraiser approved by Purchaser and Seller. The credit for the value of the Alternative Energy System shall be given if Purchaser voluntarily relinquishes the Alternative Energy System, whether the Alternative Energy System is re-sold by Seller or not.

6. **Seller's Rights upon Default.** If Purchaser fails to pay any Annual Installment or any portion thereof when due or within the thirty (30) days grace period thereafter, or if Purchaser becomes subject to any state or federal insolvency, bankruptcy, receivership, trusteeship or similar proceeding, or if Purchaser shall default in any other term of this Agreement, Seller may immediately terminate this Agreement by notice in writing to Purchaser and repossess the Alternative Energy System and all of the components thereof as stated above. In such event, Purchaser shall remain liable for all sums then due and unpaid, less the credit for the value of the repossessed Alternative Energy System as described above, plus a reasonable amount for attorneys' fees and such expenses as may be expended in the repossession of the

Alternative Energy System.

7. **Right to Reduce Purchase Amount.** If changes are made to the Internal Revenue Code after the date of this Agreement and prior to January 31, 2012, which materially reduce any tax benefit of this agreement anticipated by the Purchaser, Purchaser may elect to reduce the number of Alternative Energy Systems purchased and the Seller agrees to accept the reduced amount, provided that the reduced amount is not less than the total amount already paid as a down payment or one-time payment. Any notice stating that Buyer wishes to elect a reduction must be emailed (with confirmation of delivery) or must arrive to the Seller via hand delivery, as set forth in this paragraph, on or before Jan 31, 2012.

8. **Warranty.** Seller hereby warrants, for the thirty five (35) year period from the Installation Date to the end of the Installment Period, hereinafter referred to as the "Warranty Period" that the Alternative Energy System shall remain in good operating condition. Seller shall initiate, within five (5) business days following the receipt of written notice that the Alternative Energy System is not operating properly or is not in good operating condition, either directly or through the use of one or more independent maintenance or repair entities, maintenance or repair of the malfunctioning or non-operating components of the Alternative Energy System. Seller shall complete such maintenance or repair work within a reasonable time thereafter. Seller shall be responsible for all material, equipment and labor costs incurred to complete such maintenance and repair work. Seller shall not be responsible for or liable for loss of revenue or other consequential damages sustained by Purchaser due to the failure of the Alternative Energy System to remain in good operating condition. Seller's obligations shall be limited to the maintenance and repair obligations stated herein.

9. **Seller's Warranty Obligations.** Seller hereby warrants, for the thirty five (35) year Warranty Period, the Alternative Energy System and each of the components thereof, from defects in materials and workmanship. Within five (5) business days following the receipt of written notice from Purchaser, Seller shall initiate reasonable efforts to ascertain repair or replacement requirements, to order replacement parts and equipment needed for repair, and to deploy qualified maintenance personnel. The cost of warranty parts, replacement equipment and labor shall be borne by Seller. Seller shall not be responsible for or liable for loss of revenue or other consequential damages sustained by Purchaser due to defects in materials or workmanship. Seller's obligations shall be limited to the parts, equipment replacement, and repair obligations stated herein.

10. **Target Production Rate.** Seller and Purchaser acknowledge that the Target Production Rate from one Alternative Energy System is 600 peak watts, rated for clear sky conditions at noon, local time, June 21, at a latitude of forty degrees (40 degrees) North (the "Rating Conditions"), and the Warranty Production Rate is ninety-five percent (95%) of the Target Production Rate. Seller hereby warrants that for the initial five year period from the Installation Date to a date five years following the Installation Date, the Warranty Energy

Production for the Alternative Energy system, shall be no less than 570 peak watts, at the Rating Conditions.

In the event that the actual peak energy production, at the Rating Conditions, from the Alternative Energy System during the initial five year period is less than the Warranty Energy Production, Purchaser shall have the option to terminate this Agreement and relinquish the Alternative Energy System to Seller. Purchaser shall thereafter have no further obligation under this Agreement to make any further payment or to perform any other obligation to Seller arising under this Agreement, except to cooperate with and assist Seller in obtaining possession of the Alternative Energy System. If Purchaser elects to terminate this Agreement as provided above, Purchaser shall not be entitled to a reimbursement of any portion of the Initial Down Payment. The foregoing option to terminate must be exercised within sixty (60) calendar days following the expiration of the initial five year period and must be exercised by Purchaser providing written notice to Seller.

11. **Waiver for Delays.** Purchaser hereby waives any and all claims against Seller for delays, including but not limited to claims for damages due to delays in preparing plans; delays in applying for or obtaining approvals or permits; delays in the delivery, installation, or start-up; or delays in performing warranty work. This waiver includes any and all direct, indirect or consequential damages.

12. **Limitation of Liability.** Neither of the parties shall have liability for consequential damages to the other arising out of this agreement or the transactions, events or occurrences related thereto and each hereby waives any and all such claims for consequential damages against the other. Seller's liability for any breach under this agreement shall be limited to any amounts actually paid by Purchaser and received by Seller under this Agreement.

13. **Property Insurance.** Purchaser agrees to require Operations and Management Company to maintain property damage insurance on the Alternative Energy System.

14. **Liability Insurance.** Purchaser agrees to require Operations and Management Company to maintain liability insurance to insure against bodily injury, property damage, product liability or other claims related to the design, manufacture, delivery, installation, start-up, operation or maintenance of the Alternative Energy System.

15. **Assignment of Agreement.** This Agreement shall not be assigned by Purchaser without the express written consent of Seller. Seller may assign its rights and obligations under this Agreement but Seller shall remain liable to Purchaser for the failure of its assignee to perform the obligations of Seller under this Agreement.

16. **Binding Agreement.** This Agreement shall be binding upon the successors and assigns of each of the parties.

17. **No Additional Warranties.** Seller makes no representations or warranties,

expressed or implied, including the implied warranty of merchantability and fitness, except as expressly stated in this Agreement.

18. Authorized Personnel. Purchaser shall not repair, modify or adjust the Alternative Energy System or any component thereof and Purchaser agrees to prohibit anyone other than Seller's authorized personnel to repair, modify or adjust the Alternative Energy System or any component thereof.

19. Notification to Seller. Purchaser shall notify Seller immediately of accidents, disabilities, failures or like information concerning the Alternative Energy System.

20. Warranty Limitations. In the event the Alternative Energy System becomes inoperable for any reason, except as otherwise provided under the warranty during the Warranty Period, Seller shall not be obligated to furnish a substitute Alternative Energy System or any component thereof. In any event, Seller shall not be liable for any special or consequential damages of any nature resulting from such inoperability.

21. Operating Site and Guidelines. Purchaser agrees that the Alternative Energy System shall be used and operated only at the Installation Site and in accordance with the "Safety and Operating Guidelines" which shall be written and set forth by Seller. Purchaser agrees that the Alternative Energy System shall not be relocated by Purchaser without the written consent of Seller.

22. Written Notice. Any notice under this Agreement shall be deemed sufficient if it is in writing and it is delivered to Purchaser, personally or sent by mail addressed to Purchaser at the address set forth above.

23. Rights, Liens, Title, and Interest. Nothing herein conveys to Purchaser any right, title or interest in or to the Alternative Energy System or any component thereof, except as a Purchaser. Seller reserves the right to file or record such documents and instruments as it may deem necessary from time to time to protect its rights, liens, title and interest in the Alternative Energy System. Purchaser agrees to cooperate with Seller and to execute such documents as may be required or requested by Purchaser to assist Seller in protecting its rights, liens, title and interest in the Alternative Energy System.

24. Breach of Agreement. In the event of the breach of this Agreement by either party, the injured party shall be entitled to recover its costs, attorney fees, arbitration costs and arbitration fees incurred in enforcing the agreement and in pursuing appropriate remedies.

25. Potential Tax Benefits Responsibility of Purchaser. Seller and Purchaser acknowledge that they each understand that the Alternative Energy System may qualify for certain tax incentives and benefits under the 2005 Energy Policy Act and other statutes. Purchaser agrees to obtain the evaluation and opinion of its own tax attorney or accountant as to

any tax matters relating to this Agreement and to the Alternative Energy System. Seller does not guarantee any tax incentive or benefit to Purchaser. Seller hereby transfers to Purchaser any and all energy tax credits, if any, related to the Alternative Energy System. Seller shall not claim any such energy tax credits. Seller and Purchaser agree to the respective initial values of the components of the Alternative Energy System.

26. Dispute Resolution. In the event of a dispute arising out of this Agreement or the transactions, events or occurrences related thereto, Seller shall have the sole option of electing to have such disputes resolved by binding arbitration in accordance with the Commercial Arbitration Rules of the American Arbitration Association with all hearings and other proceedings in that arbitration being conducted in Salt Lake City, State of Utah. Seller shall have the right to elect arbitration at any time up to and including the time that either party files an Answer in pending litigation between the parties relating to such disputes.

27. Governing Law. This Agreement shall be construed in accordance with the laws of the State of Utah.

28. Entire Agreement. This is the entire agreement between the parties. This agreement shall not be modified except by written amendment signed by Purchaser and Seller.

RaPower-3 Equipment Purchase Agreement

29. **Right of Revocation.** Purchaser understands and acknowledges that s/he may revoke this Agreement for a period of up to 14 days after s/he signs it and delivers payment (counting the day it was signed and/or payment received) and that the Agreement will not become effective or enforceable until the 14-day revocation period has expired. To revoke this Agreement, Purchaser must give written notice stating that s/he wishes to revoke to the Seller's authorized sales representative or to the Seller via email to "cancel@rapower-3.com <mailto:cancel@rapower-3.com>". Any notice stating that Purchaser wishes to revoke this Agreement must be emailed (with confirmation of delivery) or must arrive to the Seller via hand delivery, as set forth in this paragraph, on or before the expiration of the 14-day revocation period.

PRESTON OLSEN

Signature

RaPower3 Windows Utility

IP Digital Signal

Seller

By: Neldon Johnson - RaPower-3

Neldon Johnson - Director **2/9/2010 9:42:13 PM**

Signature

RaPower3

This Equipment Purchase Agreement (the "Agreement") is entered into this Day

By and between RaPower-3, LLC, with principal offices at 2730 West 4000 South, Oasis, UT 84624, hereinafter referred to as "Seller", and

John Thomson, 585 Forest Street, Salt Lake City, Utah, United StatesHereinafter referred to as "Buyer".

Recitals

WHEREAS, Seller is authorized to sell components and entire systems of certain proprietary alternative energy technology, which technology relates to solar energy collection and which technology is utilized for the design and fabrication of certain components which are identified below and which are hereinafter collectively referred to as the "Alternative Energy System(s)".
WHEREAS, Seller and Buyer now desire to enter into an agreement whereby Seller will sell Buyer the Alternative Energy System(s) or components of the Alternative Energy System(s) " specifically described below, which is referred to herein as the "Property".
NOW, THEREFORE, the parties hereto agree as follows:

AGREEMENT

1. **Property Purchased:** Seller hereby sells to Buyer and Buyer hereby purchases from Seller the Property identified below, in the quantity stated: 10

   Seller shall furnish, deliver, install and startup the Alternative Energy System(s), at a site yet to be determined. When a site is selected, it shall be referred to as the "Installation Site".

2. **Documentation for Potential Tax Benefits:** Upon request Seller shall provide to Buyer documentation relating to the Property for use in substantiating potential tax benefits related to the Property, if any. However, Buyer hereby expressly acknowledges that neither Seller nor any other person or entity affiliated with Seller has made representations to Buyer regarding potential tax benefits of this Agreement or the purchase of the Property, or any portion or component thereof, to Buyer and Buyer has relied entirely on his/her own analysis of potential tax benefits. Buyer hereby waives any and all claims against Seller and its employees, agents, officers, affiliates and representatives relating to Buyer's failure to receive any anticipated tax benefits.
3. **Payment Terms:** Buyer shall pay to Seller the sum of $3,500.00 for each unit of the Property, identified as a quantity number in Section 1 of this Agreement, hereinafter referred to as the "Purchase Amount" for the purchase of the Property. The Purchase Amount includes the cost of delivery, installation and startup, as well as the cost of warranty work performed during the warranty period described below. The Total Purchase Amount shall be paid in accordance with the following schedule:

   Buyer shall pay an initial deposit to be applied against the Purchase Amount in the amount of $650.00 (six hundred fifty dollars) for each unit of the Property purchased, which shall be paid at the time this Agreement is executed by the Buyer.

   The remaining balance of the Purchase Amount shall be paid in annual installments as follows:

Buyer and Seller acknowledge that Buyer intends, with the consent of Seller, which is hereby expressly granted, within 30 days of the date of execution of this Agreement, to lease the Property for a term of 30 years to a third party lessee identified below. If, within 30 days of the date of execution of this Agreement, the Property is leased by Buyer to the third-party lessee identified below, or to another third party lessee selected by Buyer and consented to in writing by Seller, then the remaining balance of the Purchase Amount shall be paid as follows:

The Buyer shall pay the Seller thirty (30) annual payments in the amount of $120.00 (one hundred twenty dollars) for each unit of the Property purchased under this Agreement. Such payments from Buyer to the Seller are hereinafter referred to as "Annual Installments." The first Annual Installment shall be due one year following the Installation Date (defined below) and the last Installment being due thirty (30) years thereafter. Buyer and Seller agree that interest shall accrue on the unpaid balance of the Purchase Amount at the rate of Two and One Half Percent (2.5%) per annum, compounded annually, beginning on the Installation Date and continuing until the balance is paid in full. The Thirty year period from the Installation Date to a date one year following the due date of the last Installment, shall be referred to hereinafter as the "Installment Period" and the schedule of Installment payments shall be referred to hereafter as the "Installment Schedule." The Installation Date shall be defined as the date the Property has been installed and begins to produce revenue. Buyer and Seller acknowledge that the foregoing $120.00 Annual Installment payment amount for each unit of the Property purchased has been calculated to provide for an approximate thirty (30) year amortization of the balance of the Purchase Amount after reduction by the Initial Deposit Amount stated above, at the interest rate stated above.

If the Buyer leases the Property to a third party lessee as described above, in the event that the total annual lease amount paid by the third party lessee leasing the property, during any year of the Installment Period, is less than the Annual Installment that is owed to the Seller, due to a lack of production or reduced production from the Property by the leasing company, then the Annual Installment payment amount for that year will be reduced by the amount that the Installment payment amount exceeds the total lease amount paid by the third party lessee.

If Buyer fails or refuses to enter into a lease for the Property with a third party lessee within 30 days of the date of this Agreement, for a lease-term of at least five (5) years, then the remaining balance of the Purchase Amount shall be paid within one year of the date of this Agreement. If Buyer fails or refuses to enter into a subsequent lease for Property with a third party lessee upon the expiration of a lease prior to the expiration of the Installment Period, then the unpaid balance of the Purchase Amount, including accrued interest, shall be due within thirty (30) days following the expiration of any such lease for the Property.

4. **Operations and Management Company:** At the Buyer's sole discretion, the Property may be leased to, placed in operation by, and be utilized by LTB, LLC, the address of which is: 2730 West 4000 South, Oasis, UT 84624, (the "Operations and Management Company"). The terms of a separate agreement between the Buyer and the Operations and Management Company shall set forth the relationship and obligations between the Buyer and Operations and Management Company.
5. **Failure to Pay:** In the event that Buyer fails to pay any of the Annual Installments or any portion thereof, when due, interest shall accrue on the overdue amount at the rate of one and one-half percent (1.5%) per month until paid. If Buyer fails to pay any Annual Installment or any portion thereof when due or within a thirty (30) day grace period thereafter, Seller may immediately, upon written notice to Buyer, enter the Installation Site and repossess the Property. In such event, Seller shall be entitled to recover its attorney fees, court costs, arbitration costs, collection costs, repossession fees and expenses incurred in repossessing the Property and any components thereof. In the event that Buyer voluntarily relinquishes the Property to Seller, and thereby minimizes the expense to Seller in repossessing the Property, Seller agrees not to report

Buyer to any credit agencies for Buyer's default, and Buyer shall receive a credit against the balance owed under the Installment Schedule in an amount equal to the value of the Property as established by an independent, qualified appraiser approved by Buyer and Seller. The credit for the value of the Property shall be given if Buyer voluntarily relinquishes the Property, whether the Property is re-sold by Seller or not.

6. **Seller's Rights upon Default:** If Buyer fails to pay any Annual Installment or any portion thereof when due or within the thirty (30) days grace period thereafter, or if Buyer becomes subject to any state or federal insolvency, bankruptcy, receivership, trusteeship or similar proceeding, or if Buyer shall default in any other term of this Agreement, Seller may immediately terminate this Agreement by notice in writing to Buyer and repossess the Property and all of the components thereof as stated above. In such event, Buyer shall remain liable for all sums then due and unpaid, less the credit for the value of the repossessed Property as described above, plus a reasonable amount for attorneys' fees and such expenses as may be expended in the repossession of the Property.
7. **Assignment of Lease Payments:** So long as Buyer has a remaining balance of the Purchase Amount outstanding, Buyer hereby assigns absolutely to Seller all leases, rents, issues, royalties, and profits of the Property, whether now existing or hereafter arising. Until all payments of the Purchase Amount have been made or a default occurs, as set forth above, Seller shall be permitted to collect all such rents, issues, royalties, and profits earned prior to such event of default as they become due and payable. If such an event of default occurs, Seller's privilege to collect any of such monies and enjoy the benefits of such Property shall remain, or at Seller's sole election Buyer may receive back the right, as stated above, with or without taking possession of the Property, to collect all leases, rents, royalties, issues, and profits and enjoy the benefits of such Property. Failure of or discontinuance by Seller at any time or from time-to-time to collect any such moneys shall not in any manner affect the subsequent enforcement by Seller of the right, power, and authority to collect the same. Nothing contained herein, nor the exercise of the right by Seller to collect, shall be, or be construed to be, an affirmation by Seller of any tenancy, lease, or option, nor an assumption of liability under, nor a subordination of the lien or charge of this Agreement to any such tenancy, lease or option.
8. **Warranty:** Seller hereby warrants, for the thirty-five (35) year period from the Installation Date to the end of the Installment Period, hereinafter referred to as the "Warranty Period" that the Property shall remain in good operating condition. Seller shall initiate, within five (5) business days following the receipt of written notice that the Property is not operating properly or is not in good operating condition, either directly or through the use of one or more independent maintenance or repair entities, maintenance or repair of the malfunctioning or non-operating components of the Property. Seller shall complete such maintenance or repair work within a reasonable time thereafter. Seller shall be responsible for all material, equipment and labor costs incurred to complete such maintenance and repair work. Seller shall not be responsible for or liable for loss of revenue or other consequential damages sustained by Buyer due to the failure of the Property to remain in good operating condition. Seller's obligations shall be limited to the maintenance and repair obligations stated herein.
9. **Waiver for Delays:** Buyer hereby waives any and all claims against Seller for delays, including but not limited to claims for damages due to delays in preparing plans; delays in applying for or obtaining approvals or permits; delays in the delivery, installation, or start-up; or delays in performing warranty work. This waiver includes any and all direct, indirect or consequential damages.
10. **Limitation of Liability:** Neither of the parties shall have liability for consequential damages to the other arising out of this agreement or the transactions, events or occurrences related thereto and each hereby waives any and all such claims for consequential damages against the other. Seller's liability for any breach under this agreement shall be limited to any amounts actually paid by Buyer and received by Seller under this Agreement.
11. **Property Insurance:** Buyer agrees to require Operations and Management Company to maintain property damage insurance on the Property.
12. **Liability Insurance:** Buyer agrees to require Operations and Management Company to maintain liability insurance to insure against bodily injury, property damage, product liability or other claims related to the

design, manufacture, delivery, installation, start-up, operation or maintenance of the Property.

13. **Assignment of Agreement:** This Agreement shall not be assigned by Buyer without the express written consent of Seller. Seller may assign its rights and obligations under this Agreement but Seller shall remain liable to Buyer for the failure of its assignee to perform the obligations of Seller under this Agreement.
14. **Binding Agreement:** This Agreement shall be binding upon the successors and assigns of each of the parties.
15. **No Additional Warranties:** Seller makes no representations or warranties, expressed or implied, including the implied warranty of merchantability and fitness, except as expressly stated in this Agreement.
16. **Authorized Personnel:** Buyer shall not repair, modify or adjust the Property or any component thereof and Buyer agrees to prohibit anyone other than Seller's authorized personnel to repair, modify or adjust the Property or any component thereof.
17. **Notification to Seller:** Buyer shall notify Seller immediately of accidents, disabilities, failures or like information concerning the Property.
18. **Warranty Limitations:** In the event the Property becomes inoperable for any reason, except as otherwise provided under the warranty during the Warranty Period, Seller shall not be obligated to furnish a substitute Property or any component thereof. In any event, Seller shall not be liable for any special or consequential damages of any nature resulting from such inoperability.
19. **Operating Site and Guidelines:** Buyer agrees that the Property shall be used and operated only at the Installation Site and in accordance with the "Safety and Operating Guidelines" which shall be written and set forth by Seller. Buyer agrees that the Property shall not be relocated by Buyer without the written consent of Seller.
20. **Written Notice:** Any notice under this Agreement shall be deemed sufficient if it is in writing and it is delivered to Buyer, personally or sent by mail addressed to Buyer at the address set forth above.
21. **Rights, Liens, Title, and Interest:** Nothing herein conveys to Buyer any right, title or interest in or to the Property or any component thereof, except as a Buyer. Seller reserves the right to file or record such documents and instruments as it may deem necessary from time to time to protect its rights, liens, title and interest in the Property. Buyer agrees to cooperate with Seller and to execute such documents as may be required or requested by Buyer to assist Seller in protecting its rights, liens, title and interest in the Property.
22. **Breach of Agreement:** In the event of the breach of this Agreement by either party, the injured party shall be entitled to recover its costs, attorney fees, arbitration costs and arbitration fees incurred in enforcing the agreement and in pursuing appropriate remedies.
23. **Potential Tax Benefits Responsibility of Buyer:** Seller and Buyer acknowledge that they each understand that the Property may qualify for certain tax incentives and benefits. However, Buyer hereby expressly acknowledges that neither Seller nor any other person or entity affiliated with Seller has made representations to Buyer regarding potential tax benefits of this Agreement or the purchase of the Property, or any portion or component thereof, to Buyer and Buyer has relied entirely on his/her own analysis of potential tax benefits. Buyer hereby waives any and all claims against Seller and its employees, agents, officers, affiliates and representatives relating to Buyer's failure to receive any anticipated tax benefits. Buyer agrees to obtain the evaluation and opinion of its own tax attorney or accountant as to any tax matters relating to this Agreement and to the Property. Seller hereby transfers to Buyer any and all energy tax credits, if any, related to the Property. Seller shall not claim any such energy tax credits. Seller and Buyer agree to the respective initial values of the components of the Property.
24. **Dispute Resolution:** In the event of a dispute arising out of this agreement or the transactions, events or occurrences related thereto, Seller shall have the sole option of electing to have such disputes resolved by binding arbitration in accordance with the Commercial Arbitration Rules of the American Arbitration Association with all hearings and other proceedings in that arbitration being conducted in Salt Lake City, State of Utah. Seller shall have the right to elect arbitration at any time up to and including the time that either party files an Answer in pending litigation between the parties relating to such disputes.
25. **Governing Law:** This Agreement shall be construed in accordance with the laws of the State of Utah.
26. **Entire Agreement:** This is the entire agreement between the parties. This agreement shall not be modified

except by written amendment signed by Buyer and Seller.

27. **Right of Revocation:** Buyer understands and acknowledges that she/he may revoke this Agreement for a period of up to 14 days after she/he signs it and delivers payment (counting the day it was signed and/or payment received) and that the Agreement will not become effective or enforceable until the 14-day revocation period has expired. To revoke this Agreement, Buyer must give written notice stating that she/he wishes to revoke to the Sellers authorized sales representative or to the Seller via email to[glendaejohnson@hotmail.com]. Any notice stating that Buyer wishes to revoke this Agreement must be emailed (with confirmation of delivery) or must arrive to the Seller via hand delivery, as set forth in this paragraph, on or before the expiration of the 14-day revocation period.

Executed by Buyer and Seller the date stated above.

Buyer:

IP Digital Signal: 24.10.154.142

Seller

By: Neldon P. Johnson

Its: Manager

Signature

EXHIBIT B

RaPower3

OPERATION AND MAINTENANCE AGREEMENT

Alternative Energy Systems

This Operation and Maintenance Agreement (the **"Agreement"**) is entered into this day

11/30/2016
(the "**Effective Date**") by and between **LTB, LLC** (the **"Operator"**), a Nevada Limited Liability Company with principal offices at 3838 Raymert Drive, Suite #10, Las Vegas, Nevada 89121, and

John Thomson, 585 Forest Street, Salt Lake City, Utah, United States(the **"Owner"**).

RECITALS

WHEREAS pursuant to an Equipment Purchase Agreement (the **"Purchase Agreement"**) between the Owner and **RaPower-3, LLC** ("**RaPower**"), a copy of which is attached as Attachment A, the Owner has purchased certain solar thermal energy equipment which consists of

RaPower3 Commercial Solar Lens $650 Down Payment

(The **"Number of Owner's Alternative Energy Systems"**) **Alternative Energy Systems** (the **"Owner's Alternative Energy Systems"**) which are particularly described in the Purchase Agreement that will be installed at a Power Plant and/or other facilities hereafter associated therewith (collectively, the **"Project"**) at a location designated by the Equipment Purchase Agreement (the **"Installation Site"**).

WHEREAS, the Owner desires to rent to Operator and Operator desires to rent from Owner, the Owner's Alternate Energy Systems.

WHEREAS, the Owner desires to contract with the Operator for Operator to provide operation and maintenance services in respect of the Project.

WHEREAS, the Operator, at the Operator's sole discretion, may also be operating and maintaining solar thermal energy equipment other than the Alternative Energy System of the Owner, at the Installation Site.

WHEREAS, the Operator is willing to provide such services on the terms and conditions set forth in this Agreement.

NOW, THEREFORE, in consideration of the mutual covenants and agreements hereinafter set forth and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows:

ARTICLE 1

DEFINITIONS

1.1 **Alternative Energy System**. Solar energy concentrator system.

1.2 **Imbedded Definitions**. The definitions of other key terms are as stated in the text of this Agreement.

