

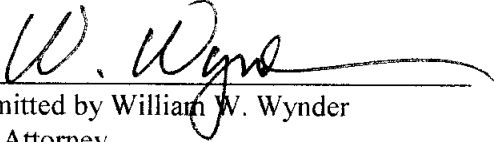


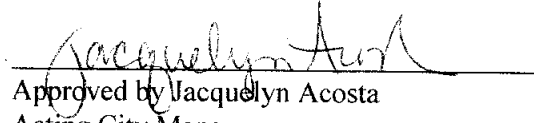
City of Carson

Report to Mayor and City Council

May 6, 2014
New Business Discussion

SUBJECT: CONSIDER APPROVING A CONTRACT SERVICES AGREEMENT FOR ECONOMIC REVITALIZATION, INDUSTRIAL CLUSTER CENTER & UTILITY ENERGY PRODUCTION ANALYSIS & RECOMMENDATIONS WITH SINHA & COMPANY


Submitted by William W. Wynder
City Attorney


Approved by Jacquelyn Acosta
Acting City Manager

I. SUMMARY

This item was continued from the City Council meeting of April 1, 2014 and is on the agenda at the request of Mayor Dear.

In 2010 and 2011, Sinha & Company commenced an analysis for the City of Carson of (1) the feasibility of attracting new age industries to 21st Century Carson, (2) the feasibility of setting up industrial cluster centers in Carson, and proposed to (3) undertake an analysis of establishing a utility energy production center in Carson.

Mayor Dear proposes that these studies be updated, given the dissolution of redevelopment agencies in California, and he proposes that Dr. Sinha study the feasibility of establishing a utility energy production center in Carson, including the possible creation of a city-owned and operated utility.

Upon timely completion of these tasks, the Mayor further proposes that a formal presentation of findings and recommendations regarding these three topics be made to the full City Council.

II. RECOMMENDATION

CONSIDER and PROVIDE direction.

III. ALTERNATIVES

1. APPROVE a CONTRACT SERVICES AGREEMENT FOR ECONOMIC REVITALIZATION, INDUSTRIAL CLUSTER CENTER & UTILITY ENERGY PRODUCTION ANALYSIS & RECOMMENDATIONS with SINHA & COMPANY, in an amount not to exceed \$30,000.00.
2. APPROPRIATE \$30,000.00 from the unassigned general fund balance to cover the cost of this agreement.
3. AUTHORIZE the Mayor to execute the same.
4. TAKE such other action as the City Council deems appropriate consistent with the requirements of law.

28

IV. BACKGROUND

In 2010 and 2011, Sinha & Company commenced an analysis for the City of Carson on the feasibility of attracting new age industries to 21st Century Carson, an analysis of setting up industrial cluster centers in Carson, and proposed to undertake an analysis of establishing a utility production center in Carson including the possibility of creating a city-owned and operated utility.

The attached contract services agreement (Exhibit 1), if approved, would assign to this consultant the following specific tasks:

1. Update the August 2, 2011 report, entitled “Attracting New Age Industries to 21st Century Carson” (Exhibit 2), in light of the dissolution of redevelopment agencies, include in the updated report specific recommendations for implementation of the same by the City Council, and present those recommendations and finding to the City Council at a public meeting, via a “power-point” presentation, within six (6) months from Council’s approval of the contract services agreement.
2. Update the December 28, 2011 report, entitled “Preliminary Feasibility Analysis of Setting Up an Industrial Cluster in Shell’s Revitalization Area” (Exhibit 3), in light of the dissolution of redevelopment agencies, include in the updated report specific recommendations for implementation of the same by the City Council, and present those recommendations and findings to the City Council at a public meeting, via a “power-point” presentation, within six (6) months from Council’s approval of the contract services agreement.
3. Study and then prepare a written report on the feasibility of creating a utility grid-tied hybrid energy production center, including an analysis of the feasibility of establishing a City-owned and operated utility, which study shall include specific recommendations for implementation of the same by the City Council, and present those recommendations and findings to the City Council at a public meeting, via a “power-point” presentation, within nine (9) months from Council’s approval of the contract services agreement.

V. FISCAL IMPACT

Funds for this contract were not included in the FY 2013/14 general fund budget; therefore, if the agreement is approved, the budget will need to be increased by \$30,000.00. Funds should be appropriated from the unassigned general fund balance to account number 01-11-000-011-6005. The current balance of the unassigned general fund balance is \$5,255,868.00.

VI. EXHIBITS

1. Contract Services Agreement. (pgs. 4 - 23)
2. August 2, 2011 Report. (pgs. 24 -123)
3. December 28, 2011 Report. (pgs. 124 - 201)

Prepared by: William W. Wynder, City Attorney

10-Rev06-19-2013

Reviewed by:

City Clerk	City Treasurer
Administrative Services	Public Works
Community Development	Community Services

Action taken by City Council

Date_____ Action_____

CITY OF CARSON

CONTRACT SERVICES AGREEMENT FOR ECONOMIC REVITALIZATION, INDUSTRIAL CLUSTER CENTER & UTILITY ENERGY PRODUCTION ANALYSIS & RECOMMENDATIONS

THIS CONTRACT SERVICES AGREEMENT (herein "Agreement"), is made and entered into this ___ day of March, 2014, by and between the CITY OF CARSON, a general law city & municipal corporation, (herein "City") and SACHIT SINHA, a sole proprietorship doing business as SINHA & COMPANY (herein "Contractor"). (The term Contractor includes professionals performing in a consulting capacity.)

The parties hereto agree as follows:

1.0 SERVICES OF CONTRACTOR

1.1 Scope of Services. In compliance with all terms and conditions of this Agreement, the Contractor shall provide those services specified in the "Scope of Services" attached hereto as Exhibit "A" and incorporated herein by this reference, which services may be referred to herein as the "services" or "work" hereunder. As a material inducement to the City entering into this Agreement, Contractor represents and warrants that Contractor is a provider of first class work and services and Contractor is experienced in performing the work and services contemplated herein and, in light of such status and experience, Contractor covenants that it shall follow the highest professional standards in performing the work and services required hereunder and that all materials shall be of good quality, fit for the purpose intended. For purposes of this Agreement, the phrase "highest professional standards" shall mean those standards of practice recognized by one or more first-class firms performing similar work under similar circumstances.

Contractor hereby agrees to a background check by the Los Angeles County Sheriff's Department if Contractor shall work with persons of 18 years of age or under (see Exhibit "E"), where applicable.

1.2 Contractor's Proposal. The Scope of Service may include the Contractor's proposal or bid which, if included, is incorporated herein by this reference as though fully set forth herein. In the event of any inconsistency between the terms of such proposal and this Agreement, the terms of this Agreement shall govern.

1.3 Compliance with Law. All services rendered hereunder shall be provided in accordance with all ordinances, resolutions, statutes, rules, and regulations of the City and any Federal, State or local governmental agency having jurisdiction in effect at the time service is rendered. Each and every provision required by law to be included in this Agreement shall be deemed to be included, and this Agreement shall be read and enforced as though they were included.

1.4 Licenses, Permits, Fees and Assessments. Contractor shall obtain at its sole cost and expense such licenses, permits and approvals as may be required by law for the performance of



the services required by this Agreement. Contractor shall have the sole obligation to pay for any fees, assessments and taxes, plus applicable penalties and interest, which may be imposed by law and arise from or are necessary for the Contractor's performance of the services required by this Agreement, and shall indemnify, defend and hold harmless City against any such fees, assessments, taxes penalties or interest levied, assessed or imposed against City hereunder.

1.5 Familiarity with Work. By executing this Contract, Contractor warrants that Contractor (a) has thoroughly investigated and considered the scope of services to be performed, (b) has carefully considered how the services should be performed, and (c) fully understands the facilities, difficulties and restrictions attending performance of the services under this Agreement. If the services involve work upon any site, Contractor warrants that Contractor has or will investigate the site and is or will be fully acquainted with the conditions there existing, prior to commencement of services hereunder. Should the Contractor discover any latent or unknown conditions, which shall or will materially affect the performance of the services hereunder, Contractor shall immediately inform the City of such fact and shall not proceed except at Contractor's risk until written instructions are received from the Contract Officer (see Section 4.2).

1.6 Care of Work. The Contractor shall adopt reasonable methods during the life of the Agreement to furnish continuous protection to the work, and the equipment, materials, papers, documents, plans, studies and/or other components thereof to prevent losses or damages, and shall be responsible for all such damages, to persons or property, until acceptance of the work by City, except such losses or damages as may be caused by City's own negligence.

1.7 Further Responsibilities of Parties. Both parties agree to use reasonable care and diligence to perform their respective obligations under this Agreement. Both parties agree to act in good faith to execute all instruments, prepare all documents and take all actions as may be reasonably necessary to carry out the purposes of this Agreement. Unless hereafter specified, neither party shall be responsible for the service of the other.

1.8 Additional Services. City shall have the right at any time during the performance of the services, without invalidating this Agreement, to order extra work beyond that specified in the Scope of Services or make changes by altering, adding to or deducting from said work. No such extra work may be undertaken unless a written order is first given by the Contract Officer to the Contractor, incorporating therein any adjustment in (i) the Contract Sum, and/or (ii) the time to perform this Agreement, which said adjustments are subject to the written approval of the Contractor. Any increase in compensation of up to five percent of the Contract Sum or \$25,000.00, whichever is less; or in the time to perform of up to one hundred eighty days may be approved by the Contract Officer. Any greater increases, taken either separately or cumulatively must be approved by the City Council. It is expressly understood by Contractor that the provisions of this Section shall not apply to services specifically set forth in the Scope of Services or reasonably contemplated therein. Contractor hereby acknowledges that it accepts the risk that the services to be provided pursuant to the Scope of Services may be more costly or time consuming than Contractor anticipates and that Contractor shall not be entitled to additional compensation therefore.

1.9 Special Requirements. Additional terms and conditions of this Agreement, if any, which are made a part hereof are set forth in the "Special Requirements" attached hereto as Exhibit "B" and incorporated herein by this reference. In the event of a conflict between the provisions of Exhibit "B" and any other provisions of this Agreement, the provisions of Exhibit "B" shall govern.

2.0 COMPENSATION

2.1 Contract Sum. For the services rendered pursuant to this Agreement, the Contractor shall be compensated in accordance with the "Schedule of Compensation" attached hereto as Exhibit "C" and incorporated herein by this reference, but not exceeding the maximum contract amount of THIRTY THOUSAND DOLLARS (\$30,000.00) (herein "Contract Sum"), except as provided in Section 1.8. The method of compensation may include: (i) a lump sum payment upon completion, (ii) payment in accordance with the percentage of completion of the services, (iii) payment for time and materials based upon the Contractor's rates as specified in the Schedule of Compensation, but not exceeding the Contract Sum or (iv) such other methods as may be specified in the Schedule of Compensation. Compensation may include reimbursement for actual and necessary expenditures for reproduction costs, telephone expense, transportation expense approved by the Contract Officer in advance, and no other expenses and only if specified in the Schedule of Compensation. The Contract Sum shall include the attendance of Contractor at all project meetings and City Council meetings reasonably deemed necessary by the City; Contractor shall not be entitled to any additional compensation for attending said meetings.

2.2 Method of Payment. Unless some other method of payment is specified in the Schedule of Compensation, in any month in which Contractor wishes to receive payment, no later than the first working day of such month, Contractor shall submit to the City in the form approved by the City's Director of Administrative Services, an invoice for services rendered prior to the date of the invoice. Except as provided in Section 7.3, City shall pay Contractor for all expenses stated thereon which are approved by City pursuant to this Agreement no later than the last working day of the month, subject to such extensions as may be necessary to obtain any required approvals for payment from the City Council.

3.0 PERFORMANCE SCHEDULE

3.1 Time of Essence. Time is of the essence in the performance of this Agreement.

3.2 Schedule of Performance. Contractor shall commence the services pursuant to this Agreement upon receipt of a written notice to proceed and shall perform all services within the time period(s) established in the "Schedule of Performance" attached hereto as Exhibit "D", if any, and incorporated herein by this reference. When requested by the Contractor, extensions to the time period(s) specified in the Schedule of Performance may be approved in writing by the Contract Officer but not exceeding one hundred eighty days cumulatively.

3.3 Force Majeure. The time period(s) specified in the Schedule of Performance for performance of the services rendered pursuant to this Agreement shall be extended because of any delays due to unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God or of the public enemy, unusually severe



weather, fires, earthquakes, floods, epidemics, quarantine restrictions, riots, strikes, freight embargoes, wars, litigation, and/or acts of any governmental agency, including the City, if the Contractor shall within ten days of the commencement of such delay notify the Contract Officer in writing of the causes of the delay. The Contract Officer shall ascertain the facts and the extent of delay, and extend the time for performing the services for the period of the enforced delay when and if in the judgment of the Contract Officer such delay is justified. The Contract Officer's determination shall be final and conclusive upon the parties to this Agreement. In no event shall Contractor be entitled to recover damages against the City for any delay in the performance of this Agreement, however caused, Contractor's sole remedy being extension of the Agreement pursuant to this Section.

3.4 Term. Unless earlier terminated in accordance with Section 7.8 of this Agreement, this Agreement shall continue in full force and effect until completion of the services but not exceeding one year from the date hereof, except as otherwise provided in the Schedule of Performance.

4.0 COORDINATION OF WORK

4.1 Representative of Contractor. The following principals of Contractor are hereby designated as being the principals and representatives of Contractor authorized to act in its behalf with respect to the work specified herein and make all decisions in connection therewith:

Mr. Sachit Sinha
Sole Proprietor

It is expressly understood that the experience, knowledge, capability and reputation of the foregoing principals were a substantial inducement for City to enter into this Agreement. Therefore, the foregoing principals shall be responsible during the term of this Agreement for directing all activities of Contractor and devoting sufficient time to personally supervise the services hereunder. For purposes of this Agreement, the foregoing principals may not be replaced nor may their responsibilities be substantially reduced by Contractor without the express written approval of City.

4.2 Contract Officer. The Contract Officer shall be such person as may be designated by the City Manager of City. It shall be the Contractor's responsibility to assure that the Contract Officer is kept informed of the progress of the performance of the services and the Contractor shall refer any decisions which must be made by City to the Contract Officer. Unless otherwise specified herein, any approval of City required hereunder shall mean the approval of the Contract Officer. The Contract Officer shall have authority to sign all documents on behalf of the City required hereunder to carry out the terms of this Agreement.

4.3 Prohibition Against Subcontracting or Assignment. The experience, knowledge, capability and reputation of Contractor, its principals and employees were a substantial inducement for the City to enter into this Agreement. Therefore, Contractor shall not contract with any other entity to perform in whole or in part the services required hereunder without the express written approval of the City. In addition, neither this Agreement nor any interest herein may be transferred, assigned, conveyed, hypothecated or encumbered voluntarily or by operation of law, whether for

the benefit of creditors or otherwise, without the prior written approval of City. Transfers restricted hereunder shall include the transfer to any person or group of persons acting in concert of more than 25% of the present ownership and/or control of Contractor, taking all transfers into account on a cumulative basis. In the event of any such unapproved transfer, including any bankruptcy proceeding, this Agreement shall be void. No approved transfer shall release the Contractor or any surety of Contractor of any liability hereunder without the express consent of City.

4.4 Independent Contractor. Neither the City nor any of its employees shall have any control over the manner, mode or means by which Contractor, its agents or employees, perform the services required herein, except as otherwise set forth herein. City shall have no voice in the selection, discharge, supervision or control of Contractor's employees, servants, representatives or agents, or in fixing their number, compensation or hours of service. Contractor shall perform all services required herein as an independent contractor of City and shall remain at all times as to City a wholly independent contractor with only such obligations as are consistent with that role. Contractor shall not at any time or in any manner represent that it or any of its agents or employees are agents or employees of City. City shall not in any way or for any purpose become or be deemed to be a partner of Contractor in its business or otherwise or a joint venture or a member of any joint enterprise with Contractor.

5.0 INSURANCE, INDEMNIFICATION AND BONDS

5.1 Insurance. Without limiting Contractor's indemnification obligations as set forth in this Agreement, the Contractor shall procure and maintain, at its sole cost and expense, in a form and content satisfactory to City, during the entire term of this Agreement including any extension thereof, the following policies of insurance:

- (a.) Comprehensive General Liability Insurance. A policy of comprehensive general liability insurance written on a per occurrence basis. If the Contract Sum is \$25,000.00 or less, the policy of insurance shall be written in an amount not less than \$500,000.00 single limit, per occurrence. If the Contract Sum is greater than \$25,000.00 but less than \$1,000,000.00, the policy of insurance shall be in an amount not less than \$1,000,000.00 single limit, per occurrence. If the Contract Sum is greater than \$1,000,000.00 but less than \$2,000,000.00, the policy of insurance shall be in an amount not less than \$2,000,000.00, single limit, per occurrence. If the Contract Sum is greater than \$2,000,000.00, the policy of insurance shall be in an amount not less than \$5,000,000.00 single limit, per occurrence.
- (b.) Worker's Compensation Insurance. A policy of worker's compensation insurance in such amount as shall fully comply with the laws of the State of California and which shall indemnify, insure and provide legal defense for both the Contractor and the City against any loss, claim or damage arising from any injuries or occupational diseases occurring to any worker employed by or any persons retained by the Contractor in the course of carrying out the work or services contemplated in this Agreement.



- (c.) Automotive/Vehicle Insurance. A policy of comprehensive automobile/vehicle liability (including owned, non-owned, leased, and hired autos/vehicles) insurance written on a per occurrence basis in an amount not less than \$500,000.00 single limit, per occurrence, for bodily injury and property damage.
- (d.) Additional Insurance. Policies of such other insurance, including professional liability insurance, as may be required in the Special Requirements.

All of the above policies of insurance shall be primary insurance and shall name the CITY OF CARSON, its officers, employees and agents as additional insureds. The insurer shall waive all rights of subrogation and contribution it may have against the City, its officers, officials, employees, agents, representatives, and volunteers, and their respective insurers. Moreover, the insurance policy must specify that where the primary insured does not satisfy the self-insured retention, any additional insured may satisfy the self-insured retention in order to assure coverage as an "additional insured." All of said policies of insurance shall be endorsed to:

- (1) provide that said insurance may not be amended or cancelled without providing thirty days prior written notice by certified or registered mail to the City;
- (2) provide that the insurer shall waive all rights of subrogation and contribution it may have against the City of Carson, its officers, officials, employees, agents, representatives, and volunteers, and their respective insurers; and
- (3) name the City of Carson, its City Council and all the City Council appointed groups, committees, boards, and any other City Council appointed bodies, and the City's elected or appointed officers, and its officials, employees, agents, representatives, and volunteers (hereinafter "City and City Personnel") as additional insureds.

All of Contractor's insurance (i) shall contain no special limitations on the scope of protection afforded to City and City Personnel; (ii) shall be primary insurance and any insurance or self-insurance maintained by City or City Personnel shall be in excess of the Contractor's insurance and shall not contribute with it; (iii) shall be "occurrence" rather than "claims made" insurance; (iv) shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability; and (v) shall be written by insurers in compliance with Section 5.4.

No work or services under this Agreement shall commence until the Contractor has provided the City with Certificates of Insurance or appropriate insurance binders evidencing the above insurance coverage's and said Certificates of Insurance or binders are approved by the City.



In the event any of said policies of insurance are materially modified or cancelled for any reason, the Contractor shall, prior to the cancellation date, submit new evidence of insurance, in conformance with this Section 5.1, to the Contract Officer. The Contract Officer, with the prior approval of the City Manager, shall have authority to consent to a modification of the foregoing insurance requirements, which consent may be given or withheld in the Contract Officer's and City Manager's respective sole and absolute and arbitrary discretion.

The Contractor agrees that the provisions of this Section 5.1 shall not be construed as limiting in any way the extent to which the Contractor may be held responsible for the payment of damages to any persons or property resulting from the Contractor's activities or the activities of any person or persons for which the Contractor is otherwise responsible.

In the event the Contractor subcontracts any portion of the work in compliance with Section 4.3 of this Agreement, the contract between the Contractor and such subcontractor shall require the subcontractor to maintain the same policies of insurance that the Contractor is required to maintain pursuant to this Section 5.1.

5.2 Indemnification. Contractor agrees to indemnify the City, its officers, agents and employees against, and shall hold and save them and each of them harmless from, any and all actions, suits, claims, damages to persons or property, losses, costs, penalties, obligations, errors, omissions or liabilities, (herein "claims or liabilities") that may be asserted or claimed by any person, firm or entity arising out of or in connection with the negligent performance of the work, operations or activities of Contractor, its agents, employees, subcontractors, or invitees, provided for herein, or arising from the negligent acts or omissions of Contractor hereunder, or arising from Contractor's negligent performance of or failure to perform any term, provision, covenant or condition of this Agreement, whether or not there is concurrent passive or active negligence on the part of the City, its officers, agents or employees but excluding such claims or liabilities arising from the sole negligence or willful misconduct of the City, its officers, agents or employees, who are directly responsible to the City, and in connection therewith:

- (a.) Contractor shall defend any action or actions filed in connection with any of said claims or liabilities and shall pay all costs and expenses, including legal costs and attorneys' fees incurred in connection therewith;
- (b.) Contractor shall promptly pay any judgment rendered against the City, its officers, agents or employees for any such claims or liabilities arising out of or in connection with the negligent performance of or failure to perform such work, operations or activities of Contractor hereunder; and Contractor agrees to save and hold the City, its officers, agents, and employees harmless therefrom;
- (c.) In the event the City, its officers, agents or employees is made a party to any action or proceeding filed or prosecuted against Contractor for such damages or other claims arising out of or in connection with the negligent performance of or failure to perform the work, operation or activities of Contractor hereunder, Contractor agrees to pay to the City, its officers,

agents or employees, any and all costs and expenses incurred by the City, its officers, agents or employees in such action or proceeding, including but not limited to, legal costs and attorneys' fees.

5.3 Performance Bond. Concurrently with execution of this Agreement, Contractor shall deliver to City a performance bond in the sum of the amount of this Agreement, in the form provided by the City Clerk, which secures the faithful performance of this Agreement, unless such requirement is waived by the Contract Officer. The bond shall contain the original notarized signature of an authorized officer of the surety and affixed thereto shall be a certified and current copy of his power of attorney. The bond shall be unconditional and remain in force during the entire term of the Agreement and shall be null and void only if the Contractor promptly and faithfully performs all terms and conditions of this Agreement.

5.4 Sufficiency of Insurer or Surety. Insurance or bonds required by this Agreement shall be satisfactory only if issued by companies qualified to do business in California, rated "A" or better in the most recent edition of Best Rating Guide, The Key Rating Guide or in the Federal Register, and only if they are of a financial category Class VII or better, unless such requirements are waived by the Senior Risk Management Analyst of the City due to unique circumstances. In the event the Senior Risk Management Analyst of the City determines that the work or services to be performed under this Agreement creates an increased or decreased risk of loss to the City, the Contractor agrees that the minimum limits of the insurance policies and the performance bond required by this Section 5.0 may be changed accordingly upon receipt of written notice from the City's Senior Risk Management Analyst; provided that the Contractor shall have the right to appeal a determination of increased coverage by the Senior Risk Management Analyst to the City Council of City within ten days of receipt of notice from the Senior Risk Management Analyst.

5.5 Payment Bond for Contracts Over \$25,000.00. Concurrently with the execution of their Agreement, if the contract sum specified in Section 2.1 of this Agreement is in excess of twenty-five thousand dollars (\$25,000.00), Contractor shall deliver to City a payment bond in the sum specified below, in the form provided by the City Clerk, which secures payments to subcontractors and suppliers in the event of default by Contractor. The payment bond shall contain the original notarized signature of an authorized officer of the surety and affixed thereto shall be a certified and current copy of his power of attorney. The payment bond shall be unconditional and remain in force during the entire term of the Agreement and shall be null and void only if the Contractor completely and faithfully pays all subcontractors and suppliers that have been approved in writing pursuant to Section 4.3 of this Agreement to perform in whole or part the services required herein.

The payment bond shall be in a sum not less than that prescribed by law under California Civil Code § 3248, such that the bond shall be in the sum of:

- (a.) 100% of the total amount payable by the terms of this Agreement if the total amount payable does not equal or exceed five million dollars (\$5,000,000.00); or
- (b.) 50% of the total amount payable by the terms of this Agreement if the total



amount payable is not less than five million dollars (\$5,000,000.00) and does not exceed ten million dollars (\$10,000,000.00); or

- (c.) 25% of the total amount payable by the terms of this Agreement if the Agreement exceeds ten million dollars (\$10,000,000.00).