ARTICLE 2

OPERATOR SCOPE OF WORK

2.1 Appointment.

The Owner appoints the Operator and the Operator accepts the appointment to perform the following services subject to and in accordance with the provisions of this Agreement (collectively, the **"Work"**):

2.1.1 Routine O&M Services;

2.1.2 Additional Services; and

2.1.3 Transition Services.

2.2 Effective Date.

The Operator shall begin performing the Work on the date the Owner's Alternative Energy Systems are installed at the Installation Site (the **"Effective Date").**

2.3 Operation and Maintenance Services.

The Operator will perform the Work in accordance with the standard of a reasonable and prudent operator in the state wherein the Installation Site is located and in compliance with the Safety and Operating Guidelines ("Guidelines") provided by RaPower to Operator, except to the extent that a reasonable and prudent operator would be unable, or would be hindered in its ability, to perform such obligations. Operator and Owner agree that RaPower may modify or amend the Guidelines from time to time in the sole discretion of RaPower. The Guidelines, as amended and modified hereafter in the sole discretion of RaPower, are hereby incorporated by reference into this Agreement and Operator and Owner hereby agree to be bound thereby.

2.4 Appointment of Liaison.

The Operator may appoint a representative who will represent the Operator under this Agreement and be responsible for receiving approvals or instructions from the Owner that may be required from time to time.

The Owner shall be entitled to rely on the actions of such representative for the purposes of this Agreement.

2.5 Governmental Approvals.

The Operator shall apply for and use reasonable efforts to obtain and maintain all Governmental Approvals that are required to be in the Operators name and that are necessary for the Operator to perform its obligations under this Agreement. The Operator shall assist the Owner, to the extent reasonably necessary, in obtaining Governmental Approvals that the Owner is required to obtain pursuant to Article 3.

2.6 Work Force.

The Operator is responsible for hiring, employing, training and managing, and additionally, in respect of employees employed by Affiliates of the Operator, overseeing the work force necessary to operate, maintain and repair the Project in accordance with this Agreement.

2.7 Access.

The Operator shall at all times provide access to the areas of the Project to the designated representatives of the Owner, provided that such access is in compliance with the Equipment Purchase Agreement and is coordinated with the Operator to ensure that it does not unreasonably interrupt or interfere with the performance of the Work or the safe operation of the Project and is at the sole risk and expense of the Owner, as applicable.

2.8 Legal Requirements.

The Operator shall comply in all material respects with all applicable law in the performance of the Work.

2.9 Property Tax.

The Operator shall comply with and pay all property tax on the Alternate Energy Systems.

ARTICLE 3

OWNER SCOPE OF RESPONSIBILITIES

3.1 Delivery of the Project.

Once this Agreement becomes effective, the Owner shall grant the Operator and its designated and identified Affiliates, employees, agents and representatives, access to the Installation Site and the Project, as are necessary or desirable for the Operator to carry out the Work and to comply with the Operators obligations hereunder.

3.2 Appointment of Liaison.

The Owner may appoint a representative who will represent the Owner under this Agreement and be responsible for giving approvals or instructions to the Operator that may be required from time to time. The Operator shall be entitled to rely on the approvals or instructions of such representative.

3.3 Governmental Approvals.

The Owner shall apply for and use reasonable efforts to obtain and maintain all Governmental Approvals that are required to be in the Owners name and that are necessary for the Owner to perform its obligations under this Agreement. The Owner shall assist the Operator; to the extent reasonably necessary, in obtaining Governmental Approvals that the Operator is required to obtain pursuant to Article 2.

3.4 Compliance with Applicable Law.

The Owner shall comply in all material respects with all applicable law in connection with the performance of this Agreement.

ARTICLE 4

SAFETY AND OPERATING GUIDELINES

4.1 Safety and Operating Guidelines.

Pursuant to the Equipment Purchase Agreement between the Owner and RaPower, RaPower has provided Safety and Operating Guidelines ("Guidelines") for operating and maintaining the Project, which Guidelines include but are not limited to a description of the services to be provided by Operator to Owner.

The services are categorized by the Guidelines into Routine O&M Services, Additional Services, and Transition Services. The Guidelines written and set forth by RaPower are subject to modification or amendment by RaPower without prior notice, in the sole discretion of RaPower. Operator shall perform the Work in accordance with and in full compliance with the Guidelines, as modified or amended by RaPower from time to time, which Guidelines are incorporated by reference into this Agreement.

4.2 Health, Environmental and Safety Standards.

The Operator agrees that the Project shall be operated in compliance with all applicable laws and with the OSHA Standards and that the Operator shall not be obligated to perform the Work in a manner that does not meet the OSHA Standards or that would violate applicable law.

ARTICLE 5

COMPENSATION AND PAYMENT

5.1 Owner's Alternative Energy System(s) Production.

In consideration for the performance by Operator of the services set forth in this Agreement, from the Effective Date of this Agreement until the Date of Termination of this Agreement as provided below, as for so long as Operator is in possession and control of the Project, Operator shall be entitled to receive all revenue from the use or sale of thermal energy or electric power generating using the Alternative Energy Systems.

5.2 Rental payment.

Once the Owner's Alternative Energy System(s) are installed and producing revenue, then at the end of each quarter a rental payment will be due and owing from Operator to Owner. The Operator shall send to Owner, on a quarterly basis, the rental payment by check or wire transfer to an account specified by Owner.

The rental payment from Operator to Owner will culminate into an annual payment equal to $150 (One Hundred Fifty Dollars) per Alternative Energy System. All Payments shall be in dollars unless otherwise agreed. Each Payment shall be delivered to Owner within thirty calendar days following the end of the quarter.

5.3 Late Payments.

Late payments under this Agreement shall bear interest at a rate calculated from day to day on the basis of a 360 day year equal to one percent per annum above the Discount Rate. The payment of interest shall not excuse or cure any late payment hereunder.

5.4 Lease of Structural Components

Operator will provide a structure that holds the Owner's Alternative Energy Systems and a receiver to collect the energy from the Owner's Alternative Energy Systems. The Operator has agreed to lease space on the structure to the Owner , at $1.00 per year per Alternative Energy System for ninety-nine years or until the Owner of the Alternative Energy Systems chooses to move the Alternative Energy Systems to another location.

ARTICLE 6

INDEMNIFICATION

6.1 Scope of Indemnification.

- The Owner shall indemnify, defend and hold harmless the Operator, its Affiliates and its and their respective directors, officers, employees and agents **("Operator Indemnified Persons")** from and against any liability, loss, damage, claim, cost, charge or expense of any kind or nature, including reasonable attorneys fees, expenses and other costs of litigation (collectively, **"Damages")** incurred by any Operator Indemnified Person in connection with (i) injury to or death of any person or damage to property (including the Project and any facilities related to the Project) and (ii) any claims by third parties, in each case, as a result of or otherwise relating to (A) the breach by the Owner of any of its obligations under this Agreement, (B) the gross negligence or willful misconduct of the Owner, its Affiliates and its and their respective directors, officers, employees and agents, or (C) the Project; provided that the Owner shall not be liable to indemnify any such Operator Indemnified Person for any Damages to the extent that such Damages are to be indemnified by the Operator pursuant to Section 6.1(b)(ii) or are the result of the gross negligence or willful misconduct of the Operator or, in respect of any such Operator Indemnified Person, such Operator Indemnified Person.
- Subject to the limitation of liability under Article 10, the Operator shall indemnify, defend and hold harmless the Owner, its Affiliates and its and their respective directors, officers, employees and agents **("Owner Indemnified Persons")** from and against any Damages incurred by any Owner indemnified Person in connection with (i) injury to or death of any person or damage to property (including the Project and any facilities related to the Project) and (ii) any claims by third parties, in each case, as a result of (A) the breach by the Operator of any of its obligations under this Agreement or (B) the gross negligence or willful misconduct of the Operator, its Affiliates and its and their respective directors, officers, employees and agents; provided that the Operator shall not be liable to indemnify any such Owner Indemnified Person to the extent Damages are the result of the gross negligence or willful misconduct of the Owner or any such Owner Indemnified Person or the breach by the Owner of any of its obligations under this Agreement.

- **Limitation of Liability.**

The limitation of liability under Article 10 shall not apply to or include the amount of insurance proceeds received by the Operator under insurance obtained in accordance with this Agreement other than insurance obtained and paid by the Operator unless the amount paid by the Operator is reimbursed by the Owner hereunder.

- **No Effect on Insurers.**

The provisions of this Article 6 will not be construed to relieve any insurer of its obligations to pay any insurance claims in accordance with the provisions of any valid insurance Policy.

- **Gross Negligence.**

No Party shall have its liability limited hereunder for its own gross negligence or willful misconduct.

- **Survival.**

The Parties obligations under this Article 6 survive any termination of this Agreement.

ARTICLE 7 INSURANCE

7.1 Insurance Required of the Operator.

The Operator shall procure and maintain the insurance listed below:

- Workers compensation insurance, or the equivalent, as required by law.
- Comprehensive general liability coverage, or the equivalent, including bodily injury and physical damage, with a per occurrence limit of US $1,000,000.00.

ARTICLE 8

FORCE MAJEURE

8.1 Event of Force Majeure.

Any failure by the Operator or the Owner to carry out any of its obligations under this Agreement will not be deemed a breach of contract or default, other than obligations to pay monies due and payable pursuant to this Agreement, if such failure is caused by an Event of Force Majeure, that Party having taken all appropriate precautions, due care and reasonable alternative measures with the objective of avoiding such failure and of carrying out its obligations under this Agreement. If any activity is delayed, curtailed or prevented by an Event of Force Majeure, then, anything in this Agreement to the contrary notwithstanding, the time for carrying out the activity thereby affected and the term of this Agreement will each be extended for a period equal to the total of the periods during which such causes or their effects were operative, and for such further periods, if any, as are necessary to make good the time lost as a result of such Event of Force Majeure.

8.2 Notice; Cooperation.

The Party whose ability to perform its obligations is affected by an Event of Force Majeure shall notify as soon as practicable the other Party in writing, stating the cause, and the Parties shall endeavor to do all reasonable acts and things within their power to remove such cause. No Party is obligated to resolve or terminate any disagreement with third parties, including labor disputes, except under conditions acceptable to it or pursuant to the final decision of any arbitral, judicial or statutory agent having jurisdiction to finally resolve the disagreement. As to labor disputes, any Party may request the other Party to cooperate in a joint endeavor to alleviate any conflict which may arise.

ARTICLE 9

TERM AND TERMINATION

9.1 Term of Agreement.

This Agreement becomes effective as of the Effective Date and, unless terminated by either Party pursuant to this Article 9, will terminate upon the termination of the Equipment Purchase Agreement.

9.2 Termination by the Owner.

This Agreement may be terminated at any time by the Owner if the Operator breaches any of its material obligations under this Agreement and Operator fails to cure such breach within 90 days of the receipt of written notice from the Owner; provided that the exercise of any termination right to be effective must occur within 90 days after the Owner becomes aware that its termination right exists. The Operator will have the opportunity, within 90 days of receiving notice of the event or breach to cure the event or breach, or, if such event or breach is not reasonably capable of being cured within such period, to submit to the Owner a plan (an **"Operator Remedial Plan"**) calculated to cure such event or breach within an additional reasonable period of time. The Owner may terminate this Agreement if, having commenced actions to cure the event or breach in accordance with an Operator Remedial Plan, the Operator fails to pursue such actions diligently or is unable to effect a cure within the period contemplated in the Operator Remedial Plan; provided that if the existence of such event or breach is disputed, such termination may occur only following resolution of the dispute regarding the existence or non-existence of a breach. The Date of Termination shall be the date that all conditions and contingencies to termination have been satisfied and the Owner is entitled to terminate this Agreement.

9.3 Termination by the Operator.

This Agreement may be terminated at any time by the Operator if the Owner breaches any of its material obligations under this Agreement, and Owner fails to cure such breach within 90 days of the receipt of written notice from Operator. The Operator shall have the right to immediately suspend performance hereunder in the event of any such default, until the same is cured by the Owner, and the Owner shall have no rights against the Operator in respect of such suspension until the time of such cure. Additionally, the Operator may terminate this Agreement if any change in ownership results in the Operator no longer being an Affiliate of the Owner. The exercise of any termination right to be effective must occur within 90 days after the Operator becomes aware that its termination right exists. The Date of Termination shall be the date that all conditions and contingencies to termination have been satisfied and the Operator is entitled to terminate this Agreement.

9.4 Transition to New Operator.

In the event of any termination under Section 9.2, the Owner may request that the Operator continue to maintain a sufficient number of local and expatriate employees to assist in training a replacement operator and to perform such other transition work as the Owner may reasonably request, and the Operator shall comply with any such request for a period not to exceed three months.

ARTICLE 10

LIMITATIONS OF LIABILITY

Neither of the parties shall have liability for consequential damages to the other arising out of this agreement or the transactions, events or occurrences related thereto and each hereby waives any and all such claims for consequential damages against the other.

ARTICLE 11

CONSULTATION AND ARBITRATION

11.1 Arbitration.

- If any Dispute arising out of this Agreement cannot be resolved by the Parties, then such Dispute shall be resolved by binding arbitration pursuant to the Commercial Arbitration Rules of the American Arbitration Association. The arbitration shall be the sole and exclusive forum for resolution of such Dispute, and the award rendered shall be final and binding. Judgment on the award rendered may be entered in any court having jurisdiction thereof.
- The arbitration shall be conducted in the English and shall be held in Salt Lake City, Utah.
- Any award of the arbitrator(s) (i) shall be in writing, (ii) shall state the reasons upon which such award is based and (iii) may include an award of costs, including reasonable attorneys fees and disbursements.
- The arbitrators shall have no authority to award consequential damages or punitive damages or any other damages not measured by the prevailing Partys actual direct damages, and the arbitrators may not, in any event, make any ruling, finding or award that does not conform to the term and conditions of this Agreement.
- Any Party may make an application to the arbitrators seeking injunctive relief to maintain the status quo until such time as the arbitration award is rendered or the dispute, controversy or claim is otherwise resolved. Any Party may also apply to any court having jurisdiction and seek injunctive relief in order to maintain the status quo until such time as the arbitration award is rendered or the dispute, controversy or claim is otherwise resolved. In the course of resolving Disputes, to the extent practicable, the Parties shall continue to perform the terms and conditions of this Agreement that are not in dispute.

ARTICLE 12

REPRESENTATIONS AND WARRANTIES

12.1 By the Owner.

In order to induce the Operator to enter into this Agreement the Owner makes the following representations and warranties as of the date hereof, which survive the execution and delivery hereof:

- the Owner is an individual having all requisite power and authority to enter into and perform this Agreement;
- the execution, delivery and performance of this Agreement (i) have been duly authorized by all necessary actions on the part of the Owner, and (ii) will not result in any violation of or conflict with or constitute a default under any provision of applicable law or of any judgment, decree or order of a court or Governmental Instrumentality applicable to the Owner or any material agreement or other instrument to which the Owner is a party or by which it is bound, including the Energy Sales Contract; and
- this Agreement constitutes a valid and binding obligation of the Owner.

12.2 By the Operator.

In order to induce the Owner to enter into this Agreement, the Operator makes the following representations and warranties as of the date hereof, which survive the execution and delivery hereof:

- it is a corporation duly organized, validly existing and in good standing under the laws of the State of Nevada and has all requisite corporate power and authority to enter into and perform this Agreement;
- the execution, delivery and performance of this Agreement (i) have been duly authorized by all necessary corporate action on its part and (ii) will not result in any violation of or conflict with or constitute a default under any provision of applicable law or its charter or by-laws or any judgment, decree or order applicable to it or any material agreement or other instrument to which it is a party or by which it is bound; and
- this Agreement constitutes a valid and binding obligation of the Operator.

ARTICLE 13 MISCELLANEOUS

13.1 Governing Law.

This Agreement is governed by and construed in accordance with the laws of the State of Utah, United States of America.

Signature

IP Digital Signal: 24.10.154.142

Seller

By: Neldon Johnson - RaPower-3

Neldon Johnson - Director -

Signature

OPERATION AND MAINTENANCE AGREEMENT

Alternative Energy Systems

This Operation and Maintenance Agreement (the **"Agreement"**) is entered into this day 12/9/2011 1:04:52 PM (the "**Effective Date**") by and between **LTB, LLC** (the "**Operator**"), a Nevada Limited Liability Company with principal offices at 3838 Raymert Drive, Suite #10, Las Vegas, Nevada 89121, and **PRESTON OLSEN** whose address is 957 Bryanston Cv Murray, UT. 123456 (the "**Owner**").

RECITALS

WHEREAS pursuant to an Equipment Purchase Agreement (the **"Purchase Agreement"**) between the Owner and **RaPower-3, LLC** ("**RaPower**"), a copy of which is attached as Attachment A, the Owner has purchased certain solar thermal energy equipment which consists of 7

(the **"Number of Owner's Alternative Energy Systems"**) **Alternative Energy Systems** (the **"Owner's Alternative Energy Systems"**) which are particularly described in the Purchase Agreement that will be installed at a Power Plant and/or other facilities hereafter associated therewith (collectively, the **"Project"**) at a location designated by the Equipment Purchase Agreement (the **"Installation Site"**).

WHEREAS, the Owner desires to rent to Operator and Operator desires to rent from Owner, the Owner's Alternate Energy Systems.

WHEREAS, the Owner desires to contract with the Operator for Operator to provide operation and maintenance services in respect of the Project.

WHEREAS, the Operator, at the Operator's sole discretion, may also be operating and maintaining solar thermal energy equipment other than the Alternative Energy System of the Owner, at the Installation Site.

WHEREAS, the Operator is willing to provide such services on the terms and conditions set forth in this Agreement.

NOW, THEREFORE, in consideration of the mutual covenants and agreements hereinafter set forth and

for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows:

ARTICLE 1

DEFINITIONS

1.1 **Alternative Energy System**. Solar energy concentrator system.

1.2 **Imbedded Definitions**. The definitions of other key terms are as stated in the text of this Agreement.

ARTICLE 2

OPERATOR SCOPE OF WORK

2.1 **Appointment**.

The Owner appoints the Operator and the Operator accepts the appointment to perform the following services subject to and in accordance with the provisions of this Agreement (collectively, the **"Work"**):

2.1.1 Routine O&M Services;

2.1.2 Additional Services; and

2.1.3 Transition Services.

2.2 **Effective Date**.

The Operator shall begin performing the Work on the date the Owner's Alternative Energy Systems are installed at the Installation Site (the **"Effective Date"**).

2.3 **Operation and Maintenance Services**.

The Operator will perform the Work in accordance with the standard of a reasonable and prudent operator in the state wherein the Installation Site is located and in compliance with the Safety and Operating Guidelines ("Guidelines") provided by RaPower to Operator, except to the extent that a reasonable and prudent operator would be unable, or would be hindered in its ability, to perform such obligations. Operator and Owner agree that RaPower may modify or amend the Guidelines from time to time in the sole discretion of RaPower. The Guidelines, as amended and modified hereafter in the sole discretion of RaPower, are hereby incorporated by reference into this Agreement and Operator and Owner hereby agree to be bound thereby.

2.4 Appointment of Liaison.

The Operator may appoint a representative who will represent the Operator under this Agreement and be responsible for receiving approvals or instructions from the Owner that may be required from time to time. The Owner shall be entitled to rely on the actions of such representative for the purposes of this Agreement.

2.5 Governmental Approvals.

The Operator shall apply for and use reasonable efforts to obtain and maintain all Governmental Approvals that are required to be in the Operator's name and that are necessary for the Operator to perform its obligations under this Agreement. The Operator shall assist the Owner, to the extent reasonably necessary, in obtaining Governmental Approvals that the Owner is required to obtain pursuant to Article 3.

2.6 Work Force.

The Operator is responsible for hiring, employing, training and managing, and additionally, in respect of employees employed by Affiliates of the Operator, overseeing the work force necessary to operate, maintain and repair the Project in accordance with this Agreement.

2.7 Access.

The Operator shall at all times provide access to the areas of the Project to the designated representatives of the Owner, provided that such access is in compliance with the Equipment Purchase Agreement and is coordinated with the Operator to ensure that it does not unreasonably interrupt or interfere with the performance of the Work or the safe operation of the Project and is at the sole risk and expense of the Owner, as applicable.

2.8 **Legal Requirements.**

The Operator shall comply in all material respects with all applicable law in the performance of the Work.

2.9 **Property Tax.**

The Operator shall comply with and pay all property tax on the Alternate Energy Systems.

ARTICLE 3

OWNER SCOPE OF RESPONSIBILITIES

3.1 **Delivery of the Project.**

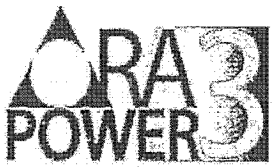
Once this Agreement becomes effective, the Owner shall grant the Operator and its designated and identified Affiliates, employees, agents and representatives, access to the Installation Site and the Project, as are necessary or desirable for the Operator to carry out the Work and to comply with the Operator's obligations hereunder.

3.2 **Appointment of Liaison.**

The Owner may appoint a representative who will represent the Owner under this Agreement and be responsible for giving approvals or instructions to the Operator that may be required from time to time. The Operator shall be entitled to rely on the approvals or instructions of such representative.

3.3 **Governmental Approvals.**

The Owner shall apply for and use reasonable efforts to obtain and maintain all Governmental Approvals that are required to be in the Owner's name and that are necessary for the Owner to perform its obligations



under this Agreement. The Owner shall assist the Operator; to the extent reasonably necessary, in obtaining Governmental Approvals that the Operator is required to obtain pursuant to Article 2.

3.4 Compliance with Applicable Law.

The Owner shall comply in all material respects with all applicable law in connection with the performance of this Agreement.

ARTICLE 4

SAFETY AND OPERATING GUIDELINES

4.1 Safety and Operating Guidelines.

Pursuant to the Equipment Purchase Agreement between the Owner and RaPower, RaPower has provided Safety and Operating Guidelines ("Guidelines") for operating and maintaining the Project, which Guidelines include but are not limited to a description of the services to be provided by Operator to Owner. The services are categorized by the Guidelines into Routine O&M Services, Additional Services, and Transition Services. The Guidelines written and set forth by RaPower are subject to modification or amendment by RaPower without prior notice, in the sole discretion of RaPower. Operator shall perform the Work in accordance with and in full compliance with the Guidelines, as modified or amended by RaPower from time to time, which Guidelines are incorporated by reference into this Agreement.

4.2 Health, Environmental and Safety Standards.

The Operator agrees that the Project shall be operated in compliance with all applicable laws and with the OSHA Standards and that the Operator shall not be obligated to perform the Work in a manner that does not meet the OSHA Standards or that would violate applicable law.

ARTICLE 5

COMPENSATION AND PAYMENT

5.1 Owner's Alternative Energy System(s) Production.

In consideration for the performance by Operator of the services set forth in this Agreement, from the Effective Date of this Agreement until the Date of Termination of this Agreement as provided below, as for so long as Operator is in possession and control of the Project, Operator shall be entitled to receive all revenue from the use or sale of thermal energy or electric power generating using the Alternative Energy Systems.

5.2 Rental payment.

Once the Owner's Alternative Energy System(s) are installed and producing revenue, then at the end of each quarter a rental payment will be due and owing from Operator to Owner. The Operator shall send to Owner, on a quarterly basis, the rental payment by check or wire transfer to an account specified by Owner. The rental payment from Operator to Owner will culminate into an annual payment equal to $150 (One Hundred Fifty Dollars) per Alternative Energy System. All Payments shall be in dollars unless otherwise agreed. Each Payment shall be delivered to Owner within thirty calendar days following the end of the quarter.

5.3 Late Payments.

Late payments under this Agreement shall bear interest at a rate calculated from day to day on the basis of a 360 day year equal to one percent per annum above the Discount Rate. The payment of interest shall not excuse or cure any late payment hereunder.

5.4 Lease of Structural Components

Operator will provide a structure that holds the Owner's Alternative Energy Systems and a receiver to collect the energy from the Owner's Alternative Energy Systems. The Operator has agreed to lease space on the structure to the Owner , at $1.00 per year per Alternative Energy System for ninety-nine years or until the Owner of the Alternative Energy Systems chooses to move the Alternative Energy Systems to another location.

ARTICLE 6

INDEMNIFICATION

6.1 Scope of Indemnification.

(a) The Owner shall indemnify, defend and hold harmless the Operator, its Affiliates and its and their respective directors, officers, employees and agents (**"Operator Indemnified Persons"**) from and against any liability, loss, damage, claim, cost, charge or expense of any kind or nature, including reasonable attorneys' fees, expenses and other costs of litigation (collectively, **"Damages"**) incurred by any Operator Indemnified Person in connection with (i) injury to or death of any person or damage to property (including the Project and any facilities related to the Project) and (ii) any claims by third parties, in each case, as a result of or otherwise relating to (A) the breach by the Owner of any of its obligations under this Agreement, (B) the gross negligence or willful misconduct of the Owner, its Affiliates and its and their respective directors, officers, employees and agents, or (C) the Project; provided that the Owner shall not be liable to indemnify any such Operator Indemnified Person for any Damages to the extent that such Damages are to be indemnified by the Operator pursuant to Section 6.1(b)(ii) or are the result of the gross negligence or willful misconduct of the Operator or, in respect of any such Operator Indemnified Person, such Operator Indemnified Person.

(b) Subject to the limitation of liability under Article 10, the Operator shall indemnify, defend and hold harmless the Owner, its Affiliates and its and their respective directors, officers, employees and agents (**"Owner Indemnified Persons"**) from and against any Damages incurred by any Owner indemnified Person in connection with (i) injury to or death of any person or damage to property (including the Project and any facilities related to the Project) and (ii) any claims by third parties, in each case, as a result of (A) the breach by the Operator of any of its obligations under this Agreement or (B) the gross negligence or willful misconduct of the Operator, its Affiliates and its and their respective directors, officers, employees and agents; provided that the Operator shall not be liable to indemnify any such Owner Indemnified Person to the extent Damages are the result of the gross negligence or willful misconduct of the Owner or any such Owner Indemnified Person or the breach by the Owner of any of its obligations under this Agreement.

6.2 Limitation of Liability.

The limitation of liability under Article 10 shall not apply to or include the amount of insurance proceeds received by the Operator under insurance obtained in accordance with this Agreement other than insurance obtained and paid by the Operator unless the amount paid by the Operator is reimbursed by the Owner hereunder.

6.3 No Effect on Insurers.

The provisions of this Article 6 will not be construed to relieve any insurer of its obligations to pay any insurance claims in accordance with the provisions of any valid insurance Policy.

6.4 Gross Negligence.

No Party shall have its liability limited hereunder for its own gross negligence or willful misconduct.

6.5 Survival.

The Parties' obligations under this Article 6 survive any termination of this Agreement.