If Contractor is the provider of architectural, engineering, and land surveying services pursuant to an existing contract with City for a public work, Contractor shall not be required to post or deliver a payment bond. Further, if the sum of the payment bond as required under California Civil Code § 3248 is different than the sum required under this Agreement, the sum specified in California Civil Code § 3248 is controlling.

5.6 Sufficiency of Insurer or Surety for Payment Bond. If Contractor must deliver a payment bond pursuant to Section 5.5 of this Agreement, Contractor shall deliver, concurrently with the execution of this Agreement and delivery of said payment bond, to City the following documents:

- (a.) A certified copy of the Certificate of Authority of the Insurer or Surety issued by the Insurance Commissioner, which authorizes the Insurer or Surety to transact insurance in the State of California;
- (b.) A certificate from the Clerk of the County of Los Angeles that the Certificate of Authority of the Insurer or Surety has not been surrendered, revoked, canceled, annulled, or suspended; or, in the event the Certificate of Authority of the Insurer or Surety has been suspended, that renewed authority has been granted; and
- (c.) True and correct copies of the Insurer's or Surety's most recent annual statement and quarterly statement filed with the Department of Insurance.

Failure of Contractor to deliver these documents by the time of execution of this Agreement shall require City to refrain from entering the Agreement, as Contractor will be deemed to have failed to ensure the sufficiency of the Insurer or Surety to the satisfaction of City, as required by the provisions of the Bond and Undertaking Law, Code of Civil Procedure § 995.660.

6.0 RECORDS AND REPORTS

6.1 Reports. Contractor shall periodically prepare and submit to the Contract Officer such reports concerning the performance of the services required by this Agreement as the Contract Officer shall require. Contractor hereby acknowledges that the City is greatly concerned about the cost of work and services to be performed pursuant to this Agreement. For this reason, Contractor agrees that if Contractor becomes aware of any facts, circumstances, techniques, or events that may or shall materially increase or decrease the cost of the work or services contemplated herein or, if

Contractor is providing design services, the cost of the project being designed. Contractor shall promptly notify the Contract Officer of said fact, circumstance, technique or event and the estimated increased or decreased cost related thereto and, if Contractor is providing design services, the estimated increased or decreased cost estimate for the project being designed.

6.2 Records. Contractor shall keep, and require subcontractors to keep, such books and records as shall be necessary to perform the services required by this Agreement and enable the Contract Officer to evaluate the performance of such services. The Contract Officer shall have full and free access to such books and records at all times during normal business hours of City, including the right to inspect, copy, audit and make records and transcripts from such records. Such records shall be maintained for a period of three years following completion of the services hereunder, and the City shall have access to such records in the event any audit is required.

6.3 Ownership of Documents. All drawings, specifications, reports, records, documents and other materials prepared by Contractor, its employees, subcontractors and agents in the performance of this Agreement shall be the property of City and shall be delivered to City upon request of the Contract Officer or upon the termination of this Agreement, and Contractor shall have no claim for further employment or additional compensation as a result of the exercise by City of its full rights of ownership of the documents and materials hereunder. Any use of such completed documents for other projects and/or use of uncompleted documents without specific written authorization by the Contractor shall be at the City's sole risk and without liability to Contractor, and the City shall indemnify the Contractor for all damages resulting therefrom. Contractor may retain copies of such documents for its own use. Contractor shall have an unrestricted right to use the concepts embodied therein. All subcontractors shall provide for assignment to City of any documents or materials prepared by them, and in the event Contractor fails to secure such assignment, Contractor shall indemnify City for all damages resulting therefrom.

6.4 Release of Documents. The drawings, specifications, reports, records, documents and other materials prepared by Contractor in the performance of services under this Agreement shall not be released publicly without the prior written approval of the Contract Officer.

7.0 ENFORCEMENT OF AGREEMENT

7.1 California Law. This Agreement shall be construed and interpreted both as to validity and to performance of the parties in accordance with the laws of the State of California. Legal actions concerning any dispute, claim or matter arising out of or in relation to this Agreement shall be instituted in the Superior Court of the County of Los Angeles, State of California, or any other appropriate court in such county, and Contractor covenants and agrees to submit to the personal jurisdiction of such court in the event of such action. Service of process on City shall be made in the manner required by law for service on a public entity. Service of process on Consultant shall be made in any manner permitted by law and shall be effective whether served inside or outside of California.

7.2 Disputes. Subject to the provisions of Section 7.7 (Termination Prior to Expiration of Term), in the event of a dispute arising under this Agreement, Contractor shall

comply with the provisions of this Section, and City may, in its sole discretion, comply with the provisions of this section. The injured party shall notify the injuring party in writing of its contentions. The injured party shall continue performing its obligations hereunder so long as the injuring party commences to cure such default within ten days of service of such notice and completes the cure of such default within 60 days after service of the notice, or such longer period as may be permitted by the injured party; provided that if the default is an immediate danger to the health, safety and general welfare, such immediate action may be necessary. Compliance with the provisions of this section shall be a condition precedent to termination of this Agreement for cause by Consultant and to any legal action commenced by Consultant, and such compliance shall not be a waiver of Consultant's right to take legal action in the event that the dispute is not cured. Nothing herein shall limit City's right to terminate this Agreement with or without cause pursuant to Section 7.7.

7.3 Retention of Funds. Contractor hereby authorizes City to deduct from any amount payable to Contractor (whether or not arising out of this Agreement) (i) any amounts the payment of which may be in dispute hereunder or which are necessary to compensate City for any losses, costs, liabilities, or damages suffered by City, and (ii) all amounts for which City may be liable to third parties, by reason of Contractor's acts or omissions in performing or failing to perform Contractor's obligation under this Agreement. In the event that any claim is made by a third party, the amount or validity of which is disputed by Contractor, or any indebtedness shall exist which shall appear to be the basis for a claim of lien, City may withhold from any payment due, without liability for interest because of such withholding, an amount sufficient to cover such claim. The failure of City to exercise such right to deduct or to withhold shall not, however, affect the obligations of the Contractor to insure, indemnify, and protect City as elsewhere provided herein.

7.4 Waiver. No delay or omission in the exercise of any right or remedy by a nondefaulting party on any default shall impair such right or remedy or be construed as a waiver. A party's consent to or approval of any act by the other party requiring the party's consent or approval shall not be deemed to waive or render unnecessary the other party's consent to or approval of any subsequent act. Any waiver by either party of any default must be in writing and shall not be a waiver of any other default concerning the same or any other provision of this Agreement.

7.5 Rights and Remedies are Cumulative. Except with respect to rights and remedies expressly declared to be exclusive in this Agreement, the rights and remedies of the parties are cumulative and the exercise by either party of one or more of such rights or remedies shall not preclude the exercise by it, at the same or different times, of any other rights or remedies for the same default or any other default by the other party.

7.6 Legal Action. In addition to any other rights or remedies, either party may take legal action, in law or in equity, to cure, correct or remedy any default, to recover damages for any default, to compel specific performance of this Agreement, to obtain declaratory or injunctive relief, or to obtain any other remedy consistent with the purposes of this Agreement.

7.7 Termination Prior to Expiration of Term. This Section shall govern any termination of this Agreement except as specifically provided in the following Section for termination for cause. The City reserves the right to terminate this Agreement at any time, with or

without cause, upon written notice to Contractor. Contractor may terminate this Agreement only for cause and with not less than thirty days prior written notice and only after following the procedures of Section 7.2 to enable the City to affect a cure of a default. Upon receipt of any notice of termination, Contractor shall immediately cease all services hereunder except such as may be specifically approved by the Contract Officer. Except where the Contractor has initiated termination, the Contractor shall be entitled to compensation for all services rendered prior to the effective date of the notice of termination and for any services authorized by the Contract Officer thereafter in accordance with the Schedule of Compensation or such as may be approved by the Contract Officer, except as provided in Section 7.3. In the event the Contractor has initiated termination, the Contractor shall be entitled to compensation only for the lesser of (i) the amount due for work completed under the Schedule of Compensation or (ii) the reasonable value of the work product actually produced hereunder. In the event of termination without cause pursuant to this Section, the terminating party need not provide the non-terminating party with the opportunity to cure pursuant to Section 7.2.

7.8 Termination for Default of Contractor. If termination is due to the failure of the Contractor to fulfill its obligations under this Agreement, City may take over the work and prosecute the same to completion by contract or otherwise, and the Contractor shall be liable to the extent that the total cost for completion of the services required hereunder exceeds the compensation herein stipulated (provided that the City shall use reasonable efforts to mitigate such damages), and City may withhold any payments to the Contractor for the purpose of set-off or partial payment of the amounts owed the City as previously stated.

7.9 Attorneys' Fees. If either party to this Agreement is required to initiate or defend or made a party to any action or proceeding in any way connected with this Agreement, the prevailing party in such action or proceeding, in addition to any other relief which may be granted, whether legal or equitable, shall be entitled to its expert witness fees and reasonable attorney's fees. Attorney's fees shall include attorney's fees on any appeal, and in addition, a party entitled to attorney's fees shall be entitled to all other reasonable costs for investigating such action, taking depositions and discovery and all other necessary costs the court allows, which are incurred in such litigation. All such fees shall be deemed to have accrued on commencement of such action and shall be enforceable whether or not such action is prosecuted to judgment.

8.0 CITY OFFICERS AND EMPLOYEES: NON-DISCRIMINATION

8.1 Non-Liability of City Officers and Employees. No officer, official, employee, agent, representative, or volunteer of the City shall be personally liable to the Contractor, or any successor in interest, in the event of any default or breach by the City or for any amount which may become due to the Contractor or to its successor, or for breach of any obligation of the terms of this Agreement.

8.2 Conflict of Interest. No officer, official, employee, agent, representative, or volunteer of the City shall have any financial interest, direct or indirect, in this Agreement nor shall any such officer or employee participate in any decision relating to the Agreement which effects his financial interest or the financial interest of any corporation, partnership or association in which he is, directly or indirectly, interested, in violation of any State statute or regulation. The Contractor

warrants that it has not paid or given and shall not pay or give any third party any money or other consideration for obtaining this Agreement.

8.3 Covenant Against Discrimination. Contractor covenants that, by and for itself, its heirs, executors, assigns, and all persons claiming under or through them, that there shall be no discrimination against or segregation of, any person or group of persons on account of race, color, creed, religion, sex, marital status, national origin, or ancestry in the performance of this Agreement. Contractor shall take affirmative action to insure that applicants are employed and that employees are treated during employment without regard to their race, color, creed, religion, sex, marital status, national origin, or ancestry.

9.0 MISCELLANEOUS PROVISIONS

9.1 Notice. Unless otherwise provided herein, all notices required to be delivered under this Agreement or under applicable law shall be (i) personally delivered, or (ii) delivered by United States mail, prepaid, certified, return receipt requested, or (iii) delivered by reputable document delivery service that provides a receipt showing date and time of delivery. Notices personally delivered or delivered by a document delivery service shall be effective upon receipt. Notices delivered by mail shall be effective at 5:00 p.m. on the second calendar day following dispatch. Notices shall be delivered to the City at the following address: City of Carson, 701 East Carson Street, Carson, California 90745; Attn: Mr. Sachit Sinha. Notices shall be delivered to Contractor at the following address: 14252 Culver Drive, Suite A, Irvine, CA 92604. Either party may change the address for receipt of notices to that party by written notice delivered in compliance with this section.

9.2 Interpretation. The terms of this Agreement shall be construed in accordance with the meaning of the language used and shall not be construed for or against either party by reason of the authorship of this Agreement or any other rule of construction which might otherwise apply.

9.3 Integration Amendment. It is understood that there are no oral agreements between the parties hereto affecting this Agreement and this Agreement supersedes and cancels any and all previous negotiations, arrangements, agreements and understandings, if any, between the parties, and none shall be used to interpret this Agreement. This Agreement may be amended at any time by the mutual consent of the parties by an instrument in writing.

9.4 Severability. In the event that any one or more of the phrases, sentences, clauses, paragraphs, or sections contained in this Agreement shall be declared invalid or unenforceable by a valid judgment or decree of a court of competent jurisdiction, such invalidity or unenforceability shall not affect any of the remaining phrases, sentences, clauses, paragraphs, or sections of this Agreement which are hereby declared as severable and shall be interpreted to carry out the intent of the parties hereunder unless the invalid provision is so material that its invalidity deprives either party of the basic benefit of their bargain or renders this Agreement meaningless.

9.5 Corporate Authority. The persons executing this Agreement on behalf of the parties hereto warrant that (i) such party is duly organized and existing, (ii) they are duly authorized to execute and deliver this Agreement on behalf of said party, (iii) by so executing this Agreement,

such party is formally bound to the provisions of this Agreement, and (iv) the entering into this Agreement does not violate any provision of any other Agreement to which said party is bound.

9.6 Authority to Execute. The person(s) executing this Agreement on behalf of the parties hereto warrant that (i) such party is duly organized and existing, (ii) they are duly authorized to execute and deliver this Agreement on behalf of said party, (iii) by so executing this Agreement, such party is formally bound to the provisions of this Agreement, and (iv) the entering into this Agreement does not violate any provision of any other Agreement to which said party is bound.

9.7 Warranty and Representation of Non-Collusion. No official, officer, or employee of City has any financial interest, direct or indirect, in this Agreement, nor shall any official, officer, or employee of City participate in any decision relating to this Agreement which may affect his/her financial interest or the financial interest of any corporation, partnership, or association in which (s)he is directly or indirectly interested, or in violation of any corporation, partnership, or association in which (s)he is directly or indirectly interested, or in violation of any State or municipal statute or regulation. The determination of "financial interest" shall be consistent with State law and shall not include interests found to be "remote" or "noninterests" pursuant to Government Code Sections 1091 or 1091.5. Consultant warrants and represents that it has not paid or given, and will not pay or give, to any third party including, but not limited to, any official, officer, or employee of City, any money, consideration, or other thing of value as a result or consequence of obtaining or being awarded any agreement. Consultant further warrants and represents that (s)he/it has not engaged in any act(s), omission(s), or other conduct or collusion that would result in the payment of any money, consideration, or other thing of value to any third party including, but not limited to, any official, officer, or employee of City, as a result of consequence of obtaining or being awarded any agreement. Consultant is aware of and understands that any such act(s), omission(s) or other conduct resulting in the payment of money, consideration, or other thing of value will render this Agreement void and of no force or effect.

Consultant's Authorized Initials _____

[end - signature page and exhibits follow]

IN WITNESS WHEREOF, the parties have executed and entered into this Agreement as of the date first written above.

CITY:

CITY OF CARSON,
a municipal corporation

Mayor Jim Dear

ATTEST:

City Clerk Donesia L. Gause, CMC

APPROVED AS TO FORM:
ALESHIRE & WYNDER, LLP

City Attorney

CONTRACTOR:

SACHIT SINHA, a sole proprietorship,
d/b/a/ SINHA & COMPANY

By: _____

Name: Sachit Sinah

Title: Sole Proprietor

Address: 14252 Culver Drive, Suite A
Irvine, CA. 92604

[END OF SIGNATURES]

Exhibit "A"
SCOPE OF SERVICES

A-1. Within fourteen (14) days of receipt of a written notice to proceed, Contractor shall meet with City staff responsible for economic development to conduct a scoping meeting to determine the order and priority of completion of the scope of services herein. Following such scoping meeting, City and Contractor shall agree, in writing on the order of performance of the scope of services herein.

A-2. Contractor shall, within the time period agreed upon in the scoping meeting, up-date its August 2, 2011 report, entitled "Attracting New Age Industries to 21st Century Carson," and shall include in the same specific recommendations for implementation of the same by City's City Council. Upon approval of the up-dated report by City's staff, Contractor shall present the same to City's City Council at a public meeting including a "power-point" presentations of its findings and recommendations. Such up-dated report and presentation shall be completed and presented not later than six (6) months of the date of the scoping meeting.

A-3. Contractor shall, within the time period agreed upon in the scoping meeting, up-date its December 28, 2011 report, entitled "Preliminary Feasibility Analysis of Setting up and Industrial Cluster in Shell's Revitalization Area," and shall include in the same specific recommendations for implementation of the same by City's City Council. Upon approval of the up-dated report by City's staff, Contractor shall present the same to City's City Council at a public meeting including a "power-point" presentations of its findings and recommendations. Such up-dated report and presentation shall be completed and presented not later than six (6) months of the date of the scoping meeting.

A-4. Contractor shall, within the time period agreed upon in the scoping meeting, prepare a written report on the feasibility of creating a utility grid-tied hybrid energy production center, including an analysis of the feasibility of establishing a City-owned utility provider, which study shall include specific recommendations for implementation of the same by City's City Council. Upon approval of the up-dated report by City's staff, Contractor shall present the same to City's City Council at a public meeting including a "power-point" presentations of its findings and recommendations. Such up-dated report and presentation shall be completed and presented not later than nine (9) months of the date of the scoping meeting.

Exhibit "B"

SPECIAL REQUIREMENTS

B-1 Without limiting Consultant's indemnification obligations set forth in this Agreement, Consultant shall procure and maintain in full force and effect, at its sole cost and expense, in a form and content satisfactory to City, during the entire term of this Agreement, including any extension thereof, and for a period of three (3) consecutive years thereafter, the following policies of insurance.

B-2. A policy of professional liability insurance written in an amount not less than \$1,000,000.00 and written on a claims made basis.

B-3. City hereby waives the requirements of Sections 5.3, 5.5 and 5.6 of this Agreement.

Exhibit "C"

Exhibit "C"

SCHEDULE OF COMPENSATION

C-1. Contractor shall be compensated at the rate of \$55.00 per hour for services rendered pursuant to this Agreement. Contractor shall render a monthly billing statement for fees and shall indicate the basis of the fees, including the hours worked the billable rates charged, and description of the work performed. All bills are expected to be paid within thirty (30) day of the date of billing statement.



Exhibit "D"

SCHEDULE OF PERFORMANCE

D-1. Within fourteen (14) days of receipt of a written notice to proceed, Contractor shall meet with City staff responsible for economic development to conduct a scoping meeting to determine the order and priority of completion of the scope of services herein. Following such scoping meeting, City and Contract shall agree, in writing on the order of performance of the scope of services herein.

D-2. Contractor shall, within the time period agreed upon in the scoping meeting, up-date its August 2, 2011 report, entitled "Attracting New Age Industries to 21st Century Carson," and shall include in the same specific recommendations for implementation of the same by City's City Council. Upon approval of the up-dated report by City's staff, Contractor shall present the same to City's City Council at a public meeting including a "power-point" presentations of its findings and recommendations. Such up-dated report and presentation shall be completed and presented not later than six (6) months of the date of the scoping meeting.

D-3. Contractor shall, within the time period agreed upon in the scoping meeting, up-date its December 28, 2011 report, entitled "Preliminary Feasibility Analysis of Setting up and Industrial Cluster in Shell's Revitalization Area," and shall include in the same specific recommendations for implementation of the same by City's City Council. Upon approval of the up-dated report by City's staff, Contractor shall present the same to City's City Council at a public meeting including a "power-point" presentations of its findings and recommendations. Such up-dated report and presentation shall be completed and presented not later than six (6) months of the date of the scoping meeting.

D-4. Contractor shall, within the time period agreed upon in the scoping meeting, prepare a written report on the feasibility of creating a utility grid-tied hybrid energy production center, including an analysis of the feasibility of establishing a City-owned utility provider, which study shall include specific recommendations for implementation of the same by City's City Council. Upon approval of the up-dated report by City's staff, Contractor shall present the same to City's City Council at a public meeting including a "power-point" presentations of its findings and recommendations. Such up-dated report and presentation shall be completed and presented not later than nine (9) months of the date of the scoping meeting.

Exhibit "E"

LOS ANGELES SHERIFF'S DEPARTMENT REVIEW (IF APPLICABLE)

If applicable (see Section 1.1), attach a receipt from the Los Angeles County Sheriff's Department confirming you have been fingerprinted and indicate the following:

Name: _____

Driver's License No.: _____ Date of Birth: _____

Are you now, or have you ever been a member of P.E.R.S. ?

Yes _____ No _____

Signature of Contractor

CITY OF CARSON

**ATTRACTING NEW AGE INDUSTRIES
TO
21st CENTURY CARSON**

*Discussion of Industrial Enterprises Positioned by Technology and
Commitment to be Strong Employers in the Coming Decades
&
Strategy to Attract some of them to Carson and
Develop Clusters of New age Industries*

Prepared and Submitted

By

Sinha & Company LLC

August 2, 2011

EXECUTIVE SUMMARY

This document makes a case that Carson's strategic location in terms of domestic / foreign trade combined with Southern California's advanced technological / industrial infrastructure and the city's **significant available industrial land resource** not commonly available in urban communities, endow it with a unique opportunity to rebrand itself into a modern 21st century city by being at the center of new age industrial activities and ensuing economic and cultural innovations capable of catapulting it into a model new age thriving place to live and work.

This report develops a strategic plan to attract promising companies with products requiring high paying manufacturing workforce, growth of which can be sustained in the coming decades. To achieve that end Carson will set up modern industrial clusters in different fields affording competitive advantage to companies by becoming neighbors to other companies in their fields and to other support industries. These clusters will be comprised of cutting age technology driven energy efficient broad band connected facilities incorporating expansion space and possibly renewable energy hybrid power generating units. In order to make this project stand alone cost wise, it is recommended that the city aggressively seek government grants as this program fits in the government goals of promoting high paying jobs, development of clean energy sources, energy saving projects, economic development and eradicating blight and poverty. These grants will be used as seed capital and reduce the cost of the project making it possible to charge rent below market rate, a real incentive for getting companies to move to Carson.

This report includes findings of extensive research on the technologies of the coming decades, companies that are working in those fields and possible company candidates which may be persuaded to move to Carson. The report also incorporates an inventory of Carson's available industrial land where clusters can be located. The document ends with recommendations for what steps city of Carson should take to achieve this goal and an immediate plan to test the government grant possibilities.

TABLE OF CONTENT

Introduction	7
Overview	7
Work Statement	15
Chapter I	16
Technology Search	16
Fuel Cell Technology	17
Wind Energy Technology	20
Solar Energy Technology	24
Inverter Technology	27
Microgrid Technology and Smart Power supply System	29
Energy Storage Technology	32
Battery	32
Flywheel Storage Technology	33
Medical Device technology	35
Manufacturing Technology	36
Metal and Plastic Machining and Fabrication	37
Advanced and Precision Machining	37
Composites	38
Specialized Manufacturing Technology	39
Importation of Semi-Finished Goods and Finishing Them in the US.	39
 Chapter II	 40
Profiles of Companies	40
Fuel Cell companies	41
Carson Compatible Wind Power Companies	47
Solar Energy Companies (Photovoltaic Manufacturers)	49
Manufacturers of Inverters, Micrgrid Inverters,	
Grid-Tie Inverters and Controls	55
Microgrid Control Systems, Energy Storage Controls and	
Smart Switches.....	58
Manufacturers of Battery	60
Manufacturers of Flywheel Energy Storage Systems	62
Medical Devices Manufacturers	63
Mechanical Hardware Manufacturing Support Industries	64
Advanced Machining	65
Advanced Casting	65
Composites manufacturing	66
Potential Manufacturers and Importers of Semi-Finished Goods	67
Sources of Information	67
 Chapter III	 69
Companies Recommended for Follow-Up	69
Company Selection	69

Fuel Cell companies for Follow-Up	69
Wind Power Companies for Follow-Up	70
Photovoltaic Manufacturers for Follow-Up	70
Manufacturers and Designers of Inverters and Grid-Tie Electronics for Follow-Up	71
Energy Storage Systems Manufacturers and Follow-Up	71
Medical Device Manufacturers for Follow-Up	71
Mechanical Hardware Manufacturing Support Industries for Follow-Up	71
Potential Manufacturers and Importers of Semi-Finished Goods for Follow-Up	72
Chapter IV	73
Developing New Age Industrial Clusters in Carson	73
A Cluster Defined for This Project	73
Why Clusters?	73
Conceptual Planning for New Age Industrial Clusters for Carson	74
Taking Advantage of Existing Commercial and Industrial Framework	74
Incorporating Concept of Distributed Energy	77
Chapter V	78
Inventory of Available Industrial Land in Carson	78
Chapter VI	89
Project Financing Methodology and Feasibility	89
Overall Financing Strategy	89
Grants Opportunity	89
Environmental Protection Agency	90
Department of Housing and Urban Development	91
Department of Energy	92
Department of Commerce	93
Department of Labor	93
Department of Transportation	93
Financing Calculation	94
Chapter VII	96
What Should Carson Do to Attract New Industries	96
Chapter VIII	99
Immediate Next Step	99

LIST OF TABLES

Table 1: Top 20 States Ranked by Potential Investment in Wind Energy	22
Table 2: Fuel Cell Companies	41
Table 3: Carson Compatible Wind Power Companies	47
Table 4: Solar Energy Companies (Photovoltaic Manufacturers)	49
Table 5: Manufacturers of Inverters, Microgrid Inverters, Grid-Tie Inverters and Controls	55
Table 6: Microgrid Control Systems, Energy Storage Controls and Smart Switches.....	58
Table 7: Manufacturers of Battery	60
Table 8: Manufacturers of Flywheel Energy Storage Systems	62
Table 9: Medical Devices Manufacturers	63
Table 10: Mechanical Hardware Manufacturing Support Industries	64
Table 11: Potential Manufacturers and Importers of Semi-Finished Goods	67
Table 12: Fuel Cell companies for Follow-Up	69
Table 13: Wind Power Companies for Follow-Up	70
Table 14: Photovoltaic Manufacturers for Follow-Up	70
Table 15: Manufacturers and Designers of Inverters and Grid-Tie Electronics for Follow-Up	71
Table 16: Energy Storage Systems Manufacturers and Follow-Up	71
Table 17: Medical Device Manufacturers for Follow-Up	71
Table 18: Mechanical Hardware Manufacturing Support Industries for Follow-Up	71
Table 19: Potential Manufacturers and Importers of Semi-Finished Goods for Follow-Up	72

LIST OF FIGURES

Figure 1: Simplified Fuel Cell Schematic	18
Figure 2: Local Emissions: Fuel Cells Versus Heat Engines	19
Figure 3: One of the Vertical Wind Turbine Configurations	21
Figure 4: Module of Photovoltaic Cells	25
Figure 5: Super-Thin Film Which Works Even After Sun Set	26
Figure 6: A Large Solar Array of Silicon Cells	27
Figure 7: Thin-Film application to a Shelter	27
Figure 8: Solar Array Module with a Single Inverter	28
Figure 9: Separate Micro-Inverter for Each Panel	28
Figure 10: An AC-PV Micro-Grid System	31
Figure 11: Micro-Grid Transformation	31
Figure 12: Schematic of a Flywheel Storage System	34
Figure 13: NASA G2 Flywheel	35
Figure 14: An Outline of a Complete Cluster That Include Virtual Components	75
Figure 15: Architecture of Carson Cluster System	76
Figure 16A: Carson's Vacant and Under Utilized Industrial Land Map	80
Figure 16B: Carson's Vacant and Under Utilized Industrial Land Map	81
Figure 17: A Combined Total of Ninety Two And A Half (92.56) Acres On Main St.	82
Figure 18: A Thirty Six (36.13) Acres on the Intersection Of Main and Lomita	83
Figure 19: Seventeen and A Half (17.46) Acres on Avalon Blvd.	84
Figure 20: A Twenty Three And A Half Acres (23.63) on Wilmington Ave.	85
Figure 21: Shell Property and Approx, 8.5 Acres of Adjoining Land.	86
Figure 21B: Shell Project Land Use Concept Map.	87
Figure 22: Ten and A Half (10.48) Acres at Dominguez (City Corporate Yard)	88

INTRODUCTION

1.1 Overview:

Sinha & Company (SAC) is pleased to present to the city of Carson the findings of research and analysis conducted under the tasking "Conducting Analysis of How to Attract and Grow Right Type of Companies for 21st Century Carson". The tasks were performed within the framework of the "Work Statement" made part of the contract with the underlying premise that the solutions must leverage:

- Carson's strategic location vis-à-vis the next door Los Angeles port system, several airports and well developed Caltrans network facilitating foreign and domestic trade;
- Population demographics that include heritage from emerging economies with contacts in those overseas markets;
- City's available industrial land;
- Concept of Clusters: Developing Clusters of interconnected New Age Industries along with virtual connectivity with existing industrial base within the city and in surrounding communities;
- Availability of highly trained work force in disciplines such as aerospace, defense, electronics, controls, software, every kind of state-of-the-art manufacturing, research, export / import, logistics and so on.
- Access to top schools, colleges, well known universities and research institutions.
- Access to support systems comprised of corporate and intellectual property attorneys, temp services, accountants, courier services, freight forwarders and basically every thing a flourishing business is in need of.

This project's goals and objectives of attracting new age employment intensive technology driven industries to Carson emanated from a previous study conducted by

SAC for the city of Carson. This study and further discussion with the city's management established that Carson's industrial base was dominated by logistics type companies which used their facilities in this city for temporary storage of imported goods for onward distribution to their final destinations all over the country – hence creating comparatively fewer number of semi skilled lower paying jobs.¹

Carson-Specific Observations

In order to draw some inference regarding the economic direction the city of Carson could take it is necessary to collect some comparative data with adjoining and / or demographics wise similar cities. This report is a preliminary one (phase I) and so one or two important indicators are cited here.

First let us compare two contiguous cities of Carson and Torrance (2008 data)

Characteristics	Carson	Torrance
Total Population	99,342	100,881
Median Age	35.7	42.8
High School Education	78.9%	94.1%
Bachelor's degree or higher	23.5%	43.9%
Per Capita Income	\$23,891	\$39,118

It is important to note that there is a striking difference in the education and per capita income between the two cities. Another important difference is in manufacturing employment. Torrance's 16 percent population is employed in manufacturing industry, whereas there is no data available for Carson leading to a guess that the number in this category is not significant. For high paying jobs it is necessary to produce more manufacturing and high finance jobs in the community. Although Carson has some large industries such as Northrop Grumman, Ducommun Technology and a few others, a majority of technical and management employees of these companies live outside the city of Carson. To facilitate high income residents the city has to bring in high value comparatively smaller manufacturing and technology companies into the cities and encouraging their upper level employees to live in the city. These companies have higher ratio of technical employees who are well paid. As stated earlier it is also important to develop high end housing and other service entities to attract high income residents..

Large Projects like upcoming Watson Industrial Center and others can produce a lot of industrial activity and bring substantial revenue to the city government which may happen a few years down the road. It does not necessarily increase income and wealth of the local residents, the reason being that majority of high pay workers drive to the city from outside. For example city of Long Beach has many large projects but the per capita income of the city residents is \$25,961, only 2, 070 dollars higher than Carson's. Furthermore, at some point cost of providing services as compared to the revenue may reach a point of diminishing return. Example can be found in the budget problems of the

The underlying theory behind this project is that the city must get into the business of facilitating creation of long term dependable wealth by becoming active participants in planning for capturing the wave of technology and its employers for timely modernization of economic, cultural and place capabilities. They must compete to keep making the city a better place to work and live. For this the city must brand itself, i.e., it should be known for creating an economic milestone.

Integration of carrying out the individual components of the work statement results in a plan which looks at all the possibilities that can be harnessed to optimally and strategically utilize and develop land and building resources in order to create a sustainable mixed technology industrial, commercial and real estate base to make Carson a 21st century city going forward technologically, economically and socially. In that process the effort leads to laying out a planning blueprint that command funding from several initiatives of the federal government and leverage that as seed capital for starting semi-planned economic projects in the framework of industrial clusters in public private partnership which will set in motion technological direction and branding. Comprised in the planning blueprint is a recommendation that the city should build state of the art industrial complex of 5 specialized industrial clusters where each individual clusters will house interconnected industrial units from the same or similar field supporting each other and developing a particular technology environment.

city of Long Beach which is facing deficit of millions of dollars. Raising taxes to cover the deficit without raising income of the tax payers will not work in the long run. (Sinha & Company, September 10, 2010. *City of Carson, A Plan For Utilizing Federal Grants For Projects, Chapter III pp. 16-17*)

The 5 specialized clusters are planned be: (1) New Energy Cluster, (2) Electronics and Sensor Cluster, (3) Advanced Machining, Casting and Composites Cluster, (4) Cluster for Finishing Semi-Finished Imports, and (5) Medical Devices Cluster. Chapters I, II and III provide the research which lead to selection of 5 technological activity groups, one for each cluster.

In chapter I considerable effort is devoted to the issue of technology. In selection of technology it is important to evaluate the economy it serves, how sustainable it is in future applications, its adaptability to future widget designs, multiple applications and expanding market share. Is it a technology: (1) that is evolving and incrementally replacing the old ones as it employs more commonly available drivers such as alternative sources of energy, and is increasingly compatible with distributed and customized applications involving hybridization of multiple input and output grids, opening opportunities to an ever expanding base of users in both advanced and emerging economies, AND (2) that has successfully undergone beta testing and is ready to be incorporated in design and construction of hardware that is simpler and lighter which has or can be tested accurately for performance and reliability, leading to commercial successes in terms of fair number of companies employing it in different products and selling them to users?. The other question is: what levels of awareness about the technology exists in different parts of the world so that the benefit of equipment/hardware based on it will be appreciated to create demand, at the same time it is not easily copied? How rapidly is the technology changing? Is the change refinement or structural? What is the marketing life cycle? The most important question is: **Is the technology making life easier?**

Chapter II develops a list of companies with different degrees of commercial successes in pursuit of promising technologies and processing innovations which may be of interest for Carson to create effective industrial clusters. This basic list is followed in chapter III by a follow-up list which contains companies selected from the first which are more likely to consider moving to Carson depending on the incentives that the city may provide such as lower rent, room for expansion and the information and mentoring service along with tremendous advantage of being a part a modern and vibrant state-of-the-art industrial community of Southern California.

Chapter IV presents the evidence of economic advantage from clusters as compared to an industrial sector. Chapter IV also outlines the proposed cluster configurations. Chapter V establishes the inventory of available industrial land, which is significant in area. Land in the inventory includes brown fields with varying degree of contamination and also landfills. However, it is anticipated since this project requires large areas of land, and it incorporates extensive remediation plans.

As a side but interdependent issue it is also recommended that the city should build upper scale housing (not necessarily contiguous to the industrial parks) to encourage and facilitate the entrepreneurs and senior managers to live in the city. With this approach Carson will become permanent home for the new industries and their management -- providing the city a dependable permanent source of revenue. Most likely the real estate value will also move upwards. Quality of retail business, restaurants, education and entertainment will improve.

These industrial clusters will house "innovation" driven enterprises positioned by technology and strategy to be strong employers in coming decades. One of the strong

factors in "innovation" will be in marketing of products domestically and internationally. It will be important to ensure commitment of these enterprises to seek export markets and maintain flexibility in product design to meet the electrical grids and other infrastructure requirements of other countries at the same time maintaining the national interest of this country, especially the laws pertaining to export control. City of Carson has a large population whose families have had origin in foreign countries and they possess ability to make contacts in foreign markets. Some of the member of the community could become ancillary to the business to work in the foreign market field. Furthermore, United States is the largest importer of goods in the world. Its trade balance with other countries has chronically been negative. In this plan city of Carson could attract a few companies which may be interested in importing goods in semi finished or dismantled condition and provide to these goods American quality finish thereby reducing the size of imports, create manufacturing jobs in the U.S. and produce quality products at a lower price. One complete cluster has been devoted to companies which will import semi-finished goods and provide final assembly, finish and inspection in the US.

As suggested in Chapter VI a considerable part of the construction work will be eligible for several sources of grant from the federal government and other agencies since this project involves economic development, removal of blight, energy efficient building design, job creation, export and other attributes strongly desired by the government and grants for such activities are generally provided for in the budget. The funding methodology may be to construct a development plan in modules, each of which is comprised of work-components which individually fits in the grant framework of a federal agency. For example, funding for cleaning up a brown field is generally available

from Environmental Protection Agency (EPA), grants for construction can be received from Economic Development Agency (EDA) and even from Department of Housing and Urban Development (HUD), and grant for incorporating energy efficiency in buildings can be obtained from Department of Energy (DOE). Matching fund if needed can be arranged separately. The program may be implemented by the city's Redevelopment Agency or the city government itself. Partial project funding by grant money will reduce the cost of construction enabling the city or the developer to reduce the rent below the market rate. Low rent may become one of the most effective tools to attract established industrial tenants. Grant money is competitive and therefore a well defined proposal needs to be made and for that early planning is essential. Grant application is not just a 20 page proposal and the local governments can't expect grants just because they applied for it. The proposal needs to contain a well defined project with start to finish plan of implementation, details of expected funding sources for every stage and the sources, AND anticipated impact on economic development and environment as justification.

As an example, chapter VI presents a Project Financing Model which delineates the cost of the project with and without grants. **The grant money can be used as seed capital or down payment, and if it is more than 25% of the cost it will meet the down payment requirement for commercial lending making it possible for the rest of the project cost to be raised commercially based on the strength of the project without any long term liability to the city. Additionally, use of grant money will reduce the project cost to the city or developer, allowing the project to offer the facility at a lower than market rent.** The goal is to aggressively seek grants and

subsidies through extensive research, making to the point and timely proposals solicited and unsolicited.

Furthermore, it is proposed that captive energy generation is installed through hybridizing solar, wind and fuel cells and connecting it to the utility grid through smart grids which will allow sale of excess energy to the utilities. This type of comprehensive new energy approach is expected to attract business tenants committed to similar energy production and saving approaches. All these features are normally eligible for substantial subsidies and grants for this project. These features together will further raise favorable profile of the project for the government agencies which will make it possible to make unsolicited proposals.

Carson has to take distinct enabling steps to attract new age industries to the city and these steps are listed in Chapter VII. There are also some immediate steps that ought to be taken to continue with the project which will take it to the next stage. Those steps are described in chapter VIII. These two chapters emphasize that the city has to be in the driver's seat as the project leader, director and choreographer of this project. Outside developer can build the project with the financing arranged through commercial lending instruments, which may be a revenue bond or a mortgage.

Incidentally, during the investigation for this report discussions have taken place with official from Shell Oil Products US Carson Revitalization Project in order to maintain synergy so that the final outcome of the two projects would lead to 21st Century Carson. Result of the discussion was highly encouraging. There is likelihood that part of a cluster or so can be housed in their revitalization zone.

1.2 The Work Statement:

- 1.0 Research and identify which technologies will drive the market in 2011 going forward. Following that identify as many as possible new age industrial enterprises positioned by technology and strategy to be strong employers in coming decades.
- 2.0 From the list developed above select companies that according to strategic analysis are likely to find Southern California, especially Carson, more attractive location in terms of future growth.
- 3.0 Perform a top level assessment of vacant industrial land in Carson including the industrial land availability from the Shell Project and develop a preliminary approach to how these properties can be utilized to house the new age industries.
- 4.0 Articulate an approach that Carson could adopt to attract these companies to Carson; such as providing energy efficient state of the art facilities with room to expand, a well designed clustering plan, lower rent, brand marketing and city's proactive stance in providing information and support for the businesses in networking with financial institutions, venture capitalists and government agencies.
- 5.0 Briefly discuss what steps Carson should take in immediate future to pursue the objectives outlined in this program.

CHAPTER I

TECHNOLOGY SEARCH

In a broad sense, definition of “technology” in the context of this project is the same as what sociologist Read Bain put forward in 1937, i.e. “ technology includes all tools, machines, utensils, weapons, instruments, housing, clothing, communicating and transport devices, and the skills by which we produce and use them.”² Although this search encompasses most of these technology components directly or indirectly, the focus here is on technologies of the year 2011 and beyond, technologies that are driving most of the innovations and investments at this time and expected to continue in future - that means technologies employed in enhancement of resources and production of goods and services that are most in demand today and can be sustained or increased in coming decades.

The objective of this chapter is to identify technologies that have economic promise for the city of Carson of 2011 and beyond if some of the companies involved in their exploitation are induced to move to the city. Since this research is application oriented, the technology domain will incorporate not only the basic science of physics or chemistry but all the tools, techniques and processes that turn that science into a device or a system that produces something that people can use directly or that something drives something else that people can use or enjoy.

Due to ubiquitous nature of demand for energy in modern life energy has become the hottest technology issue. Hence technologies associated with production, transmission and conservation of energy acquires the first place in the consideration

² Read Bain, “Technology and State Government” American Sociological Review 2 (December, 1937):860

matrix. Consumption of energy in the world has reached a critical point and the demand is increasing at a faster rate with rising standard of living in the emerging countries with access to mobile communication and computing devices. According to International Energy Agency (IEA) energy consumption will grow by 55 percent between 2005 and 2030 at an average annual rate of 1.8 % per year. AND, owing to carbon emission concerns and ambition for self dependency almost every country is taking urgent steps in devising policy framework of offering substantial incentives to the private sector to help exploit **alternative energy sources** such as wind, solar and fuel cells.

These incentives have produced massive growth in the renewable energy sector.

- Global wind capacity has grown at a compound annual growth rate (CAGR) of 24% since 1999, reaching over 94 Giga Watts (GW) by the end of 2007 according to the Global Wind Energy Council.
- From 2003 to 2008, global solar installations have expanded more than fourfold from approximately 0.6 GW in 2003 to nearly 3 GW in 2008. Some forecast show that this will grow to 22GW by 2012.³

California took a substantive step on April 12, 2011 to promote clean energy technology when Governor Jerry Brown signed into law a new mandate that requires state utilities to get 33% of their electricity from renewal sources such as geothermal, wind and solar by 2020.

Fuel Cell Technology

An important source for alternative cleaner energy source is fuel cells. Following years of developmental efforts as a result of government incentives application of fuel cells in production of distributed and non-intermittent energy has become a reality.

Thousands of fuel cells have been installed around the world, for primary or back up

³ Source of information for market and drivers for wind and solar energy is www.henderson.com: downloaded on 2/2/2011.

power. Fuel cell is a clean and efficient source of energy. It is an electric power generating device like a turbine in a power plant, only that fuel cells do not burn other fuels, but uses hydrogen rich fuel and air to produce electricity, heat and water through chemical reaction and without any combustion. Fuel cells are mechanical devices that convert energy released from chemical reaction directly into electrical energy. It is a green energy source as there is no combustion. The basic construction of a fuel cell in the simplest form consists of an electrolyte layer sandwiched between porous anode and cathode. Fuel Cell efficiency run about 60 percent , about double the efficiency of a conventional power plant and if all the heat produced is harnessed through a Combined Heat and Power (CHP) system the efficiency can rise up to 80 to 90%..

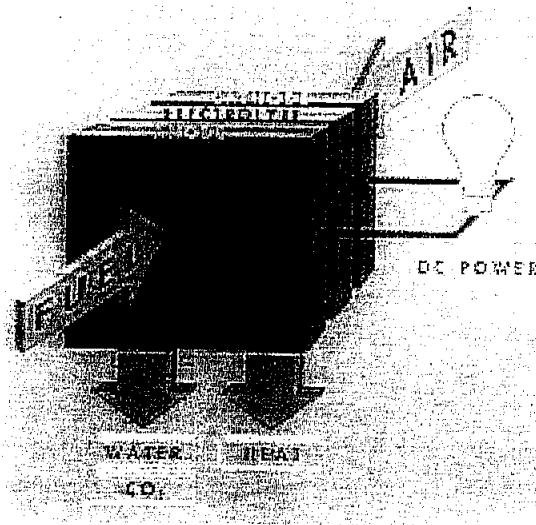
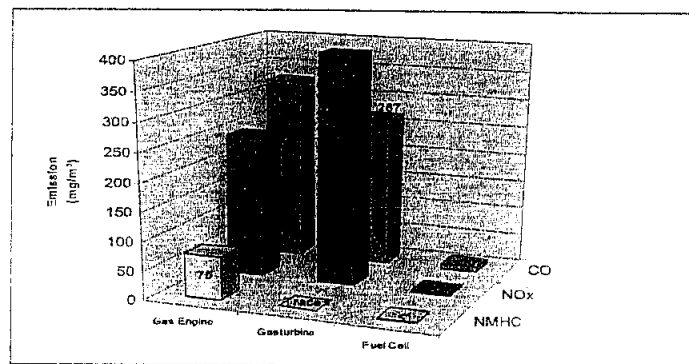


Figure1: Simplified Fuel Cell Schematic
Source: Fuel Cell Handbook described in foot note 5

Fuel cells can be stacked to achieve higher output. An important characteristic of fuel cell is that it can be built in any size giving it a flexibility of being a stationary or a movable / portable power source. Due to the flexibility in size, no combustion foot print,

and extremely low emission, fuel cells have large diversity of applications such as (1) consumer and military electronics, (2) space vehicles, (3) transport vehicles i.e. cars, trucks, construction equipment, (4) residential CHP, i. e, homes, multi unit residential buildings, (5) Commercial CHP, i.e. Office buildings, warehouses, hospitals, nursing homes, department stores, (6) Industrial CHP, i.e. Industrial buildings, machines, equipment and instruments. Figure 3 provides a quantitative idea of how low is the emission from fuel cell power source as compared to heat engines

Local Emissions: fuel cells versus heat engines



Source: Verband der Industriellen Energie- und Kraftwirtschaft e. V. (VIEK) Bericht Nummer 214

CORE TECHNOLOGY VENTURES LLP

Figure 2

Although there is work to be done in reducing cost, Fuel Cell provides locally generated stable and continuous supply of energy without causing any measurable pollution. For that reason:

- Major companies such as Coca Cola, Wal-Mart, Wegman's whole foods, Verizon, Sprint, and Pepperidge Farm have installed fuel cells.

- Outside the business world fuel cells are being used by hospitals, nursing homes, universities, National Parks, Zoos, aquariums and museums.
- In Asia and Europe, thousands of fuel cells have been installed at homes to provide heat and power and in the U.S. real estate developers are starting to incorporate fuel cells into their multi-family residential units.
- Fuel Cell Council has profiled 30 major companies that have ordered, installed and deployed more than 1000 fuel cell fork lifts, 58 stationary fuel cell systems, totaling 14,916 megawatts (MW) of power and more than 600 units of telecom sites. Six of these companies have reported savings of \$ 2 million a year in electricity costs from 4.2 MW of fuel cell power. Three companies have reported \$ 700, 000 a year in labor and insurance costs. Twenty companies have reported savings of 43,122 tons of carbon emission per year.

Because of almost infinite application possibilities of fuel cells, comparatively smaller facility requirement for manufacturing and unlimited export potential this report has devoted significant space to this category of energy source. Additionally, fuel cell supply chain creates industrial activity in manufacturing of plates, electrodes, electrolytes, catalysts, invertors, convertors, cells, humidifiers, heat exchangers, reactors, filters, piping, tanks, filters, sensors, controls, power conditioners, and fuel processors⁴

Wind Energy Technology

As far as the potential of industrial activity in wind energy in Carson is concerned, two kinds of activities are possible. The first activity is manufacturing of vertical axis micro turbines capable of supplying power to residential and smaller office buildings in urban setting. These turbines can be installed in the backyard or on top of buildings. Manufacturing of these micro turbines will require a medium size

⁴ Sources for the information on fuel cells are (1) Fuel Cell Council 2000, September 2010. *Business Case for Fuel Cells: Why Top Companies are purchasing fuel Cells Today*. (2) U.S. Department of Energy, Office of Fossil Energy, National Energy Technology Laboratory, October 2000. *Fuel Cell Handbook (fifth Edition) Chapter I*, (3) Doran, Phill. Core Technology Ventures LLP, 2002. *Fuel Cell Technologies: State of the Art & Market Perspectives*. HSBC Investor Conference, September 19, 2002 (4) Schell Smith Lori, Empowered Energy, USA. 2008. *Solar Voltaic and Fuel Cells: Valuing the Contribution of Distributed Energy Resources to the State of California, U.S.A.* downloaded on April 13, 2011 from www.EempoweredEnwrgy.com.

manufacturing and testing plant which can be housed in the cluster being planned in Carson.