ARTICLE 7

INSURANCE

7.1 Insurance Required of the Operator.

The Operator shall procure and maintain the insurance listed below:

(a) Workers' compensation insurance, or the equivalent, as required by law.

(b) Comprehensive general liability coverage, or the equivalent, including bodily injury and physical damage, with a per occurrence limit of US$1,000,000.00.

ARTICLE 8

FORCE MAJEURE

8.1 Event of Force Majeure.

Any failure by the Operator or the Owner to carry out any of its obligations under this Agreement will not be deemed a breach of contract or default, other than obligations to pay monies due and payable pursuant to this Agreement, if such failure is caused by an Event of Force Majeure, that Party having taken all

appropriate precautions, due care and reasonable alternative measures with the objective of avoiding such failure and of carrying out its obligations under this Agreement. If any activity is delayed, curtailed or prevented by an Event of Force Majeure, then, anything in this Agreement to the contrary notwithstanding, the time for carrying out the activity thereby affected and the term of this Agreement will each be extended for a period equal to the total of the periods during which such causes or their effects were operative, and for such further periods, if any, as are necessary to make good the time lost as a result of such Event of Force Majeure.

8.2 Notice; Cooperation.

The Party whose ability to perform its obligations is affected by an Event of Force Majeure shall notify as soon as practicable the other Party in writing, stating the cause, and the Parties shall endeavor to do all reasonable acts and things within their power to remove such cause. No Party is obligated to resolve or terminate any disagreement with third parties, including labor disputes, except under conditions acceptable to it or pursuant to the final decision of any arbitral, judicial or statutory agent having jurisdiction to finally resolve the disagreement. As to labor disputes, any Party may request the other Party to cooperate in a joint endeavor to alleviate any conflict which may arise.

ARTICLE 9

TERM AND TERMINATION

9.1 Term of Agreement.

This Agreement becomes effective as of the Effective Date and, unless terminated by either Party pursuant to this Article 9, will terminate upon the termination of the Equipment Purchase Agreement.

9.2 Termination by the Owner.

This Agreement may be terminated at any time by the Owner if the Operator breaches any of its material obligations under this Agreement and Operator fails to cure such breach within 90 days of the receipt of written notice from the Owner; provided that the exercise of any termination right to be effective must occur within 90 days after the Owner becomes aware that its termination right exists. The Operator will have the opportunity, within 90 days of receiving notice of the event or breach to cure the event or breach,

or, if such event or breach is not reasonably capable of being cured within such period, to submit to the Owner a plan (an "**Operator Remedial Plan**") calculated to cure such event or breach within an additional reasonable period of time. The Owner may terminate this Agreement if, having commenced actions to cure the event or breach in accordance with an Operator Remedial Plan, the Operator fails to pursue such actions diligently or is unable to effect a cure within the period contemplated in the Operator Remedial Plan; provided that if the existence of such event or breach is disputed, such termination may occur only following resolution of the dispute regarding the existence or non-existence of a breach. The Date of Termination shall be the date that all conditions and contingencies to termination have been satisfied and the Owner is entitled to terminate this Agreement.

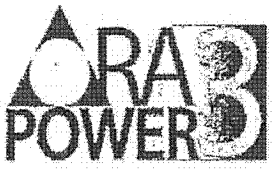
9.3 Termination by the Operator.

This Agreement may be terminated at any time by the Operator if the Owner breaches any of its material obligations under this Agreement, and Owner fails to cure such breach within 90 days of the receipt of written notice from Operator. The Operator shall have the right to immediately suspend performance hereunder in the event of any such default, until the same is cured by the Owner, and the Owner shall have no rights against the Operator in respect of such suspension until the time of such cure. Additionally, the Operator may terminate this Agreement if any change in ownership results in the Operator no longer being an Affiliate of the Owner. The exercise of any termination right to be effective must occur within 90 days after the Operator becomes aware that its termination right exists. The Date of Termination shall be the date that all conditions and contingencies to termination have been satisfied and the Operator is entitled to terminate this Agreement.

9.4 Transition to New Operator.

In the event of any termination under Section 9.2, the Owner may request that the Operator continue to maintain a sufficient number of local and expatriate employees to assist in training a replacement operator and to perform such other transition work as the Owner may reasonably request, and the Operator shall comply with any such request for a period not to exceed three months.

ARTICLE 10



LIMITATIONS OF LIABILITY

Neither of the parties shall have liability for consequential damages to the other arising out of this agreement or the transactions, events or occurrences related thereto and each hereby waives any and all such claims for consequential damages against the other.

ARTICLE 11

CONSULTATION AND ARBITRATION

11.1 Arbitration.

(a) If any Dispute arising out of this Agreement cannot be resolved by the Parties, then such Dispute shall be resolved by binding arbitration pursuant to the Commercial Arbitration Rules of the American Arbitration Association. The arbitration shall be the sole and exclusive forum for resolution of such Dispute, and the award rendered shall be final and binding. Judgment on the award rendered may be entered in any court having jurisdiction thereof.

(b) The arbitration shall be conducted in the English and shall be held in Salt Lake City, Utah.

(c) Any award of the arbitrator(s) (i) shall be in writing, (ii) shall state the reasons upon which such award is based and (iii) may include an award of costs, including reasonable attorneys' fees and disbursements.

(d) The arbitrators shall have no authority to award consequential damages or punitive damages or any other damages not measured by the prevailing Party's actual direct damages, and the arbitrators may not, in any event, make any ruling, finding or award that does not conform to the term and conditions of this Agreement.

(e) Any Party may make an application to the arbitrators seeking injunctive relief to maintain the status quo until such time as the arbitration award is rendered or the dispute, controversy or claim is otherwise resolved. Any Party may also apply to any court having jurisdiction and seek injunctive relief in order to maintain the status quo until such time as the arbitration award is rendered or the dispute, controversy or claim is otherwise resolved. In the course of resolving Disputes, to the extent practicable,

the Parties shall continue to perform the terms and conditions of this Agreement that are not in dispute.

ARTICLE 12

REPRESENTATIONS AND WARRANTIES

12.1 By the Owner.

In order to induce the Operator to enter into this Agreement the Owner makes the following representations and warranties as of the date hereof, which survive the execution and delivery hereof:

(a) the Owner is an individual having all requisite power and authority to enter into and perform this Agreement;

(b) the execution, delivery and performance of this Agreement (i) have been duly authorized by all necessary actions on the part of the Owner, and (ii) will not result in any violation of or conflict with or constitute a default under any provision of applicable law or of any judgment, decree or order of a court or Governmental Instrumentality applicable to the Owner or any material agreement or other instrument to which the Owner is a party or by which it is bound, including the Energy Sales Contract; and

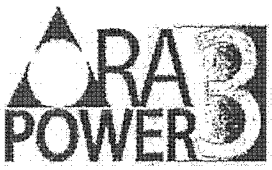
(c) this Agreement constitutes a valid and binding obligation of the Owner.

12.2 By the Operator.

In order to induce the Owner to enter into this Agreement, the Operator makes the following representations and warranties as of the date hereof, which survive the execution and delivery hereof:

(a) it is a corporation duly organized, validly existing and in good standing under the laws of the State of Nevada and has all requisite corporate power and authority to enter into and perform this Agreement;

(b) the execution, delivery and performance of this Agreement (i) have been duly authorized by all



necessary corporate action on its part and (ii) will not result in any violation of or conflict with or constitute a default under any provision of applicable law or its charter or by-laws or any judgment, decree or order applicable to it or any material agreement or other instrument to which it is a party or by which it is bound; and

(c) this Agreement constitutes a valid and binding obligation of the Operator.

ARTICLE 13

MISCELLANEOUS

13.1 Governing Law.

This Agreement is governed by and construed in accordance with the laws of the State of Utah, United States of America.

PRESTON OLSEN

Signature

RaPower3 Windows Utility

IP Digital Signal

Seller

By: Neldon Johnson - RaPower-3

Neldon Johnson - Director - 12/9/2011 1:04:52 PM

Signature

EXHIBIT C

Name:
Address:
Address:

Date:

Dear Name:

This notification is to confirm that your solar lenses have been placed in service, for those that the 30% down has been paid in full. LTB,LLC has utilized solar energy from your solar panels for the purpose of assisting IAS in research and development for both agricultural and municipal solar thermal waste heat reclamation and multiple non-serial array concentrated photovoltaic receiver circuitry, among other applications such as refinement of gearless dual-axis hydraulic tracking mechanisms and quick-release panel stabilizers and connections, which qualify as commercial use of solar energy.

This letter is regarding the "Alternative Energy Systems" that you purchased from RaPower3 LLC. RaPower3 put into service your equipment.

(However for your personal information, Section 103 Div.B Energy Credit (code Sec.48), "For projects whose construction time is expected to equal or exceed two years, the Credit may be claimed as is placed in service.")

We appreciate your business and look forward to the opportunity to work with you to help solve our nation's energy needs. If you have any questions you may correspond with us at the below address.

Respectfully Yours,

Greg Shepard
Chief Director of Operations

RaPower-3, 2800 West 4000 S, Delta, Utah 84624

EXHIBIT D

ANDERSON
Law Center, P.C.

www.deltaattorney.com
andersonlawcenter@deltaattorney.com

P.O. Box 193
54 South 300 East
Delta, UT 84624

P. 435.864.4357
F. 435.864.4358

August 8, 2012

Re.: *Potential tax advantages.*

Dear Potential RaPower-3 Customer,

To help you, as a taxpayer, understand the possible tax saving benefits of purchasing energy equipment through RaPower-3, we have assembled the following information so that you can consult with your own tax professional about the potential tax advantages of entering the energy market by owning RaPower-3 energy equipment.

With the purchase of Rapower-3 Energy Equipment, there are four possible ways to reduce tax liability:

- energy credits;
- depreciation;
- § 179 costs,
- deductions and expenses.

Depending on your situation, all four approaches may apply to you. Below is a discussion regarding each possible benefit for you to review with your own tax professional and determine the applicability to your own unique financial situation.

I. Energy credit – Internal Revenue Code §§ 45 & 48

Through tax code, the Federal Government has implemented several programs to incentivize renewable energy projects. One such program is found in IRC § 45 in conjunction with IRC § 48. Simply stated the sections provide for a credit of 30% the basis (essentially the purchase price) of energy equipment that is placed in service during the taxable year. For energy equipment that has not been placed in service, such as equipment still being manufactured, a taxpayer can elect to take a portion of the credit if the equipment is a Qualified Progress Expenditure Property ("QPEP"). QPEP is property being constructed by or for the taxpayer and which (a) has a normal

construction period of two years or more, and (b) it is reasonable to believe that the property will qualify for the energy credit (from IRC § 48) once it is placed in service.

An owner of QPEP may claim the 30% credit on: (a) the amount paid towards the purchase (during the tax year) to another person for the construction of QPEP, or (b) an amount attributable to the portion of the QPEP that is completed (during the tax year); whichever is less.

Detailed language of this Energy Credit can be found in the United States Code, Title 26, §§ 45 through 48. Other considerations may apply, so be sure to talk to your tax professional about how you can personally qualify for this energy tax credit.

II. Depreciation

Depreciation is an annual income tax deduction that could allow an owner of energy equipment to recover the purchase cost. The tax code acknowledges that hard assets such as energy equipment wear out and lose value over time. Thus, depreciations is an allowance that accrues over time for the wear and tear, deterioration, or obsolescence of the property. You can depreciate most types of tangible property, such as buildings, machinery, vehicles, and equipment.

To be depreciable, the property must meet all of the following requirements: it must be property you own; it must be used in your business or income-producing activity; it must have a determinable useful life; and it must be expected to last more than one year after being placed in service.

A taxpayer can start claiming depreciation of an asset as soon as his or her property is placed in service. Property is placed in service when it is ready and available for a specific use, whether in a business activity, an income-producing activity, a tax-exempt activity, or a personal activity. This does not mean you have to be using the property, just that it is ready and available for its specific use.

If the equipment is ready and available for ANY income producing activity, including leasing it out for advertising purposes, the owner may start claiming depreciation of the asset.

III. Section 179 Expenses

A qualifying taxpayer may treat the costs (such as maintenance, upkeep, and repairs) of his or her energy property as an expense beginning the year the property is placed in service. This is in addition to claiming the depreciation of the property as discussed above.

In 2010, the Federal Government through the Small Business Jobs Act (SBJA) increased the cap of Section 179 expenses so that certain business can claim up to $500,000 beginning in the 2010 and 2011 tax years. To qualify for the section 179 deduction, your property must have been acquired for use in your trade or business. Property you acquire only for the production of income, such as investment property, rental property (if renting property is not your trade or business), and property that produces royalties, does not qualify.

IV. Deductions and Losses

So long as a taxpayer materially participates in a business activity, the taxpayer may deduct the losses from such activity against investment income. Moreover, even if the taxpayer does not materially participate, any losses may be deducted if the taxpayer has passive income from other sources to offset the passive losses.

For a taxpayer to materially participate in a business activity, the payer must work on a regular, continuous and substantial basis in the activity. *I.R.C. § 469 (h)(1)* lays out several tests to determine material participation and the taxpayer only has to meet one of the possible requirements. The tests are as follows:

a. The taxpayer does substantially all the work in the activity.

b. The taxpayer works more than 100 hours in the activity during the year and no one else works more than the taxpayer.

c. The taxpayer works 500 hours or more during the year in the activity.

d. Based on all of the facts and circumstances, the taxpayer participates in the activity on a regular, continuous, and substantial basis during such year. This test only applies if the taxpayer works at least 100 hours in the activity, no one else works more hours than the taxpayer in the activity, and no one else receives compensation for managing the activity.

Stated simply, if you do most of the work in the business using the RaPower-3 energy equipment, any losses associated with your business will be non-passive and can be deducted without limitation.

Generally any work you do in connection with your business will be considered participation. In a multi-level marketing structure, participation would include any activity to increase the productivity of other individuals engaged in sales such as recruiting, training, motivating and counseling such individuals. Other ways to participate in your business would include meeting and counseling with the operator of the equipment, negotiating sale and distribution of energy, reviewing productivity and costs, among others.

V. Conclusion

Right now, the government is enacting programs geared to foster and encourage development of energy sources. RaPower-3's equipment could allow you to enter the energy market and capitalize on those government incentives. This is only a brief overview of some of the possibilities that may be available to new owners of RaPower-3 energy equipment.

Although we have tried to ensure our information is accurate and useful, we are not acting as your attorney and the above is offered to you for informational purposes only. We recommend that you consult your own lawyer and tax professional for particularized assurance that the information applies to your situation.

Sincerely,

Anderson Law Center, P.C.

DISCLAIMER: Anderson Law Center, P.C. as an institution or its attorneys are not offering you advice on any personal income tax requirements or issues. The purpose of this communication for general information only and does not represent personal tax advice either expresses or implied. You are encouraged to seek professional tax advice for personal or corporate income tax questions and assistance.

Tax Information

From: **Todd Anderson** (todd@deltaattorney.com)
Sent: Mon 11/15/10 3:41 PM
To: neldon@iaus.com; glendaejohnson@hotmail.com
2 attachments
Operation & Maintenance Agreement.docx (125.6 KB) , Taxpayer Info.docx (59.6 KB)

Todd Anderson
Attorney and Counselor at Law
ANDERSON
Law Offices, P.C.
P.O. Box 183
54 South 300 East
Delta, UT 84624
P: 435 864-4357
F: 435 864 4358
todd@deltaattorney.com
435-864-HELP (4357)

11/16/10

EXHIBIT E

KIRTON | McCONKIE

MEMORANDUM

DATE: October 31, 2012

TO: SOLCO I, LLC
Attn: Neldon Johnson

FROM: Kenneth W. Birrell

SUBJECT: Tax Issues Relating to Purchase of Solar Lenses

INTRODUCTION

This memorandum is in response to your request for our analysis of certain tax consequences for the buyers (the "Buyers") of solar lenses from SOLCO, I, LLC (the "Seller") based on factual circumstances that are substantially similar in all material respects to the Facts (as such term is defined below). Please note that the analysis in this memorandum is based upon the existing provisions of the Internal Revenue Code of 1986, as amended (the "Code") and regulations thereunder (including final, temporary and proposed) and upon current Internal Revenue Service ("Service") published rulings and existing court decisions, any of which could be changed at any time. Any such changes may be retroactive and could significantly modify the analysis set forth herein. Similarly, any change in the Facts or the assumptions stated below, upon which our analysis is based, could modify our conclusions.

EXECUTIVE SUMMARY

The solar lenses that Buyers purchase from Seller (the "Solar Lenses") will qualify as "energy property" that is eligible for the energy tax credit under Code Section 48. For purposes of calculating the energy credit, the basis of each Solar Lens will be Three Thousand Five Hundred Dollars ($3,500) and the energy percentage will be thirty percent (30%) so long as the energy credit is claimed prior to January 1, 2017 (and will be ten percent (10%) if claimed after that date). Buyers will be able to claim the energy credit in the year that the Solar Lenses are placed into service. The Solar Lenses will be eligible for depreciation under Code Section 168(a) as 5-year property.

FACTUAL BACKGROUND

The Solar Lenses will be purchased by Buyers that are (i) corporations or limited liability companies organized in the United States, (ii) neither tax-exempt nor governmental entities and (iii) taxed as subchapter C corporations for federal income tax purposes. The Solar Lenses will

be purchased pursuant to a Solar Lenses Purchase Agreement that is substantially similar to the agreement set forth in Exhibit A hereto (the "Purchase Agreement"). The Solar Lenses were manufactured by International Automated Systems or one of its affiliates and consist of thin-film solar lenses that focus the sun's energy, which energy is collected and transmitted to produce heated steam for power generation and other uses. The Treasury Department has made a grant under Section 1603 of the American Recovery & Reinvestment Act of 2009 with respect to the same model of solar lenses as the Solar Lenses and related equipment, which grant required a finding by the Treasury Department that such solar lenses and related equipment constituted property described in Code Section 48(a)(3)(A)(i) or (ii).

According to the Purchase Agreement, the purchase price ("Purchase Price") for each Solar Lens shall be Three Thousand Five Hundred Dollars ($3,500). Buyer shall pay thirty percent (30%) of the Purchase Price upon execution of the Purchase Agreement and provide Seller with a Promissory Note that is substantially similar to the promissory note set forth in Exhibit B hereto (the "Promissory Note") for the remaining balance of the Purchase Price. The Promissory Note provides for payment of the remaining balance of the Purchase Price in substantially equal annual installment payments over a period of thirty (30) years (the "Installment Payments") with interest at a rate equal to the long-term applicable federal rate determined in accordance with Code Section 1274 as such rate is in effect for the month in which the Solar Lenses are acquired.

All of the Solar Lenses will be new at the time of their purchase by the Buyer. No person will have put the Solar Lenses to any type of use prior to the Buyer's purchase of the Solar Lenses. No person will have claimed any credits under Code Section 45 or 48 or received a Section 1603 grant with respect to the Solar Lenses prior to the Buyer's purchase of the Solar Lenses. All of the Solar Lenses will be installed at projects located within the United States.

The Buyer will enter into an Operation and Maintenance Agreement that is substantially similar to the agreement attached hereto as Exhibit C (the "O&M Agreement") with LTB, LLC, a Nevada limited liability company (the "Operator") to oversee the operation and maintenance of the Solar Lenses. The Operator is a for-profit commercial enterprise that is not related to either Buyer or Seller through common ownership. The Operator will also lease from Seller or an affiliate of Seller the towers in which the Solar Lenses will be installed, receivers to collect the energy from the Solar Lenses and certain other equipment relating thereto. The Operator shall be responsible for performing the services described in the O&M Agreement, including the collection of all income generated from the operation of the Solar Lenses, including any revenue generated from the use or sale of thermal energy or electric power generated using the Solar Lenses (the "Gross Revenue"). As compensation for its services, the Operator shall be entitled to retain an amount equal to the Gross Revenue minus an annual rental payment as set forth in the O&M Agreement (the "Rental Payment"). The Rental Payment shall be a fixed amount and shall not be a function of the net profits generated by the Solar Lenses.

The Purchase Agreement, Promissory Note and O&M Agreement are referred to herein as the "Transaction Documents." The factual matters set forth above along with the Transaction Documents shall be referred to collectively herein as the "Facts."

EXPLANATION OF THE LAW AND APPLICATION OF THE FACTS TO THE LAW

I. Sale vs. Lease

The Buyer's tax treatment with respect to the Solar Lenses depends in part upon whether the overall transaction constitutes a sales transaction in which the Buyer becomes and remains the owner of the Solar Lenses for tax purposes and therefore is the party entitled to claim the energy tax credits and depreciation deductions relating to the Solar Lenses. Although there is no bright-line test for determining whether a transaction constitutes a sale or a lease for tax purposes, the Service and the courts have developed various factors that they use to guide this determination. For example, in Rev. Rul 55-540 the Service stated that the determination of whether a transaction constitutes a sale or a lease "depends upon the intent of the parties as evidenced by the provisions of the agreement, read in light of the facts and circumstances existing at the time the agreement was executed." The Service noted that although "no single test, or any special combination of tests, is absolutely determinative," it provided a list of several conditions that, if present, "in the absence of compelling persuasive factors of contrary implication [evidence] an intent warranting treatment of a transaction for tax purposes as a purchase and sale rather than as a lease or rental agreement."

One of the conditions indicating a sale is that "[p]ortions of the periodic payments are made specifically applicable to an equity to be acquired by the lessee." Rev. Rul. 55-540, citing *Truman Bowen v. Commissioner*, 12 T.C. 446, acquiescence, C.B. 1951-2. The Purchase Agreement specifies that the Promissory Note represents payment of the Purchase Price that remains due after receipt of the Down Payment. Conversely, no part of the Rental Payment due under the O&M Agreement is specifically applicable to the Operator acquiring an equity interest in the Solar Lenses since the parties do not anticipate the Operator ever acquiring such an equity interest.

Another and related condition indicating a sale is that "[s]ome portion of the periodic payments is specifically designated as interest or is otherwise readily recognizable as the equivalent of interest." Rev. Rul 55-540, citing *Judson Mills v. Commissioner*, 11 T.C. 25, acquiescence, C.B. 1949-1. As noted above, the Purchase Agreement and PromissoryNote specifically designate a portion of the Installment Payments as interest, but there is no corresponding specific designation of interest within the O&M Agreement. Moreover, no portion of the Rental Payments appear to be readily recognizable as the equivalent of interest.

A third condition indicating a sale is that "[t]he lessee will acquire title upon the payment of a stated amount of 'rentals' which under the contract he is required to make." Rev. Rul. 55-540, citing *Hervey v. Rhode Island Locomotive Works*, 93 U.S. 664 (1876); *Taft v. Commissioner*, 27 B.T.A. 808; *Truman Bowen v. Commissioner*, 12 T.C. 446, acquiescence, C.B. 1951-2. Under the terms of the Purchase Agreement and the O&M Agreement, the Buyer will receive title to the Solar Lenses from Seller and not pass that title to the Operator under any conditions. Therefore, the Buyer will hold title to the Solar Lenses throughout the term of both agreements.

In general, courts look to whether the benefits and burdens of ownership have passed to the purported buyer/lessor when determining how to classify sale-leaseback transactions for tax purposes. One important factor has been whether the buyer-lessor truly had an economic investment that would be meaningful if it abandoned the property. For example, in *Frank Lyon Co v. United States*, 435 U.S. 561 (1978), a key factor in the Supreme Court's decision to uphold a sale-leaseback transaction was the substantial economic investment made by the buyer/lessor. The buyer/lessor purchased a building for $7.64 million with a $500,000 down payment

(representing 6.5% of the purchase price) and took out a mortgage for the remaining purchase price. The buyer/lessor then leased the building back to the seller/lessee with the annual rent exactly equal to the buyer/lessor's annual mortgage payments. The seller/lessee had options to purchase the building at various times at a price equal to the sum of the unpaid mortgage plus the buyer/lessor's $500,000 plus 6% interest. The Supreme Court's decision to uphold the sale-leaseback transaction was based in large measure the significance of the buyer/lessor's economic investment, with the court finding that the buyer/lessor's financial position was substantially affected due to the $500,000 investment and long-term debt and the buyer/lessor was exposed to real and substantial risk. Conversely, sale-leaseback transactions that have not been upheld by the courts typically involve minor down payments, nonrecourse financing and inflated sales prices. *See e.g., Franklin Estate v. Commissioner*, 64 T.C. 752 (1975), *aff'd*, 544 F.2d 1045 (9th Cir. 1976). Here, the Buyer will make a substantial economic investment in the Solar Lenses. For example, the Buyer's down payment is thirty percent (30%) of the Purchase Price, nearly five times as large as the down payment in *Frank Lyon*, and the financing on the remainder of the Purchase Price is fully recourse.

Another important factor for the courts is the existence of repurchase options at favorable prices, which indicate that the sellor/lessee has not truly relinquished its interest in the property. *See e.g., Sowerby v. Commissioner*, 47 T.C.M. 897 (1984). Here, neither the Seller nor the Operator will have an option to purchase the Solar Lenses at any price, let alone a favorable price.

Another important factor for the courts has been the relative cash flows, such as situations where the rental income stream is tailored to match the debt payments without any significant positive cash flow for the buyer/lessor. *See e.g., Larsen v. Commissioner*, 89 T.C. 1229 (1987). Here, it is anticipated that the annual revenue stream (from the Rental Payments) will be substantially greater than the annual debt payments (the Installment Payments), which means that the Buyer should have substantial positive cash flows.

Finally, the Purchase Agreement provides that all parties shall, for tax purposes, report the transactions provided for in the Purchase Agreement and O&M Agreement as a sale of the Solar Lenses to the Buyer followed by a thirty (30) year operating lease of the Solar Lenses to the Operator. Thus, the parties clearly intend for the transactions to constitute a sale of the lenses to Buyer with the Buyer bearing the economic benefits and burdens of ownership of the Solar Lenses. Given the substantial economic investment being made by the Buyer, the specific designation of principal and interest payments by the Buyer to Selller and no such designation of with respect to payments by the Operator to the Buyer, the fact that the Buyer will have title to the Solar Lenses, the fact that neither the Seller nor the Operator will have an option to acquire the Solar Lenses from the Buyer and the fact that the Buyer will recognize substantial positive cash flow from the Solar Lenses, we believe that the transactions should be treated as a sale of the Solar Lenses to Buyer for tax purposes. Accordingly, the Buyer should be the person entitled to claim the energy credit and depreciation deductions relating to the Solar Lenses.

II. Energy Tax Credit

Code Section 38 provides as a credit against a taxpayer's federal income taxes an amount equal to various credits, including "the investment credit determined under section 46." Code Section 46 defines the investment credit as the sum of various credits, including "the energy credit." Code Section 48(a) provides that, subject to certain exceptions not applicable to the

Solar Lenses, that "the energy credit for any taxable year is the energy percentage of the basis of each energy property placed in service during such taxable year."

A. Energy Property

Code Sections 48(a)(3) and 50(b) contain six (6) requirements that property must satisfy in order to qualify as "energy property. " As summarized below, the Solar Lenses satisfy each of these requirements.

1. Solar Energy Property

First, the property must consist of property described in Code Section 48(a)(3)(A). Among the types of property described therein is "equipment which uses solar energy to generate electricity, to heat or cool (or provide hot water for use in) a structure, or to provide solar process heat, excepting property used to generate energy for the purposes of heating a swimming pool" Code Section 48(a)(3)(A)(i). Such solar energy property includes equipment and materials, as well as parts related to the function of that equipment, that use solar energy directly to perform these functions, generally through the use of equipment such as collectors (to absorb sunlight and create hot liquids or air), storage tanks (to store hot liquids), rockbeds (to store hot air), theremostats (to activate pumps or fans that circulate the hot liquids or air) and heat exchangers (to utilize hot liquids or air to create hot air or water). *See* Treas. Reg. Section 1.48-9(d)(1). Solar energy property includes equipment that uses solar energy to generate electricity, and includes storage devices, power conditioning equipment, transfer equipment, and parts related to the functions of those items, which are part of the process involving the transformation of sunlight into electricity through the use of such devices as solar cells or other collectors so long as such equipment is used up to (but not including) the state that transmits or uses electricity. *See* Treas. Reg. Section 1.48-9(d)(3). Equipment that uses solar energy beyond the distribution stage is eligible only if specially adapted to use solar energy. *See* Treas. Reg. Section 1.48-9(d)(5).

It is not necessary for solar energy property to comprise a completely functional solar system in order to qualify for the energy credit. In *Cooper v. Commissioner*, 88 T.C. 84 (1987), the Tax Court held that property within the meaning of Code Section 48(a)(3)(A)(i) is any equipment that uses solar energy to generate electricity, to heat, cool, or provide hot water for use in a structure, or to provide solar process heat, and includes parts solely related to the functioning of such equipment; the court found that an incomplete system made up of qualifying parts, such as collectors, storage tanks, thermostats, heat exchangers, etc. can qualify for the credit.

The Solar Lenses will be capable of using solar energy to generate electricity and/or solar process heat once they have been properly installed in a tower and otherwise incorporated into a larger solar energy system. As explained by the Tax Court in *Cooper v. Commissioner*, 88 T.C. 84 (1987), the fact that the Solar Lenses must be installed and incorporated into a larger solar energy system does not prevent them from qualifying as energy property. Finally, it is our understanding that the Solar Lenses will not be used for the purposes of heating a swimming pool except to the extent that electricity generated by the Solar Lenses is sold to an end-user who uses such electricity to heat a swimming pool. Therefore, the Solar Lenses are described in Code Section 48(a)(3)(A)(i) and thereby satisfy this first requirement to being classified as energy property.

2. Acquisition and Original Use

Second, the Property must either be (i) constructed, reconstructed or erected by the taxpayer or (ii) acquired by the taxpayer if the original use of such property commences with the taxpayer. Code Section 48(a)(3)(B). Treas. Reg. Section 1.48-2(b)(6) provides that property is deemed to be acquired when reduced to physical possession or control. Treas. Reg. Section 1.48-2(b)(7) provides that original use means the first use to which the property is put, whether or not such use corresponds to the use of such property by the taxpayer.

The Buyer will not construct, reconstruct or erect any of the Solar Lenses itself. However, the Buyer will acquire control of the Solar Lenses pursuant to the terms of the Purchase Agreement. Therefore, the Buyer will have acquired all of the Solar Lenses within the meaning of Code Section 48(a)(3)(B) and Treas. Reg. 1.49-2(b)(6). As noted in the Facts, none of the Solar Lenses will have been put to any use by any other person prior to their acquisition by the Buyer. Therefore, the original use of the Solar Lenses will commence with the Buyer within the meaning of Code Section 48(a)(3)(B) and Treas. Reg. 1.49-2(b)(6). Accordingly, the Solar Lenses satisfy this second requirement to being classified as energy property.

3. Qualify for Depreciation

Third, the property must qualify for depreciation (or amortization in lieu of depreciation). Code Section 48(a)(3)(C). Treas. Reg. Section 1.48-1(b)(1) provides that property qualifies for deprecation within the meaning of Code Section 48(a)(3) "if the property is of a character subject to the allowance for depreciation under section 167 and the basis (or cost) of the property is recovered through a method of depreciation, including, for example, . . . methods of depreciation which measure the life of the property in terms of years."

As summarized in greater detail in Section III.A below, the Solar Lenses are of a character subject to allowance for depreciation under Code Section 167 and the Buyer's basis in the Solar Lenses will be recovered through a method of depreciation. Therefore, the Solar Lenses satisfy this third requirement to being classified as energy property.

4. Satisfy Performance Standards

Fourth, the property must satisfy the performance standards, if any, which the Service has prescribed by regulation and are in effect at the time of the acquisition of the property. Code Section 48(a)(3)(D). However, taxpayers need not wait for issuance of performance standards before proceeding with the acquisition of the property or the claiming of the energy credit. *See* Information Release 2134, 1979-28 I.R.B. 36.

To date the Service has not published any performance standards that would apply to the Solar Lenses. Because a Buyer need to wait until performance standards are issued, until such time as the Service publishes performance standards, the Solar Lenses will satisfy this fourth requirement to being classified as energy property.

5. No Claiming of Code Section 45 Credit

Fifth, taxpayer cannot have claimed a renewable electricity production credit under Code Section 45 for the taxable year or any prior taxable year with respect to the property. Code Section 48(a)(3). Code Section 45 provides a credit to certain facilities that use renewable resources, such as solar energy, to produce electricity. However, Code Section 45(d)(4) provides that such a facility "shall not include any property described in section 48(a)(3) the basis of which is taken into account by the taxpayer for purposes of determining the energy credit under section 48." In essence, the taxpayer has to choose between claiming a tax credit under Code Section 48 (which is based upon the basis of the property) or Code Section 45 (which is based upon the amount of electricity sold).

No person has claimed a credit under Code Section 45 with respect to the Solar Lenses. So long as the Buyer does not attempt to claim such a credit in the future, the Solar Lenses will satisfy this fifth requirement to being classified as energy property.

6. No Disqualifying Use

Property does not qualify as energy property if it is used (i) predominantly outside of the United States, (ii) predominantly to furnish lodging or in connection with the furnishing of lodging, (iii) by certain tax-exempt organizations, (iv) a governmental entity or (v) a foreign person or entity. Code Section 50(b).

The Solar Lenses will all be installed in projects located within the United States; therefore the Solar Lenses will not be predominantly outside of the United States. Given the nature of the Solar Lenses, they are not capable of furnishing lodging within the meaning of Code Section 50(b), therefore their use will not be predominantly to furnish lodging or in connection with the furnishing of lodging. Neither the Buyer nor the Operator is a tax-exempt organization, governmental entity or foreign person. Moreover, under the terms of the O&M Agreement the Operator is not permitted to sublet any of the Solar Lenses or assign any of its rights or obligations under such agreement without the prior written consent of the Buyer, so the Operator cannot cause the Solar Lenses to be used by a tax-exempt organization, governmental entity or foreign person or entity without the Buyer's consent. Therefore, so long as the Solar Lenses are subject to the O&M Agreement, they will not be used by a tax-exempt organization, governmental entity or foreign person or entity without the Buyer's prior consent. Accordingly, the Solar Lenses satisfy this sixth and final requirement to being classified as energy property.

B. Energy Percentage

Code Section 48(a)(2)(A)(i)(II) provides that the energy percentage is thirty percent (30%) for various types of properties, including energy properties described in Code Section 48(a)(3)(A)(i) for periods ending before January 1, 2017 and ten percent (10%) for periods beginning on January 1, 2017. As summarized in Section II.A.1 above, the Solar Lenses are described in Code Section 48(a)(3)(A)(i). Therefore, so long as the energy credit is claimed before January 1, 2017, the energy percentage for the Solar Lenses will be thirty percent (30%). If the energy credit is claimed on or after January 1, 2017, then the energy percentage will be ten percent (10%).

C. Basis

1. In General

The basis of the Solar Lenses for purposes of the energy credit will initially be determined in accordance with Code Section 1012(a), which provides that basis of the Solar Lenses is their cost. Because the Purchase Price for each Solar Lens will be Three Thousand Five Hundred Dollars ($3,500), such amount will be the cost basis of each Solar Lens for purposes of Code Section 1012(a).

2. At-Risk Limitation

For purposes of calculating the amount of the energy tax credit under Code Section 48(a), the cost basis amount determined in accordance with Code Section 1012 must be reduced to the extent required by the at-risk rules of Code Section 49. Code Section 49(a)(1)(A) provides that in computing the investment credit amount, the basis of property placed in service by a taxpayer described in Code Section 465(a)(1) and used in an activity with respect to which any loss is subject to limitation under Code Section 465 must be reduced by the amount of nonqualified nonrecourse financing relating to such property as of the close of the tax year in which the property is placed in service.

Taxpayers described in Code Section 465(a)(1) include individuals and subchapter C corporations with respect to which the stock ownership requirement of Code Section 542(a)(2) are met. The stock ownership requirement of Code Section 542(a)(2) is met if more than fifty percent (50%) of the corporation's stock is owned, directly or indirectly, by not more than five (5) individuals. Code Section 544 includes various attribution rules for determining stock ownership for purposes of Code Section 542(a)(2) which, among other things, deem an individual to hold all of the stock held by various members of the individual's family (including brothers, sisters, spouse, ancestors and lineal descendants) and various corporations, partnerships, estates and trusts. In terms of the type of activity requirement, if a corporation satisfies the ownership requirements of Code Section 542(a)(2), then essentially all of its activities are activities with respect to which losses are subject to limitation under Code Section 465. Thus, whether a Buyer will be described in Code Section 465(a)(1) will depend upon the Buyer's ownership structure. If a Buyer's stock is widely held, then it will not be subject to the at-risk limitations of Code Section 49; if a Buyer's stock is closely held (as defined in Code Section 542(a)(2)), then the Buyer will be subject to Code Section 49.

However, even if a Buyer is described in Code Section 542(a)(2) and therefore subject to Code Section 49, the amount of its basis in the Solar Lenses will not be reduced. Code Section 49(a)(1)(F) provides that the at-risk rules of Code Section 49 do not apply to qualified energy property as such term was defined for purposes of Code Section 46(c)(8) as such was in effect prior to the enactment of the Revenue Reconciliation Act of 1990 ("RRA-1990") on November 5, 1990. Qualified energy property is any property that satisfies each of the four (4) conditions summarized in the following sections.[1]

a. At-Risk Limitations Would Otherwise Apply

[1] Note: The rules set forth in pre-1990 RRA Code Section 46(c)(8)(F) included a fifth condition that precluded exclusion from applying to all energy property. Pre-1990 RRA Code Section 46(c)(8)(F)(ii)(I). However, the repeal of pre-1990 RRA Code Section 46(c)(8)(F) was accompanied by a narrowing of eligible energy property, with the result that property that qualifies for the energy credit necessarily satisfies the fifth condition in all events. Pre-1990 RRA Code Section 46(c)(8)(F)(iii).

First, the property must be energy property to which the at-risk limitation on the investment credit would otherwise apply. Pre-1990 RRA Code Section 46(c)(8)(F). As described above, the at-risk limitation rules generally apply to property that is placed in service by a taxpayer that is described in Code Section 465(a)(1) and is used in connection with an activity with respect to which losses are subject to limitation under Code Section 465. Whether the Solar Lenses are qualified energy property is only an issue if they would otherwise be subject to the at-risk limitation, so the Solar Lenses will satisfy this first requirement for being qualified energy property.

b. Energy Percentage Greater than Zero

Second, the energy percentage for the property must be more than zero at the time it is placed in service. Pre-1990 RRA Code Section 46(c)(8)(F)(ii). As noted in Section II.B. above, the energy percentage for the Solar Lenses will be either thirty percent (30%) or ten percent (10%). Therefore, the Solar Lenses satisfy this second requirement for being qualified energy property.

c. No More Than 75% Qualified Nonrecourse Financing

Third, as of the close of the tax year in which the property is placed in service, no more than seventy-five percent (75%) of the basis of the property may be attributable to nonqualified nonrecourse financing. Pre-1990 RRA Code Section 46(c)(8)(F)(ii). To be nonqualified nonrecourse financing, the financing must, among other things, be nonrecourse financing. Code Section 49(a)(1)(D)(i). Financing is "nonrecourse financing" if (i) the borrower/taxpayer is protected against loss through guarantees, stop-loss agreements or other similar arrangements or (ii) any amount borrowed from a person who has an interest (other than as a creditor) in the activity in which the property is used or from a person related to such a person. Code Section 49(a)(1)(D)(iii). A person has an interest other than as a creditor only if the person has either a capital interest in the activity or an interest in the net profits of the activity. Treas. Reg. Section 1.465-8(b)(1). For this purpose, a capital interest means an interest in the assets of the activity that is distributable to the owner of the capital interest upon liquidation of the activity. Treas. Reg. Section 1.465-8(b)(2).

The Buyer is not protected against loss through guarantees, stop-loss agreements or other similar arrangements – the Buyer is the only person that is liable with respect to the Installment Payments. Thus, the Buyer is not protected against loss through guarantees, stop-loss agreements or other similar arrangements within the meaning of such terms for purposes of Treas. Reg. Section 1.465-8(b)(2).

Likewise, Seller, the person providing the financing for the Solar Lenses, will not have an interest other than as a creditor in the activity in which the Solar Lenses will be used. Seller will not have a capital interest in such activity since it will not be entitled to receive any portion of the Solar Lenses in the event the Buyer decides to liquidate the activity. For example, if the Buyer decides to sell the Solar Lenses and liquidate, the Seller would not be entitled to a portion of the sale or liquidation proceeds except that Seller would be entitled to payment of the remaining balance of the Purchase Price, which right is consistent with the interests of a creditor. Similarly, Seller will not have an interest in the net profits of the activity since the amounts that it receives, both from Buyer in the form of Installment Payments and from Operator in the form of rental payments for the solar towers, receivers and other equipment, is not a function of the

net profits, as opposed to the gross receipts, from the activity. Therefore, the Installment Payments do not constitute either nonrecourse financing or nonqualified nonrecourse financing and the Solar Lenses satisfy this third requirement for being qualified energy property.

d. Level Payment Loan

Fourth, any nonqualified nonrecourse financing in connection with the property must consist of a loan in which each installment is substantially equal, a portion of each installment must be attributable to the repayment of principal, and that portion must be increased commensurately with decreases in the portion of the payment attributable to interest. Pre-1990 RRA Code Section 46(c)(8)(F)(ii)(II). Because the Installment Payments do not constitute nonqualified nonrecourse financing, there is no nonqualified nonrecourse financing with respect to the Solar Lenses. Therefore, the Solar Lenses satisfy this fourth requirement for being qualified energy property. Accordingly, Code Section 49 does not require any reduction in the basis of the Solar Lenses as determined in accordance with Code Section 1012 irrespective of whether the Buyer is described in Code Section 465(a)(1).

D. Placed in Service

Property is placed in service when it is "placed in a condition or state of readiness and availability for a specifically assigned function." Treas. Reg. Section 1.46-3(d)(1)(ii). However, the Tax Court has held that for property purchased for lease to others to be placed in service, "it is not necessary that the property actually be used during the taxable year in the taxpayer's profit-motivated venture. It is sufficient that the property be available for use." *Waddell v. Commissioner*, 86 T.C. 848 (1986), *citing Sears Oil Co. v. Commissioner*, 359 F.3d 191, 198 (2d Cir. 1966) and *Grow v. Commissioner*, 80 T.C. 314, 326-327 (1983). An important factor in the court's decision in *Waddell* was the fact that the taxpayers executed distribution agreements simultaneously with the purchase, thereby showing that the equipment was actually available for lease at the time of purchase even though it was not actually leased until more than a year later.

The Buyer will enter into the O&M Agreement, which effectively leases the Solar Lenses to the Operator, simultaneously with the execution of the Purchase Agreement. Thus, the Solar Lenses will be available for use in the Buyer's leasing operations as soon as they are manufactured and Buyer acquires them. Therefore, given the holdings in *Waddell* and the cases cited therein, the Solar Lenses will be considered to have been placed in service as soon as they are acquired by the Buyer even though they will not be installed and actually used by the Operator to generate electricity or solar process heat until some later date.

III. Deprecation

A. In General

Code Section 167(a) permits taxpayers to claim a depreciation deduction with respect to certain types of property used in a trade or business or held for the production of income. Code Section 168(a) provides that the depreciation deduction authorized by Code Section 167(a) for any tangible personal property is determined by using (i) the applicable depreciation method, (ii) the applicable recovery period and (iii) the applicable convention.

Code Section 168(b)(1) provides that the applicable depreciation method for property generally is the double declining balance method. There are exceptions to this general rule for various types of properties listed in Code Section 168(b)(2) and (3), but the Solar Lenses would not fall into any of the listed property types. Therefore, unless the Buyer elects otherwise, the applicable depreciation method for the Solar Lenses will be the double declining balance method.

Code Section 168(c) provides that the applicable recovery period for a property is determined by the recovery class of the property. Code Section 168(e)(B)(vi) provides that the 5-year recovery class includes property that is described in Code Section 48(a)(3)(A). Code Section 168(c) provides that the applicable recovery period for 5-year property is five (5) years. Therefore, the applicable recovery period for the Solar Lenses will be five (5).

Code Section 168(d) provides that the applicable convention for tangible personal property such as the Solar Lenses is generally the half-year convention. However, the applicable convention becomes the mid-quarter convention if the aggregate bases of depreciable property placed in service during the final three (3) months of the taxable year exceed forty percent (40%) of the aggregate bases of all depreciable property placed in service during such taxable year. Therefore, the applicable convention for the Solar Lenses will be either the half-year or the mid-quarter convention.

Code Section 167(c) provides that the basis for depreciation purposes is the property's adjusted basis determined in accordance with Code Section 1011 for purposes of determining the gain on the sale or other disposition of the property. Code Section 1011 provides that such basis is the basis as determined under Code Section 1012 and adjusted as provided in Section 1016 (and certain other provisions not applicable to the Solar Lenses). As noted above, Code Section 1012 provides that the basis of property is the cost of such property. Code Section 1016 provides that the cost basis must be adjusted by certain amounts, including the adjustment required by Code Section 50(c) for investment credit property. Code Section 50(c) provides that if an investment credit (including the energy credit) is claimed with respect to a property, that the basis of such property shall be reduced by an amount equal to fifty percent (50%) of the credit.

As noted above, the Buyer's cost basis in each Solar Lens will be the Purchase Price of Three Thousand Five Hundred Dollars ($3,500). Assuming the Buyer claims the energy tax credit prior to January 1, 2017, such that the energy credit would be equal to thirty (30%) of such basis amount, the reduction to basis required by Code Section 50(c) would be an amount equal to fifteen percent (15%). Therefore, the basis of each Solar Lens would be reduced to Two Thousand Nine Hundred Seventy-Five Dollars ($2,975) for purposes of calculating its depreciation deductions under Code Section 168(a).

IV. Limitations upon Use of Credits and Depreciation Deductions

A. At-Risk Limitations

Code Section 465(a) provides that the losses (in this case, depreciation deductions in excess of the Rental Payments) of certain taxpayers from certain activities are only allowed to the extent of the aggregate amount with respect to which the taxpayer is at risk with respect to such activity. The taxpayers subject to Code Section 465(a) include a subchapter C corporation that meets the ownership requirements of Code Section 542(a)(2), which are summarized above.

For purposes of Section 465(a), a taxpayer is considered to be at risk for an activity in amount equal to the sum of the amount of money or property contributed to the activity and certain amounts borrowed with respect to the activity. Code Section 465(b)(1). Taxpayers are considered to be at risk for borrowed amounts only if the taxpayer is personally liable for the repayment of such amounts or has pledged property (other than property used in such activity) as security for such borrowed amounts; provided that a taxpayer will not be considered to be at risk with respect to borrowed amounts to the extent such amounts are borrowed from a person who has an interest in the activity (other than as a creditor) or from a person who is related to such a person. Code Section 465(b)(2) and (b).

Whether an obligation constitutes debt for tax purposes ultimately depends upon whether there was "a genuine intention to create a debt, with a reasonable expectation of repayment, and did that intention comport with the economic reality of creating a debtor-creditor relationship." *Jensen v. Commissioner*, 208 F.2d 226 (10th Cir. 2000) (citing *Dixie Dairies Corp. v. Commissioner*, 74 T.C. 476, 494 (1980)). Courts consider a variety of factors in making this determination, including (i) whether the promise to repay was evidenced by a written agreement, (ii) interest was charged, (iii) a fixed maturity date and/or a fixed schedule for repayments was set forth in the instrument or by agreement, (iv) security or other collateral was given to ensure repayment, (v) repayments were made, (vi) the borrower was not insolvent at the time of the advance and (vii) the parties otherwise acted consistently with such transfer being a loan. *See e.g., Fisher v. United States*, 54 T.C. 905 (1970) and *Miller v. Commissioner*, T.C. Memo 1982-629. Of course, not every factor is relevant in every situation, and the weight assigned to each factor varies from situation to situation. As noted by the Supreme Court, "[t]here is no one characteristic . . . which can be said to be decisive in the determination of whether the obligations are . . . debts" for tax purposes." *John Kelley Co. v. Commissioner*, 326 U.S. 521, 530 (1946).

It is our understanding that the parties genuinely intend to create a debt in the form of the Promissory Note and Buyer's obligation to make the Installment Payments and that the parties intend for the Installment Payments to be made. Similarly, the economic relationship between the Buyer and Seller appears to comport with the economic reality of creating a debtor-creditor relationship. For example, the Buyer and Seller have evidenced their intent for the Buyer to make the Installment Payments in both the Purchase Agreement and the Promissory Note; they have agreed that the Installment Payments will bear interest at the long-term applicable federal rate; they have agreed upon a fixed schedule for repayments; the Buyer's obligation to make the Installment Payments is secured by the Solar Lenses, which the Seller may repossess in the event the Buyer fails to make the Installment Payments when due; the Buyer will not be insolvent when it enters into the Purchase Agreement and is expected to have sufficient cash flow to make the Installment Payments; and the parties have acted consistently with treating the Installment Payments as a loan. Therefore, the Installment Payments appear to be a bona fide debt for tax purposes.

As discussed in Section II.C.2.c above, the Buyer is personally liable for the Installment Payments and such amounts are not borrowed from a person who has an interest in the activity (other than as a creditor) in which the Solar Lenses will be used or from a person who is related to such a person. Therefore, the Buyer's amount at risk with respect to the Solar Lenses for purposes of Code Section 465 shall be an amount equal to the aggregate Purchase Price for the Solar Lenses.

B. Passive Activity Limitations

Code Section 469(a) provides that certain losses (in this case, depreciation deductions in excess of the Rental Payments) and credits associated with passive activities of certain taxpayers are only allowed to the extent of the taxpayer's income from passive activities. The taxpayers subject to Code Section 469 include closely-held subchapter C corporations. Code Section 469(a)(2). However, Code Section 469(e)(2) provides that a closely held subchapter C corporation that is not a personal service corporation can offset active income with passive activity losses and credits. Code Section 269A(b)(1) defines a personal service corporation as a corporation the principal activity of which is the performance of personal services and such services are substantially performed by employee-owners. Code Section 269A(b)(3) provides that all related persons, within the meaning of Code Section 144(a)(3), are treated as a single entity. Code Section 144(a)(3) defines a related person as anyone described in Code Sections 267, 707(b) or 1563(a) (except that 80% is substituted for 50% everywhere is appears in Code Section 1563(a)).

So long as a Buyer's principal activity is something other than the performance of personal services, the Buyer will be able to use the credits and losses attributable to the Solar Lenses to offset active income from other sources.

CIRCULAR 230 DISCLOSURE

The analysis set forth in this memorandum was not intended or written to be used, and it cannot be used, by any taxpayer for the purpose of avoiding United States federal tax penalties that may be imposed on the taxpayer. The analysis was written to support the promotion or marketing of the transactions or matters addressed in this memorandum. Each taxpayer should seek advice based upon the taxpayer's particular circumstances from an independent tax advisor. The foregoing language is intended to satisfy the requirements under the regulations in Section 10.35 of Circular 230.

EXHIBIT F

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LAW

¶3140.03.B. Energy Property

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Tax Practice Series
Tax Practice Series: Credits, Computations and AMT
¶3140: Investment Tax Credit
Explanation
¶3140.03. The Energy Credit

¶3140.03.B. Energy Property

TPS 3140.03.B.

"Energy property" is any property that satisfies the following conditions:[245]

[245] §48(a)(3). *See also* Reg. §1.48-9.

- The property must be qualified energy property.[246]

- The construction, reconstruction, or erection of the property must be completed by the taxpayer,[247] or acquired by the taxpayer if the original use of the property begins with the taxpayer.[248]

- The property must be property with respect to which depreciation or amortization is allowable.[249]

- The property must meet the applicable performance and quality standards.[250]

- The property must not be part of a facility the production from which is taken into account in computing the credit for electricity produced from certain renewable resources.[251]

- The property must not be property for which the taxpayer receives a grant in lieu of the energy credit.[252]

[246] §48(a)(3)(A).

[247] §48(a)(3)(B)(i).

[248] §48(a)(3)(B)(ii).

[249] §48(a)(3)(C).

[250] §48(a)(3)(D).

[251] §48(a)(3) (flush language) (reference to §45). However, qualified property that is part of a qualified investment credit facility (renewable electricity production credit facilities described in §45(d)(1), §45(d)(2), §45(d)(3), §45(d)(4), §45(d)(6), §45(d)(7), §45(d)(9), or §45(d)(11)) for which the taxpayer does not claim the renewable electricity production credit under §45, qualifies as energy property. §48(a)(5). For further discussion, see ¶3140.03.B.2., below.

[252] §48(d)(1). For further discussion of grants that are available in lieu of the energy credit, see ¶3140.03.B.3., below.

(1) Qualified Energy Property — TPS 3140.03.B.1.