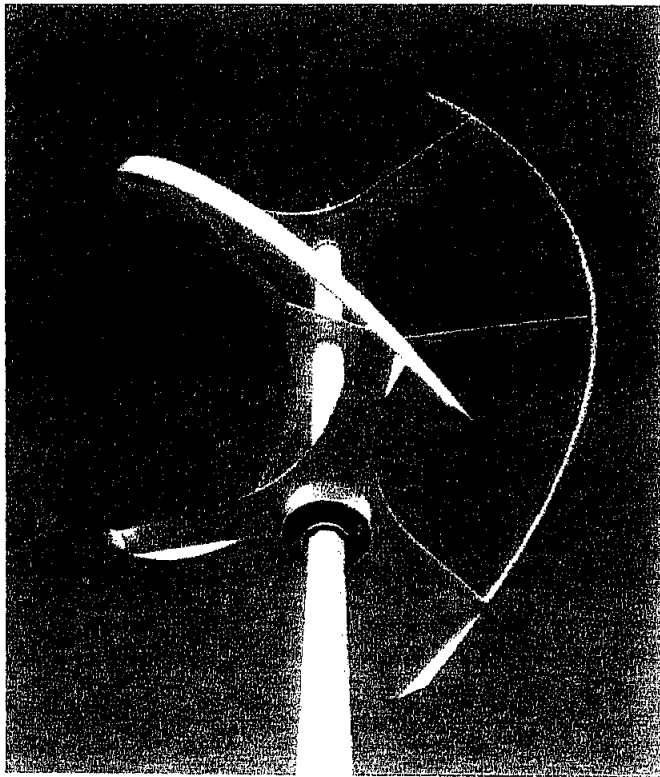


Figure 3: One of the Vertical Wind Turbine Configurations

Source: windturbine1.com downloaded from www.google.com on 4/24/2011

The second activity may be manufacturing parts of large turbines for wind farms as well as micro turbines. Manufacturers of advanced plastic, composites, and metal parts qualified as aerospace suppliers, advanced ferrous, non-ferrous and alloy foundries, manufacturers of industrial fans, blowers, industrial speed changers, printed circuits and electronic assemblies can be a part of the supply chain for wind turbines.

Contrary to conventional thinking that most of manufacturing benefits related to wind energy will be available to the upper Great Plains region of the country because large part of wind energy source is available in that region, manufacturing of parts for

wind turbines is spread out through the fifty states, with California in the lead because of existing manufacturing base and trained workforce connected with the aerospace, equipment building and electronics industry. As a result California attracts the maximum investment in the wind energy field.⁵

Table 1

TOP 20 STATES RANKED BY POTENTIAL INVESTMENT IN WIND ENERGY

State	Investment, \$ Billions	No. of employees	No. of New Jobs
California	4.24	102, 255	12,717
Ohio	3.90	80,511	11,688
Texas	2.98	60,229	8,943
Michigan	2.85	66, 550	8,549
Illinois	2.84	57, 304	8,530
Indiana	2.77	53,064	8,317
Pennsylvania	2.54	50, 304	7,622
Wisconsin	2.32	48, 164	6,956
New York	2.18	47,375	6,549
South Carolina	1.65	20,532	4,964
North Carolina	1.55	30,229	4,661
Tennessee	1.41	28,407	4,233
Alabama	1.19	21,213	3,571
Georgia	1.18	20,898	3,532

⁵ Investment in new wind will create a demand for all of the components that make up a wind generator. As a rule of thumb, every 1000 MW requires a \$1 Billion investment in rotors, generators, towers, and other related investments. According to a recent analysis done by the Renewable Energy Policy Project (REPP) for a Proposed Renewable Portfolio Standard in Pennsylvania, every 1000 MW of wind power developed created a potential of 300 jobs in manufacturing, 700 jobs in installation, and 600 in operations and maintenance. (Sterzinger, George, Svercek, Matt. 2004. *Wind Turbine Development: Location of Manufacturing Activity*. Renewable Energy Policy Project (REPP) Technical Report September, 2004)

Virginia	1.13	26,201	3,386
Florida	1.12	24,008	3,371
Missouri	1.08	23,634	3,234
Massachusetts	1.07	27,955	3,210
Minnesota	1.02	26,131	3,064
New Jersey	0.97	22,535	2,920

Source: (Ibid, pp.5)

Table 1 presents a breakdown of the twenty states which are expected to receive the greatest portion of the investment. The larger the number of existing employees in the field, the larger is the investment. One can see that California is getting the largest share of investment in wind energy thereby creating maximum number of jobs in this industry. The research presented in Table 1 also provides a state wide share of job creation estimate in manufacturing components/subsystems of the wind turbine out of the estimated total of 102, 255.. For example, rotor manufacturing creates 25, 226 jobs, nacelle and controls 52,490, gear box and drive train 1,380; generator and power electronics 14,889, and tower 8,270. Obviously a large part of this job creation takes place in Southern California. Carson, by being able to attract modern (or in the process of modernization), manufacturing companies with the state-of-the-art design capabilities and the latest quality management system such as ISO 900 or better from Southern California itself or other locations looking to serve the wind energy industry, will be able to create high paying manufacturing jobs in the city..

Solar Energy Technology

The next technology of interest is solar energy generation. Grid-connected solar photovoltaic is the fastest growing energy technology in the world with 50% annual increase in cumulative installed capacity in 2006 and 2007, to an estimated 7.7 GW. This translates into 1.5 million homes with roof tops photovoltaic feeding into the electricity grids world wide. The potential of solar power induced even the oil companies to acquire nascent solar companies as they position themselves in solar energy in a big way. ARCO acquired Solar Power international (SPI) to form Arco Solar. Arco Solar's factory in Camarillo California has been in continual operation since 1977. Shell, Amoco (Later purchased by BP) and Mobil Oil have had major solar divisions.⁶ Photovoltaic technology for this report includes science of photovoltaic, manufacturers of cell, inverters, needed controls and electronics as well as panel manufacturers and installers.

The workhorse of the photovoltaic industry over the past decades has been the bulk crystalline silicon solar cells. Investment trend during this decade suggests that silicon wafer based approach has withstood the test of time. Silicon solar cells are produced as (i) monocrystalline silicon form where single wafer is cut from cylindrical ingots, (ii) poly-or multicrystalline silicon produced from cast square ingots, a cheaper but less efficient and (iii) Ribbon silicon formed by drawing flat thin films from molten silicon, less efficient than poly-Si but less expensive due to reduction in silicon waste. But now this technology is challenged by a new wave of thin-film cells based on

⁶ Hirshman, W. P., Surprise, Surprise (Cell Production 2009 Survey), Photon International (<http://www.photon-magazine.com>), (March 2010), pp.176-199 quoted in http://en.wikipedia.org/wiki/List_photovoltaics_companies, downloaded on 4/4/2011. Solar Cell. http://en.wikipedia.org/wiki/solar_cell, downloaded on 4/27/2011
Green A Martin. 2003. *Crystalline and thin-film silicon solar cells: state of the art and future potential* Solar Energy, Volume 74, Issue 3, pages 181-192.

amorphous silicon and its alloy with germanium. Solar cells are generally connected into a module. The photovoltaic module has a sheet of glass on the sun up side allowing the light to pass through while protecting the semiconductor from abrasion and rain.

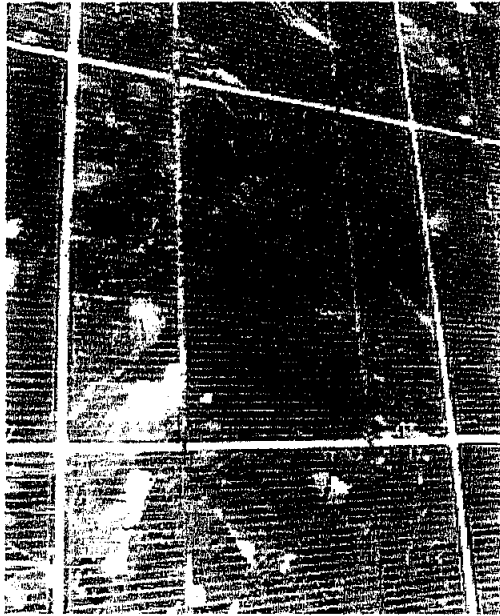


Figure 4
Module of Photovoltaic Cells
Source: Wikipedia (ibid pp.4)

The generated electricity is fed into the grid through inverters which convert DC power to AC. In stand alone system batteries are used to store power.

The ongoing challenge is cutting cost and maximizing the light trapping efficiency of the solar panel for the extended period time even after exposure to sun at a given time has ended. Two important characteristics are high absorption and efficient conversion into electricity. Thin-film solar cell technology reduces the cost by saving on material, although it may also reduce energy conversion efficiency. Thin-film silicon cells have become popular due to cost, flexibility, lighter weight and ease of integration compared to wafer silicon cells. Initially appearing as small strips powering hand-held calculators, thin-film PV is available in very large modules used in sophisticated

building-integrated installations and vehicle charging systems. GBI Research projects thin film production to grow 24% from 2009 and to reach 22,214 MW in 2020.⁷

Enormous amount of innovation both in wafer and thin-film technologies is taking place in the entire industry, universities and national laboratories in improving efficiency and cost and the government is pouring in money to help make that happen. For example, researchers at Idaho National Laboratory are in the process of producing a super-thin solar film that can be printed on a flexible material, would be cost effective and would be able to harvest solar energy even after sunset.

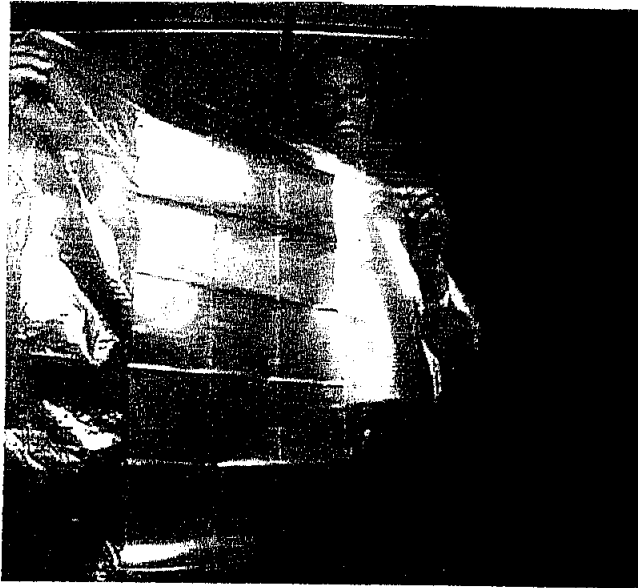


Figure 5

Super-Thin Solar Film Which Works Even After Sunset
Source: <http://inhabitat.com/solar-panels-work-at-night/>

⁷ http://en.wikipedia.org/wiki/Thin_film_solar_cell downloaded 4/16/2011

Pilloiton, Emily uploaded 02/04,2008.*New Solar Panels That Work At Night*. <http://inhabitat.com> , downloaded 4/25/2011

Firestone, Rebecca, posted on 06, Nov., 2009. Solar Technology: What's The State of Art? <http://greencomplianceplus.markenglisharchitects.com> downloaded 4/25/2011

Large commercial applications such a power generation plant can afford the space for huge arrays, where as thin-film solar products can be more adaptable to homes and other off-the-grid shelters.

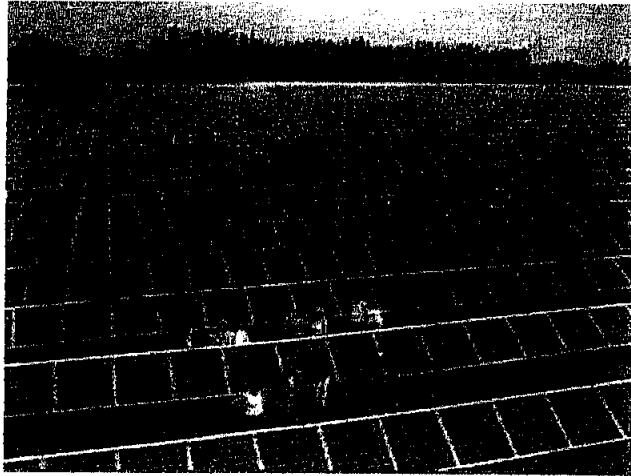


Figure 6

A large Solar Array of Silicon Cells

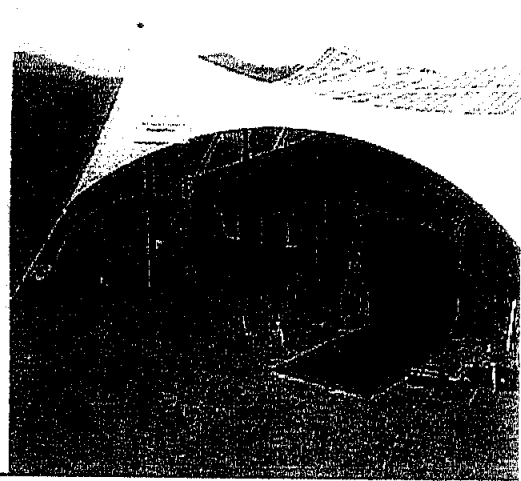


Figure 7

Thin-Film Application to a Shelter

Source: Green Compliance Plus-Mark English, (see foot note 8)

Inverter Technology

In a solar power system there is need for a transformer based device called inverter to take the low-voltage, high-current DC signal form the PV panels and convert them into 120 VAC, or 240VAC. The older or smaller systems use only one inverter. The solar panels are arranged into series and parallel strings as illustrated by figure 8 below which presents a 4x 4 solar array of 16 panels. The array is mounted on a roof. It is normal that sometimes cloud will appear and one two of the panels get shaded. If a single panel gets shaded, the entire string suffers, and the total output of the inverter suffers as well

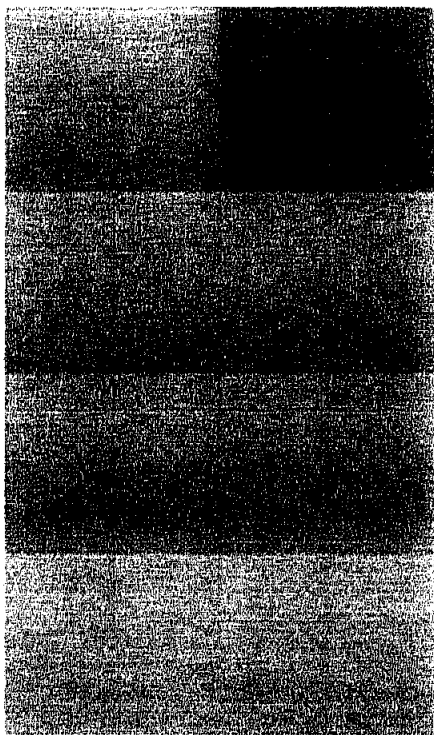


Figure 8: Solar Array Module with a single Inverter

With a single inverter, the two shaded panels will bring down the performance of the entire array.
Source: Green Compliance Plus - Mark English (see foot note 8).

With advent of micro-inverters, the problem caused by shading of panels is solved by attaching a micro-inverter to each panel. (figure 9)

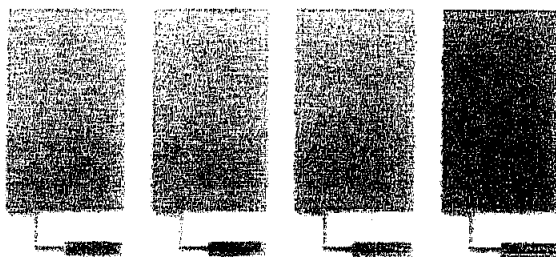


Figure 9: Separate Micro-Inverter for each Panel

With separate micro-inverters, each panel is always producing maximum. Source: same as figure 8

In general **Inverter** is a device that converts direct current (DC) electricity from a source such as batteries, solar panels or fuel cells to alternating current (AC) at any required voltage or frequency with the use of appropriate transformers, switching and control circuits. The AC can be rectified to produce DC at any voltage. There are micro-inverters and commercial/ utility scale inverters.

Microgrid Technology and Smart Power Supply Systems

The technology which can hybridize usage of different sources of energy especially solar and wind, and can create smooth operational connection to the grid is called MICROGRID. Solar panels and wind turbines offer the promise of locally generated clean electricity by deriving their power from wind and sun. But both suffer from the problem of intermittency. A gust of wind can cause a wind turbine to spin faster, producing a power spike down the line, and a cloud passing over a solar panel can cause a sudden drop in electricity. If these energy sources are connected to the conventional grid it creates a problem for utility power infrastructure as traditionally power has flowed from generator to end user, with occasional rerouting to manage occasional peak demand.. Renewable energy flows at a variable rate. Sudden drop can cause localized brownout condition, or even blackouts that shut down computers or medical devices. Rooftop solar can also complicate matters because building with excess power can sell it back to the grid. All this creates need for a system smart enough to reverse the stream every time the sun rises or cloud passes by. In the modern grid management of the energy variation is achieved by micro grids. These microgrids, which are also called smart grids, are used for balancing distributed energy streams. The sources of energy may be wind, solar, fuel cell, battery, or even combustion engine based energy generators.

The microgrid or smart grid consists of five major components: smart meters, information processing sensors, optimization and integration controls and storage.⁸ Smart grids are much better positioned than centralized grid to meet the known and unknown energy needs of the future needs of the future. They provide the flexibility to local communities and commercial campuses to increase the electricity supply quickly and efficiently through relatively small local generators, solar cells, wind turbines, fuel cells and other means rather than waiting for power companies to build centralized power plants that are costly and take longer to come on line. Additionally, smart microgrids' energy management enables plug-in electric vehicles to be connected to the electricity system as smart power storage rather than simply another electricity user. Smart micro grid also permits modular flexibility in the power supply system which can localize the effect of a component or sub-system failure

It appears that almost unlimited scope is opening up in smart grid application in California for companies which are already involved in advanced control systems, advanced lighting technology, new heating and air conditioning technology and new energy generation systems. As an example, figure 10 presents an example of an AC-PV microgrid system installed for supply of energy loads and an irrigation system.

⁸ Source of most of this information on microgrids has been obtained from the article by Eric Wolf *ENERGY: Rooftop solar cells blossom, posing new challenges for power grid*. The North Country Times posted November 8, 2009, downloaded on 4/7/2011 from <http://www.nctimes.com>. Other sources of information are Galvin Electricity Initiative www.galvinpower.org, and Engler A. Strauss. 2003. *AC Coupled PV Hybrid Systems And Micro Grids – State Of The Art And Future Trends*. 3rd World Conference on Photovoltaic Energy Conversion, Osaka, Japan, 18 May 2003 and a presentation dated May 20, 2010. *Microgrids: A critical Component of U.S. Energy Policy* by Galvin Electricity Initiative.

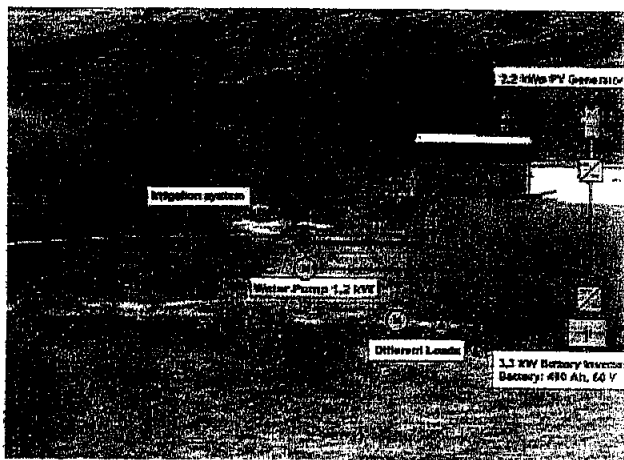


Figure 10: An AC-PV Microgrid System
Source: Strauss, See Footnote 9

Figure 11 illustrates a futuristic view of a smart power generation and supply system comprising renewable, alternate and conventional energy sources, microgrids, smart switches, energy storage units and an intelligent supervisory control. System..

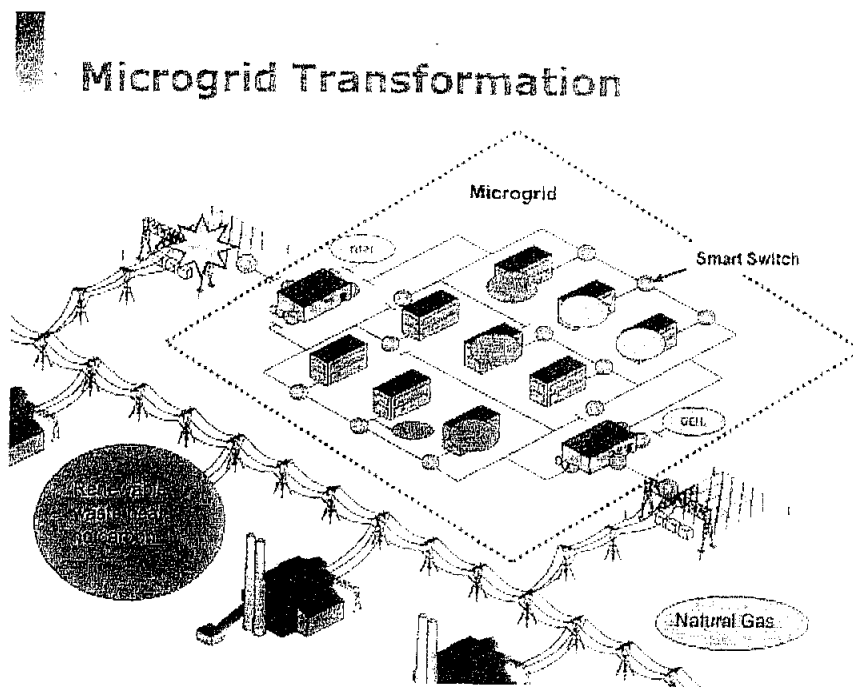


Figure 11
Source: Galvin Electricity Initiative, See Foot Note 9

This illustration indicates that transformation of existing electrical supply grid into a system that can draw electricity from conventional alternative sources and also allow people or commercial entities become consumers and suppliers of energy they produce by installing wind, solar or fuel cell generators at their homes and facilities, and by installing and programming a digital grid management system that enables the electricity flow into and from the grid in a controlled fashion to prevent any interruption to the grid. A number of technologies are employed to achieve this goal and companies engaged in different disciplines play their roles as it requires manufacturers of programmable electronics, sensors and controls, smart switches, smart meters, and, programmers and system integrators.

Energy Storage Technology

A. Battery:

Battery technology has acquired a role of critical importance with the growing demand for portable electronics and electric power tools. Effective use of low emission - free energy sources such as renewable-intermittent-wind and solar energy demands stationary, high yield, long-lasting, and low maintenance electrical energy storage solutions. The battery market is expanding and the global revenue in 2009 was 47.5 billion. It is expected to reach 74 billion in 2015. Batteries are divided into two categories primary and secondary. Primary batteries are used in watches, electronic keys, remote controls, children toys, light beacons and military devices. Primary batteries made up 23.6 percent in 2009 revenue and according to Frost and Sullivan a decline of 7.4 percent in revenue is expected by 2015.

Real growth is expected in the market for the secondary batteries which are rechargeable ones. And they account for 76.4 percent of the global market as suggested by Frost and Sullivan, that market share is expected to increase to 82.6 percent by 2015. The most common secondary batteries are lithium-, lead-, and nickel based systems. Now Lithium-ion has become the battery of choice. The lead-acid market is similar in size to Li-ion. Lead acid holds a solid position in SL1 (starter battery) for automotive, stationary for power back up, and deep-cycle for wheeled mobility such as golf carts, wheel chairs and scissor lifts. Nickel-metal-hydride (NiMH) continues to hold an important role, as it replaces many application previously served by nickel-cadmium (NiCd). However, with only three percent market share, NiMH is a minor player in the battery world and will likely relinquish more of its market to Li-ion by 2015.