Qualified energy property includes property that is solar energy property, solar illumination property for periods ending before January

1, 2017, geothermal deposit property, qualified fuel cell property, qualified microturbine property, and, combined heat and power system property, qualified small wind energy property, and geothermal heating and cooling equipment for periods ending before January 1, 2017.[253]

[253] §48(a)(3)(A). In Notice 2015-70, *2015-43 I.R.B. 604*, the IRS requested comments on qualifying energy property definitions in anticipation of issuing new regulations.

Energy property also includes property that is part of a renewable electricity production facility placed into service after 2008 and the construction of which begins before January 1, 2017 (January 1, 2020 in the case of a wind facility), for which (1) the taxpayer makes an irrevocable election to treat the facility as energy property; and (2) no renewable electricity production credit has been allowed.[254]

[254] §48(a)(5). The IRS will not issue a ruling or determination letter regarding the application of the beginning of construction requirement. Rev. Proc. 2017-3, *2017-1 I.R.B. 130*, §3.01(4), *modified by* Rev. Proc. 2017-38, *2017-22 I.R.B. 1258*. For a further discussion, see ¶3140.03.B.2., below.

(a) Solar Energy Property — TPS 3140.03.B.1.a.

Solar energy property is equipment that uses solar energy to generate electricity, to heat, cool, or provide hot water for use in a structure, or to provide solar process heat, but it does not include property used to generate energy for heating swimming pools.[255] Solar energy property includes equipment and materials, as well as parts related to the function of that equipment, that use solar energy directly to perform these functions, generally through the use of equipment such as collectors (to absorb sunlight and create hot liquids or air), storage tanks (to store hot liquids), rockbeds (to store hot air), thermostats (to activate pumps or fans which circulate the hot liquids or air), and heat exchangers (to utilize hot liquids or air to create hot air or water).[256] However, property that uses as an energy source fuel or energy derived indirectly from solar energy, such as ocean thermal energy, fossil fuel, or wood, is not considered solar energy property.[257]

[255] §48(a)(3)(A)(i). *See* PLR 200947027 and plr 201450013 (when installed with rooftop solar generation system of photovoltaic cells, reflective roof surface facilitates generation of additional electricity by causing sunshine to be reflected on cells' underside).

[256] Reg. §1.48-9(d)(1).

[257] Reg. §1.48-9(d)(1).

Solar energy property includes equipment that uses solar energy to generate electricity, and includes storage devices, power conditioning equipment, transfer equipment, and parts related to the functioning of those items. In general, this process involves the transformation of sunlight into electricity through the use of such devices as solar cells or other collectors. However, solar energy property used to generate electricity includes only equipment up to (but not including) the stage that transmits or uses electricity.[258] Equipment that uses solar energy beyond the distribution stage is eligible only if specially adapted to use solar energy.[259]

[258] Reg. §1.48-9(d)(3). *See* PLR 201444025 (generally, equipment essential to the functioning of solar power energy systems are energy property under §48, including equipment upon which solar panels are mounted, but such equipment that provides structural support for solar collectors may also provide structural support for lights and other equipment not used for the generation of solar energy, thus some portion of basis must be allocated to non-energy property). *But see* PLR 201308005 (photovoltaic system battery that, in addition to storing electricity, allows customers to supply excess electricity generated to local utility qualifies as solar energy property).

[259] Reg. §1.48-9(d)(5).

Pipes and ducts used exclusively to carry energy derived from solar energy are solar energy property for purposes of the energy credit.[260] Pipes and ducts that are used to carry both energy derived from the solar energy and energy derived from other sources are solar energy property only if their use of energy other than solar energy does not exceed 25% of their total energy input in an annual measuring period, and only to the extent of their basis or cost allocable to their use of solar energy during an annual measuring period.[261] The same rule applies to so-called "auxiliary equipment" such as hot water tanks, which is utilized by both auxiliary equipment and solar energy equipment.[262] Property used in this way is called "dual-use" equipment.[263]

[260] Reg. §1.48-9(d)(4).

[261] Reg. §1.48-9(d)(4).

[262] *Id.*

[263] Reg. §1.48-9(d)(6).

The annual measuring period for an item of dual-use equipment is the 365-day period beginning with the day it is placed in service, or a 365-day period beginning the day after the last day of the immediately preceding annual measuring period.[264] The allocation of energy use required for dual use equipment can be made by comparing, on a Btu basis, energy input to dual use equipment from solar energy with energy input from other sources.[265] However, the IRS will consider any other method that accurately establishes the relative annual use by dual-use equipment of solar energy and energy derived from other sources.[266]

[264] *Id.*

[265] *Id.*.

[266] *Id.*.

Solar energy property does not include so-called auxiliary equipment such as furnaces and hot water heaters that use a source of power other than solar energy to provide usable energy.[267] However, as described above, solar energy property does include dual use equipment such as ducts and hot water tanks, which is utilized by both auxiliary equipment and solar energy equipment, as long as not more than 25% of the equipment's use of energy is from sources other than solar energy.[268]

[267] *Id.*.

[268] *Id.* *See* PLR 201308005 (photovoltaic system battery subject to 25% test separate from rest of solar energy system for purposes of potential investment credit recapture).

Solar energy property does not include equipment that uses solar energy to generate steam at high temperatures for use in industrial or commercial processes (solar process heat).[269]

[269] Reg. §1.48-9(d)(7).

So-called "passive" solar energy systems do not qualify for the energy credit, even if they are combined with "active" solar systems.[270] An active solar system is based on the use of mechanically forced energy transfer, such as the use of fans or pumps to circulate solar generated energy.[271] Passive systems are based on the use of conductive, convective, or radiant energy transfer. Passive solar property includes greenhouses, solariums, roof ponds, glazing, and mass or water trombe walls.[272] Thus, these types of property do not qualify for the energy credit.

[270] Reg. §1.48-9(d)(2)(i).

[271] Reg. §1.48-9(d)(2)(ii).

[272] Reg. §1.48-9(d)(2)(iii).

Generally, buildings and their structural components do not qualify as "section 38 property" for purposes of the investment credit, of which the energy credit is a part.[273] Thus, buildings and such components also generally are not considered energy property. However, the IRS ruled that a photovoltaic curtain wall designed to use solar energy to generate electricity and as a structural component enclosing the exterior of the taxpayer's building constitutes energy property.[274] Similarly, when a structural component is an integrated and inseparable component of a single system, the IRS has ruled that the component qualifies for the credit.[275]

[273] Reg. §1.48-1(e)(1).

[274] PLR 201043023 (citing Reg. §1.48-9(b)(1)(i)).

[275] PLR 201121005 (citing Rev. Rul. 79-183, 1979-1 C.B. 44).

It is not necessary for solar energy property to comprise a completely functional solar system in order to qualify for the credit. The Tax Court has held that solar energy property is any equipment that uses solar energy to generate electricity, to heat, cool, or provide hot water for use in a structure, or to provide solar process heat, and includes parts solely related to the functioning of such equipment. Thus, an incomplete system made up of qualifying parts, such as collectors, storage tanks, thermostats, heat exchangers, etc., can qualify for the credit.[276]

[276] *Cooper v. Commissioner*, 88 T.C. 84 (1987).

Because property must be "placed in service" in order to qualify for the energy credit, it is of some importance to determine when property is actually placed in service. The Tax Court has determined that a lessor of solar energy property is deemed to have placed the property in service when it is first held out for leasing to others in a profit-motivated leasing venture.[277]

[277] *Id.* , relying on *Waddell v. Commissioner*, 86 T.C. 848 (1986).

Example— *Solar Property Qualifying for the Energy Credit*

In Year 1, Corporation X, a calendar year taxpayer, constructs an apartment building and purchases equipment to convert solar energy into heat for the building. All equipment is placed in service on Oct. 1 of Year 1. X also installs an oil-fired water heater and other equipment to provide a backup source of heat when the solar energy equipment cannot meet the energy needs of the building. On a BTU basis, 80% of the total energy input to the dual use equipment during the 365-day period beginning on Oct. 1 of Year 1 is from solar energy. In addition to the water heater, X purchases and places in service a roof solar collector, a heat exchanger, a hot water tank, a control component, pumps, pipes, fan-coil units, and valves. The fan-coil units could be used with energy derived from an oil or gas substance without significant modification. All items are depreciable and have a useful life of three years or more. The use of the equipment to heat the building is the first use to which the equipment has been put. Water is pumped from the basement through pipes to the roof solar collector. Heated water returns through pipes to a heat exchanger which transfers heat to the water in the hot water tank. The hot water tank and the oil-fired water heater utilize the same distribution pipe. Pumps and valves at the points of connection between the hot water tank, the oil-fired water heater, and the distribution pipe regulate the auxiliary energy supply use. They also prevent the oil-fired water heater from heating water in the hot water tank. An integrated control component determines whether hot water from the hot water tank or from the oil-fired water heater is distributed to fan-coil units located throughout the building. The roof solar collector is solar energy property. The pump

that moves the water to the roof collector and the pipes between the roof collector and the hot water tank qualify because they are solely related to transporting solar heated water. The hot water tank qualifies because it stores water heated solely by solar radiation. The heat exchanger also qualifies as energy property. The oil-fired water heater does not qualify as solar energy property because it is auxiliary equipment. The fan-coil units do not qualify as solar energy property because they are not specially adapted to use energy derived from solar energy. Because the distribution pipe, the control component, and the pumps and valves serve the oil-fired water heater as well as the solar energy equipment, they qualify only to the extent of 80% of their cost or basis, the portion allocable to the use of solar energy.[278]

[278] Reg. §1.48-9(d)(8).

(b) Solar Illumination Property — TPS 3140.03.B.1.b.

Solar illumination property is equipment that uses fiber-optic distributed sunlight to illuminate the inside of a structure, but only for periods ending before January 1, 2017.[279]

[279] §48(a)(3)(A)(ii).

(c) Geothermal Deposit Property — TPS 3140.03.B.1.c.

Geothermal deposit property is equipment used to produce, distribute, or use energy derived from a geothermal deposit,[280] but only, in the case of electricity generated by geothermal power, up to (but not including) the electrical transmission stage.[281] A geothermal deposit is a geothermal reservoir consisting of natural heat which is stored in rocks or in an aqueous liquid or vapor (whether or not under pressure).[282] Only geothermal deposits located in the United States or in a possession of the United States meet the definition of "geothermal deposit" for purposes of the energy credit.[283]

[280] Within the meaning of §613(e)(2).

[281] §48(a)(3)(A)(iii); Reg. §1.48-9(c)(10)(i).

[282] §613(e)(1), §613(e)(2).

[283] §613(e)(1).

Geothermal production equipment includes equipment necessary to bring geothermal energy from the subterranean deposit to the surface, including wellhead and downhole equipment, such as screening or slotting liners, tubing, downhole pumps, and associated equipment.[284] Reinjection wells required for production also may qualify.[285] "Production" does not include exploration and development.[286]

[284] Reg. §1.48-9(c)(10)(ii).

[285] *Id.*

[286] *Id.*

Geothermal distribution equipment includes equipment that transports geothermal steam or hot water from a geothermal deposit to the site of ultimate use.[287] If geothermal energy is used to generate electricity, distribution equipment includes equipment that transports hot water from the geothermal deposit to a power plant.[288] Distribution equipment also includes components of a heating system, such as pipes and ductwork that distribute within a building the energy derived from the geothermal deposit.[289]

[287] Reg. §1.48-9(c)(10)(iii).

[288] *Id.*

[289] *Id.*.

Geothermal equipment includes equipment that uses energy derived both from a geothermal deposit and from sources other than a geothermal deposit ("dual-use equipment"), as long as the portion of such equipment's use of energy from sources other than a geothermal deposit does not exceed 25% of its total energy input in an annual measuring period, and only to the extent of its basis or cost allocable to its use of energy from a geothermal deposit during an annual measuring period.[290] An annual measuring period for an item of dual-use geothermal equipment is the 365-day period beginning with the day it is placed in service or a 365-day period beginning the day after the last day of the immediately preceding annual measuring period.[291] The allocation of energy use required may be made by comparing, on a Btu basis, energy input to dual-use equipment from the geothermal deposit with energy input from other sources.[292] However, the IRS may accept any other method that accurately establishes the relative annual use by dual use equipment of energy derived from a geothermal deposit and energy derived from other sources.[293]

[290] Reg. §1.48-9(c)(10)(iv).

[291] *Id.*

[292] *Id.*

[293] *Id.*

The existence of a backup system designed for use only in the event of a failure in the system providing energy derived from a geothermal deposit will not disqualify any other equipment.[294] If geothermal energy is used to generate electricity, equipment using geothermal energy includes the electrical generating equipment, such as turbines and generators.[295] However, geothermal equipment does not include any electrical transmission equipment, such as transmission lines and towers, or any equipment beyond the electrical transmission stage, such as transformers and distribution lines.[296]

[294] Reg. §1.48-9(c)(10)(v).

[295] *Id.*

[296] *Id.*

Example (1)— *Geothermal Property Qualifying for the Energy Credit*

On Oct. 1, Year 1 Corporation X, a calendar year taxpayer, places in service a system which heats its office building by circulating hot water heated by energy derived from a geothermal deposit through the building. Geothermal equipment includes the circulation system, including the pumps and pipes which circulate the hot water through the building.[297]

[297] Reg. §1.48-9(c)(10)(vi), *Ex. 1.*

Example (2)— *Property Which Is Not Geothermal Property*

The facts are the same as in *Example 1* , above, except that X also places in service a boiler to produce hot water for heating the building exclusively in the event of a failure of the geothermal equipment. The boiler is not geothermal equipment, but the existence of the backup system does not serve to disqualify the eligible property described in *Example 1.*[298]

[298] Reg. §1.48-9(c)(10)(vi), *Ex. 2.*

Example (3)— *Dual-Use Property*

The facts are the same as in *Example 1*, above, except that the water heated by energy derived from a geothermal deposit is not hot enough to provide sufficient heat for the building. Therefore, the system includes an electric boiler in which the water is heated before being circulated in the heating system. On a Btu basis, 80% of the total energy input to the circulating system during the 365-day period beginning on Oct. 1, Year 1, is energy derived from a geothermal deposit. The boiler is not geothermal equipment. For Year 1, 80% of the circulating system is geothermal equipment because 80% of its basis or cost is allocable to use of energy from a geothermal deposit.[299]

[299] Reg. §1.48-9(c)(10)(vi), *Ex. 3.*

Example (4)— *Geothermal Property*

Corporation X acquires a commercial vegetable dehydration system in Year 1. The system operates by placing fresh vegetables on a conveyor belt and moving them through a dryer. The conveyor belt is powered by electricity. The dryer uses only energy derived from a geothermal deposit. The dryer is geothermal equipment while the equipment powered by electricity does not qualify.[300]

[300] Reg. §1.48-9(c)(10)(vi), *Ex. 4.*

Note: The Tax Court has held that the energy credit with respect to geothermal deposit property is not computed with respect to the taxpayer's basis in the entire facility but is limited to the basis of assets within the facility that actually distribute geothermal energy throughout the facility or that use geothermal energy in the operation of the equipment.[301] Thus, the court held that the owner of a commercial mushroom production facility that used geothermal energy could compute the credit with respect only to the pipes in the compost wharf that delivered the geothermal heat, the delivery system for the geothermally heated water used in the pasteurization unit structure, the pasteurization tunnels, and the grow rooms that used geothermal heat. In contrast, the credit was not allowed with respect to the compost preparation equipment, the transportation equipment used to move the compost to the compost wharf, the compost wharf aside from the pipes, the mushroom spawn sprinkling equipment, the transportation equipment used to move the spawned compost to grow rooms, and the harvesting, sorting, packaging, and shipping equipment.

[301] *Oregon Trail Mushroom Co. v. Commissioner*, T.C. Memo 1992-293.

(d) Qualified Fuel Cell Property — TPS 3140.03.B.1.d.

Qualified fuel cell property is a fuel cell power plant that satisfies two conditions.[302] First, it must have a nameplate capacity of at least 0.5 kilowatt of electricity using an electrochemical process.[302.1] Second, it must have an electricity-only generation efficiency greater than 30%.[302.2] A fuel cell power plant is an integrated system comprised of a fuel cell stack assembly and associated balance of plant components that converts a fuel into electricity using electrochemical means.[302.3] The credit for any fuel cell is limited to $1500 for each 0.5 kilowatts of capacity.[302.4] Qualified fuel cell property does not include any property for any period after December 31, 2016.[302.5]

[302] §48(c)(1)(A). *See also* Notice 2008-68, *2008-34 I.R.B. 418*, §3.01-§3.03, effective for property placed in service after Aug. 25, 2008, though taxpayers may apply this notice to property placed in service after Dec. 31, 2005, and before Jan. 2, 2009. Notice 2008-68, §8.

[302.1] §48(c)(1)(A)(i).

[302.2] §48(c)(1)(A)(ii).

[302.3] §48(c)(1)(C).

[302.4] §48(c)(1)(B).

[302.5] §48(c)(1)(D).

(e) Qualified Microturbine Property — TPS 3140.03.B.1.e.

Qualified microturbine property is a stationary microturbine power plant that satisfies two conditions.[303] First, it must have a nameplate capacity of less than 2,000 kilowatts.[303.1] Second, it must have an electricity-only generation efficiency of not less than 26% at International Standard Organization conditions.[303.2] A stationary microturbine power plant is an integrated system comprised of a gas turbine engine, a combustor, a recuperator or regenerator, a generator or alternator, and associated balance of plant components that converts a fuel into electricity and thermal energy.[303.3] A stationary microturbine power plant also includes all secondary components located between the existing infrastructure for fuel delivery and the existing infrastructure for power distribution, including equipment and controls for meeting relevant power standards, such as voltage, frequency and power factors.[303.4] The credit for any microturbine property is limited to $200 for each kilowatt of capacity.[303.5] Qualified microturbine property does not include any property for any period after December 31, 2016.[303.6]

[303] §48(c)(2)(A). *See also* Notice 2008-68, *2008-34 I.R.B. 418*, §3.01-.03, effective for property placed in service after Aug. 25, 2008, though taxpayers may apply this notice to property placed in service after Dec. 31, 2005, and before Jan. 2, 2009. Notice 2008-68, §8.

[303.1] §48(c)(2)(A)(i).

[303.2] §48(c)(2)(A)(ii).

[303.3] §48(c)(2)(C).

[303.4] *Id.*

[303.5] §48(c)(2)(B).

[303.6] §48(c)(2)(D).

(f) Combined Heat and Power System Property — TPS 3140.03.B.1.f.

Combined heat and power system property is property that makes up a system that meets four requirements.[304] First, the system must use the same energy source for the simultaneous or sequential generation of electrical power, mechanical shaft power, or both, in combination with the generation of steam or other forms of useful thermal energy (including heating and cooling applications).[304.1] Second, the system must produce (1) at least 20% of its total useful energy in the form of thermal energy which is not used to produce electrical or mechanical power or a combination thereof, and (2) at least 20% of its total useful energy in the form of electrical or mechanical power or a combination thereof.[304.2] Third, the system's energy efficiency percentage must exceed 60%.[304.3] Fourth, the system must be placed in service before January 1, 2017.[304.4] The energy efficiency percentage of a system is a fraction, the numerator of which is the total useful electrical, thermal, and mechanical power produced by the system at normal operating rates, and expected to be consumed in its normal application, and the denominator of which is the

lower heating value of the fuel sources for the system.[304.5] A system designed to use biomass does not have to meet the 60% energy efficiency percentage requirement, but the credit is prorated if that requirement is not met.[304.6]

[304] §48(c)(3)(A).

[304.1] §48(c)(3)(A)(i).

[304.2] §48(c)(3)(A)(ii). The percentages are determined on a Btu basis. §48(c)(3)(C)(ii).

[304.3] §48(c)(3)(A)(iii).

[304.4] §48(c)(3)(A)(iv).

[304.5] §48(c)(3)(C)(i). The energy efficiency percentage is determined on a Btu basis. §48(c)(3)(C)(ii).

[304.6] §48(c)(3)(D).

Combined heat and power system property does not include property used to transport the energy source to the facility or to distribute energy produced by the facility.[304.7]

[304.7] §48(c)(3)(C)(iii).

If the electrical capacity of a combined heat and power system placed in service during the taxable year exceeds the applicable capacity, the credit amount is reduced proportionally.[304.8] The applicable capacity is 15 megawatts or a mechanical energy capacity of more than 20,000 horsepower or an equivalent combination of electrical and mechanical energy capacities.[304.9] Combined heat and power system property does not include any property making up a system that has a capacity greater than 50 megawatts or a mechanical energy capacity greater than 67,000 horsepower or an equivalent combination of electrical and mechanical energy capacities.[304.10]

[304.8] Thus, the allowable credit amount is the full credit amount multiplied by the ratio of the applicable capacity to the capacity of the property. §48(c)(3)(B)(i).

[304.9] §48(c)(3)(B)(ii).

[304.10] §48(c)(3)(B)(iii).

(g) Qualified Small Wind Energy Property — TPS 3140.03.B.1.g.

Qualified small wind energy property is property that uses a qualifying small wind turbine (a wind turbine that has a nameplate capacity of 100 kilowatts or less) to generate electricity.[305] Qualified small wind energy property does not include any property for any period after December 31, 2016.[305.1]

[305] §48(c)(4)(A), §48(c)(4)(B). Qualifying small wind energy property must meet certain performance and quality standards. *See* Notice 2015-4, *2015-5 I.R.B. 407*, *modified by* Notice 2015-51, *2015-31 I.R.B. 133* (effective dates).

[305.1] §48(c)(4)(C).

(h) Geothermal Heating and Cooling Equipment — TPS 3140.03.B.1.h.

Geothermal heating and cooling equipment is equipment that uses the ground or ground water as a thermal energy source to heat a structure or as a thermal energy sink to cool a structure, but only with respect to periods ending before January 1, 2017.

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[306] §48(a)(3)(A)(vii).

(2) Election of Energy Credit in Lieu of Renewable Electricity Production Credit — TPS 3140.03.B.2.

Effective for renewable electricity production facilities placed in service after 2008, the construction of which begins before January 1, 2017 (January 1, 2020 in the case of a wind facility),[307] taxpayers otherwise entitled to the renewable electricity production credit (determined on a cents-per-kilowatt hour basis) may elect the energy credit in lieu of the production credit (referencing §45).[307.1] The election is irrevocable.[307.2] The energy percentage is 30% for such property.[307.3] Under the election, any qualified property that is part of a qualified investment credit facility is treated as energy property for purposes of the energy credit.[307.4] If the taxpayer makes the election, no production credit for any year is allowed for any qualified investment credit facility.[307.5]

[307] §48(a)(5). See Notice 2013-29, *2013-20 I.R.B. 1085*, *clarified by* Notice 2013-60, *2013-44 I.R.B. 431*, *clarified and modified by* Notice 2014-46, *2014-36 I.R.B. 520*, as updated by Notice 2015-25, *2015-13 I.R.B. 814*, *clarified and modified* by Notice 2016-31, *2016-23 I.R.B. 1025*, as *clarified and modified by* Notice 2017-4, *2017-4 I.R.B. 541*, for methods of establishing that construction of a qualified facility has begun.

[307.1] §48(a)(5). The IRS will not issue a ruling or determination letter regarding the application of the beginning of construction requirement. Rev. Proc. 2017-3, *2017-1 I.R.B. 130*, §3.01(4), *modified by* Rev. Proc. 2017-38, *2017-22 I.R.B. 1258*. See ¶3170.05.C., for a discussion of the renewable electricity production credit.

[307.2] §48(a)(5)(C)(iii)(II).

[307.3] §48(a)(5)(A)(ii).

[307.4] §48(a)(5)(A)(i).

[307.5] §48(a)(5)(B).

(a) Qualified Investment Credit Facility — TPS 3140.03.B.2.a.

A qualified investment credit facility is any of the following facilities if no production credit has been allowed for that facility:[308]

[308] §48(a)(5)(C). *See also* Reg. §1.48-9, which applies to §48(a)(3) energy property and presumably analogous to §48(a)(5) energy property to the extent that property is covered by both provisions, e.g., property used to produce electricity from geothermal deposits or wind energy property. *See, e.g.*, CCA 201122018 (Reg. §1.48-9(e) cited with respect to §48(a)(5)(D) wind energy property determination); PLR 201208035 (Reg. §1.48-9(e) cited as authority for determination storage device qualified as wind energy property).

- A qualified wind facility placed in service after 2008, the construction of which begins before January 1, 2020.[308.1]

- A qualified closed-loop biomass facility placed in service after 2008, the construction of which begins before January 1, 2017.[308.2]

- A qualified open-loop biomass facility placed in service after 2008, the construction of which begins before January 1, 2017.[308.3]

- A qualified geothermal facility placed in service placed in service after 2008, the construction of which begins before January 1, 2017.[308.4]

• A qualified landfill gas facility placed in service after 2008, the construction of which begins before January 1, 2017.[308.5]

• A qualified trash facility placed in service after 2008, the construction of which begins before January 1, 2017.[308.6]

• A qualified hydropower facility placed in service after 2008 and the construction of which begins before January 1, 2017.[308.7]

• A qualified marine and hydrokinetic renewable energy facility placed in service after 2008 and the construction of which begins before January 1, 2017.[308.8]

[308.1] §48(a)(5)(C)(i) (reference to §45(d)(1)), §48(a)(5)(C)(ii).

[308.2] §48(a)(5)(C)(i) (reference to §45(d)(2)), §48(a)(5)(C)(ii).

[308.3] §48(a)(5)(C)(i) (reference to §45(d)(3)), §48(a)(5)(C)(ii).

[308.4] §48(a)(5)(C)(i) (reference to §45(d)(4)), §48(a)(5)(C)(ii).

[308.5] §48(a)(5)(C)(i) (reference to §45(d)(6)), §48(a)(5)(C)(ii).

[308.6] §48(a)(5)(C)(i) (reference to §45(d)(7)), §48(a)(5)(C)(ii).

[308.7] §48(a)(5)(C)(i) (reference to §45(d)(9)), §48(a)(5)(C)(ii).

[308.8] §48(a)(5)(C)(i) (reference to §45(d)(11)), §48(a)(5)(C)(ii).