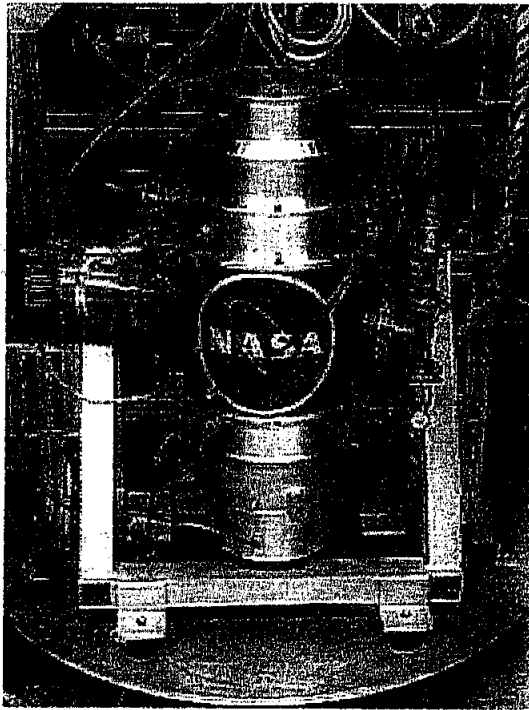
The specific gravity of Li-ion is twice that of NiCd, and high nominal cell voltage of 3.60 V as compared to 1.2 V for nickel systems. Manufacturing cost has been falling steadily: It is a low maintenance battery. The battery has no memory and does not need deliberate self-discharge to keep in shape. The nominal cell voltage of 3.6 V can directly power cell phones and digital cameras, offering simplifications and cost reduction over multi-cell-designs. The U.S. Department of Energy is investing billions of dollars in grants to major producers of Li-ion batteries to reduce cost further.⁹

B. Flywheel Energy Storage Technology

Flywheel energy storage system is a mechanical battery that stores energy in the kinetic form in a rotating flywheel. Electricity is used to wind the wheel up and it keeps rotating on a frictionless magnetic bearing until the stored energy is needed back. Then

⁹ Most of the information on battery has been taken from battery university.com. Another source of information is article by Daniel Claus. *Materials and Processing for Lithium-Ion Batteries* JOM Vol.60, No.9, pp.43-48 downloaded from www.tms.org on 4/8/2011.

- (v) Amusement Rides: It is used to achieve the very high current required to accelerate coaster train to full speed uphill.
- (vi) Motor Sports: It is used to improve acceleration.
- (vii) Grid Storage Energy: It is used in power plants for lower carbon emission, faster response time and ability to buy power at off-peak hours.
- (viii) Space Application: Maintenance free long life, quicker discharge.¹⁰



NASA G2 flywheel

Figure 13:

Source: Wikipedia (see foot note 11)

Figure 13 provides the construction details of a flywheel storage system used by NASA.

Medical Devices Technology

Another high growth industry and the associated technologies in the year 2001 and beyond have to do with health care. Economic, social and technological trends have

¹⁰ Material for the Flywheel Storage has been taken from (i) *Flywheel Energy Storage*. Downloaded on 5/1/2011 from http://en.wikipedia.org/wiki/Flywheel_energy-storage, (ii) *Distributed Generation, Education Module* downloaded on 5/1/2011 from <http://dg.history.vt.edu/ch2/storage.html> (iii) *Flywheel Energy Storage* downloaded on 5/1/2011 from www.FlywheelEnergyStorage.com

put the health care industry on one of the highest growth path. The global population reached 6.6 billion in 2007 and is expected to surpass 9 billion in 2050. According to Henderson Global Investors this would equate to health care spending in 2050 of \$ 11.5 trillion, compared to \$6.31 trillion in 2005. Furthermore, an aging population also needs greater health care. Since 1950 proportion of older persons (aged 60 or older) has been rising steadily, moving from 8% in 1950 to 11% in 2007 and is expected to reach 22%. Boston Scientific reports that the medical device industry's revenue for 2010 came in at roughly \$300 billion and the figure is projected to top \$310 billion for 2011. United States accounted for \$95 billion of the 2010 of the global medical device market.

In the United States innovation in niche sectors such as atrial fibrillation (AF) and ventricular assist device (VAD) are poised for double digit growth in the near to mid-term future. The CV device market remained relatively resilient during the economic downturn. Carson would try to attract early-to-late-stage medical technology companies with high growth potential.¹¹

Manufacturing Technologies

None of the above described energy technologies, smartgrid and associated electronics technologies and healthcare device technologies will succeed without the manufacturing industry keeping pace. The demand in manufacturing today is widescale product customization. One size fits all is fading away. Manufacturing, to day, is becoming less vertically centralized and more widely distributed. Manufacturing supply chains are becoming widely (world wide) distributed and are dependant on proprietary

¹¹ The sources of information on medical devices technologies are (1) Henderson Global Investors www.henderson.com downloaded on 2/2/2010, (2) www.marketwines.net *The Top 10 Cardiovascular Devices Companies: Market Trends, growth strategies, and SWOT analysis* posted by admn Nov. 04,2010, downloaded on 2/12/2011, and (3) Medical Devices Today, www.medicaldevicestoday.com, article dated July 8, 2008. *Spotlight on Early-Stage High-Growth Technology Companies*, downloaded on 4/19/2011.

and ahead of the curve capabilities in manufacturing, process, quality assurance, logistics and web based intelligence . Cost management, lean concept, six sigma, just-in-time, and now just- in- case have become important part of manufacturing management equation. Three types of manufacturing technologies are discussed here. They are (A) Metal and Plastic Machining and Fabrication (B) Advanced and Precision Casting and (C) Composites Fabrication.

A. Metal and Plastic Machining and Fabrication

Advanced Machining Technology of 2011 and beyond will require not only CNC machines for preprogrammed machining but microscale machine tools for precision cutting on microscale and free-form magnetoabrasive machining for producing microscale parts for medical devices, microgrids, precision parts for wind turbines and electronics and controls for all the categories of energy sources discussed above. Furthermore advanced machining and fabrication requires knowledge of material science to ensure proper strength and life cycle of the finished parts.

B. Advanced and Precision Casting

Precision, final finish, alloy metal casting is an extremely important manufacturing activity which requires state-of the-art tool design capability, the best equipment and highly skilled workforce. It is a critical part of the supply chain for almost all industries which require dimensionally accurate hardware in finished shape including aerospace, defense, new energy systems, controls, sensors, and custom equipment and parts manufacturing. Several processes are involved such as investment casting, permanent mold casting, die casting, centrifugal casting and continuous casting.



C) Composites

The word "composite" means two or more materials combined to form a composite material. Fiber reinforced material has been around from centuries. One of the oldest composite is straw and mud composite. A recent example is steel bar embedded in concrete. In the modern age, light weight composites in the form of fiber reinforced resins have become standard in aerospace and sporting goods applications. Modern composites use high strength fibers made from variety of materials such as fiber glass, carbon, aramid, boron and others. The most popular is carbon fiber due to high strength, high stiffness and light weight. When combined with resin, resin binds the fiber since resin comes in liquid form which is thickened by another compound called hardener. Phenolic resins are used for fire and smoke applications such as heat shields and aircraft interior or duct work. Resins have also been developed to perform better in situations such as extreme heat, radar absorption, radar transparency, and fire and smoke inhibitors.

Composites are being used more and more each day in structural and non-structural applications. Several composite aircraft fuselage are in service, some of which are pressurized. Composites are more suitable for some aircraft structural parts than metal. One example is the fuselage. A metal fuselage comprises of hundreds of pieces, cut, shaped, drilled, riveted and welded, where as a composite fuselage can be made of a few pieces and bonded together. Wind turbine blades are made of carbon fiber composites for weight and strength. Carbon fiber pound for pound is five times stronger



than steel or aluminum. As an evolving structural technology there is a great demand for innovative composite manufacturing companies¹²

Specialized Manufacturing Technologies

There are some specialized manufacturing that will remain highly important for 2011 and beyond in the context of space that may be available for Carson. For example,

1. Manufacturing control equipment, servo systems, sensors, radar, and electro optic devices.
2. Manufacturing instruments, tools, gauges and precise devices
3. Manufacturing energy saving lighting such as LEDs

Importation of semi-finished goods and finishing them in the U.S.

City of Carson has a large population with foreign roots. U.S. is the largest importers of goods made abroad, especially China; the main reason being the low production cost due to lower wages in those countries. In many case, however, quality has been suspect. An importation innovator, preferably a Carson resident, who could perfect mechanism and logistics to import goods in semi finished condition and finishing them or getting them finished in the U.S. could be of interest to city of Carson. As a result OEMs and retailers in U.S. will benefit by receiving American quality goods at their door step at reduced prices and further saving money on supply chain management in foreign countries.

¹² Most of the materials for discussion on composites have been taken from www.fibersonix.com and www.contourcomp.com downloaded on 5/2 2011



CHAPTER II

PROFILES OF COMPANIES

Pursuant to discussion of the technologies of interest in Chapter I, the objective of Chapter II is to help frame a state-of-the-art entrepreneurial opportunity landscape in the field of new age technology. This entails evaluation of industrial activities in the technology domain discussed above especially by mid size players who are our targets for enticement to relocate or open facilities in Carson. To that end this chapter develops their brief profiles and makes sure that their innovation, management skills, strategies and competitive edge are likely to prevail in the year 2011 and beyond in opening new markets, specially exports, and creating high paying manufacturing jobs.

For this project there are three pillars of the job creation paradigm: technology, manufacturing and foreign trade. As described in chapter I technology here encompasses “means and processes” that enable us to build things which have strong markets abroad. The second part of the “means and process” is enabling us to reduce the import burden of this country by importing goods in semi-finished conditions from countries like China and finishing them in our facilities resulting in three bottom line benefits – keeping the cost of production relatively lower, ensuring American quality standards for the products and creating manufacturing jobs in this country. This will also ensure a reliable supply chain for OEMS and large retailers in this country. .

The company profiles are presented in the form of tables consisting of their contact information, their products and services and the overall standing. Each table lists



companies engaged in a particular technology in the same order as the technologies described in Chapter I.

Table 2
Fuel Cell Companies

During the last decade the fuel cell technology has made significant progress. It has transitioned from research and development phase to become an important part of a functioning distributed energy revolution unfolding in the energy management equation. Of course there are companies still in the process of testing their hardware; there are others who have become accepted suppliers of fuel cell energy generators by large energy consumers and facility owners. There have also been success stories in reducing cost and use of commonly available materials.

Company Name and Address	Product Overview	Corporate Information
Acumentrics Corporation 20 Southwest Park Westwood, MA 02090-1548 P: 781-461-8251	The company has two subsidiaries. First is Acumentrics SOFC which is developer of solid oxide fuel cells. Second is Acumentrics RUPS, a ISO 9001:2008 certified facility which manufactures AC and DC uninterruptible power supplies (RUPS) for back up and mission critical missions for the military and industrial power conditioning customers.	Founded in 1995, annual revenue \$ 7.1 million, employs approximately 90. Has sold 60,000 units of 1-2kw RUPS. Adam P. Briggs is President; Norman Bessette PhD is CTO and VP Engineering. Both the subsidiaries are at a single location.
Altergy Energy systems 140 Blue Ravine Road Fulsome, CA 95630 P: 916-458-8590	The company is a producer of Altergy Freedom Power, a fully integrated, self contained high efficiency Proton Exchange Membrane (PEM) fuel cell system with zero emission - capacity range 1-30kw. Application in cable / broadband, data centers, homeland security, 24/7 operations.	Established in 2001, revenue \$ 3.5 million, employs 26, operates from a single location. Eric Mettler is CEO.
Apollo Energy Systems 4100 N. Powerline Road # D3 Pompano Beach, FL 33073 P: 954-969-7755	The company is a producer of alkaline fuel cell based Apollo Electric Propulsion Systems for land vehicles, water craft vehicles and air vehicles, and Apollo Power Flat Systems for residential, commercial and industrial establishments and computer installations; Apollo also produces Tri Polar Lead Cobalt Battery.	Founded in 1966 as Electric Fuel Propulsion Corporation, annual Sale \$ 1 to 2.5 million, employs 5-9. Robert Aronson is owner and Raymond Douglas is President
Asia Pacific Fuel Cell Technologies. Ltd. 3282 E. La Palma Ave.	The company offers Smart Fuel Cell, Natural Gas Fuel Cell, Mustang Fuel Cell and Solid	Their core technologies form power modules for various platforms for transportation and



Anaheim, CA 92807 P: 714-630-9669	Oxide Fuel Cell. The core objective is to produce low cost Polymer Electrolyte Membrane (PEM) fuel cell and metal hydride energy storage system.	mobile power generation. The focus is on world scooter market. Annual Sales \$ 2.2 million. employee 22 (many PhDs). Dr. Jefferson Yang is Chairman.
Bloom Energy 1252 Orleans Drive Sunnyvale, CA 94089 p: 408-542-1501	Bloom develops stationary power source using fuel cell technology. It claims that the their fuel cell technology has roots in NASA's Mars project since one of the founders worked on the NASA project at University of Arizona Bloom is secretive about its technology but claims that derived from common sand like powder their technology is able to produce clean , reliable power from a wide range of traditional fuels.	Bloom is a pretty hyped up company. It has raised close to 400 million dollars in venture capital. Bloom claims uniqueness in stationary fuel cells but this field is crowded with many well funded companies. Its success will depend on its ability to produce the energy servers at a cost to competitively command a higher price. It appears that some of fortune 500 firms have installed bloom's energy servers lulled by bloom's promise that it will reduce cost by mass production. It appears that its current revenue is \$ 17.7 million and it employs 200 people. The company was founded in 2001. Its CEO is .K. R Shridhar, PhD.
CellTech Power Inc. 131 Flanders Inc. Westborough, MA 01581-1031 P: 508-898-2223	Previously involved in fuel cell research services, now the company has embarked on technology and product development program to apply its unique Liquid Tin Anode to markets in need of a fuel cell that operates on real fuel such as diesel, JP-8, and coal and produce clean energy.	CellTech's fuel cells have competitive advantage since they offer all the benefits of fuel cells without waiting for the future "hydrogen economy". The system is simpler because it does not require reformer or complex storage system. Annual revenue\$ 2.4 million, employees 28, years in business 15. Jeff Bentley is CEO. Tom Tao PhD is founder CTO.
ClearEdge Power 7175 N W Evergreen Parkway, Bldg 100, Hillsboro, OR 97124 P: 877-357-3343	Produces stationary fuel cell that runs on natural gas or propane and utilizes a membrane to create water, heat, carbon dioxide, and hydrogen, with the later then going through a membrane where electrons are produced and electricity is generated. Their product is called ClearEdges 5, which generates up to 5 kilowatts of electricity. The company sells them at \$ 50,000 per piece.	Has a 80,000 sq. ft. facility with a single shift capacity to produce 2,500 units. The company has raised \$ 55 million in venture capital. It is almost a 200 employee company. The company claims competitive advantage because of 85% efficiency of their product if the heat is utilized to heat homes and commercial facilities.
Element 1 Power Systems (e1ps) Inc. with mailing address: 1745 East Borchard Street Santa Ana, CA92705 P: 714-564-9772 It is apart of e1ps.tripod a cad	Committed to bringing PEM (Proton Exchange Membrane) fuel cells to commercial and residential market place it is currently selling basic and deluxe fuel cell learning kits ranging in	No revenue, space or employee information available. Marketing fuel cell learning kits is a unique activity, the market size of which is unknown. What competitive advantage this company has is

cam design and injection molding Co. It is listed here because it is local and it is worth investigating its potential.	size from 1w to 2kw.	also unknown.
eVionyx Inc 6 Skyline Drive Hawthorn, NY 10532 P: 646-539-3900	eVionyx develops fuel and batteries using metal-fuel technology for application in portable electronics, stationary back up power, and power tools, as well as for transportation products such as scooters, golf carts and hybrid vehicles.	eVionyx is a subsidiary of Reveo Inc. It was founded in 1995. It occupies 40,000 sq ft space in Hawthorn, a New York location.. It has received \$ 80 million in venture capital funding. It has received SBIR grants, and contracts from U.S. Navy, Defense Advanced Research Projects Agency (DARPA) and U.S. Department. Of Energy It has a facility in Taiwan. Its CEO is Dr. Sadeq Farris.
FuelCell Energy, a publicly held Corporation traded on Nasdaq Great Pasture Road Danbury, CT 06813 P:203-825-6000	Manufactures ultra clean direct fuel cell (DFC) stacks run on biofuels- gases from waste water treatment, food processing and land fills – in addition to natural gas, coal gas and propane. They make sub-megawatt version, DFC 300, 1.4 megawatt version, and DFC 3000, 2.8 megawatt version	Company cites competitive advantage as its products provide 47% generation efficiency, emits virtually zero pollutant excepting low CO2 emission, are quiet, offer reliability of more than 90%, with CHP 90%efficiency. They incorporate real time monitoring and operate on wide range of fuels for use in variety of operations. The company owns 72,000 sq ft of office and research space in Danbury, 65,000 sq ft and 38,000 sq ft of manufacturing space in Torrington and Danbury. 2010 revenue was \$ 70 million. President and CEO is Chip Bottone
IdaTech LLC 63065 NE 18 th Street Bend, Oregon 97701 P: 541-383-3390	IdaTech designs and manufactures fuel cell systems for telecommunications applications. Their fuel cells are direct replacement to traditional power generators with more economic and environmental benefits.. Their products are: (1) ElectraGen H2-1 System, a 2.5 to 5 kw back up power fuel cell Proton Exchange Membrane System that runs on hydrogen (2) ExtraGen ME System, which is an extended run back up power system 2.5kw and 5kw in capacity and includes a fuel reformer that converts methanol and water liquid into hydrogen gas.	Company seems to have a lot of irons in the fire. It is a publicly traded company. Its running in loss and large part of its assets are intangibles. Its stock price is holding up.. Its 2009 revenue was 6.58 million dollars. It has been reported that it has received an order for 10,000 fuel cells to be supplied over a period of years to Acme, a company in India, which isa telecommunication infrastructure provider. IdaTech's CEO is Harol (Hal)Koyama.
Jadoo Power Systems Inc.	Jadoo Power develops and sells	Jadoo seems to be involved in

181 Blue Ravine Road Folsom, CA 95630 P: 916-608-9044	fuel cell energy storage and power generation systems for commercial and military markets. Some of the applications are field communications and medical evacuation for military and civilian emergencies, as well as power for unmanned air vehicles. Jadoo Power was honored with an Electronic products' product of the year award for its N-Gen Fuel Cell Power Unit, generating 100W 12 DC. This product can be used in portable radio, laptop battery recharging, law enforcement surveillance installations, satellite phones, walkie talkies and network repeaters. Jadoo's N-Stor canisters supply the hydrogen fuel necessary to power Jadoo's fuel cell products. The canisters contain metal hydride powder that absorbs hydrogen and releases it on demand.	developing for military portable, remote fuel cell power supply units which have longer run time, and are lighter. For example, it has delivered 10 units of its top product to the U.S. Air Force Research Laboratory under \$ 2.2 million contract for testing. The portable power supply will be used to run medical equipment that stays with injured soldiers when they are evacuated. If successful in trial it will have a great demand.. The company has received more than \$ 20 million in foreign investment. The company was founded in 2001. It has 21,000 sq. ft. of manufacturing space. Its 2010 revenue was \$ 4million. The 2011 revenue is expected to be \$ 6 million. CEO is Ken Pearson..
Lynntech Inc. 7610 Estmark College Station, TX 77840 P: 979-693-0017	Lynntech Inc. pursues energy, water and human health research for technology development activities. It leverages 20 years of history in fuel cells R & D to develop some of the world's high end catalysts, membrane and fuel cell systems to deploy in unmanned air vehicles, wheelchairs, and industrial tractors, and electrochemical power supplies, advanced catalysts, and hydrogen generation products for commercial and military applications.	Austin Holding Company owns 100% of Lynntech's stock. The company started in 1987. It has 141 employees and the last reported revenue was \$19 million. John W. Clanton is President.
Neah Power Systems Inc 22118 20eth Ave. SE, Suite 142 Bothell, Washington 98021 P: 425-483-8454	The company is engaged in development and sale of fuel cells designed to replace existing rechargeable batteries in mobile electronic devices and small scale transportation vehicles. The company also makes direct current (DC) air conditioning systems for off-the-grid applications. Its fuel cells are proprietary direct methanol fuel cells (DMFC) design that generates electricity using methanol as fuel. Neah is developing for military, industrial	Neah, originally venture funded by Intel Capital, Alta Partners, Novellus Systems, Castle Ventures and Frasier Technology Ventures, went public in 2006 as an over-the-counter traded company by a reverse merger. It was delisted in 2011. However Neah has managed to capture a number of customers such as Hoble Cat, the marine craft company and Indian scooter manufacturer Eko Vehicles. In January it announced \$10 million funding commitment from

	and consumer applications micro fuel cells using a silicon-based design which is supposed to have benefits such as high power densities, lower cost and compact size.	Ebeling Hefferman and First Equity Trust and also bought lithium-ion battery charger Cy Volt Energy Systems.
Nuvera Fuel Cells 129 Concord Road, Building 1 Billerica, MA 01821 P: 617-245-7500	The company designs, develops and manufactures fuel cell systems and fuel processors. In fuel cells hydrogen and oxygen react to make electricity. Fuel processors are plants that produce hydrogen from conventional fuels. The company offers hydrogen fuel cell power modules for industrial vehicles, equipment and stationary applications, and onboard gasoline fuel processors, and proton exchange membrane fuel cell stacks for automotive applications. Its automotive power products replace standard lead acid batteries in industrial vehicles. Its hydrogen generator and hydrogen station dispensing systems are used in industrial vehicles.	Nuvera was formed in year 2000 with the merger of Epyx corporation of Arthur D. Little, Inc of Cambridge, Massachusetts and De Nora Fuel Cells, a wholly owned subsidiary of Gruppo De Nora of Milan, Italy.. This also was a merger of 10 years of fuel processor technology of Epyx and 10 years of fuel cell stack technology of De Nora. Nuvera. The company has 125,000 sq. ft. of facilities. It has 80 employees. Roberto Cordoro is the CEO. The company seems to have several contracts from U.S Department of Defense for fuel cell applications in replacing batteries for fork lifts and vehicles.
Plug Power Inc. 968 Albany Shaker Road Latham, NY 12110 P: 518-782-7700	The company develops and sells a range of fuel cell products and services such as hydrogen fuel cell low-temperature Proton Exchange Membrane (PEM) systems for motive and stationary power and high temperature fuel cell systems for residential and light commercial co-generation. Its product line includes PEM Gen Drive power units for industrial-off-road applications such as fork lift or material handling operations, and multi shift high volume manufacturing and high throughput distribution sites.	The company is listed on Nasdaq stock exchange. It has 130,000 sq. ft facility and 133 employees. Its latest revenue figure is \$ 8.245 million. Company's niche area is the material handling industry in providing better alternative to Lead Acid batteries. The company has customers like Wegmans, Whole foods and FedEx Freight. It has more than 1000 units in the field with over 2 million hours of run time. The company was founded in 1997 Chairman is George C. McNamee and CEO is Andrew Marsh..
Protonex Technology Corporation 153 Northboro Road Southborough, MA 01772-1034 P: 508490-8575	The company provides fuel cell power solutions for sub-kilowatt portable, remote and mobile applications. Based on patented proton exchange membrane (PEM) and solid oxide fuel cell (SOFC) design and manufacturing technology, these power cells are small, light and high performing. The company has developed several products for military, commercial and	Founded in 2000, the company completed its initial public offering on the Alternative Investment Market (AIM) of the London Stock Exchange in July 2006 and a secondary offering in April 2007 raising gross proceeds of \$ 16.2 million and \$ 27.7 million respectively. In 2007 Protonex acquired Mesoscopic Devices, an industry leader in SOFC technology, fuel reforming

	consumer applications.. These applications include: power for unmanned aerial vehicles, marine power equipment, man-portable power and robotics. These power solutions are designed to meet regular requirements, exceeding run time and enhancing performance.	and desulfurization systems.. In June 2010, upon Protonex shareholders cancellation of the public listing on the AIM Protonex became a privately held company. Protonex has established strategic partnership with Parker Hannifin, Northrop Grumman, Cummins and Raytheon.. In 2009 its revenue was \$ 7million, operating expenses were \$ 19.9 million, current assets \$ 15 million out of which cash reserve is \$ 12.5 million.
ReliOn 15913-E. Euclid Ave. Spoken, WA 99216 P: 509-228-6500	ReliOn develops fuel cell products designed specifically to meet the stringent back up power requirements of today and tomorrow's telecommunications, utility and government sectors. The company has also developed fault tolerant architecture to facilitate scalable fuel cell solutions. ReliOn's systems are connected directly to system's DC plants, similar to battery strings. This bypasses the complexity of AC transfer switches. For applications under 50 w to 12 kw, the ReliOn power solution replaces majority of back up batteries and mitigates the need for back up.	ReliOn was spun out of utility Avista Corporation. The company does not disclose total investment, sales and profit figures. But it raised \$ 23 million in series C round in April 2008 from Chrysalix Energy Venture Capital, PCG Clean Energy and Technology Fund, Robeco, Oak Investment Partners, Enterprise Partners Venture Capital, and Wall Street Technology Partners. In April 2011 it raised \$6 million from a number of previous investors.. It claims it had shipped more than 1 million watts of devices as of December 2007. The company also claimed that sales and gross profit during 2010 as compared to 2009 was tripling. CEO is Gary Flood.
Trenergi Corporation 116 South Street Hopkinton, MA01748 508-497-2355	Trenergi is a start-up company. The Trion TM micro CHP product is three- in-one-appliance, an innovative green residential source of electricity, heat and water from natural gas or other readily available fuels. It is powered by a high temperature fuel cell. It also contains a thermal management system	The company was founded in 2009. It has raised \$610,000 from family, friends and investors. Trenergi completed the proof-of-concept development of one of its products. The 1kw system successfully operated from a gas mixture simulating natural gas. The stack power out put exceeded engineering expectation according to Dr. Mohammad Enayetullah.
ZTEK Corporation 300 West Cummings Park Woburn, MA01801 P: 781-933-8339	ZTEK Corporation develops, manufactures and commercializes fossil-fuel- to-electrical-energy conversion devices for stationary power and transportation markets. ZTEK's energy conversion devices are Solid Oxide Fuel Cells (SOFC). ZTEK has greatly	ZTEK is a privately held Massachusetts corporation founded in 1984. In 2004 it was selected by the Connecticut Clean Energy Fund to team with Beacon Energy LLC to receive funding for demonstration of ZTEK's 25 kw system with an



	<p>advanced research and development of SOFCs initiated at the Massachusetts Institute of Technology's Lincoln Lab in 1970s. ZTEK focuses on the stationary Power with 200KW modules which are easily scalable to half megawatt and megawatt versions. The High Performance Steam Reforming (HPSR) system used in the ZTEK's power conversion systems has also become one of its products for integration into existing gas stations giving them capability to scale the size of their hydrogen supply.</p>	<p>absorption chiller at Dinosaur State Park. In 2002 ZTEK joined the California Fuel Cell Partnership (CaFCP), a consortium of automobile companies, energy providers, fuel cell manufacturers and government agencies committed to commercialization of fuel cell vehicles.</p> <p>The founder of the company is Dr. Michael S. Hsu.</p>
--	---	--

Table 3

Carson Compatible Wind Power Companies

The market for Carson based wind power companies are residential, commercial and institutional buildings in urban setting. There is also an export market in Central America. These markets are suitable for micro turbines, especially vertical axes ones. For that reason mostly vertical axis micro turbine manufacturers are listed in table III.