The IRS provides two alternative methods for establishing that construction has begun; the first method is based on starting work of a significant nature (Physical Work Test), while the second method is a financial safe harbor (Five Percent Safe Harbor). These methods require that a taxpayer make continuous progress towards completion once construction has begun. A taxpayer need only satisfy one method. Whether the taxpayer is making continuous progress towards completion under the Physical Work Test is determined by a continuous construction test and by a continuous efforts test under the Five Percent Safe Harbor.[308.9] If a facility is placed in service by the later of (1) a year within a four year period after the beginning of construction began, or (2) December 31, 2018, the facility will be considered to satisfy both the continuous construction and continuous effort tests (Continuity Safe Harbor).[308.10] For example, if construction begins on a facility on January 15, 2016, and the facility is placed in service by December 31, 2020, the facility will be considered to satisfy the Continuity Safe Harbor. If a facility does not meet the Continuity Safe Harbor, whether that facility satisfies the continuous construction test or the continuous effort test will be determined by the relevant facts and circumstances.[308.11]

[308.9] Notice 2013-29, *2013-20 I.R.B. 1085*, *clarified by* Notice 2013-60, *2013-44 I.R.B. 431*, *clarified and modified by* Notice 2014-46, *2014-36 I.R.B. 520*, as updated by Notice 2015-25, *2015-13 I.R.B. 814*, *clarified and modified* by Notice 2016-31, *2016-23 I.R.B. 1025*, *clarified and modified by* Notice 2017-4, *2017-4 I.R.B. 541*. Notice 2013-60, *clarified and modified by* Notice 2014-46, also clarifies the effect of various types of transfers after construction has begun on a particular facility. Note that the IRS will not issue a ruling or determination letter regarding the application of the beginning of construction requirement. Rev. Proc. 2017-3, *2017-1 I.R.B. 130*, §3.01(4), *modified by* Rev. Proc. 2017-38, *2017-22 I.R.B. 1258*.

[308.10] Notice 2017-4, *2017-4 I.R.B. 541*, *clarifying and modifying* Notice 2013-29, Notice 2013-60, Notice 2014-46, Notice 2015-25, and Notice 2016-31.

[308.11] Notice 2013-60.

Qualified property is property that meets four tests. First, it must be either (1) tangible personal property,[308.12] or (2) other tangible property (not including a building or its structural components), but only if the property is used as an integral part of the qualified investment credit facility.[308.13] Second, depreciation (or amortization in lieu of depreciation) must be allowable for the property.[308.14] Third, the property must be constructed, reconstructed, erected, or acquired by the taxpayer.[308.15] Fourth, the original use of the property must commence with the taxpayer claiming the credit.[308.16]

[308.12] §48(a)(5)(D)(i)(I).

[308.13] §48(a)(5)(D)(i)(II).

[308.14] §48(a)(5)(D)(ii).

[308.15] §48(a)(5)(D)(iii).

[308.16] §48(a)(5)(D)(iv).

Taxpayers also may elect a grant in lieu of the credit for qualified property. This election is discussed further in ¶3140.03.B.3., below.

(b) Election Procedures — TPS 3140.03.B.2.b.

To make the irrevocable election to treat a qualified facility as a qualified investment credit facility, the taxpayer must make a separate claim for the energy credit on each qualified property that is an integral part of the facility using a completed Form 3468 filed with the taxpayer's timely filed (including extensions) income tax return for the year in which the property is placed in service.[309] The taxpayer must attach to Form 3468 a statement, executed under penalties of perjury, that includes:[309.1]

[309] Notice 2009-52, *2009-25 I.R.B. 1094*, §2.

[309.1] *Id.*

- the taxpayer's name, taxpayer identification number, address, and telephone number;
- a detailed technical description of each qualified investment credit facility, including generating capacity;
- a detailed technical description of the energy property placed in service during the taxable year, including a statement that the property is an integral part of the facility;
- the date the property was placed in service;
- a depreciation schedule reflecting the taxpayer's remaining basis after the energy credit is claimed; and
- a statement that the taxpayer has not and will not claim a Treasury grant for this property.

(3) Coordination with Renewable Energy Grants — TPS 3140.03.B.3.

The Secretary of the Treasury is authorized to provide a grant for specified energy property that is originally placed in service in 2009, 2010, or 2011 by the person receiving the grant, and specified energy property that is placed in service after 2011 but before the credit expiration date, if construction began during 2009, 2010, or 2011.[310]

[310] American Recovery and Reinvestment Act of 2009 (2009 ARRA), *Pub. L. No. 111-5*, §1603(a), §1603(d)(1) (referencing §45(d)). Grants originally were available only for energy property placed in service in 2009 or 2010. The Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (2010 TRA), Pub. L. No. 111-312, §707(a), amended 2009 ARRA §1603 to make grants available for energy property placed in service in 2011. The American Taxpayer Relief Act of 2012 (2012 ATRA), Pub. L. No. 112-240, §407(c), amended 2009 ARRA §1603 to clarify that the person receiving the grant had to be the person who originally placed the property in service.

The grant amount is 30% of the basis of the property that would be eligible for the energy credit[310.1] (10% for qualified microtubine, combined heat and power system, or geothermal heat pump property[310.2]) and 30% for the basis of property that would compromise a renewable electricity production credit-eligible facility.[310.3] Grants for qualified fuel cell property are limited to $1,500 for each 0.5 kilowatt of capacity.[310.4] Grants for microturbines are limited to $200 for each kilowatt of capacity.[310.5] Grants for combined heat and power systems are limited to the amount which bears the same ratio to 30% of the basis as the applicable capacity bears to the capacity of the property.[310.6] Property must be depreciable or amortizable in order to receive a grant.[310.7]

[310.1] 2009 ARRA §1603(b)(2)(A). *See Alta Wind I Owner-Lessor C v. United States*, *No. 13-402T* (Fed. Cl. Oct. 31, 2016) (eligible basis computed using purchase price under §1012 and not residual method under §1060 as there was no applicable asset acquisition); *RP1 Fuel Cell, LLC v. United States*, No. 13-552C (Fed. Cl. Mar. 31, 2015) (grant amount determined including cost basis of gas conditioning equipment, which court determined was qualified fuel cell property).

[310.2] 2009 ARRA §1603(b)(2)(B).

[310.3] 2009 ARRA §1603(b)(2)(A).

[310.4] 2009 ARRA §1603(b)(3) (referencing §48(c)(1)(B).

[310.5] 2009 ARRA §1603(b)(3) (referencing §48(c)(2)(B).

[310.6] 2009 ARRA §1603(b)(3) (referencing §48(c)(3)(B)).

[310.7] 2009 ARRA §1603(d) (flush language). For analysis of whether specific property that is part of a wind facility is eligible for a grant, see CCA 201122018.

Note: Due to the sequestration, the §1603 payment amount was less than the award amount. A §1603 award made on or after March 1, 2013 and before October 1, 2013 was subject to a sequestration reduction of 8.7%, and a §1603 award made on or after October 1, 2013, and before October 1, 2014 was subject to a reduction of 7.2%.[310.8]

[310.8] Notice 2014-39, *2014-26 I.R.B. 1109*.

The amount of a grant under this provision is not includible in gross income.[310.9] However, the basis of the property is reduced by 50% of the amount of the grant.[310.10] The grant amount and basis of the specified property is not affected by the reduced payment amount due to sequestration.[310.11]

[310.9] §48(d)(3)(A).

[310.10] §48(d)(3)(B); Notice 2012-23, *2012-11 I.R.B. 483*, Q&A-1. Basis is not reduced by the amount of the grant that is deemed to be excessive. *See* AM 2011-004. *See also* Notice 2014-39 (Basis reduced by actual payment amount and not award amount where payment amount less due to sequestration).

[310.11] Notice 2014-39. A taxpayer may not partition the basis of the specified property and claim a tax credit under §45 or §48. *Id.*

Grants are payable to the party entitled to the credits.[310.12] Payments of the grant must be made during the 60-day period beginning on the date of application, or the date the property is placed in service, whichever is later.[310.13]

[310.12] 2009 ARRA §1603(a).

[310.13] 2009 ARRA §1603(c).

Grant applications had to be received before October 1, 2012.[310.14]

[310.14] 2009 ARRA §1603(j), as amended by the 2010 TRA, §707(b).

The Department of Treasury provides guidance under this program on its website.[310.15]

[310.15] See U.S. Treasury Department, Payments for Specified Energy Property in Lieu of Tax Credits under the American Recovery and Reinvestment Act of 2009—Program Guidance (Apr. 2011), available at http://www.treasury.gov/initiatives/recovery/Pages/1603.aspx.

Grants may not be made to any Federal, state, or local government (or political subdivision, agency, or instrumentality thereof),[310.16] any §501(c) tax-exempt entity,[310.17] or any clean renewable energy bond lender or cooperative electric company.[310.18] Additionally, no grant may be made to a partnership or other pass-through entity partner of any of these entities.[310.19]

[310.16] 2009 ARRA §1603(g)(1).

[310.17] 2009 ARRA §1603(g)(2).

[310.18] 2009 ARRA §1603(g)(3) (reference to §54(j)).

[310.19] 2009 ARRA §1603(g)(4). *See* Notice 2012-23, *2012-11 I.R.B. 483*, Q&A-3.

The Secretary of the Treasury must apply rules to grants made under this provision relating to the investment credit, including recapture provisions.[310.20]

[310.20] 2009 ARRA §1603(f) (reference to §50).

If the taxpayer receives an energy credit for property for any tax year ending before the grant is made, the amount of the credit is recaptured, the credit carryforwards must be adjusted, and the grant is determined without regard to any reduction in basis by reason of the prior credit.[310.21]

[310.21] §48(d)(2).

Note: The Court of Federal Claims has held that only a portion of a plant's costs are eligible for reimbursement under 2009 ARRA §1603, i.e., the costs of the plant had to be reasonably allocated between the plant's qualifying and nonqualifying functions (i.e., electrical generation versus thermal energy production for industrial purposes). The taxpayer had constructed an open-loop biomass cogeneration plant adjacent to an industrial facility. The biomass plant used the steam from an open-loop boiler to produce electricity from a turbine, and then used the remaining steam (i.e., the bulk of steam produced) for industrial processes. Approximately one-third of the plant's energy output generated electricity, whereas two-thirds of this output was used for industrial purposes in the industrial facility next door. The electricity generation allowed the plant to qualify for state and federal renewable energy incentives under 2009 ARRA §1603. The taxpayer claimed an eligible cost basis of $9,037,769, and requested reimbursement of $2,711,331 (30% of the cost basis). However, the government approved reimbursement of only $943,754, representing the cost of the turbine and one-third of all other costs. The court noted that, in light of the plant's substantial thermal energy production and comparatively small electrical generation, the eligible cost basis of the plant was limited to the portion relating to electrical energy production.[310.22]

[310.22] *W.E. Partners II, LLC v. United States*, No. 13-54, 2015 BL 6023 (Fed. Cl. Jan. 12, 2015).

(4) Applicable Quality and Performance Standards — TPS 3140.03.B.4.

The applicable performance and quality standards are those, if any, prescribed by IRS regulations in consultation with the Secretary of Energy[311] and that are in effect when the property is acquired.[312] If no standards are in effect when the property is acquired, the property need not meet any standards issued at a later date.[313]

[311] §48(a)(3)(D)(i).

[312] §48(a)(3)(D)(ii); Reg. §1.48-9(m)(1).

[313] IR-2134 (June 8, 1979).

For this purpose, property is considered to be acquired on the date the taxpayer enters into a binding contract to acquire the property, or, for property constructed, reconstructed, or erected by the taxpayer, the earlier of the date it begins the construction, reconstruction, or erection of the property, or the date the taxpayer and another person enter into a binding contract requiring each to construct, reconstruct, or erect property and place the property in service for an agreed-upon use.[314] A binding contract to construct, reconstruct, or erect property, or to acquire property, is a contract that is binding at all times on the taxpayer under applicable state or local law.[315] A binding contract to construct, reconstruct, or erect property or to acquire property does not include a contract for preparation of architect's sketches, blueprints, or performance of any other activity not involving the beginning of physical work.[315.1]

[314] Reg. §1.48-9(m)(2).

[315] Reg. §1.48-9(m)(3).

[315.1] Reg. §1.48-9(m)(3). See the example under Reg. §1.48-9(m)(4).

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¶3140.03.B. Energy Property

TPS 3140.03.B.

"Energy property" is any property that satisfies the following conditions:[245]

[245] §48(a)(3). *See also* Reg. §1.48-9.

- The property must be qualified energy property.[246]
- The construction, reconstruction, or erection of the property must be completed by the taxpayer,[247] or acquired by the taxpayer if the original use of the property begins with the taxpayer.[248]
- The property must be property with respect to which depreciation or amortization is allowable.[249]
- The property must meet the applicable performance and quality standards.[250]
- The property must not be part of a facility the production from which is taken into account in computing the credit for electricity produced from certain renewable resources.[251]
- The property must not be property for which the taxpayer receives a grant in lieu of the energy credit.[252]

[246] §48(a)(3)(A).

[247] §48(a)(3)(B)(i).

[248] §48(a)(3)(B)(ii).

[249] §48(a)(3)(C).

[250] §48(a)(3)(D).

[251] §48(a)(3) (flush language) (reference to §45). However, qualified property that is part of a qualified investment credit facility (renewable electricity production credit facilities described in §45(d)(1), §45(d)(2), §45(d)(3), §45(d)(4), §45(d)(6), §45(d)(7), §45(d)(9), or §45(d)(11)) for which the taxpayer does not claim the renewable electricity production credit under §45, qualifies as energy property. §48(a)(5). For further discussion, see ¶3140.03.B.2., below.

[252] §48(d)(1). For further discussion of grants that are available in lieu of the energy credit, see ¶3140.03.B.3., below.

(1) Qualified Energy Property — TPS 3140.03.B.1.

Qualified energy property includes property that is solar energy property, solar illumination property for periods ending before January

1, 2017, geothermal deposit property, qualified fuel cell property, qualified microturbine property, and, combined heat and power system property, qualified small wind energy property, and geothermal heating and cooling equipment for periods ending before January 1, 2017.[253]

[253] §48(a)(3)(A). In Notice 2015-70, *2015-43 I.R.B. 604*, the IRS requested comments on qualifying energy property definitions in anticipation of issuing new regulations.

Energy property also includes property that is part of a renewable electricity production facility placed into service after 2008 and the construction of which begins before January 1, 2017 (January 1, 2020 in the case of a wind facility), for which (1) the taxpayer makes an irrevocable election to treat the facility as energy property; and (2) no renewable electricity production credit has been allowed.[254]

[254] §48(a)(5). The IRS will not issue a ruling or determination letter regarding the application of the beginning of construction requirement. Rev. Proc. 2017-3, *2017-1 I.R.B. 130*, §3.01(4), *modified by* Rev. Proc. 2017-38, *2017-22 I.R.B. 1258*. For a further discussion, see ¶3140.03.B.2., below.

(a) Solar Energy Property — TPS 3140.03.B.1.a.

Solar energy property is equipment that uses solar energy to generate electricity, to heat, cool, or provide hot water for use in a structure, or to provide solar process heat, but it does not include property used to generate energy for heating swimming pools.[255] Solar energy property includes equipment and materials, as well as parts related to the function of that equipment, that use solar energy directly to perform these functions, generally through the use of equipment such as collectors (to absorb sunlight and create hot liquids or air), storage tanks (to store hot liquids), rockbeds (to store hot air), thermostats (to activate pumps or fans which circulate the hot liquids or air), and heat exchangers (to utilize hot liquids or air to create hot air or water).[256] However, property that uses as an energy source fuel or energy derived indirectly from solar energy, such as ocean thermal energy, fossil fuel, or wood, is not considered solar energy property.[257]

[255] §48(a)(3)(A)(i). *See* PLR 200947027 and plr 201450013 (when installed with rooftop solar generation system of photovoltaic cells, reflective roof surface facilitates generation of additional electricity by causing sunshine to be reflected on cells' underside).

[256] Reg. §1.48-9(d)(1).

[257] Reg. §1.48-9(d)(1).

Solar energy property includes equipment that uses solar energy to generate electricity, and includes storage devices, power conditioning equipment, transfer equipment, and parts related to the functioning of those items. In general, this process involves the transformation of sunlight into electricity through the use of such devices as solar cells or other collectors. However, solar energy property used to generate electricity includes only equipment up to (but not including) the stage that transmits or uses electricity.[258] Equipment that uses solar energy beyond the distribution stage is eligible only if specially adapted to use solar energy.[259]

[258] Reg. §1.48-9(d)(3). *See* PLR 201444025 (generally, equipment essential to the functioning of solar power energy systems are energy property under §48, including equipment upon which solar panels are mounted, but such equipment that provides structural support for solar collectors may also provide structural support for lights and other equipment not used for the generation of solar energy, thus some portion of basis must be allocated to non-energy property). *But see* PLR 201308005 (photovoltaic system battery that, in addition to storing electricity, allows customers to supply excess electricity generated to local utility qualifies as solar energy property).

[259] Reg. §1.48-9(d)(5).

Pipes and ducts used exclusively to carry energy derived from solar energy are solar energy property for purposes of the energy credit.[260] Pipes and ducts that are used to carry both energy derived from the solar energy and energy derived from other sources are solar energy property only if their use of energy other than solar energy does not exceed 25% of their total energy input in an annual measuring period, and only to the extent of their basis or cost allocable to their use of solar energy during an annual measuring period.[261] The same rule applies to so-called "auxiliary equipment" such as hot water tanks, which is utilized by both auxiliary equipment and solar energy equipment.[262] Property used in this way is called "dual-use" equipment.[263]

[260] Reg. §1.48-9(d)(4).

[261] Reg. §1.48-9(d)(4).

[262] *Id.*

[263] Reg. §1.48-9(d)(6).

The annual measuring period for an item of dual-use equipment is the 365-day period beginning with the day it is placed in service, or a 365-day period beginning the day after the last day of the immediately preceding annual measuring period.[264] The allocation of energy use required for dual use equipment can be made by comparing, on a Btu basis, energy input to dual use equipment from solar energy with energy input from other sources.[265] However, the IRS will consider any other method that accurately establishes the relative annual use by dual-use equipment of solar energy and energy derived from other sources.[266]

[264] *Id.*

[265] *Id.*.

[266] *Id.*.

Solar energy property does not include so-called auxiliary equipment such as furnaces and hot water heaters that use a source of power other than solar energy to provide usable energy.[267] However, as described above, solar energy property does include dual use equipment such as ducts and hot water tanks, which is utilized by both auxiliary equipment and solar energy equipment, as long as not more than 25% of the equipment's use of energy is from sources other than solar energy.[268]

[267] *Id.*.

[268] *Id.* *See* PLR 201308005 (photovoltaic system battery subject to 25% test separate from rest of solar energy system for purposes of potential investment credit recapture).

Solar energy property does not include equipment that uses solar energy to generate steam at high temperatures for use in industrial or commercial processes (solar process heat).[269]

[269] Reg. §1.48-9(d)(7).

So-called "passive" solar energy systems do not qualify for the energy credit, even if they are combined with "active" solar systems.[270] An active solar system is based on the use of mechanically forced energy transfer, such as the use of fans or pumps to circulate solar generated energy.[271] Passive systems are based on the use of conductive, convective, or radiant energy transfer. Passive solar property includes greenhouses, solariums, roof ponds, glazing, and mass or water trombe walls.[272] Thus, these types of property do not qualify for the energy credit.

[270] Reg. §1.48-9(d)(2)(i).

[271] Reg. §1.48-9(d)(2)(ii).

[272] Reg. §1.48-9(d)(2)(iii).

Generally, buildings and their structural components do not qualify as "section 38 property" for purposes of the investment credit, of which the energy credit is a part.[273] Thus, buildings and such components also generally are not considered energy property. However, the IRS ruled that a photovoltaic curtain wall designed to use solar energy to generate electricity and as a structural component enclosing the exterior of the taxpayer's building constitutes energy property.[274] Similarly, when a structural component is an integrated and inseparable component of a single system, the IRS has ruled that the component qualifies for the credit.[275]

[273] Reg. §1.48-1(e)(1).

[274] PLR 201043023 (citing Reg. §1.48-9(b)(1)(i)).

[275] PLR 201121005 (citing Rev. Rul. 79-183, 1979-1 C.B. 44).

It is not necessary for solar energy property to comprise a completely functional solar system in order to qualify for the credit. The Tax Court has held that solar energy property is any equipment that uses solar energy to generate electricity, to heat, cool, or provide hot water for use in a structure, or to provide solar process heat, and includes parts solely related to the functioning of such equipment. Thus, an incomplete system made up of qualifying parts, such as collectors, storage tanks, thermostats, heat exchangers, etc., can qualify for the credit.[276]

[276] *Cooper v. Commissioner*, 88 T.C. 84 (1987).

Because property must be "placed in service" in order to qualify for the energy credit, it is of some importance to determine when property is actually placed in service. The Tax Court has determined that a lessor of solar energy property is deemed to have placed the property in service when it is first held out for leasing to others in a profit-motivated leasing venture.[277]

[277] *Id.*, relying on *Waddell v. Commissioner*, 86 T.C. 848 (1986).

Example— *Solar Property Qualifying for the Energy Credit*

In Year 1, Corporation X, a calendar year taxpayer, constructs an apartment building and purchases equipment to convert solar energy into heat for the building. All equipment is placed in service on Oct. 1 of Year 1. X also installs an oil-fired water heater and other equipment to provide a backup source of heat when the solar energy equipment cannot meet the energy needs of the building. On a BTU basis, 80% of the total energy input to the dual use equipment during the 365-day period beginning on Oct. 1 of Year 1 is from solar energy. In addition to the water heater, X purchases and places in service a roof solar collector, a heat exchanger, a hot water tank, a control component, pumps, pipes, fan-coil units, and valves. The fan-coil units could be used with energy derived from an oil or gas substance without significant modification. All items are depreciable and have a useful life of three years or more. The use of the equipment to heat the building is the first use to which the equipment has been put. Water is pumped from the basement through pipes to the roof solar collector. Heated water returns through pipes to a heat exchanger which transfers heat to the water in the hot water tank. The hot water tank and the oil-fired water heater utilize the same distribution pipe. Pumps and valves at the points of connection between the hot water tank, the oil-fired water heater, and the distribution pipe regulate the auxiliary energy supply use. They also prevent the oil-fired water heater from heating water in the hot water tank. An integrated control component determines whether hot water from the hot water tank or from the oil-fired water heater is distributed to fan-coil units located throughout the building. The roof solar collector is solar energy property. The pump

that moves the water to the roof collector and the pipes between the roof collector and the hot water tank qualify because they are solely related to transporting solar heated water. The hot water tank qualifies because it stores water heated solely by solar radiation. The heat exchanger also qualifies as energy property. The oil-fired water heater does not qualify as solar energy property because it is auxiliary equipment. The fan-coil units do not qualify as solar energy property because they are not specially adapted to use energy derived from solar energy. Because the distribution pipe, the control component, and the pumps and valves serve the oil-fired water heater as well as the solar energy equipment, they qualify only to the extent of 80% of their cost or basis, the portion allocable to the use of solar energy.[278]

[278] Reg. §1.48-9(d)(8).

(b) Solar Illumination Property — TPS 3140.03.B.1.b.

Solar illumination property is equipment that uses fiber-optic distributed sunlight to illuminate the inside of a structure, but only for periods ending before January 1, 2017.[279]

[279] §48(a)(3)(A)(ii).

(c) Geothermal Deposit Property — TPS 3140.03.B.1.c.

Geothermal deposit property is equipment used to produce, distribute, or use energy derived from a geothermal deposit,[280] but only, in the case of electricity generated by geothermal power, up to (but not including) the electrical transmission stage.[281] A geothermal deposit is a geothermal reservoir consisting of natural heat which is stored in rocks or in an aqueous liquid or vapor (whether or not under pressure).[282] Only geothermal deposits located in the United States or in a possession of the United States meet the definition of "geothermal deposit" for purposes of the energy credit.[283]

[280] Within the meaning of §613(e)(2).

[281] §48(a)(3)(A)(iii); Reg. §1.48-9(c)(10)(i).

[282] §613(e)(1), §613(e)(2).

[283] §613(e)(1).

Geothermal production equipment includes equipment necessary to bring geothermal energy from the subterranean deposit to the surface, including wellhead and downhole equipment, such as screening or slotting liners, tubing, downhole pumps, and associated equipment.[284] Reinjection wells required for production also may qualify.[285] "Production" does not include exploration and development.[286]

[284] Reg. §1.48-9(c)(10)(ii).

[285] *Id.*

[286] *Id.*

Geothermal distribution equipment includes equipment that transports geothermal steam or hot water from a geothermal deposit to the site of ultimate use.[287] If geothermal energy is used to generate electricity, distribution equipment includes equipment that transports hot water from the geothermal deposit to a power plant.[288] Distribution equipment also includes components of a heating system, such as pipes and ductwork that distribute within a building the energy derived from the geothermal deposit.[289]

[287] Reg. §1.48-9(c)(10)(iii).

[288] *Id.*

[289] *Id.*.

Geothermal equipment includes equipment that uses energy derived both from a geothermal deposit and from sources other than a geothermal deposit ("dual-use equipment"), as long as the portion of such equipment's use of energy from sources other than a geothermal deposit does not exceed 25% of its total energy input in an annual measuring period, and only to the extent of its basis or cost allocable to its use of energy from a geothermal deposit during an annual measuring period.[290] An annual measuring period for an item of dual-use geothermal equipment is the 365-day period beginning with the day it is placed in service or a 365-day period beginning the day after the last day of the immediately preceding annual measuring period.[291] The allocation of energy use required may be made by comparing, on a Btu basis, energy input to dual-use equipment from the geothermal deposit with energy input from other sources.[292] However, the IRS may accept any other method that accurately establishes the relative annual use by dual use equipment of energy derived from a geothermal deposit and energy derived from other sources.[293]

[290] Reg. §1.48-9(c)(10)(iv).

[291] *Id.*

[292] *Id.*

[293] *Id.*

The existence of a backup system designed for use only in the event of a failure in the system providing energy derived from a geothermal deposit will not disqualify any other equipment.[294] If geothermal energy is used to generate electricity, equipment using geothermal energy includes the electrical generating equipment, such as turbines and generators.[295] However, geothermal equipment does not include any electrical transmission equipment, such as transmission lines and towers, or any equipment beyond the electrical transmission stage, such as transformers and distribution lines.[296]

[294] Reg. §1.48-9(c)(10)(v).

[295] *Id.*

[296] *Id.*

Example (1)— *Geothermal Property Qualifying for the Energy Credit*

On Oct. 1, Year 1 Corporation X, a calendar year taxpayer, places in service a system which heats its office building by circulating hot water heated by energy derived from a geothermal deposit through the building. Geothermal equipment includes the circulation system, including the pumps and pipes which circulate the hot water through the building.[297]

[297] Reg. §1.48-9(c)(10)(vi), *Ex. 1.*

Example (2)— *Property Which Is Not Geothermal Property*

The facts are the same as in *Example 1* , above, except that X also places in service a boiler to produce hot water for heating the building exclusively in the event of a failure of the geothermal equipment. The boiler is not geothermal equipment, but the existence of the backup system does not serve to disqualify the eligible property described in *Example 1.* [298]

[298] Reg. §1.48-9(c)(10)(vi), *Ex. 2.*

Example (3)— *Dual-Use Property*

The facts are the same as in *Example 1*, above, except that the water heated by energy derived from a geothermal deposit is not hot enough to provide sufficient heat for the building. Therefore, the system includes an electric boiler in which the water is heated before being circulated in the heating system. On a Btu basis, 80% of the total energy input to the circulating system during the 365-day period beginning on Oct. 1, Year 1, is energy derived from a geothermal deposit. The boiler is not geothermal equipment. For Year 1, 80% of the circulating system is geothermal equipment because 80% of its basis or cost is allocable to use of energy from a geothermal deposit. [299]

[299] Reg. §1.48-9(c)(10)(vi), *Ex. 3.*

Example (4)— *Geothermal Property*

Corporation X acquires a commercial vegetable dehydration system in Year 1. The system operates by placing fresh vegetables on a conveyor belt and moving them through a dryer. The conveyor belt is powered by electricity. The dryer uses only energy derived from a geothermal deposit. The dryer is geothermal equipment while the equipment powered by electricity does not qualify. [300]

[300] Reg. §1.48-9(c)(10)(vi), *Ex. 4.*

Note: The Tax Court has held that the energy credit with respect to geothermal deposit property is not computed with respect to the taxpayer's basis in the entire facility but is limited to the basis of assets within the facility that actually distribute geothermal energy throughout the facility or that use geothermal energy in the operation of the equipment. [301] Thus, the court held that the owner of a commercial mushroom production facility that used geothermal energy could compute the credit with respect only to the pipes in the compost wharf that delivered the geothermal heat, the delivery system for the geothermally heated water used in the pasteurization unit structure, the pasteurization tunnels, and the grow rooms that used geothermal heat. In contrast, the credit was not allowed with respect to the compost preparation equipment, the transportation equipment used to move the compost to the compost wharf, the compost wharf aside from the pipes, the mushroom spawn sprinkling equipment, the transportation equipment used to move the spawned compost to grow rooms, and the harvesting, sorting, packaging, and shipping equipment.

[301] *Oregon Trail Mushroom Co. v. Commissioner*, T.C. Memo 1992-293.

(d) Qualified Fuel Cell Property — TPS 3140.03.B.1.d.

Qualified fuel cell property is a fuel cell power plant that satisfies two conditions.[302] First, it must have a nameplate capacity of at least 0.5 kilowatt of electricity using an electrochemical process.[302.1] Second, it must have an electricity-only generation efficiency greater than 30%[302.2] A fuel cell power plant is an integrated system comprised of a fuel cell stack assembly and associated balance of plant components that converts a fuel into electricity using electrochemical means.[302.3] The credit for any fuel cell is limited to $1500 for each 0.5 kilowatts of capacity.[302.4] Qualified fuel cell property does not include any property for any period after December 31, 2016.[302.5]

[302] §48(c)(1)(A). *See also* Notice 2008-68, *2008-34 I.R.B. 418*, §3.01-§3.03, effective for property placed in service after Aug. 25, 2008, though taxpayers may apply this notice to property placed in service after Dec. 31, 2005, and before Jan. 2, 2009. Notice 2008-68, §8.

[302.1] §48(c)(1)(A)(i).

[302.2] §48(c)(1)(A)(ii).

[302.3] §48(c)(1)(C).

[302.4] §48(c)(1)(B).

[302.5] §48(c)(1)(D).

(e) Qualified Microturbine Property — TPS 3140.03.B.1.e.

Qualified microturbine property is a stationary microturbine power plant that satisfies two conditions.[303] First, it must have a nameplate capacity of less than 2,000 kilowatts.[303.1] Second, it must have an electricity-only generation efficiency of not less than 26% at International Standard Organization conditions.[303.2] A stationary microturbine power plant is an integrated system comprised of a gas turbine engine, a combustor, a recuperator or regenerator, a generator or alternator, and associated balance of plant components that converts a fuel into electricity and thermal energy.[303.3] A stationary microturbine power plant also includes all secondary components located between the existing infrastructure for fuel delivery and the existing infrastructure for power distribution, including equipment and controls for meeting relevant power standards, such as voltage, frequency and power factors.[303.4] The credit for any microturbine property is limited to $200 for each kilowatt of capacity.[303.5] Qualified microturbine property does not include any property for any period after December 31, 2016.[303.6]

[303] §48(c)(2)(A). *See also* Notice 2008-68, *2008-34 I.R.B. 418*, §3.01-.03, effective for property placed in service after Aug. 25, 2008, though taxpayers may apply this notice to property placed in service after Dec. 31, 2005, and before Jan. 2, 2009. Notice 2008-68, §8.

[303.1] §48(c)(2)(A)(i).

[303.2] §48(c)(2)(A)(ii).

[303.3] §48(c)(2)(C).

[303.4] *Id.*

[303.5] §48(c)(2)(B).

[303.6] §48(c)(2)(D).

(f) Combined Heat and Power System Property — TPS 3140.03.B.1.f.

Combined heat and power system property is property that makes up a system that meets four requirements.[304] First, the system must use the same energy source for the simultaneous or sequential generation of electrical power, mechanical shaft power, or both, in combination with the generation of steam or other forms of useful thermal energy (including heating and cooling applications).[304.1] Second, the system must produce (1) at least 20% of its total useful energy in the form of thermal energy which is not used to produce electrical or mechanical power or a combination thereof, and (2) at least 20% of its total useful energy in the form of electrical or mechanical power or a combination thereof.[304.2] Third, the system's energy efficiency percentage must exceed 60%.[304.3] Fourth, the system must be placed in service before January 1, 2017.[304.4] The energy efficiency percentage of a system is a fraction, the numerator of which is the total useful electrical, thermal, and mechanical power produced by the system at normal operating rates, and expected to be consumed in its normal application, and the denominator of which is the

lower heating value of the fuel sources for the system.[304.5] A system designed to use biomass does not have to meet the 60% energy efficiency percentage requirement, but the credit is prorated if that requirement is not met.[304.6]

[304] §48(c)(3)(A).

[304.1] §48(c)(3)(A)(i).

[304.2] §48(c)(3)(A)(ii). The percentages are determined on a Btu basis. §48(c)(3)(C)(ii).

[304.3] §48(c)(3)(A)(iii).

[304.4] §48(c)(3)(A)(iv).

[304.5] §48(c)(3)(C)(i). The energy efficiency percentage is determined on a Btu basis. §48(c)(3)(C)(ii).

[304.6] §48(c)(3)(D).

Combined heat and power system property does not include property used to transport the energy source to the facility or to distribute energy produced by the facility.[304.7]

[304.7] §48(c)(3)(C)(iii).

If the electrical capacity of a combined heat and power system placed in service during the taxable year exceeds the applicable capacity, the credit amount is reduced proportionally.[304.8] The applicable capacity is 15 megawatts or a mechanical energy capacity of more than 20,000 horsepower or an equivalent combination of electrical and mechanical energy capacities.[304.9] Combined heat and power system property does not include any property making up a system that has a capacity greater than 50 megawatts or a mechanical energy capacity greater than 67,000 horsepower or an equivalent combination of electrical and mechanical energy capacities.[304.10]

[304.8] Thus, the allowable credit amount is the full credit amount multiplied by the ratio of the applicable capacity to the capacity of the property. §48(c)(3)(B)(i).

[304.9] §48(c)(3)(B)(ii).

[304.10] §48(c)(3)(B)(iii).

(g) Qualified Small Wind Energy Property — TPS 3140.03.B.1.g.

Qualified small wind energy property is property that uses a qualifying small wind turbine (a wind turbine that has a nameplate capacity of 100 kilowatts or less) to generate electricity.[305] Qualified small wind energy property does not include any property for any period after December 31, 2016.[305.1]

[305] §48(c)(4)(A), §48(c)(4)(B). Qualifying small wind energy property must meet certain performance and quality standards. *See* Notice 2015-4, *2015-5 I.R.B. 407*, *modified by* Notice 2015-51, *2015-31 I.R.B. 133* (effective dates).

[305.1] §48(c)(4)(C).

(h) Geothermal Heating and Cooling Equipment — TPS 3140.03.B.1.h.

Geothermal heating and cooling equipment is equipment that uses the ground or ground water as a thermal energy source to heat a structure or as a thermal energy sink to cool a structure, but only with respect to periods ending before January 1, 2017.

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[306] §48(a)(3)(A)(vii).

(2) Election of Energy Credit in Lieu of Renewable Electricity Production Credit — TPS 3140.03.B.2.

Effective for renewable electricity production facilities placed in service after 2008, the construction of which begins before January 1, 2017 (January 1, 2020 in the case of a wind facility),[307] taxpayers otherwise entitled to the renewable electricity production credit (determined on a cents-per-kilowatt hour basis) may elect the energy credit in lieu of the production credit (referencing §45).[307.1] The election is irrevocable.[307.2] The energy percentage is 30% for such property.[307.3] Under the election, any qualified property that is part of a qualified investment credit facility is treated as energy property for purposes of the energy credit.[307.4] If the taxpayer makes the election, no production credit for any year is allowed for any qualified investment credit facility.[307.5]

[307] §48(a)(5). See Notice 2013-29, *2013-20 I.R.B. 1085*, *clarified by* Notice 2013-60, *2013-44 I.R.B. 431*, *clarified and modified by* Notice 2014-46, *2014-36 I.R.B. 520*, as updated by Notice 2015-25, *2015-13 I.R.B. 814*, *clarified and modified* by Notice 2016-31, *2016-23 I.R.B. 1025*, as *clarified and modified by* Notice 2017-4, *2017-4 I.R.B. 541*, for methods of establishing that construction of a qualified facility has begun.

[307.1] §48(a)(5). The IRS will not issue a ruling or determination letter regarding the application of the beginning of construction requirement. Rev. Proc. 2017-3, *2017-1 I.R.B. 130*, §3.01(4), *modified by* Rev. Proc. 2017-38, *2017-22 I.R.B. 1258*. See ¶3170.05.C., for a discussion of the renewable electricity production credit.

[307.2] §48(a)(5)(C)(iii)(II).

[307.3] §48(a)(5)(A)(ii).

[307.4] §48(a)(5)(A)(i).

[307.5] §48(a)(5)(B).

(a) Qualified Investment Credit Facility — TPS 3140.03.B.2.a.

A qualified investment credit facility is any of the following facilities if no production credit has been allowed for that facility:[308]

[308] §48(a)(5)(C). *See also* Reg. §1.48-9, which applies to §48(a)(3) energy property and presumably analogous to §48(a)(5) energy property to the extent that property is covered by both provisions, e.g., property used to produce electricity from geothermal deposits or wind energy property. *See, e.g.*, CCA 201122018 (Reg. §1.48-9(e) cited with respect to §48(a)(5)(D) wind energy property determination); PLR 201208035 (Reg. §1.48-9(e) cited as authority for determination storage device qualified as wind energy property).

- A qualified wind facility placed in service after 2008, the construction of which begins before January 1, 2020.[308.1]

- A qualified closed-loop biomass facility placed in service after 2008, the construction of which begins before January 1, 2017.[308.2]

- A qualified open-loop biomass facility placed in service after 2008, the construction of which begins before January 1, 2017.[308.3]

- A qualified geothermal facility placed in service placed in service after 2008, the construction of which begins before January 1, 2017.[308.4]

• A qualified landfill gas facility placed in service after 2008, the construction of which begins before January 1, 2017.[308.5]

• A qualified trash facility placed in service after 2008, the construction of which begins before January 1, 2017.[308.6]

• A qualified hydropower facility placed in service after 2008 and the construction of which begins before January 1, 2017.[308.7]

• A qualified marine and hydrokinetic renewable energy facility placed in service after 2008 and the construction of which begins before January 1, 2017.[308.8]

[308.1] §48(a)(5)(C)(i) (reference to §45(d)(1)), §48(a)(5)(C)(ii).

[308.2] §48(a)(5)(C)(i) (reference to §45(d)(2)), §48(a)(5)(C)(ii).

[308.3] §48(a)(5)(C)(i) (reference to §45(d)(3)), §48(a)(5)(C)(ii).

[308.4] §48(a)(5)(C)(i) (reference to §45(d)(4)), §48(a)(5)(C)(ii).

[308.5] §48(a)(5)(C)(i) (reference to §45(d)(6)), §48(a)(5)(C)(ii).

[308.6] §48(a)(5)(C)(i) (reference to §45(d)(7)), §48(a)(5)(C)(ii).

[308.7] §48(a)(5)(C)(i) (reference to §45(d)(9)), §48(a)(5)(C)(ii).

[308.8] §48(a)(5)(C)(i) (reference to §45(d)(11)), §48(a)(5)(C)(ii).

The IRS provides two alternative methods for establishing that construction has begun; the first method is based on starting work of a significant nature (Physical Work Test), while the second method is a financial safe harbor (Five Percent Safe Harbor). These methods require that a taxpayer make continuous progress towards completion once construction has begun. A taxpayer need only satisfy one method. Whether the taxpayer is making continuous progress towards completion under the Physical Work Test is determined by a continuous construction test and by a continuous efforts test under the Five Percent Safe Harbor.[308.9] If a facility is placed in service by the later of (1) a year within a four year period after the beginning of construction began, or (2) December 31, 2018, the facility will be considered to satisfy both the continuous construction and continuous effort tests (Continuity Safe Harbor).[308.10] For example, if construction begins on a facility on January 15, 2016, and the facility is placed in service by December 31, 2020, the facility will be considered to satisfy the Continuity Safe Harbor. If a facility does not meet the Continuity Safe Harbor, whether that facility satisfies the continuous construction test or the continuous effort test will be determined by the relevant facts and circumstances.[308.11]

[308.9] Notice 2013-29, *2013-20 I.R.B. 1085*, *clarified by* Notice 2013-60, *2013-44 I.R.B. 431*, *clarified and modified by* Notice 2014-46, *2014-36 I.R.B. 520*, as updated by Notice 2015-25, *2015-13 I.R.B. 814*, *clarified and modified* by Notice 2016-31, *2016-23 I.R.B. 1025*, *clarified and modified by* Notice 2017-4, *2017-4 I.R.B. 541*. Notice 2013-60, *clarified and modified by* Notice 2014-46, also clarifies the effect of various types of transfers after construction has begun on a particular facility. Note that the IRS will not issue a ruling or determination letter regarding the application of the beginning of construction requirement. Rev. Proc. 2017-3, *2017-1 I.R.B. 130*, §3.01(4), *modified by* Rev. Proc. 2017-38, *2017-22 I.R.B. 1258*.

[308.10] Notice 2017-4, *2017-4 I.R.B. 541*, *clarifying and modifying* Notice 2013-29, Notice 2013-60, Notice 2014-46, Notice 2015-25, and Notice 2016-31.

[308.11] Notice 2013-60.

Qualified property is property that meets four tests. First, it must be either (1) tangible personal property,[308.12] or (2) other tangible property (not including a building or its structural components), but only if the property is used as an integral part of the qualified investment credit facility.[308.13] Second, depreciation (or amortization in lieu of depreciation) must be allowable for the property.[308.14] Third, the property must be constructed, reconstructed, erected, or acquired by the taxpayer.[308.15] Fourth, the original use of the property must commence with the taxpayer claiming the credit.[308.16]

[308.12] §48(a)(5)(D)(i)(I).

[308.13] §48(a)(5)(D)(i)(II).

[308.14] §48(a)(5)(D)(ii).

[308.15] §48(a)(5)(D)(iii).

[308.16] §48(a)(5)(D)(iv).

Taxpayers also may elect a grant in lieu of the credit for qualified property. This election is discussed further in ¶3140.03.B.3., below.

(b) Election Procedures — TPS 3140.03.B.2.b.

To make the irrevocable election to treat a qualified facility as a qualified investment credit facility, the taxpayer must make a separate claim for the energy credit on each qualified property that is an integral part of the facility using a completed Form 3468 filed with the taxpayer's timely filed (including extensions) income tax return for the year in which the property is placed in service.[309] The taxpayer must attach to Form 3468 a statement, executed under penalties of perjury, that includes:[309.1]

[309] Notice 2009-52, *2009-25 I.R.B. 1094*, §2.

[309.1] *Id.*

- the taxpayer's name, taxpayer identification number, address, and telephone number;
- a detailed technical description of each qualified investment credit facility, including generating capacity;
- a detailed technical description of the energy property placed in service during the taxable year, including a statement that the property is an integral part of the facility;
- the date the property was placed in service;
- a depreciation schedule reflecting the taxpayer's remaining basis after the energy credit is claimed; and
- a statement that the taxpayer has not and will not claim a Treasury grant for this property.

(3) Coordination with Renewable Energy Grants — TPS 3140.03.B.3.

The Secretary of the Treasury is authorized to provide a grant for specified energy property that is originally placed in service in 2009, 2010, or 2011 by the person receiving the grant, and specified energy property that is placed in service after 2011 but before the credit expiration date, if construction began during 2009, 2010, or 2011.[310]

[310] American Recovery and Reinvestment Act of 2009 (2009 ARRA), *Pub. L. No. 111-5*, §1603(a), §1603(d)(1) (referencing §45(d)). Grants originally were available only for energy property placed in service in 2009 or 2010. The Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (2010 TRA), Pub. L. No. 111-312, §707(a), amended 2009 ARRA §1603 to make grants available for energy property placed in service in 2011. The American Taxpayer Relief Act of 2012 (2012 ATRA), Pub. L. No. 112-240, §407(c), amended 2009 ARRA §1603 to clarify that the person receiving the grant had to be the person who originally placed the property in service.

The grant amount is 30% of the basis of the property that would be eligible for the energy credit[310.1] (10% for qualified microtubine, combined heat and power system, or geothermal heat pump property[310.2]) and 30% for the basis of property that would compromise a renewable electricity production credit-eligible facility.[310.3] Grants for qualified fuel cell property are limited to $1,500 for each 0.5 kilowatt of capacity.[310.4] Grants for microturbines are limited to $200 for each kilowatt of capacity.[310.5] Grants for combined heat and power systems are limited to the amount which bears the same ratio to 30% of the basis as the applicable capacity bears to the capacity of the property.[310.6] Property must be depreciable or amortizable in order to receive a grant.[310.7]

[310.1] 2009 ARRA §1603(b)(2)(A). *See Alta Wind I Owner-Lessor C v. United States, No. 13-402T* (Fed. Cl. Oct. 31, 2016) (eligible basis computed using purchase price under §1012 and not residual method under §1060 as there was no applicable asset acquisition); *RP1 Fuel Cell, LLC v. United States*, No. 13-552C (Fed. Cl. Mar. 31, 2015) (grant amount determined including cost basis of gas conditioning equipment, which court determined was qualified fuel cell property).

[310.2] 2009 ARRA §1603(b)(2)(B).

[310.3] 2009 ARRA §1603(b)(2)(A).

[310.4] 2009 ARRA §1603(b)(3) (referencing §48(c)(1)(B).

[310.5] 2009 ARRA §1603(b)(3) (referencing §48(c)(2)(B).

[310.6] 2009 ARRA §1603(b)(3) (referencing §48(c)(3)(B)).

[310.7] 2009 ARRA §1603(d) (flush language). For analysis of whether specific property that is part of a wind facility is eligible for a grant, see CCA 201122018.

Note: Due to the sequestration, the §1603 payment amount was less than the award amount. A §1603 award made on or after March 1, 2013 and before October 1, 2013 was subject to a sequestration reduction of 8.7%, and a §1603 award made on or after October 1, 2013, and before October 1, 2014 was subject to a reduction of 7.2%.[310.8]

[310.8] Notice 2014-39, *2014-26 I.R.B. 1109.*

The amount of a grant under this provision is not includible in gross income.[310.9] However, the basis of the property is reduced by 50% of the amount of the grant.[310.10] The grant amount and basis of the specified property is not affected by the reduced payment amount due to sequestration.[310.11]

[310.9] §48(d)(3)(A).

[310.10] §48(d)(3)(B); Notice 2012-23, *2012-11 I.R.B. 483*, Q&A-1. Basis is not reduced by the amount of the grant that is deemed to be excessive. *See* AM 2011-004. *See also* Notice 2014-39 (Basis reduced by actual payment amount and not award amount where payment amount less due to sequestration).

[310.11] Notice 2014-39. A taxpayer may not partition the basis of the specified property and claim a tax credit under §45 or §48. *Id.*

Grants are payable to the party entitled to the credits.[310.12] Payments of the grant must be made during the 60-day period beginning on the date of application, or the date the property is placed in service, whichever is later.[310.13]

[310.12] 2009 ARRA §1603(a).

[310.13] 2009 ARRA §1603(c).

Grant applications had to be received before October 1, 2012.[310.14]

[310.14] 2009 ARRA §1603(j), as amended by the 2010 TRA, §707(b).

The Department of Treasury provides guidance under this program on its website.[310.15]

[310.15] See U.S. Treasury Department, Payments for Specified Energy Property in Lieu of Tax Credits under the American Recovery and Reinvestment Act of 2009—Program Guidance (Apr. 2011), available at http://www.treasury.gov/initiatives/recovery/Pages/1603.aspx.

Grants may not be made to any Federal, state, or local government (or political subdivision, agency, or instrumentality thereof),[310.16] any §501(c) tax-exempt entity,[310.17] or any clean renewable energy bond lender or cooperative electric company.[310.18] Additionally, no grant may be made to a partnership or other pass-through entity partner of any of these entities.[310.19]

[310.16] 2009 ARRA §1603(g)(1).

[310.17] 2009 ARRA §1603(g)(2).

[310.18] 2009 ARRA §1603(g)(3) (reference to §54(j)).

[310.19] 2009 ARRA §1603(g)(4). *See* Notice 2012-23, *2012-11 I.R.B. 483*, Q&A-3.

The Secretary of the Treasury must apply rules to grants made under this provision relating to the investment credit, including recapture provisions.[310.20]

[310.20] 2009 ARRA §1603(f) (reference to §50).

If the taxpayer receives an energy credit for property for any tax year ending before the grant is made, the amount of the credit is recaptured, the credit carryforwards must be adjusted, and the grant is determined without regard to any reduction in basis by reason of the prior credit.[310.21]

[310.21] §48(d)(2).

Note: The Court of Federal Claims has held that only a portion of a plant's costs are eligible for reimbursement under 2009 ARRA §1603, i.e., the costs of the plant had to be reasonably allocated between the plant's qualifying and nonqualifying functions (i.e., electrical generation versus thermal energy production for industrial purposes). The taxpayer had constructed an open-loop biomass cogeneration plant adjacent to an industrial facility. The biomass plant used the steam from an open-loop boiler to produce electricity from a turbine, and then used the remaining steam (i.e., the bulk of steam produced) for industrial processes. Approximately one-third of the plant's energy output generated electricity, whereas two-thirds of this output was used for industrial purposes in the industrial facility next door. The electricity generation allowed the plant to qualify for state and federal renewable energy incentives under 2009 ARRA §1603. The taxpayer claimed an eligible cost basis of $9,037,769, and requested reimbursement of $2,711,331 (30% of the cost basis). However, the government approved reimbursement of only $943,754, representing the cost of the turbine and one-third of all other costs. The court noted that, in light of the plant's substantial thermal energy production and comparatively small electrical generation, the eligible cost basis of the plant was limited to the portion relating to electrical energy production.[310.22]

[310.22] *W.E. Partners II, LLC v. United States*, No. 13-54, 2015 BL 6023 (Fed. Cl. Jan. 12, 2015).

(4) Applicable Quality and Performance Standards — TPS 3140.03.B.4.

The applicable performance and quality standards are those, if any, prescribed by IRS regulations in consultation with the Secretary of Energy[311] and that are in effect when the property is acquired.[312] If no standards are in effect when the property is acquired, the property need not meet any standards issued at a later date.[313]

[311] §48(a)(3)(D)(i).

[312] §48(a)(3)(D)(ii); Reg. §1.48-9(m)(1).

[313] IR-2134 (June 8, 1979).

For this purpose, property is considered to be acquired on the date the taxpayer enters into a binding contract to acquire the property, or, for property constructed, reconstructed, or erected by the taxpayer, the earlier of the date it begins the construction, reconstruction, or erection of the property, or the date the taxpayer and another person enter into a binding contract requiring each to construct, reconstruct, or erect property and place the property in service for an agreed-upon use.[314] A binding contract to construct, reconstruct, or erect property, or to acquire property, is a contract that is binding at all times on the taxpayer under applicable state or local law.[315] A binding contract to construct, reconstruct, or erect property or to acquire property does not include a contract for preparation of architect's sketches, blueprints, or performance of any other activity not involving the beginning of physical work.[315.1]

[314] Reg. §1.48-9(m)(2).

[315] Reg. §1.48-9(m)(3).

[315.1] Reg. §1.48-9(m)(3). See the example under Reg. §1.48-9(m)(4).

EXHIBIT G

Holy Grail of Solar Energy

By Neldon Johnson, CEO of Intentional Automated Systems, Inc. [OTC:IAUS]

International Automated Systems, Inc. has developed new and exciting technologies in the energy markets. Some of these are almost unbelievable. We also understand the need for a police force to regulate the collection of taxes. We also understand that the IRS has a job to do in fulfilling those responsibilities. It is also their responsibility to make sure that scams or other means that might prevent the IRS from collecting those taxes are stopped in order to keep our country properly funded. It is also their responsibility to make sure that if a mistake is made by the IRS that they do all in their power to rectify their mistake so that it would minimize the damages that they caused. This is why we would like to have an opportunity to explain why it would be difficult for the IRS to believe that we could accomplish what we claim to have accomplished.