<p>A&C Green Energy, Inc. 1108 Summit Ave., Ste 8 Plano, TX 75074 972-516-0692</p>	<p>Specializes in manufacturing, integrating and marketing small wind turbines in North America, Central America, Asia, Africa, Australia and Europe. The company's wind turbines are direct drive, gearless and brushless, . The design allows continued performance in an extremely wide range of conditions. Its Talon series of downwind turbines features exclusive Variable Pitch Technology that produces maximum power at 56 mph, which ranges in power output of 2kw to 30kw..Powermax+ series with upwind turbines range in power output from 20kw to 25kw. The company also produces grid-tied or off-grid invertors.</p>	<p>The company was founded in 1999, first supplying wind power components such as blades, magnets, and magnet wires. In 2003 they decided to design, produce and integrate their own wind power systems.</p>
<p>Bergey Windpower Company 2200 Industrial Blvd. Norman, OK 73069 P: 405-3644212</p>	<p>The company manufactures highly reliable wind energy systems up to 10kw. They are used on-grid and off-grid applications such as utility bill reduction (homes, farms, and</p>	<p>The company was founded in 1977. The company has origin in work done at the University of Oklahoma. The company has 23,000 sq. ft manufacturing facility. The CEO Mike Bergey is</p>



	<p>small businesses), telecommunications and village electrification. Bergey energy generators are successfully in all types of environments from Alaska to Saudi Arabia, in all 50 states and in 100 countries. Bergey has developed prototypes of an advanced 50kw turbine generator..</p>	<p>an aeronautical engineer from Penn State and MIT. He served as Assistant Chief Engineer at the Piper Development Center in Vero Beach, Florida, where he designed such notable aircraft as the Piper Cherokee.</p>
<p>Cascade Engineering, Inc. 4855 Thirty-Seventh St SE Grand Rapids, MI 49512 P: 866-544-5520</p>	<p>Cascade Engineering engages through its multi-business operation in the research, design, development, engineering and manufacture of engineered parts and systems. The company is exclusive distributor of SWIFT wind turbine and manufacturer of all SWIFT rotors sold world wide. SWIFT design is focused on safety, reliability, ease of operation and high performance. Mounting brackets and patented diffuser ring minimize vibration during operation. In addition, five- blade design allows for a slower speed of rotation to further reduce noise and vibration. The Swift is a grid tied closed-component system mounted on an aluminum mast with a minimum blade -roof clearance of 2 ft.</p>	<p>. In partnership with the original designer of SWIFT wind turbine, the UK based company Renewable Devices, Cascade Engineering, Inc plans to become the manufacturer and marketer of SWIFT wind turbine in North America. Cascade Engineering Inc. is a multi-operation business which employs 1100 people. The share of the wind turbine business is not known. The company was founded in 1973. It appears, the SWIFT is being marketed for the last five years. The CEO of the company is Fred P. Keller.</p>
<p>Northern Power Systems 20 Pitman Road Barre, Vermont, 05641 P: 802-461-2955</p>	<p>The company is a leader in wind power technology for over 30 years. Its flagship Northern Power 100 model with 100 kilowatt of rated power is sized specifically for farms, schools, businesses, municipalities and other distributed power applications. Its unique features are gearless direct drive, permanent magnet generator, and pleasing aesthetics. It starts generating power at a wind speed of 6 miles per hour, providing economic benefits in all kinds of wind regimes. In 2011 the company has produced 2.3 MW wind turbine, and installed it at McBain, Michigan for Heritage, Sustainable Energy. This puts the company in utility scale wind energy market.</p>	<p>Northern Power Systems was started in 1974.. In 1978 it received a contract from U.S. Department of Energy to develop a 2.2kw wind turbine. The company continued working with D.O.E. until 198 and at the same time started to design, manufacture and install hybrid power systems that included wind power generators. In 2008 its Vermont operations was acquired by Wind Power Holdings and raised \$50 million in funding. CEO is John P. Danner.</p>
<p>Renewegy, LLC 3650 Jackson Street</p>	<p>The company manufactures electronically controlled 20kw to</p>	<p>The company was formed in 2008 by four former executives</p>

<p>Oshkosh, Wisconsin 54901 P: 920-527-0303</p>	<p>200kw wind turbines designed for schools, municipalities, universities and farms. By using variable pitch these products bring utility scale technology to the light commercial market. Standard Internet connectivity on every turbine provides 24 hour monitoring to ensure maximum up time. Unique hydraulic monopole eliminates the need for expensive cranes for installation or service.</p>	<p>who had successfully founded Moto Tron Corporation, a wholly owned subsidiary of Brunswick Corporation (NYSE: BC). CEO is John Ehlers.</p>
<p>Southwest Windpower Systems 1801 W. Route 66 Flagstaff, AZ 86001 p: 928-779-9463</p>	<p>With a history lasting more than two decades, the company is a global leader and pioneer in the design, manufacturing and distribution of small wind systems (400 to 3000watts). It has built and shipped 160,000 wind turbines to more than 120 countries world wide. Application of its products includes residential homes, commercial properties, microgrids, remote cabins, telecom transmitters, offshore platforms, water pumping and sailboats. Its well known products are Skystream and Whisper.</p>	<p>Skystream 600 produces 74% more energy for residential and commercial use than its predecessor – making it the most efficient grid connected wind turbine in its class. It will produce 80% of the required energy for a home. The company's power generators can complement with photovoltaics for supplying energy in rural areas. The company was founded in 1987. In 2000 it became the first manufacturer to receive UL (Underwriters Laboratories) and IEC (International Electrotechnical Commission) certifications for its AIR series wind turbines. Since then company has received substantial funding support from investors such as Altira Group, Chevron Technology Ventures, GE Energy Financial Services, NGP Energy Technology Partners, PCG Clean Energy Technology Fund and Rockport Capital Partners. CEO Dixon Thayer is busy trying to take the company to a higher level. The company has operation in Cologne, Germany and joint venture in Ningbo, China.</p>
<p>TechnoSpin Inc 601 W 26th St. New York, NY 10001-1129 P: 212-656-1444</p>	<p>Develops and manufactures revolutionary small wind turbine systems in the sense that the turbine is so quiet that one can have conversation at its base while the turbine is at full operating speed – negligible vibration, light weight and low load and easy installation.. The blade design is a completely low</p>	<p>Founded in 2004, it is a private company. Its major investors are NY based 21 Ventures and California based Quercus Trust. In 2008, 21 Ventures invested in the company 8 million dollars in series A financing. The company has world wide activities. In 2009 it installed its ComSpin 2000turbine on top of 50 meter</p>

	<p>profile, modeled according to aerodynamic principles, and not an adaptation of an aircraft wing. The company offers its products under PowerSpin Series for residential and commercial applications; ComSpin for telecommunications, security and control systems use; and AquaSpin Series for agricultural applications.</p>	<p>high telecom tower in India. The company's co-founder and Chief Executive is Maxim Rakov.</p>
<p>Ventura Energy, Inc 6100 Waseca St. Duluth, MN55807 p: 218-624-4040</p>	<p>The company is the maker of a new VT10, a 10kw, grid-tied wind turbine, which produces enough energy to completely eliminate need to buy energy for a typical farm house - producing between 1,000 to 2,000 kilowatt-hours per month with a good wind resource. The cutting edge system is a product of 30 years experience in the small wind turbine industry. The patented governing mechanism protecting the VT10 in high winds not only allows it to survive wind speed of 100 mph but (unlike competitors) to continue producing at near peak levels. VT10 uses a free standing tilt down tower with a total foot print of 5 to 13 ft. Not using guy wires radically reduces land use and the risk associated with climbing the tower. The equipment is direct drive, with few moving parts and sealed bearings reduce maintenance. The VT 10 uses dual wind and solar input, dual peak power tracking synchronous inverter capable of creating a 12kw system. The current unit does not have battery charging capability but the company is working on it.</p>	<p>The company was launched in 2004 by the current president Elliot Bayly, who has been in small-scale wind energy business three decades. The company sells 3 VT10s a month at the price of \$ 21,000 each. The company seems to have a good future and VT10 is a solid contender in the small wind market.</p>
<p>Wind Turbine Industries Corp 16801 industrial Circle, SE Prior Lake, MN 55372 P: 952-447-6064</p>	<p>Manufacturer of <i>Jacobs®</i> wind energy systems. The wind mills range from 10kw to 20kw with rotor size ranging from 23 ft to 29ft. These systems can provide power for a broad range of applications including Grid Inter tie or battery charging.</p>	<p>The company was founded in 1986. It offers its products through a network of dealers in USA, Canada, UK, and the Caribbean. Archie Pavcek is CEO. It is estimated that its annual revenue is between \$2.5 to 5 M. It employs a staff of 4-5</p>

Table 4
Solar Energy Companies
(Photovoltaic Manufacturers)

Solar cell and module manufacturing is no longer an experimental industry. Many companies that started in mid 1970's or 1980's have become billion dollar global organizations by virtue of their technological competitive edge which attracted attention of corporate and private investors leading to a series of acquisitions and mergers putting these companies on a fast growth track. When they became substantial and credible companies they were able to exploit worldwide craze and hunger for alternative energy sources and penetrate not only residential and commercial markets but engage in building solar power plants and providing back up power for critical national security projects, military equipment and vehicles, space vehicles and satellites. For example: First Solar, a thin- film manufacturer founded in 1984 in Tempe Arizona had 2010 worldwide revenue of \$ 2.58 billion and is ranked 7th in Forbes 2010 ranking of fastest growing companies.

There are many success stories in many recent startups but the competition has grown more intense. The competitive edge is comprised in cost, structural flexibility and weight of solar panels and the technology is moving from monocrystalline silicon solar cells to thin-film. Still billions of venture capital dollars are flowing into these new companies where the investors are hedging their bets by spreading their investments in several promising technologies managed by credible management teams. **Table IV presents many of those companies.**

Ascent Solar Technologies Inc. 12300 Grant Street Thornton, CO 80241 729-d72-5000	Company's primary product is a flexible thin- film photovoltaic material on a plastic substrate. These thin-film solar modules are manufactured using copper indium gallium (di)selenide (CIGS). Ascent is focusing on space, near-space and terrestrial applications for their solar product. Ascent is still primarily a R&D company which has just moved into production mode with its construction of second-generation roll-to-roll production plant.	Ascent is a publicly traded company which was listed on Nasdaq stock exchange in 2006. Ascent was founded in 2005 by ITN Energy Systems, a company engaged in commercializing emerging energy technologies through spin-offs and joint ventures. In 2006 Ascent completed its IPO releasing 3,000,000 shares at \$ 5.50 per share. In June 2007 Norsk Hydro ASA, a Norwegian supplier of aluminum products purchased 23% of Ascent shares and increased its stake to 35% in October 2,008.. The company has reached a research and production deal with Texsa S.A., a Spanish roofing company and with others. It has also partnered with the U.S. Air Force on several research and production contracts. However, in 2011 first quarter it lost \$ 9.7 million on a revenue of \$1.2 million. Company's CEO is Ron
--	--	--



Advanced Solar Photonics LLC 400 Rinehart Road Suite 1060 Lake Mary, FL 32746 P: 407-804-1000	The company researches, designs and manufactures monocrystalline solar panels and solar generators for residential, commercial and utility applications. The solar generators come as a complete turnkey-kit to include panels, inverters, racking, mounting hardware, cables, etc.; that is every thing required to complete an installation. The company also manages various projects, including large solar installations, engages in building solar cell phone towers and building metal parts for the solar industry.	Eller. Advanced Solar Photonics (ASP) was formed in 2007 as a subsidiary of Fonon Technology International to target the solar market. ASP bases its innovative solutions on the strong knowledge and experience in laser technology available through its parent companies Fonon Technology International and Laser Photonics. The company occupies 350, 000 sq. ft. of facility. Revenue is more than \$ 10 million which the company is aggressively trying to ramp up. CEO is Dimitri Nikitin.
Global Solar Energy Inc. 8500 South Rita Road Tucson, AZ 85747 P: 520-546-6313	Global Solar manufactures and distributes thin-film photovoltaic copper, indium gallium diselenide (CIGS) solar cells for glass module or flexible material products. It offers these products on flexible substrates. It also offers portable solar chargers, and solar glass modules. The company has introduced a flexible roof material, a building integrated photovoltaic (BIPV) module designed for roof tops.	Founded in 1996, the Global Solar is the only manufacturer in full scale production of CIGS and has vaulted in the ranks of the world's top ten producers of thin-film photovoltaic cells in 2010. The company operates two factories, one in Tucson Arizona and the other in Berlin, Germany. Global Solar Energy is a former subsidiary of Advanced Energy Technology Inc. CEO is Dr. Jeffrey S. Britt.
HelioVolt Corporation 6301-8E Stassney Lane Austin, TX 78744-3055 P: 512-767-6000	HelioVolt has developed a new way to manufacture thin-film CIGS semiconductor coating for solar panels. Conventional semiconductor processing requires a vacuum process to deposit the semiconductor film on the substrate, a lengthy batch – oriented production process. Company's goal is to produce high efficiency low cost thin-film CIGS panels. It has already achieved conversion efficiency of 12.2 percent.	The company has attracted over \$130 million in investment capital from venture capitalists. It has 122, 400 sq. ft. of manufacturing facility. It has hired a solar industry veteran Jim Flanary as CEO to take it to next stage. Reuters is reporting a partnership in the making with a large investor as the new CEO has decided that the company needs much more capital to reach its potential.
International Solar Electric Technology 20,600 Plummer Street Chatsworth, CA 91311 p: 818-882-8687	Company is working on nanoparticle "ink-based" process for manufacturing CIGS thin-film PV modules. It has been largely funded by National Renewable Energy Laboratory.	The company was founded in 1985. It has established a 25000sq.ft production facility for a pilot operation to verify the technology. CEO Dr. Vijay Kapur is the past Director of Arco Solar with a solid reputation. Thus far the company has not attracted any venture capital.
Konarka Technologies Inc. 116 John Street,	Develops and manufactures nano-enabled, polymer photovoltaic	Konarka Technologies inc., was founded in 2001. The name

<p>3rd Floor, Suite 12 Lowell, MA 01852 P: 976-569-1400</p>	<p>cells for industrial, government and consumer applications. Konarka cells are light weight, flexible photovoltaics that can be printed or created onto surfaces. The company is also researching infra red activated photovoltaics which will enable night time power generation. These materials as well as positive and negative electrodes made from metallic ink, can be inexpensively spread over a sheet of plastic using printing and coating machines using roll-to-roll manufacturing, similar to how news papers are printed on a large sheet of paper. The product is called power plastic.</p>	<p>emanates from Konarka temple in Orissa India. The founders were a team of eminent scientists from UMass, led by late Dr. Sukant Tripathy, a universally known material scientist and a professor at UMass, Dr. Alan Heeger, a 2000 Nobel Laureate in Chemistry and Howard Berk, Konarka Executive Chairman. The company has attracted \$150 million in private capital and \$ 20 million in government grants. In 2008 the company introduced Power Plastic to market. In 2009 the company started production in a former Polaroid plant in New Bedford MA.</p>
<p>MiaSole 2590 Walsh Ave. Santa Clara, CA 95051 P:408-919- 5701</p>	<p>MiaSole is focused on developing and producing copper indium gallium selenide (CIGS) thin-film photovoltaic products for large scale commercial and utility projects. Leveraging its executives' experience in the hard disk drive and semiconductor industries it lays its CIGS on flexible stainless steel substrate through a continuous sputtering process. Sputtering is used in high volume thin-film production, and is used by high volume manufacturing companies in the semiconductor manufacturing industries. For that reason Miasole management has hired Intel's technical Manufacturing Unit to assist in improving production.</p>	<p>The company has a sprawling manufacturing facility with proprietary equipment in Santa Clara and has already shipped 120 MW of solar modules to more than 30 customers in 7 countries. The company has raised \$350 million from investors such as Kliener Perkins, Caulfield & Byers and Vantage Point Venture Partners. The current CEO is Joseph Laia. It has 315 employees.</p>
<p>Nanosolar, Inc 5521 Hellyer Ave San Jose, CA 95138 P: 408-365-5960</p>	<p>Nanosolar claims that it can produce high-throughput CIGS at a cost of less than a dollar. The company is using discoveries in nanotechnology to produce cells that are so small that it can be applied in a wafer thin coating just like paint. Nanosolar is focused on solar panels for utilities and industrial applications. Its Utility Panel is supposed to be industry's most cost-efficient solution for utility scale deployment of solar power. For example, a typical Nanosolar Utility Panel produces 200-240</p>	<p>The company has operations in San Jose California and a panel assembly plant in Germany. It has a portfolio of 180 patents. The company has produced video that shows the thin film solar cells rolling off the presses at 100 ft per minute. The company's production capacity seems to have hit 1.4 Giga watts at the end of 2010 and it plans to expand that to 2.7 Giga watts in 2012. it is producing panels at 75 cents per watt. Nanosolar has received about \$400 million in venture capital funding and \$ 20 million</p>

	watt as compared to a same size other thin-film panel producing 80 watts.	grant from U.S. Department of Energy. Geoff Tate is CEO of the company.
PowerFilm Inc. 2337 230 th Street Ames IA 50014 888-354-7773	PowerFilm is a developer and manufacturer of thin flexible solar modules made possible by a proprietary production process. Amorphous silicon in PowerFilm's solar cell has an absorption coefficient that allows an extremely thin semiconductor material to absorb a good portion of the light. If this material is thick like a crystalline wafer it would break; when it is thin enough, say 5,000 angstrom thick, in the same type of structure it is flexible and tends to bend. This super thin absorber layer is placed on a thin plastic substrate which also is flexible but adds mechanical support and strength to the solar component. Some of PowerFilm products are OEM components, foldable solar chargers, rollable solar chargers and military solar products	PowerFilm was founded in 1988 by Dr. Frank Jeffrey and Dr. Derrick Grimmer former 3M research physicists. They came up with first product in 1995. In 1999 the company received a huge contract from Freeplay Energy for supplying solar modules for crank radios. In may 2007 PowerFilm went public on the London Stock exchange. Company's 2010 revenue was \$10.3 million as compared to \$6.6 million in 2009. Although still in loss its loss in 2010 was \$0.6 million as compared to \$1.9 million in 2009.
Pyron Solar 4060 Morena Blvd San Diego, CA 92117-5243 P; 760-599-5100	Pyron Solar Inc. develops and manufactures the Pyron Solar Triad, a patented solar concentrator that harnesses the sun's energy with high energy conversion and unlimited scalability. The utility-scale solar system consists of three 30 kilowatt arrays floating in water. Each array features specially designed lenses that concentrate sunlight into optical chambers which house glass designed to diffuse and direct light evenly into a proprietary, multi-junction photovoltaic cell. Pyron's conversion rate of solar energy to electricity is currently 17 to 18 percent which may be improved to 25 percent. Pyron's CEO claims, "we have a 50 ft diameter concentrator that generates as much energy as a flat panel that is as big as a football field".	Pyron Solar was founded in 2004 by two German scientists. They have collaborated with Boeing's Spectrolab to enhance the multi-junction (MJ) high efficiency solar cells and have integrated this technology in their concentrator. The company did receive between 4-5 million dollars in venture capital investment but that was not enough. In 2009 the company was acquired by Ellis Energy Investments of Bakersfield. With fresh capital from Ellis Pyron plans to move ahead with technology demonstration under an agreement with San Diego Gas and Electric. The company also has prototypes in China, Korea and Spain. The renewable energy startup currently has 5 employees which is likely to grow up to 12.
Suniva Inc. 5765 Peachtree Industrial Blvd. Norcross, GA 30092 P: 404-477-2700	Suniva manufactures high efficiency (19%+) monocrystalline silicon solar cells and high power solar modules. From inception Suniva's goal has	Suniva, Inc. was formed in 2007. Suniva built its first manufacturing plant in Norcross Georgia in 2008 with an initial production capacity of 32 MW. It

	<p>been to offer customers highest power solar modules produced at the lowest cost made possible by using patented technology and manufacturing process, and bring photovoltaic technology into the main stream of energy generation market by making it competitive with other energy sources without need incentives and subsidies. Suniva has evolved from the work of Ajeet Ruhatgi of the Georgia Institute of Technology's University's Center of Excellence in Photovoltaics (UCEP) which is a DoE's Center of Excellence since 1992.</p>	<p>was expanded to 64 MW in 2009 and is now at a capacity of 170 MW. It is a privately held company and hence exact employment and revenue data are not available. It is estimated that its current revenue base is \$15-20 million and it employs about 150 people.</p>
<p>Sun Power 700 Rio Robles San Jose, CA 95134 P: 408-240-5500</p>	<p>SunPower Corporation designs and manufactures high efficiency crystalline silicon photovoltaic cell, roof tiles and solar panels based on a silicon all-back-contact solar cell invented at Stanford University. The rear contact design eliminates front side metallization, maximizes the working cell area, eliminates redundant wires and makes automated production easier. Furthermore, forming the junction at the rear of the cell, combined with a clever surface treatment, allows it to trap much more of the available photons and mobile electrons resulting in jump in efficiency nearing 24.2%</p>	<p>Originally the company was incorporated in 1985 by Dr. Richard Swanson. In 2002 Cypress Semiconductor made a significant investment. In 2009 Cypress acquired 100% of the outstanding shares of capital stock. In January 2007, Sun Power acquired Power Light Corporation, a leading global provider of large-scale solar power systems. In February 2010 Sun Power acquired Europe's SunRay Renewable Energy for \$ 27 million. After IPO the company trades on Nasdaq global select market and is no longer a subsidiary of Cypress. On 29 April 2011, Total S.A. agreed to buy 60% of Sun Power for US\$ 1.38 billion. Company's CEO is Thomas H. Werner.</p>

Table 5
Manufacturers of Inverters, Micro-Inverters, Grid Tie Inverters and Controls

Companies engaged in development, manufacture and installation of grid network electronics have existed for long time, many of which have become publicly-traded global entities in instrumentation for power generation and distribution. These companies have kept pace with technology evolution in digital electronics and controls. They have started manufacturing and employing programmable grid interfaces incorporating regular, micro and smart inverters especially in cases that involve the current trend toward distributed energy modules comprised of alternative and renewable energy systems in on-grid /off grid situations. Some of the manufacturers of solar modules and

wind power equipment also manufacture inverters and supply them as a part of the power generation system. This list contains both types of companies.

Advanced Energy Industries Inc. 1625 Sharp Point Drive Fort Collins, CO 80525 P: 800-448-9167	Products include: String inverters 2 to 5.2kw, Commercial and utility scale inverters with output up to 500kw, electrical power systems and thermal instrumentation, DC pulsing products, RF and HF instrumentation.	30 year old publicly traded at NASDAQ GS, Last stock quote 14.40
Advanced Solar Photonics 400 Rinehart Road Suite 1060 Lake Mary, FL 32746 P: 407-804-1000	This company has been described above as manufacturers of solar systems. They also manufacture their own inverters of the following applications: for residential use with outputs from 1.1 to 5.6kw; for commercial applications with output up to 260kw.	Advanced Solar operates out of a 380,000 sq. ft facility.
Apollo Solar 23 F. J. Clark Circle Bethel, CT 06801 P: 203-790-6400	Apollo manufactures a full line of inverters, charge controllers and monitoring modules for PV power management systems. Examples of its inverters are: (i) 24 volt sinewave inverter/charger with 3.2kw output and charger current up to 100 amps, and (ii) 48 volt sinewave inverter / charger rated at 4kw with a charger current up to 70 amps.	Apollo Solar was founded in 2002 as a spin-off of Electronic Design Lab (EDL), a Connecticut company with an extensive experience in design of industrial electronics. The senior management has 40 years of experience in this field. The company employs 10-20 people.
Enphase 201 1 st Street # 300 Petaluma CA 94952 P: 707-763-4784	Enphase Energy brings system approach to solar energy by leveraging expertise in semiconductor integration, power electronics and networking technologies. It produces 200 watt micro inverters for grid tied systems with each panel or module having its own inverter.	Enphase energy is a privately held company led by veterans from the solar, telecom, networking and software industries.
ExelTech 7317 Jack Newell Blvd. N Fort Worth, TX 76118 P: 817-595-4969	The company produces a range of full sinewave inverters with output up to 2000watts. These inverters can be stacked to increase the power output up to 40,000 watts. The company makes grid tied inverters and accessories as well.	ExelTech was founded in 1990 with the philosophy that efficiencies in manufacturing process through product design, coordinated with facility layout, was paramount to productivity and quality of products. Their customers are Brookhaven National Labs, Digital Equipment Corporation, Motorola, MCI, GTE, and numerous federal and state agencies.
Magnetek, Inc	Produces commercial grid tied	Founded in 1984, it is a New

N49 W13650, Campbell Drive Menomonee Falls WI 53051 P: 800-288--8178	inverters with outputs up to 1 MW. It also provides (i) braking and collision avoidance subsystems, (ii) digital power interfaces that tie fuel cells, wind turbines, and solar arrays to the utility grid and (iii) power conditioners for commercial fuel cells.	York Stock Exchange listed company (NYSE:MAG). The company operates three ISO certified research and manufacturing facilities in the US and employs approximately 400 people.
Outback Power 5917 195 th St. NE #7 Arlington, VA 98223	Produces (i) pure sine wave inverter/chargers with inverter outputs of 2-3.5kw charging at up to 85 amps, designed for various situations including marine, (ii) a range of grid-tied inverters with battery back up to provide power during power cuts-outputs up to 3kw and up to 69Kwh of power, (iii) also flex power inverter systems, (iv) integration hardware, (v) charge controllers, and (vi) other state-of-the-art power electronics.	Founded in 2001 by three engineers with a long time experience in leading edge power electronics is a privately held company. It employs 120 people. Its products are working in village micro-grids in Africa, rural electrification projects in Latin America, remote off-grid cabin in Alaska, or a suburban home in California.
Satcon 27 Dryock Ave Boston, MA 02210 P: 617-697-2400	Satcon develops utility scale power conversion solutions and provides system design services for utility scale renewable markets. Satcon inverters, with outputs from 40kw to 1 Mw, provide critical system bridge between clean energy generators and large scale power grids. In several applications their inverters are equipped with power harvesting and management solutions. Some of their inverters have achieved best-in-class efficiency of 98.5%.	Satcon is a publicly traded (NASDAQ CM) company with stock price \$2.31 (6/8/11). Had a 2011 first quarter revenue of US dollar 62 million.
Solectria Renewables LLC 360 Merrimack Street Building 9 2 nd Floor Lawrence, MA 01843 P 978-683-9700	The company produces PV inverters, string combiner and web based performance monitoring of residential, commercial and utility based solar projects. Specifically it produces grid-tied sine wave inverters with outputs from 1,950 to 5,300 watt; a range of commercial inverters with outputs from 13 to 95 kw and a range of utility scale inverters with outputs from 225 to 500 kw.	Selectria Renewables was formed in 2005 as a spin-off from Selectria Corporation. The company has expanded its facility from 12,000 sq. ft to 40,000 sq. ft. Its staff has grown from 18 to 86.

Table 6
Microgrid Control Systems, Energy Storage Controls, Smart Switches, and Associated Optimization Software Platforms and Modeling

This section deals with electronic system integrating companies which help large energy consumers and utilities in developing integrated control of uninterrupted flow of energy to the consumer, and lately in a hybrid infrastructure where consumers maintain captive renewable energy production ensuring the best value in their energy consumption. This involves putting together a programmable microgrid control system embedded with an intelligent energy management software platform which not only controls the flow of energy from utility to different loads or from local energy producing sources such as wind, solar, fuel cell or other, but to ensure in off-grid application need based storage of energy in case of overproduction, and if an efficient cost management dictates supplying energy back to the grid.

<p style="text-align: center;">Encorp LLC 1825 Sharp Point Drive, Suite 116 Fort Collins, Colorado 80525 P: 970-674-5300</p>	<p>Encorp conceptualizes, manufactures and markets integrated services, software and hardware systems for distributed energy in today's new energy economy. Company's power technology products and services include energy automation software and grid interconnection equipment. Its technology – neutral solutions simplify and automate the control of a wide variety of distributed power sources such as engine-generator sets, microturbines, fuel cells, combined heat and power (CHP or Cogeneration), and energy storage devices.</p>	<p>Encorp has been linking disparate energy sites since 20 years. Their favorite slogan is “we have been microgridding before microgrid”. Encorp technologies are installed in over 400 power systems. 90% of Encorp projects have involved full interconnection with the utility transmission and distribution grid. Their vertical market experience involves manufacturers, military/government, healthcare, municipalities, energy, telecommunications, and retail. Michael Clark is senior vice President.</p>
<p>Spirae, Inc. 320 East Vine Drive Ste 703 Fort Collins, CO 80525 P: 970-484-d259</p>	<p>Founded in 2002 Spirae develops infrastructure solutions for distributed energy and smart grid applications. The company has developed innovative techniques to incorporate control logic into power system models in MatLab, DigSilent, PSS/E and many other simulation tools rendering the model a real world grid simulation tool. The company provides protocol implementation, and protocol translation for SCADA systems, RTUs, IEDs and PLCs.</p>	<p>The company was founded in 2002 by Sunil Cherian Ph.D. who is CEO. He previously founded Six Dimension which was acquired by Comverge. The company co-owns and operates InteGrid Test and Development Laboratory in collaboration with Colorado State University. The company is expanding into a bigger 5,300 sq. fit facility in Fort Collins.</p>
<p>EDSA Power Analytic Corporation 16870 West Bernardo Drive</p>	<p>Power Analytic develops software for electrical power system design and analysis. It</p>	<p>Power Analytic, founded 25 years ago is a privately held company with worldwide operations</p>

Suite 330 San Diego, CA 92127	offers three software products: (i) Paladin DesignBase, a power system engineering modeling platform used in the design phase ensuring that the power system model is perfect on paper before construction phase begins., (ii)Paladin Live which uses data encoded in the DesignBase model to continuously compare live data, (iii) Paladin Smart Grid designed for management of new generation hybrid power infrastructure incorporating , solar, wind, battery etc.	including 30 sales, distribution and support offices located throughout North America, South America, Europe, Asia and Africa. Its products are used to ensure the fail-safe operation of data and network operation centers, manufacturing plants, nuclear power facilities, deep sea oil platforms, aircraft carriers, submarines, FAA networks, and other complex structures with uncompromising electrical power requirements. Its CEO is Mark Ascolese.
Viridity Energy 100 West Elm Street Suite 410 Conshohocken, PA 19428 P: 484-534-2222	In a Smart Grid World, the two way digital information exchanges between utilities and their customers opens up new opportunities for large energy consumers. Company's VPower system is an advanced software and hardware solution that combines an organization's individual and/or multiple distributed resources, energy storage systems, and controllable loads to achieve maximum economic value.	Viridity was founded in 2008 by former executives of PJM Interconnection. The company has raised series B investment of \$ 14 million from Braemar Energy Ventures and Intel Capital. In Philadelphia, Viridity set up for the Transit Authority systems that capture energy released by braking electric subway trains and store it in rail-side battery arrays, routing the power back through the third rail to reuse it for trains' acceleration. The company's CEO is Audrey Zibelman
ZBB Energy Corporation N93 W14475 Whittaker Way Menomonee Falls WI 53051 P: 262- 253-9800	ZBB's ZESS POWRPECC (Power & Energy Control Center)is an integrated management Platform that is configurable, modular, flexible and scalable for on-grid, off-grid and backup power applications. ZBB also manufactures modular Zinc-Bromide batteries used for energy storage.	Founded in 1986 ZBB Energy Corporation is a publicly traded company (NYSE AMEX:ZBB). Corporate headquarters and 75,000 sq ft of manufacturing space are located in Menomonee Falls WI, and development and testing facility in Bibra Lake, Western Australia. Eric Apfelbach is CEO.
SBC Electric Company 6601 North Ridge Blvd. Chicago, Illinois 60625 P: 773-338-1000	Products: Automation products such as communication and software, switching equipment, energy storage systems, switching equipment, metal enclosed switch gear. Services: Analytical studies, engineering services, laboratory services, automation services.	Founded in 1911, it is a century old company. It provides solutions world wide. The company has engineering and manufacturing facilities in Chicago, Illinois; Franklin Wisconsin; Orlando, Florida; Alameda, California; and Duvall, Washington. It has subsidiaries almost all over the world.

Table 7
Manufacturers of Battery

Battery manufacturing and supply is billion dollar market. There are hundreds of battery manufacturers in the world, of which a significant number are in the US. For this project we are looking for a battery manufacturing company as a candidate for a possible New Energy Cluster in Carson. The following list has been developed with cost of relocation in mind, and it incorporates mostly California battery manufacturers which are vested in new energy applications along with other capabilities. A few well established California battery manufacturers for military, aerospace and defense applications, and medical devices applications are also included hoping they may be interested in expansion and may consider new Carson facility as a choice. Large battery manufacturers such as Exide, Duracell, Eveready and Panasonic are not included in this list as they are too large.

Concorde Battery Corporation 2009 West San Bernardino Road West Covina, CA 91790P: 626-813-1234	Manufacturer of premium quality lead-acid batteries. The present product line includes valve regulated (sealed) lead-acid batteries (VRB) for aircraft, marine, medical, telecommunications, emergency back up and photovoltaic applications. The company also makes flooded lead acid batteries for commercial and military aircraft.	Since 1979 the company has provided the department of defense over 150,000 military batteries. Concorde's manufacturing facility is AS9100 REV. B2004 and ISO 9001:2000 Certified and is fully qualified under the FAA Parts Manufacturing Approval (PMA). Concorde's management group represents over 150 years of battery manufacturing experience.
Quallion LLC Sylmar Biomedical Park 12744 San Fernando Road Sylmar CA 91342 P:818-833-2000	Quallion produces a number of primary and rechargeable cell and battery configurations for use in the medical, military and aerospace markets. Chemistry experience includes Li ion, Li Polymer, Li Metal, and Li Air. The company has capacity for high volume production of medical and military batteries as well as unique custom designed aerospace batteries.. Cell designs range from the smallest lithium ion cell 1.8 mAh for implants to 15 and 72 Ah prismatic cells.	Quallion LLC was founded by famous entrepreneur and founder of biopharmaceutical and medical devices companies Alfred E. Mann.. He founded Quallion to produce advanced batteries for medical devices. It is a Delaware LLC company; 85% of the corporation is owned by Mr. Mann and 15% by Boston Scientific. It has 47,000 sq ft facility leased in the building owned by Mr. Mann, with an option for additional 200,000 sq. ft. According to Quallion it is the only truly US owned and operated company which can make rechargeable lithium ion batteries.
Sanyo Energy Corporation 2055 Sanyo Ave San Diego, CA 92154 619-661-4888	Manufactures lithium ion batteries, lithium polymer batteries, photovoltaic cells, rechargeable batteries, primary batteries, nickel cadmium batteries and nickel metal hydride batteries.	A world leader in development and production of power sources and commercial battery products. In 1963 Sanyo developed the CADNICA, (Ni-Cd0 battery making the beginning of era of cordless electric product. Sanyo

		also pioneered rechargeables such as Lithium Ion, Lithium Polymer, and Nickel Metal Hydride.
Trojan Battery Company 12380 Clark Street Santa Fe Springs, CA 90670 800-423-6569	Manufactures deep-cycle lead acid batteries, sealed lead acid batteries, renewable energy systems batteries, rechargeable batteries.	Trojan Battery is a world leader in deep cycle rechargeable battery technologies. It has been producing deep cycle batteries since 1925
U.S. Battery Manufacturing Company 1675 Sampson Ave Corona, CA 92879 P: 951-371-8090	Manufactures Lead acid deep cycle batteries for golf cars, sweeper scrubber, aerial lifts, marine applications, standby; rechargeable batteries, sealed lead acid batteries, electric vehicle batteries, renewable energy system batteries, and AGM.	Founded in 1926, U.S. Battery Corporation is one of the leaders in development and manufacture of deep cycle batteries.
Atlantic battery Co Inc. 80 Elm Street Watertown, MA 02459 617-924-2868	Produces flooded lead acid batteries, industrial batteries, deep cycle batteries, emergency back up batteries, nickel cadmium batteries, automotive starting batteries.	Year in business 77 years; employs 20-49 people.
Dyno battery Inc. 4248 23 rd Avenue W. Seattle, Washington 98199 P: 206-283-7450	Manufactures and exports lead acid batteries, sealed lead acid batteries, renewable energy system batteries, marine batteries, industrial batteries, automotive starting batteries, deep cycle batteries.	Started in 1947 after world war 2 in a rented basement 10,000 sq. ft. facility the company has moved to its present state-of-the-art facility.
Industrial Battery Engineering Inc. 9121 DeGarmo Ave. Sun Valley, CA 91352 P: 818-767-7067	Manufactures renewable energy systems batteries, lead Acid batteries, industrial batteries and battery chargers	The company claims to have years of experience in construction of batteries and battery chargers.. Batteries are custom built to specification.
Tempest Batteries 1272 Alma Court San Jose, CA 95112 P: 408-9240800	Manufactures valve regulated sealed lead acid power security batteries .for applications that demand precision, rigidity and reliability.	Tempest Battery is a wholly owned subsidiary of IMC Power Sources established in 1988.. Tempest brand is backed by 45 years of battery manufacturing experience. Tempest batteries are used around the world in applications such as UPS, Fire and Security Alarm Systems and Mobility Products.
American Lithium Energy Corporation 935 Bailey Court Unit 106 San Marcos, CA 92069 P: 760-591-0611	Produces lithium power cells 1.8 Ah, 3.2Ah, 1.4 Ah, and 1.5 Ah and batteries with 10Ah 36 V (E bike), 20 Ah 48V (E bile, 50Ah for Fork lift, 300Ah for E bus.	The company has R&D and pilot production facility just outside San Diego. In 2009 the company formed a joint venture with Hefei China to mass produce these cells and batteries.

Table 8

Manufacturers of Flywheel Energy Storage Systems (FESS)

Flywheel energy storage plays an effective role in a UPS (uninterrupted power supply systems) where pulsed power is required, or in applications such as load leveling in a large battery system. With advancement in materials technology and metal machining / forming technologies a long lasting FESS has become a possibility and FESS manufacture an important part of an Energy industrial cluster of 2011 and beyond.

Active Power Inc. 2128 W. Braker Lane, BK12 Austin, Texas 78758 P: 512-836-6464	Manufactures flywheel Energy Storage Systems, UPS (120-1200KVA scalable to multi-megawatt) Emerging Technologies DC & AC Equipment Battery Free.	Publicly traded company Nasdaq ACPW with offices all over the world.
Flywheel Energy Systems, Inc (Blueprint Energy) 25 C Northside Road Ottawa, Ontario Canada K2H 8S1 P: 613-596-0856	Manufactures electric vehicle components, flywheel energy storage systems, and kinetic energy storage batteries.	Founded in 1993 the company has developed a flywheel kinetic storage platform suitable for transportation applications. The technology was originally designed for low earth orbit satellite applications. The company claims that their transportation solutions, derived from spacecraft power system research, offer a low cost reliable alternative to battery, ultra capacitor and hydraulic energy storage systems.
Beacon Power Corporation 65 Middlesex Road Tyngsboro, MA 01879 P: 978-694-9127	Designs and develops flywheel based solutions in multiple power plant applications. For example their Smart Energy 25 flywheel, a 4 th generation device, is designed for hundreds of thousands of charge-discharge cycles over its 20 year life making it ideally suited to frequency regulation function. It includes a rotating carbon-fiber rim levitated on hybrid rotating bearings operating in a near-frictionless vacuum-sealed environment.	Incorporated in 1997 Beacon Power Corporation (NASDAQ:BCON) is a publicly traded company. It has not been able to make profit yet.
AFS Trinity Power Corporation, Inc. 8586 Hunts Point Lane Bellevue, WA 98004 P: 425-454-1818	Develops Fast Energy Storage for vehicular, spacecraft, and stationary power systems incorporating flywheels, batteries and ultracapacitors. It also develops flywheel power systems for racing cars.	Trinity Power Corporation was formerly known as American Flywheel Systems, Inc. changed its name in 2000. The company was founded in 1993 to commercialize technology developed at Lawrence Livermore National Laboratory.. It still has an engineering center in Livermore, California.
Optimal Energy Systems, Inc. 2560 West. 237 th Street	Develops and manufactures flywheel power systems. Its	The company was founded in 1997. It serves aerospace.

Torrance, CA 90505 P: 310-257-0301	products include FFOV, a flywheel based power system for hi-voltage pulsed charging source.	defense, industrial energy management, municipal electric rail traction system, wind energy power plant and heavy industrial utility market.
---------------------------------------	---	--

Table 9
Medical Devices Manufacturers

Medical industry is huge. However, focus of this project is medical device manufacturing. This table lists a few mid size companies, currently located in Southern California. It may be possible to persuade some of them to Carson, which may offer more attractive lease rate, captive power generation and energy efficient buildings. Since the move will be local the companies may not have to undertake major restructuring of their work force.

Applied Medical Resource Corporation 22872 Avenida Empresa Rancho Santa Margarita, CA 92688 P: 949-713-8000	Develops, manufacturers and markets medical devices for minimally invasive cardiovascular, vascular, colorectal, obstetrics, gynecology, urology, and general surgeries. Devices include wound retraction systems, hand access laparoscopic systems, occlusion systems, clamps for off pump procedures, clot management products, and so on	It is a private company founded in 1987, categorized under Electromedical Equipment. Annual revenue is over \$100 million and it employs more than 500 people. Said S. Hilal is the chairman.
Biolase Technology Inc.(BLTI) 4 Cromwell Irvine, CA 92618 P: 949-361-1200	Biolase Technology develops, manufactures and markets lasers and related products to dentistry and medicine. Its products include dental laser systems that allow general dentists, endodontists and oral surgeons perform a range of dental procedures. The company offers two categories of laser system products. They are: waterlase systems and diode systems systems. The company also offers medical systems for dental and medical pain relief and dental imaging equipment.	The company was formerly known as Societo Endo Technic, SA which changed its name to Biolase Technology, Inc., in 1994. Its revenue is more than \$70 million and employs 157 people.
Avail Medical Products Inc. 1900 Carnegie Ave. Santa Ana, Ca 92705	Contract manufacturer of single use medical devices. Assembly line work, joint sealing devices, weight measuring instruments, length and thickness and distance measuring instruments	Parent company head quarters is locate in Fort Worth, Texas,. Employs about 350 people in Santa Ana.
Masimo corporation 40 Parker Irvine, CA 92618	Masimo develops and manufactures non-invasive patient monitoring devices and	Masimo was a "garage start-up" company in 1989 founded by Joe Kiani. Today it is a publicly

P: 949-297-7000	wide array of sensors. Masimo SET is a breakthrough in pulse oximetry that virtually eliminates false alarms and detects threatening events. Masimo Rainbow SET Pulse Co-Oximetry is a platform that measures and monitors blood constituents that previously required invasive procedures.	traded (Nasdaq GS) company employing 2,500 people world wide of which 220 are employed in the Irvine facility. Its 2007 revenue was \$256 million.
SenoRx Inc. 3 Morgan Irvine CA 92618 P: 949-362-4800	SenoRX develops, manufactures and markets minimally invasive devices for the diagnosis and treatment of breast cancer such as EnCor breast biopsy device that delivers samples from various locations within the breast. The company's line of breast care products includes biopsy disposables, biopsy capital equipment, biopsy adjunct products and therapeutic disposables.	The company was founded in 1998. It was acquired by C.R. Bard Inc (NYSE BCR) in 2010 for \$200 million. SenoRx has 160 employees or more.
Endologix Inc. 11 Studebaker Irvine, CA 92618 P:949-595-7200	Endologix develops, manufactures and markets minimally invasive treatment for aortic disorders. Endologix Powerlink System is a unibody self-expandable stent graft for endovascular repair of Abdominal Aortic aneurysm.	Endologix Inc. (ELGX: NASDAQ GM) is a publicly traded company The company was founded in 1992. It was formerly known as Radiance Medical Systems, Inc. In 2002 it changed its name to Endologix Inc. Its 2010 revenue was 67.5 million. It has 125 employees.
I-Flow Corp 20202 Windrow Drive Lake Forrest, CA 90630 949-206-2700	I-Flow's product line includes portable infusion pumps, catheters that deliver anesthetic pain medications directly to wound sites, as well as disposable products for administration of chemotherapies and antibiotics and nutrients.	I-Flow is a subsidiary of Kimberly-Clark. The CEO is Joanne Bauer. The Lake Forest facility employs 120 people. Year 2009 revenue was 137 million
Tenacore Holdings Inc. 1525 East Edinger Ave Santa Ana, CA 92705 P: 800-297-2241	Manufacturer and service provider in quality medical equipment repair, OEM compatible parts and new and refurbished products such as suction regulators, oxygen blenders, SPO2 cables, fetal transducers, ECG/EKG cables.	Tenacore is ISO 13485-2003 certified.

Table 10

Mechanical Hardware Manufacturing Support Industries

All the basic industries described in tables 2 through 10 use specially formed hardware produced by metal, plastic or composites forming enterprises. The manufactured



hardware made out of specific materials subjected to specific processes forms the containment and medium for the physics or chemistry to take effect. Therefore quality and timely delivery of the manufactured parts play critical roles. There are, usually, a large number of mechanical components involved in assembly of any complex device and hence multiple processes are involved in manufacturing them. Furthermore the number of companies providing this support function is quite large. However, it is determined that for this project three manufacturing support disciplines will play important roles, and it is recommended that an industrial cluster is created comprised of capable companies experienced in these three manufacturing disciplines, which are (1) Advanced Machining, (2) Advanced Casting and (3) Specialized Composites Manufacturing. This table lists a few local companies whose activities fit the requirement for this project.