There have been many companies working in the past 45 years in developing solar energy tech and other energy sources and technologies that would improve our abilities to become more self-sufficient. Some these companies are large companies with well-recognized names. Many have been partially funded by the federal government in their endeavors to try and develop new and exciting solar energy technology. Some of these companies are IBM Raytheon. Several major universities like MIT Stanford and many others. This is why we can understand why the IRS would have a difficult time believing that a small-company with one inventor could create such vast amounts of technology. We understand it would be very hard for anyone to believe that we could accomplish such a masterful undertaking when other companies such as IBM and Raytheon and many major universities such as MIT Stanford were unable to accomplish the same kinds of technologies that would or would have the opportunity to revolutionize the energy sources in the world and the United States. Nevertheless, this small-company international automated system with one basic engineer and one and the same person as the inventor of most of these products have indeed accomplished that masterful goal. Developing solar energy that would compete with coal and bring this our country energy independence. One of the major accomplishments that international automated systems has been able to build and to demonstrate is concentrated solar energy. This new concentrated solar energy using concentrated photovoltaic cells in a way that can now be used by a solar concentrator that is made of a plastic refractive lens. This is an unbelievable accomplishment and again we recognize difficulty for the IRS or any other group to believe that we could have accomplished such high and lofty goals. Companies like IBM Raytheon, Universities like Stanford MIT and many others have tried for 45 years to develop the same technology. Much of their funding came from the United States government. Billions of dollars have been spent. It is referred to as the Holy Grail of solar energy. Why? Why is it concentrated solar photovoltaic is considered the holy grail of solar energy? Because of what it can accomplish. What concentrated solar energy accomplishes is 300 to 500 to 1 over traditional photovoltaic systems. Concentrated photovoltaics reduces the amount of photovoltaic material by 300 to 500 times. Using this new concentrated format that was developed by international automated systems and Neldon Johnson, the inventor. What does this mean? It means you can use 300 times more plastic and 300 times less photovoltaic material to generate the same amount of electricity that now can only be achieved with massive amounts of solar panels.

Photovoltaic

New exciting revolutionary photovoltaic patent pending technology introduced by international automated systems.

What does this mean to the energy market especially the photovoltaic energy markets. IAS can now replace silicon photovoltaic chips with plastic at 300 to 1. 300 times more plastic than one silicon chip. If you pay six dollars a watt for silicone photovoltaic today, you would now pay less than two cents a watt for IAS's new photovoltaic technology.

International automated system is introducing a new technology for solar energy. It is obvious that we cannot reveal how this new technology works at this time but what we can tell you is what it will do to the price of renewable solar energy, specifically solar renewable energy. This new technology is a brand new patent pending photovoltaic system. Some of the advantages of this new patent pending photovoltaic system over other systems is the fact that the panels do not need expensive inverters for every 25 V panel to increase voltages. The panels themselves can produce voltages of 1000V to 10,000 V without a inverter for each panel. Now a single inverter can control all the energy needed for the home, for an entire business, for many business, or for entire cities. The second advantage of the new photovoltaic system is we can now replace silicon with plastic. This new patent pending photovoltaic solution for solar renewable energy will make it possible to replace silicon with plastic at about 300 to 1. Yes! 300 times more plastic than silicon. If in today's market you would pay six dollars a watt today for silicon photovoltaic system, now it would now cost 2 cents. This new photovoltaic system will now make it possible to replace silicon with 300 times more plastic. This will reduce the cost of a photovoltaic solar energy by almost 300 to one. Photovoltaic for five cents to ten cents a watt. This makes it possible for photovoltaics to compete in any energy market including coal.

As the need for energy increases every year the need for new technology is ever and ever more important, for the success of our standard of living today in the United States and increase the living standards of millions and possibly billions of people worldwide. This new technology is now in the early stages of development at IAS. This new technology is called new photovoltaic technology because it's new. 50 years, yes we've waited over 50 years for an advancement in solar energy technology that can actually replace any all traditional energy systems and do it at equal to or better price. Now it has happened and it happened at IAS.

It now makes it possible for us to replace expensive inverters for every 25 V panel so the panels now can produce 1000 V to 10,000 V per panel. The second advantage to this new photovoltaic patent pending system is that we now can replace silicone chips with plastic at the rate of 300 to 1. 300 times more plastic than silicone in the new photovoltaics technology introduced by IAS.

For those with limited background in the technology of photovoltaics it may be helpful for us to introduce a small background of how the traditional technology photovoltaics functions. Photovoltaic systems typically consist of one or more arrays of photovoltaic cells, electrical connections, charge storage elements or direct DC to alternative current AC conversion elements or both, and control elements for a charge, I. E. Current, produced by the photovoltaic cells. Each photovoltaic array comprises a polarity of photovoltaic cells.

The photovoltaic cells of the photovoltaic array convert electromagnetic radiation, including visible light, and typically portions of the ultraviolet spectrum and near infrared spectrum, into a DC current. This is accomplished by irradiating the photovoltaic cells with sunlight, the photons of sunlight being absorbed by the photovoltaic cells, and the photovoltaic cells release electrons, thereby generating a current.

Depending upon the extent of the array of the photovoltaic cells and the nature of the electrical circuit to which the photovoltaic cell or the photovoltaic array as a whole is connected, a photovoltaic cell may typically generate between zero and .5 V. The photovoltaic cell will continue to produce electrons while being irradiated by sunlight so long as the voltage or of the circuit to which the photovoltaic cell is discharging electrons does not exceed a shutdown voltage.

Considerable effort has been made over the last decade or so to improve the design and efficiency of photovoltaic systems, and to reduce the cost. Efficiency of less than 10% have been common to date. As a result, the cost per watt at maximum power output and the cost per kilowatt hour for power generation has been high in comparison to the cost of power generation from the burning of fossil fuels. The extent of the effort made in recent years to improve the efficiency of photovoltaic systems is evidenced by the number of prior art devices and methods. These methods and devices have been met with varying degrees of success. Energy from a photovoltaic system is generally stored in batteries for later use or converted to an AC current for discharge to an electric grid. If the energy is to be stored in a battery, the voltage for the photovoltaic system will have to be adjusted to exceed the transient voltage of the battery. Since the maximum voltage output of a photovoltaic cell is typically on the order of .5 V, the voltage must be stepped up before the energy can be stored in a battery system. Similar, if the energy generated by a photovoltaic cell is to be discharged to an electrical grid system, which may be operated at 240 V, 480 V, or much higher voltages, the voltages must be stepped up to the lowest voltage exceeding the minimum voltage required by an inverter which will invert the DC current to a pulsed AC current. Depending upon the operating voltages its photovoltaic energy is to be discharged, a transformer may be used to further step up the voltage. Objective of the present invention is to provide a voltage and current controller for a photovoltaic array, alternative definitely referred to herein as photovoltaic controller which provides for the continuous production of current by each of the radiative photovoltaic cells of all of photovoltaic array regardless of the level of its irradiation.

A further objective of the present invention is to provide for the continuous and optimize the production of energy by each of the following photovoltaic cells of a photovoltaic array while simultaneously stepping up the voltage of an aggregate and current discharge by the full photovoltaic array to the level required for discharge to an inverter or to a DC battery storage system or both
The current photovoltaic technologies inherent problems exist because of the necessity of the photovoltaic cells be placed in a series network to provide the proper operating voltages high enough to charge a battery or to operate an AC inverter and limit the losses in the cells network to a minimum. This voltage is typically 25 V. This is about the maximum voltage that the current photovoltaic panels can produce without sustaining significant losses due to internal cell resistance.

The next major problem that exist in the photovoltaic cells being placed in a series network is that the cells themselves are limited to the lowest producing cell in that network. This means that if one cell is in a concentrated solar energy system the lowest power producing cell in the network will determine every other cells power output. This makes it almost impossible to use a concentrated photovoltaic system today.

Our new technology for photovoltaic array systems eliminates this problem entirely. Every cell in the array produces power independent of every other cell unit in the array. This makes it possible to get the maximum power out of each and every cell in the array. Now it is economically feasible to produce concentrated photovoltaic systems that will utilize the full spectrum of power hitting the array.

Certainly this technology will be beneficial for the home to provide a concentrated solar energy photovoltaic system. There however, are other applications that you might want to be aware of. This would include the power used to power traditional satellites. With the same amount of weight used in traditional power systems for the satellites that we use today, we can produce 100 times the power output for transmitting information. This is one application would make it possible to transmit traditional satellite signals to a device as small as a cell phone antenna. It would now be possible to have satellites transmit signals to cell phones with traditional satellites. This means cell phone transmissions could be achieved around the world. It also means that traditional satellite dish networks could be sent directly to the cell phone, allowing the cell phone to be the receiver used to receive ballgames, movies, or essentially all the same broadcast information that is now typically sent over cable or dish satellite networks.

As you can see this technology represents a huge leap in the advancement of energy and broadcast technology

CAPACITOR ENHANCED MULTI-ELEMENT PHOTOVOLTAIC CELL BACKGROUND OF THE INVENTION

This invention is in the field of photovoltaic cells and in particular in the field of multi junction, multi-element photovoltaic cells.

In the normal operation of a solar panel, photons from sunlight strike the photovoltaic cells of the solar panel and are absorbed by semiconducting materials, such as silicon. The energy from the absorbed photons excites electrons from their respective atomic or molecular orbitals. Once excited, an electron can either dissipate the energy as heat and return to its orbital or travel through the cell until it reaches an electrode. Current flows through the material in response to the electric potential generated by the photons striking the photovoltaic cells, and this electric current, and its associated energy, is captured. Thus, an array of solar cells in the solar panel converts solar energy from sunlight into a usable amount of direct current (DC) electricity. The energy of the direct current can be stored in batteries, capacitors or other energy storage processes, or the direct current can be converted to alternating current.

Traditional photovoltaic cells are commonly composed of doped silicon and then depositing metallic contacts on the top and bottom. The doping is normally applied to a thin layer on the top of the cell, producing a pn-junction with a particular bandgap energy, Eg. Photons that irradiate the top of the solar cell are either reflected or transmitted into the cell. Transmitted photons have the potential to give their energy hv to an electron if $hv \geq Eg$, generating an electron-hole pair. Electrons and holes are accelerated towards their respective n-doped and p-doped regions (up and down, respectively). The resulting current Ig is called the generation photocurrent.

At present, the most common type of photovoltaic cells are single layer, single junction cells constructed of crystalline silicon, or thin film cells. Based upon present technology, typical solar cells are made from semiconductors wafers which commonly range between 180 to 240 micrometers thick.

Solar cells are often encapsulated as a module. Photovoltaic modules often have a sheet of glass on the sun-facing side, allowing light to pass while protecting the semiconductor wafers. Solar cells are usually connected in series in modules, creating an additive voltage. Connecting cells in parallel yields a higher current; however, problems such as shadow effects can shut down the weaker, less illuminated parallel string of a number of series connected cells causing substantial power loss and possible damage because of the reverse bias applied to the shadowed cells by their illuminated partners. Strings of series cells are usually handled independently and not connected in parallel, though individual power boxes are often supplied for each module, and are connected in parallel. Although modules can be interconnected to create an array with the desired peak DC voltage and loading current capacity, using independent MPPTs (maximum power point trackers) is preferable. Otherwise, shunt diodes can reduce shadowing power loss in arrays with series/parallel connected cells.

Traditional single-junction cells have a maximum theoretical efficiency of 34%. The theoretical performance of a solar cell was first studied in depth in the 1960's, and is today known as the Shockley-Queisser limit. The limit describes several loss mechanisms that are inherent to any solar cell design. Under the Shockley-Queisser limit, the efficiency of a single-junction solar cell, under unconcentrated sunlight, cannot exceed 34%. The first of the losses taken into consideration in the Shockley-Queisser

limit, is the blackbody radiation loss, a loss mechanism that affects any material object above absolute zero. In the case of solar cells at standard temperature and pressure, this loss accounts for about 7% of the power. The second is an effect known as "recombination", where the electrons created by the photoelectric effect meet the electron holes left behind by previous excitations. In silicon, this accounts for another 10% of the power. However, the dominant loss mechanism is the inability for a solar cell to extract all of the power in the photon, and the associated problem that it cannot extract any power at all from certain photons. This is due to the fact that the electrons must have enough energy to overcome the bandgap of the material.

If the photon has less energy than the bandgap, it is not collected at all. This is a major consideration for conventional solar cells, which are not sensitive to most of the infrared spectrum, although that represents almost half of the power coming from the sun. Conversely, photons with more energy than the bandgap, say blue light, initially eject an electron to a state high above the bandgap, but this extra energy is lost through collisions in a process known as "relaxation". This lost energy turns into heat in the cell, which has the side-effect of further increasing blackbody losses.

Combining all of these factors, the maximum efficiency for a single bandgap material, such as a conventional silicon cell, is about 34%. That is, 66% of the energy in the sunlight hitting the cell will be lost. Practical concerns, notably reflection off the front surface or the metal terminals, further reduce the actual efficiency. It is reported that single p–n junction crystalline silicon devices are now approaching the theoretical limiting power efficiency of 33.7%, noted as the Shockley-Queisser limit in 1961. Modern high-quality cells commercially available have an efficiency of about 25%.

Multi-junction solar cells are solar cells with multiple pn junctions made of different semiconductor materials. Each material's pn junction will produce electric current in response to a different wavelength of light. A multi-junction cell solar cell will produce electric current at multiple wavelengths of light, increasing the conversion efficiency of the no-cost solar light power to usable electric power.

A multi-junction cell, however, can exceed that limit. Theoretically, with an infinite number of junctions, multi-junction cell efficiency would be 87% under highly concentrated sunlight. Maximum demonstrated efficiencies of multi-junction cells have demonstrated performance over 43%. Commercial, two layer, photovoltaic cells are available with 30% efficiency under one-sun illumination, and 40% under concentrated sunlight. However, these two layer cells have a higher price to performance ratio than the traditional single layer silicon cells, which has limited their commercialization to date. The potential for commercialization of multi-layer cells is more promising for concentrated photovoltaics (CPV). It is reported that in September 2013, a solar cell achieved a new record with 44.7 percent efficiency, as demonstrated by the German Fraunhofer Institute for Solar Energy Systems. Photovoltaic cells made from multiple materials have multiple bandgaps, and will respond to multiple light wavelengths. Hence, some of the energy that would otherwise be lost to relaxation as described above, can be captured and converted. Following an analysis similar to that performed for single bandgap devices, it can be concluded that the perfect bandgaps for a two-gap device are at 1.1 eV and 1.8 eV.

Multi-junction cells are constructed by layering the different materials on top of each other, shortest wavelengths on the "top" and increasing through the body of the cell. As the photons have to pass through the cell to reach the proper layer to be absorbed, transparent conductors need to be used to collect the electrons being generated at each layer.

For a typical MJ solar cell, there are six important types of layers: pn junctions, back surface field (BSF) layers, window layers, tunnel junctions, anti-reflective coating and metallic contacts. Producing a two layer, "tandem" cell is not an easy task, largely due to the thinness of the materials and the difficulties extracting the current between the layers. The easy solution is to use two mechanically separate thin film solar cells and then wire them together separately outside the cell. This technique is widely used by amorphous silicon solar cells.

The more difficult solution is the "monolithically integrated" cell, where the cell consists of a number of layers that are mechanically and electrically connected. These cells are much more difficult to produce because the electrical characteristics of each layer have to be carefully matched. In particular, the photocurrents generated in each layer need to be matched, otherwise electrons will be absorbed between layers. This limits their construction to certain materials, best met by the III-V semiconductors. Since each sub-cell is connected electrically in series, the same current flows through each junction. The materials are ordered with decreasing bandgaps, Eg, allowing sub-bandgap light ($hc/\lambda < e \cdot Eg$) to transmit to the lower sub-cells. Therefore, suitable bandgaps must be chosen such that the design spectrum will balance the current generation in each of the sub-cells, achieving current matching. The maximum conversion efficiency for every junction as a function of the wavelength is directly related to the number of photons available for conversion into photocurrent.

The majority of multi-junction cells that have been produced to date use three layers. These cells require the use of semiconductors that can be tuned to specific frequencies. Commonly utilized materials include germanium for the bottom and gallium arsenide compounds for the middle and the top-cell. The layers must be electrically optimal for high performance. For example, materials with favorable characteristics for use in a three layer cell are: InGaP for the top sub-cell (Eg = 1.8 - 1.9 eV), InGaAs for the middle sub-cell (Eg = 1.4 eV), and Germanium for the bottom sub-cell (Eg = 0.67 eV). The use of Ge is mainly due to its lattice constant, robustness, low cost, abundance, and ease of production. Current efficiencies for commercial InGaP/GaAs/Ge cells approach 40% under concentrated sunlight. Lab cells (partly using additional junctions between the GaAs and Ge junction) have demonstrated efficiencies above 40%.

Dual junction cells can be made on Gallium arsenide wafers. Alloys of Indium gallium phosphide in the range In.5Ga.5P through In.53Ga.47P serve as the high bandgap alloy. This alloy range provides for the ability to have bandgaps in the range of 1.92eV to 1.87eV. The lower GaAs junction has a bandgap of 1.42eV.

The metallic contacts are low-resistivity electrodes that make contact with the semiconductor layers. They are often aluminum and provide an electrical connection to a load or other parts of a solar cell array. They are usually positioned on two sides of the cell, and on the back face so that shadowing of the lighting surface is reduced.

Anti-reflective (AR) coating is generally composed of several layers in the case of MJ solar cells. The top AR layer has usually a NaOH surface texturation with several pyramids in order to increase the transmission coefficient T, the trapping of the light in the material (because photons cannot easily get out the MJ structure due to pyramids) and therefore, the path length of photons in the material. On the one hand, the thickness of each AR layer is chosen to get destructive interferences. Therefore, the reflection coefficient R decreases to 1%. On the other hand, the thickness of each AR layer is also chosen to minimize the reflectance at wavelengths for which the photocurrent is the lowest. Consequently, this maximizes JSC by matching currents of the three subcells. Because the current

generated by the bottom cell may be greater than the currents generated by the other cells, the thickness of AR layers is adjusted so that the infrared (IR) transmission (which corresponds to the bottom cell) is degraded while the ultraviolet transmission (which corresponds to the top cell) is upgraded. Particularly, an AR coating is very important at low wavelengths because, without it, T would be strongly reduced to 70%.

For maximum efficiency, each subcell should be operated at its optimal J-V parameters, which are not necessarily equal for each subcell. If they are different, the total current through the solar cell is the lowest of the three. By approximation, it results in the same relationship for the short-circuit current of the MJ solar cell: JSC = min (JSC1, JSC2, JSC3) where JSCi(λ) is the short-circuit current density at a given wavelength λ for the subcell i.

The theoretical efficiency of MJ solar cells is 86.8% for an infinite number of pn junctions, implying that more junctions increase efficiency. The maximum theoretical efficiency is 37, 50, 56, 72% for 1, 2, 3, 36 pn junctions, respectively, with the number of junctions increasing exponentially to achieve equal efficiency increments. The exponential relationship implies that as the cell approaches the limit of efficiency, the increase cost and complexity grow rapidly. Decreasing the thickness of the top cell increases the transmission coefficient T.

Light concentrators increase efficiencies and reduce the cost/efficiency ratio. The three types of light concentrators in use are refractive lenses like Fresnel lenses, reflective dishes (parabolic or Cassegrain), and light guide optics. Thanks to these devices, light arriving on a large surface can be concentrated on a smaller cell. The intensity concentration ratio (or "suns") is the average intensity of the focused light divided by 0.1 W/cm^2. If its value is X then the MJ current becomes X higher under concentrated illumination.

Using concentrations on the order of 500 to 1000, meaning that a 1 cm^2 cell can use the light collected from 0.1 m^2 (as 1 m^2 equal 10000 cm^2), produces the highest efficiencies seen to date. Three-layer cells are fundamentally limited to 63%, but existing commercial prototypes have already demonstrated over 40%. These cells capture about 2/3 of their theoretical maximum performance, so assuming the same is true for a non-concentrated version of the same design, one might expect a three-layer cell of 30% efficiency. This is not enough of an advantage over traditional silicon designs to make up for their extra production costs. For this reason, almost all multi-junction cell research for terrestrial use is dedicated to concentrator systems, normally using mirrors or Fresnel lenses.

Using a concentrator also has the added benefit that the number of cells needed to cover a given amount of ground area is greatly reduced. A conventional system covering 1 m^2 would require 625 16 cm^2 cells, but for a concentrator system only a single cell is needed, along with a concentrator. The argument for concentrated multi-junction cells has been that the high cost of the cells themselves would be more than offset by the reduction in total number of cells. However, the downside of the concentrator approach is that efficiency drops off very quickly under lower lighting conditions. In order to maximize its advantage over traditional cells and thus be cost competitive, the concentrator system has to track the sun as it moves to keep the light focused on the cell and maintain maximum efficiency as long as possible. This requires a solar tracker system, which increases yield, but also cost.

Measurements on MJ solar cells are usually made in laboratory, using light concentrators (this is often not the case for the other cells) and under standard test conditions (STCs). STCs prescribe, for terrestrial applications, the AM1.5 spectrum as the reference. This air mass (AM) corresponds to a fixed position

of the sun in the sky of 48° and a fixed power of 833 W/m². Therefore, spectral variations of incident light and environmental parameters are not taken into account under STC.

Consequently, performance of MJ solar cells in terrestrial environment is inferior to that achieved in laboratory. Moreover, MJ solar cells are designed such that currents are matched under STC, but not necessarily under field conditions. One can use QE(λ) to compare performances of different technologies, but QE(λ) contains no information on the matching of currents of subcells. An important comparison point is rather the output power per unit area generated with the same incident light.

The environment in space is quite different. Because there is no atmosphere, the solar spectrum is different (AM0). The cells have a poor current match due to a greater photon flux of photons above 1.87eV vs. those between 1.87eV and 1.42eV. This results in too little current in the GaAs junction, and hampers the overall efficiency since the InGaP junction operates below MPP current and the GaAs junction operates above MPP current. To improve current match, the InGaP layer is intentionally thinned to allow additional photons to penetrate to the lower GaAs layer.

In terrestrial concentrating applications, the scatter of blue light by the atmosphere reduces the photon flux above 1.87eV, better balancing the junction currents. Radiation particles that are no longer filtered can cause damage the cell. There are two kinds of damage: ionization and atomic displacement. Still, MJ cells offer higher radiation resistance, higher efficiency and a lower temperature coefficient.

As has been discussed above, the type of photovoltaic cell that is referred to as a Amonolithically integrated@ cell, which consists of two or more photovoltaic layers that are physically and electrically connected, is that the electrical characteristics of each layer have to be matched because the current will and must be the same through each layer. Accordingly, the photocurrent, that is the current generated by the electromagnetic radiation absorbed in each of the respective layers, has to be equal, or electrons will be absorbed between the layers resulting in a loss of efficiency. Each layer must then be designed to produce the same photocurrent for the electromagnetic radiation absorbed within its layer bandgap as each of the other layers will for its respective layer bandgap. For example, for a typical three layer, multi-junction photovoltaic cell, the top layer may be designed to absorb a portion of the ultraviolet spectrum and perhaps a portion of the visible light spectrum, and to pass the remaining wave lengths of visible light and infrared. A second layer, may be designed to absorb the visible light passed by the top layer and to pass infrared. A third layer may be designed to absorb as much of the shorter wavelength infrared spectrum as practical. Each of the three layers must be comprised of material specifically selected and must be designed to produce as close as possible the same photocurrent as the other two layers for the radiation absorbed in its layer bandgap.

The difficulty in matching the photocurrent produced by each layer of a multi-layer photovoltaic cell is further complicated by the variations in the power distribution over the overall operating spectrum range, the "overall bandgap," for which energy is intended to be absorbed by the photovoltaic cell. Significant variations in the power distribution among the ultraviolet, visible light, and infrared spectrums occur with variations in the time of day, season, latitude, altitude, and cloud cover. Even variations in atmospheric pressure and humidity may significantly affect the power distribution over the overall bandgap. Photovoltaic layer material selection and layer design for a sea level, equatorial, frequent cloud cover, and high humidity application, may be poorly suited for a high latitude, high altitude, clear sky, and low humidity application. Further, a photovoltaic cell with material and layer design selected to optimize efficiency during a particular season, may result in a substantially reduced efficiency during other seasons, when the power distribution within the overall bandgap will be

substantially different. Still further, a photovoltaic cell which has its layer material and layer design selections made based upon a particular time of day, i.e. optimized based upon the power distribution within the overall bandgap during a particular time of day, for example solar noon, may result in substantially diminished efficiency during other times of day, particularly the early morning and later afternoon hours. In each operating condition, the photocurrent produced by the least productive photovoltaic layer will determine the cell output photocurrent, and hence the power output and efficiency of the photovoltaic cell.

One solution to this problem of photocurrent differential between layers is to physically and electrically isolate the photovoltaic layers and to combine the current from each layer outside the photovoltaic cell. This is referred to as an amorphous photovoltaic cell.

Another inherent problem affecting the efficiency of a photovoltaic cell, or a photovoltaic layer of a multi-layer cell is related to the output voltage range of the layer. Referring to Fig. 4, the instantaneous current (I) generated by each photovoltaic cell layer and flowing from the photovoltaic cell layer will be dependent upon the extent of the irradiation of the photovoltaic cell layer, the characteristics of the photovoltaic cell layer, and the instantaneous voltage (V) of the circuit to which the current is being discharged by the photovoltaic cell layer. For a multi-layer cell, the foregoing is true of each layer.

The formula for the instantaneous power (P) generated by the photovoltaic cell may be determined by the formula P = I*V. The I and V values at which the maximum power (Pmax) is generated are I = Imp and V = Vmp respectively. I is at its maximum (I0v) when the voltage in the circuit to which the photovoltaic cell layer is being discharged is zero. In the case of a photovoltaic cell layer producing charge that is stored in a capacitor, the maximum current occurs when there is no charge on the capacitor. As the V to which the photovoltaic cell layer is subjected by the capacitor charging circuit, increases above Vmp, the current produced by the photovoltaic cell layer decreases rapidly and goes to zero at the voltage reaches the shut-off voltage (Vs). During any time period that V in the circuit to which the photovoltaic cell layer or the photovoltaic array as a whole, is discharging current, exceeds Vmp, the efficiency of the photovoltaic cell layer or photovoltaic array as a whole will be significantly diminished.

Energy from a photovoltaic system is generally stored in batteries for later use or converted to an AC current for discharge to an electrical grid. If the energy is to be stored in a battery, the voltage for the photovoltaic system will have to be adjusted to exceed the transient voltage of the battery. Since the maximum voltage output of a photovoltaic cell or a photovoltaic cell layer of a multi-layer photovoltaic cell, is typically on the order of 0.5 volts, the voltage must be stepped up before the energy can be stored in a battery system. Similarly, if the energy generated by a photovoltaic cell is to be discharged to an electrical grid system, which may be operated at 240 volts, 480 volts, or much higher voltages, the voltages must be stepped up to a voltage exceeding the minimum voltage required by an inverter which will invert the DC current to a pulsed AC current. Various filters may be used to impose a sinusoidal wave form on the AC.

To maximize the efficiency of a multi-layer photovoltaic cell, the problem of mismatched photocurrent of the photovoltaic layers of a monolithically integrated photovoltaic cell, and the problem of the photocurrent being reduced as the discharge voltage increases on the photovoltaic cell, must be addressed.