Advanced Machining

Milo Engineering 2675 Skypark Drive, Suite 304 Torrance, CA 90506 P: 310-326-0274	The company is defense and aerospace contractor experienced in precision CNC operations such as Milling and turning. It is ISO 9001 AS 9100:2009 Rev. C certified.	Founded in 1977, Milo Engineering is a family owned and operated company. It has won a multi-year contract from Northrop Grumman
Beranek Inc. 2340 205 th Street Torrance, CA 90501 P: 310-328-9094	Baranek Inc. is a manufacturer of precision-machined components for Aerospace, military and communication industry.	Its 20, 000 sq. ft facility is equipped with state-of-the-art machine tools and integrated CAD-CAM system.
Aero Swiss Inc. 22347 La Palma Ave Yorba Linda, CA 92887 P: 714- 692- 0558	The company is a contractor for machined parts for defense industry and NASA. They perform precision CNC machining, aluminum machining, titanium machining, micromachining and Swiss machining.	The company was founded in 2001. Their customers are Defense, Medical, Electronics, and Computer industries
Ideas in 3D 2535 W. 237 th Street, Suite 114 Torrance, CA 90506 p: 310-530-3491	Ideas in 3D is a unique design and prototype development company that produces solid model CAD files from 3D scanned data. From DIGITIZING POINT CLOUDS they can supply G-codes for CNC machines, Aluminum Cores, and cavities, complex parting lines and development of parting lines.	The company has a highly useful capability for reverse engineering. Their expertise in R.E.A.D. (Reverse Engineering and Digitizing) and their proprietary 5 axis Coordinate Measuring Machine give them exceptional ability to produce accurate hardware from scanned documents and complex hardware with no design data.

Advanced Casting

FS-Precision Tech Co. LLC 3025 Victoria Street Rancho Dominguez, CA 90221 p: 310-638-0595	FS-Precision produces titanium, Zirconium, stainless steel and cobalt alloy investment castings for automotive, space and	FS- Precision is a subsidiary of the Fusheng Precision Company, global leader in Golf equipment contract manufacturing
--	---	--



	commercial applications. Their castings range in weight from an ounce to one hundred pound. The company is a world leader in titanium turbo charger castings. They have developed a proprietary titanium alloy caslled FS-2S that boasts 20% higher strength than cast titanium.	
Del Mar Die Casting Co. 12901 South Western Ave. Gardena, CA 90246 p: 323-321-0600	Manufactures zinc and magnesium alloy castings. In Zinc they can produce castings from the size of a dime to about 12 inches by 16 inches. Magnesium castings can also vary in size up to 12 inches by 16 inches.	Has 110,000 sq. ft. of manufacturing space and 42 hot and cold chamber casting machines.. ISO 9001:2000 certified.
Modern Pattern & Foundry Co. Inc. (MPF) 5610 Alcoa Ave. Vernon, CA 90058 P: 323-503-4921	MPF produces ferrous and non-ferrous castings with precision investment or sand casting processes.	MPF serves aerospace, military, industrial and commercial markets.

Composites Manufacturing

Composites manufacturing candidate for the proposed industrial cluster in Carson will be a medium size company with capability to produce diverse components for new energy systems and other devices. For that reason large outfits like HITCO, although in neighborhood, is not listed here as they are too big.

Alliance Spacesystems LLC 1250 Lincoln Ave, Suite 100 Pasadena, CA 91103 P: 626-296-1373	Alliance Spacesystems provides mechanical systems engineering and fabrication of composites structures such as composite benches, damped structures, honeycomb benches, payload structures and spacecraft structures.	The company has two Southern California facilities - a 14,000 sq. ft. headquarters and engineering facility near JPL in Pasadena, and a 77,000 sq. ft. composites and structures manufacturing facility in South Bay.
ACROSS USA, Inc. 1480 Beachey Place Carson, California 90746 P: 310-635-3555	Produces carbon fiber reinforced carbon-matrix composites: (1) heat endurance and thermal conductivity, (2) friction materials and (3) advanced functions	It is a subsidiary of ACROSS Corporation headquartered in Saitama Japan.
Kinetic Composites Inc. 2520 Jason Court Oceanside, CA 92056 P: 760-945-8977	Provides development and production of advanced composite laminates for commercial and industrial applications, such as epoxy/graphite sheets and molded composite products.	Established in 1984 it is a private company with estimated revenue of 1-2.5 million dollars

Table 11
Potential Manufacturers and Importers of Semi-Finished Goods

For this section semi-finished goods have been divided into three categories: (1) engineering goods, (2) consumer goods such as toys, and (3) apparel. As an example this table lists one potential participant in each category..

Nimbus Enterprises LLC 24866 Jeronimo Lane Lake Forest, CA P:949-581-4560	Nimbus is a global supply chain partner / facilitator for US companies in importation of engineering goods in assembly or component form including metal stamping, die making parts, forging, casting and many other parts.	The company was founded in 1983. Maintains engineering and quality assurance personnel around the world.. The company is ISO 9000 certified.
Megatoys 905 East 2 nd Street Los Angeles CA 90012 P: 213-617-1353	Manufacturer, importer and wholesaler of toys.	It is an internationally known company with offices in downtown Los Angeles and Hong Kong.. Megatoy brand toys can be found in all major retail stores. The company was founded in 1989.
Lalu USA Wholesale Clothing 1043 Towne Ave. Los Angeles, CA 90021 P: 213-748-2888	Products: women's tops, jackets, dresses, vests.	Supplier of stylish affordable, quality women's clothing, designed in France by anonymous designer Lalu.

Sources of Information: Listing not Alphabetical

- 1.0 Websites of individual companies
- 2.0 Pike Research, Cleantech Market Intelligence. *Microgrids: Smart Energy Aggregation Platforms for Distributed Power Generation Safe Grid Islanding, Reliability, Security and Emergency Series*. <http://www.pilkerresearch.com/research/microgrids>. Pp1-11, downloaded on 2/13/2011.
- 3.0 Bloomberg Business Week: company information whenever available. <http://investing.businessweek.com/results/stocks>
- 4.0 Wolf, Eric. Nov. 8, 2009 *Energy: Rooftop Solar Cells Blossom Posing New Challenges For Power Grid*. North Country Times- The Californian. <http://www.nctimes.com/business/article> downloaded 4/17/2011
- 5.0 List of Inverter Manufacturers worldwide ordered by country. <http://www.solar-facts.com/inverters.com/business/article>. downloaded 5/30/2011
- 6.0 Inverter (Electrical). Wikipedia. [http://en-wikipedia.org/wiki/inverter-\(electrical\)](http://en-wikipedia.org/wiki/inverter-(electrical)) downloaded 5/27/2011
- 7.0 List of Photovoltaics Companies. <http://en.wikipedia.org> downloaded 4/4/2011
- 8.0 Manta Inc. <http://www.manta.com> wherever applicable.

- 9.0 Bigelow, V. Bruce. 7/2/09. *Bakersfield Firm Re-Energizing San Diego's Byron Solar*. <http://www.xconomy.com> downloaded 5/25/2011.
- 10.0 Wang, Uclia, April 28, 2011. *NanoSolar's 3 big contracts and Plans to Deliver them*. <http://www.renewableenergyworld.com/rea/news/article/2011> downloaded 5/24/201.
- 11.0 Woody, Todd. April 26, 2011 *Intel Inside: Chip Giant to Advise Miasole on Solar Manufacturing*. Forbes, Op/Ed
- 12.0 American Wind Energy Association (AWEA). *Small Wind turbine Equipment Providers*. <http://www.swea.org/smallwind/smvs1st.html> downloaded 10/13/2010
- 13.0 Hovers. <http://www.hoovers.com/company> whenever possible
- 14.0 List of Renewable Energy Companies by Stock Exchange. <http://www.en-wikipedia.org> downloaded on 5/15/2011.
- 15.0 Developers of Fuel Cells (Worldwide): Fuel Cells 2000. The online fuel cell information resource. <http://www.fuelcells.org/info/scdev.html> downloaded on 2/3 2011.
- 16.0 Schenker, Jennifer. Feb. 24, 2010. *Fortune 500 firms embrace Bloom Energy's Fuel Cell Technology* Informilo. <http://www.informilo.com/20100624/> downloaded on 5/8/2011.
- 17.0 John, St. Jeff. Feb.22, 2010. *10 Fuel Cell Startups Hot on Bloom Energy's Trail*. <http://gigaom.com/cleartech> downloaded on 5/7/2011.
- 18.0 Flywheel Kinetic Energy Storage Businesses in the World. <http://www.energy.source.sourceguide.com/businesses.byP/batP/batt/btora.btype/fly.s.html> downloaded 6/29/2011
- 19.0 Lithium Ion Battery Manufacturers in California. <http://energy.sourceguide.com/businesses/bvGeo/us/bvs/CA/byP/batP/batt/bvB/mfg/tor..> downloaded 6/26/2011
- 20.0 Mapping of the Green Economy: California. <http://www.edf.org/page.cfm?> Downloaded 2/9/2011.
- 21.0 City of Carson, Special Information Directory.
- 22.0 Importers of Engineering Goods. http://www.trademail.im/buyers-importers-engineering_goods_and_equipment-8.html downloaded on 7/6/2011.
- 23.0 Toy Association of Southern California. <http://www.tasc-toys.com/membership/index.html> downloaded on 7/6/2011
- 24.0 Medical Machining Manufacturers, Suppliers and Distributors. <http://mymachinemanufacturers.com> downloaded on 7/2/2011
- 25.0 Torrance Business Listing. <http://www.torrance.ca.gov/torrbus.htm>
- 26.0 Gardena Chamber of Commerce, membership list.
- 27.0 Orange County First List 2010, Orange County Business Journal

CHAPTER III

COMPANIES RECOMMENDED FOR FOLLOW UP

The objective is to attract new age industries that are well "positioned by technology and strategy to be strong employers in the coming decades ... and... are suited to Carson's geographic location". An ideal company that the city of Carson would like to attract to the city is a company which is (i) more than 5 years old (ii) focused on larger multi-product commercial and residential market share that may include technology challenging market of space and defense but not necessarily dependent on it (iii) is in production and has its products satisfactorily working for different clients, (iv) not bogged down in overcoming the product development problems, (v) more a marketing innovator, (vi) in need for more production space, (vii) developing export foot print, (viii) recipient of some venture capital investment but has not been almost taken over by multiple venture capital funds, (ix) on right track towards cost reduction, and (x) geared to design products with multi-usage compatibility.

It is very difficult to satisfy all these characteristics in one company. The contractor has used its best judgment to select three companies listed in this chapter. They will be the first one to be contacted but if some of them do not work out the others listed in chapter II should be attempted.

Company Selection

Table 12
Fuel Cell Companies for Follow Up

Company	Reason For Selection
Altery Energy Systems 140 Blue Ravine Road Fulsome, CA 95630 P: 916-458-8590	The company is more than 5 years old.. Its products are in market place. Makes fully integrated PEM fuel cells for large broadband./cable data centers, and homeland security market with export potential. It is still a single-location, small company with \$ 3.5



	million in sales with 26 employees. Has a great potential for expansion. Could use larger facility with lower rent..
Bloom Energy 1252 Orleans Drive Sunnyvale, CA 94089 p: 408-542-1501	Bloom manufactures stationary power source fuel cells from common sand. It is a pretty hyped up high growth company with \$400 million in venture capital. It may need to open another facility. Carson can provide a large space for that purpose. With proper marketing, if Carson is able to get this company interested it will be a real branding coup for Carson.
Jadoo Power Systems Inc. 181 Blue Ravine Road Folsom, CA 95630 P: 916-608-9044	Jadoo Power is an upcoming manufacturer of fuel cell energy storage and power generation systems which are lighter and long lasting with civilian, military, medical and law enforcement application. It can use larger manufacturing space pretty soon and Carson may be the place that can meet their requirements.

Table 13
Wind Power Companies for Follow Up

A&C Green Energy, Inc. 1108 Summit Ave, Ste 8 Plano, TX 75074 p: 972-516-0692	The company started out in 1999 as a supplier of wind turbine components. In 2003 the company moved on to designing, producing and integrating their own wind power system and is currently marketing them in several foreign countries. Southern California is a big market for vertical wind turbines. If Carson offers them room for expansion it will help transition to their next stage of evolution. The company might take on to the opportunity.
Ventera Energy Inc. 6100 Waseca St. Duluth, MN 55807 P: 218-624-4040	The company produces a cutting edge system which can work at wide range of wind speeds and it has a small foot print which can work well in Southern California urban environment. There seems to be a market synergy here which may interest the company in opening another facility in Carson..
Wind Turbine Industries Corp. 16801 Industrial Circle, SE Prior Lake, MN 55372 P: 952-447-6064	The company produces high quality micro wind mill for a range of applications for which there is market in Southern California. It is also an established enterprise founded in 1986. They may be interested in expanding and opening a facility in Carson.

Table 14
Photovoltaic Manufacturers for Follow Up

HelioVolt Corporation 6301-8E Stassney Lane Austin, TX 78744-3055 P: 512-767-6000	The company has made great advances in developing thin-film solar cells using its own manufacturing process which reduces cost of production considerably. It is also a favorite of investors and is on to further expansion. Although it has 122,400 sq. ft. of manufacturing space in Austin, it may be open to creating manufacturing unit in Southern California to tap into its large domestic and institutional markets.
Suniva Inc 5765 Peachtree Industrial Blvd. Norcross, GA 30092 P: 404-477-2700	Suniva manufactures high efficiency monocrystalline silicon solar cells using a patented technology and manufacturing process at a price that competes with thin-film. It is also expanding its operations. They could be interested in a facility in Carson.
Advanced Solar Photonics LLC 400 Rinehart Road Suite 1060 Lake Mary, FL 32746	The company manufactures monocrystalline solar panels, inverters and solar generators for residential, commercial and utility applications. It also manages solar projects. It seems like they could be interested in opening operations in Southern California to tap into

P: 407-804-1000	the opportunities in Southern California.
-----------------	---

Table 15
Manufacturers and Designers of Inverters and Grid-tie Electronics for Follow Up

Outback Power 5917 195 th St. NE #7 Arlington, VA 98233 P: 360-435-6030	Outback produces inverters, chargers, flex power inverter systems, integration hardware, charge controllers and state-of-the-art electronics. This is the kind of system oriented electronics design and manufacturing company needed for the new-age industrial cluster in Carson. They are also developing micro-grid systems for rural electrification in South Africa. Effort should be persuaded to open a facility in Carson
Enphase 201 1 st Street #300 Petaluma, CA 94952 P: 707-763-4784	It is an interesting privately held company. Its management has background in semiconductor integration. The company produces micro-inverters for grid tied systems, power and network electronics. Carson should persuade them to move here.
SBC Electric Company 6601 North Ridge Blvd. Chicago, Illinois 60625 P: 773-338-1000	It is a century old company which makes communication products, switching equipment and energy storage systems. It also offers engineering and analytical services. It should be persuaded to move its Alameda, CA facility to Carson.

Table 16
Energy Storage Systems Manufacturers for Follow Up

American Lithium Energy Corp 935 Bailey Court, Unit 106 San Marcos, CA 92069 P: 760-591-0611	California has large established battery manufacturers which are not expected to move. American Lithium stands out because it has developed high quality lithium ion batteries and seems ready to transition to next stage. Carson new age industrial cluster may provide them this opportunity.
AFS Trinity Power Corporation 8586 Hunts Point Lane4 Bellevue, WA 98004 425-454-1818	Company develops fast energy storage systems incorporating batteries, ultracapacitors and flywheels. Carson New clusters will provide them market, environment and culture of innovation needed especially for flywheel energy storage. This may be an opportunity for them to get to the next stage of evolution.

Table 17
Medical Devices Manufacturers for Follow Up

Avail Medical Products Inc 1900 Carnegie Ave. Santa Ana, CA 92705 P: 949-297-7000	It is a contract manufacturer of medical devices. It employs 350 people in Santa Ana. Company's head quarters is in Fort Worth TX. A better and larger facility in Carson may persuade them to move to Carson.
Biolase Technology Inc. 4 Cornmell Irvine, CA 92618 P: 949-361-1200	The company produces laser products related to dentistry and medicine. A modern industrial cluster and lower rent may persuade the company to move to Carson from Irvine, the industrial environment quality of facility being equal..

Table 18
Mechanical Hardware Manufacturing Support Industries for Follow Up

Beranek, Inc.	The company is a manufacturer of precision machined parts. Opening
---------------	--

2340 205 th Street Torrance, CA 90501 P: 310-328-9094	of industrial clusters may provide better opportunity for them in Carson. This is likely to happen.
Ideas in 3D 2535 W. 237 th Street, Suite 114 Torrance, CA 90506 P: 310-530-3491	This is a unique design and prototype development company. Although not a large job producing company, it will be very helpful to basic industries in the cluster. They may move to Carson for better opportunities.
Modern Pattern & Foundry Company Co. 5610 Alcoa Ave. Vernon, CA 90058 P: 323-503-4921	The company does ferrous and non ferrous, both sand and investment castings for aerospace, military, industrial and commercial customers. They may agree to move to a better facility in Carson.
Alliance Space Systems LLC 1250 Lincoln Ave. Suite 100 Pasadena, CA 91103 P: 626-296-1373	The company produces composites structures for space and aerospace clients. Although their headquarters is in Pasadena the company has a modest 77,000 sq. ft. composites plant in South Bay. The company may decide to move the composites plant to Carson if the offer looks attractive.

Table 19
Potential Manufacturers and Importers of Semi-Finished Goods for Follow-Up

Nimbus Enterprise LLC 24866 Jeronimo Lane Lake Forest, CA 92630 P: 949-581-4560	Nimbus is an established global supply chain company in engineering goods for U.S. Manufacturers. Either they would be interested in setting up a plant in Carson or help us by suggesting another party.
Megatoys 905 East 2 nd Street Los Angeles, CA 90012	An established toy importer and manufacturer which may be persuaded for setting up a plant in Carson where they will import semi-finished toys, complete their assembly here.
Lalu USA Wholesale Clothing 1043 Towne Ave Los Angeles, CA 90021 P: 213-748-2888	This is a candidate which is importing high-end apparel designed by anonymous designers in Europe. Their apparel is currently made in Europe. It seems that they will save money and maintain quality by following the route suggested in this program..



CHAPTER IV

DEVELOPING NEW-AGE INDUSTRIAL CLUSTERS IN CARSON

A Cluster Defined for this Project

Typically, “clusters are geographic concentration of interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field that are present in a region.”¹³ For this project a cluster is defined slightly differently. It does involve geographic concentration of main interconnected companies engaged in a particular field, but the specialized suppliers, service providers and associated institutions may be located at driving distances from the concentration.

An Industrial Cluster is distinct from an Industrial Sector. According to San Diego Association of Governments “A cluster represents the entire value chain of a broadly defined industry from suppliers to end products, including supporting services and specialized infrastructure.”¹⁴

Why Clusters?

It may seem that in the globalized economy with rapid transportation, high-speed communication, and the Internet capable of transferring large and complex files instantaneously, the location should no longer be a source of Competitive Advantage. But evidence suggests that in practice even in this economy clusters are catalysts for innovation, entrepreneurial activities and economic development, and that “competitive advantage lies increasingly in local things - knowledge, relationships, and motivation

¹³ Bulletin on *Competition and Strategy Development* by Institute for Strategy and Competition – Harvard Business School <http://www.isc.hbs.edu/econ-clustersa.htm> downloaded 6/23/2011

¹⁴ Taken from San Diego Association of Governments’ study named “What are Industrial Clusters?” downloaded from their Web Site on 6/23/2011

that distant rivals cannot replicate – geographic, cultural and institutional proximity provides companies with special access, closer relationships, better information, powerful incentives, and other advantages that are difficult to tap from a distance. The more complex, knowledge-based, and dynamic the world economy becomes, the more this is true.”¹⁵

Conceptual Planning of New Age Manufacturing Clusters for Carson

Specific Considerations:

A. Taking Advantage of Existing Commercial and Industrial Framework:

The planning for the New Age Manufacturing Clusters for Carson is not being accomplished in a vacuum. City of Carson already has an established industrial and commercial base, even if it is not in a cluster framework. Furthermore, Southern California is a vibrant center of national and international trade and commerce; manufacturing; research; and development activities in almost all technologies, prominently aerospace, space, defense, energy, electronics, sensors and energy. Hence a firmament of enabling knowledge culture thrives through the workforce, research facilities, professional associations, seminars, conferences and libraries. That being the case, a physically interconnected industrial cluster can be virtually extended to the supply and value chain outside the cluster's physical concentration.

Additionally, in Carson and adjoining cities there exists a Business Services Sector that provides a variety of professional services to local business establishments including:

Freight Forwarding and Logistics

¹⁵ Porter E. Michael 1998. "Clusters and the New Economics of Competition." Harvard Business Review, November-December 1998. Article Summary downloaded on 6/23/2011 from <http://www.isc.hbs.edu/econ-clusters.htm>

Miscellaneous Publishing
 Advertising Services
 Employment Agencies
 Help Supply services
 Information Retrieval Services
 Computer Facilities Management
 Computer Rental and Leasing
 Legal Services
 Accounting, Auditing and Bookkeeping Services
 Architectural Services
 Management Services
 And many others

The following figure outlines the overall cluster architecture incorporating the linkages among the physically interconnected cluster system and the supporting services in the neighborhood.

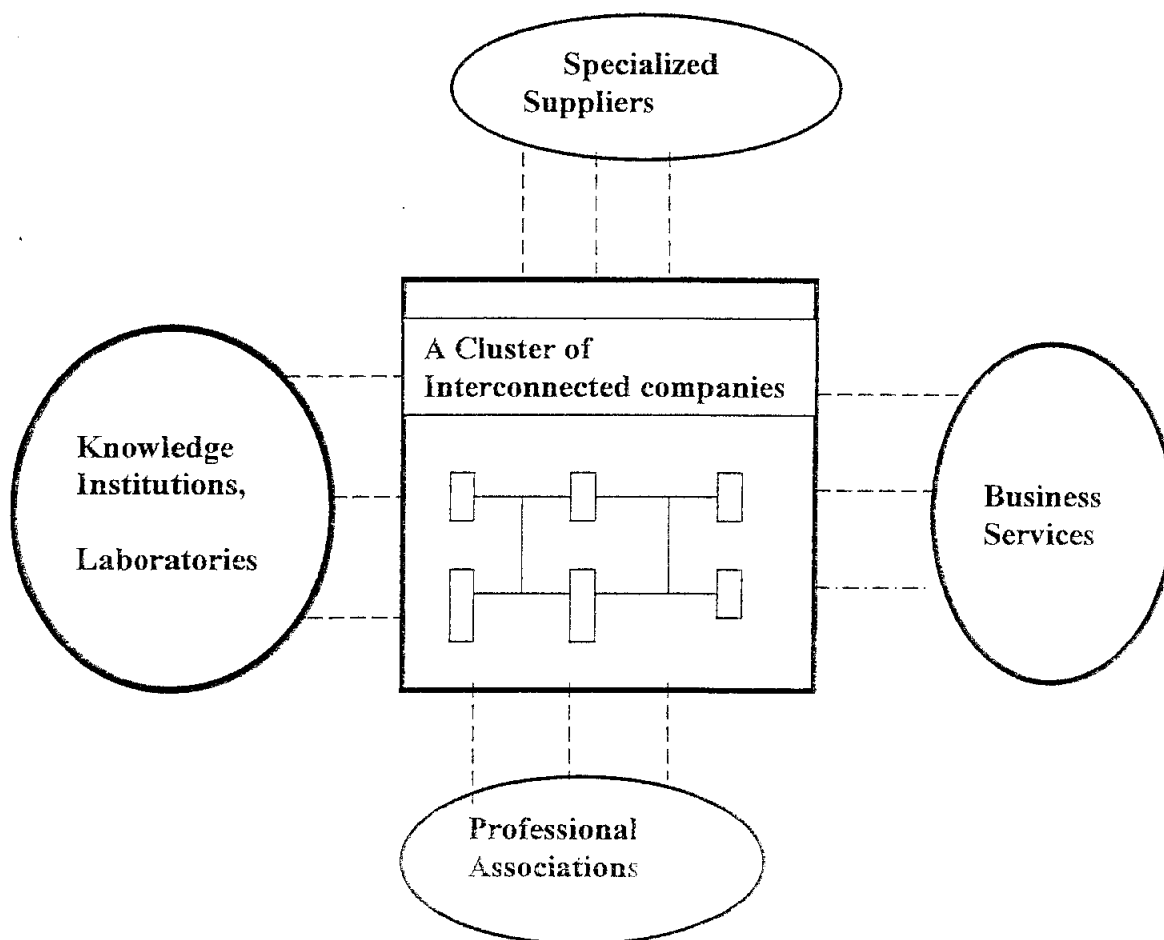
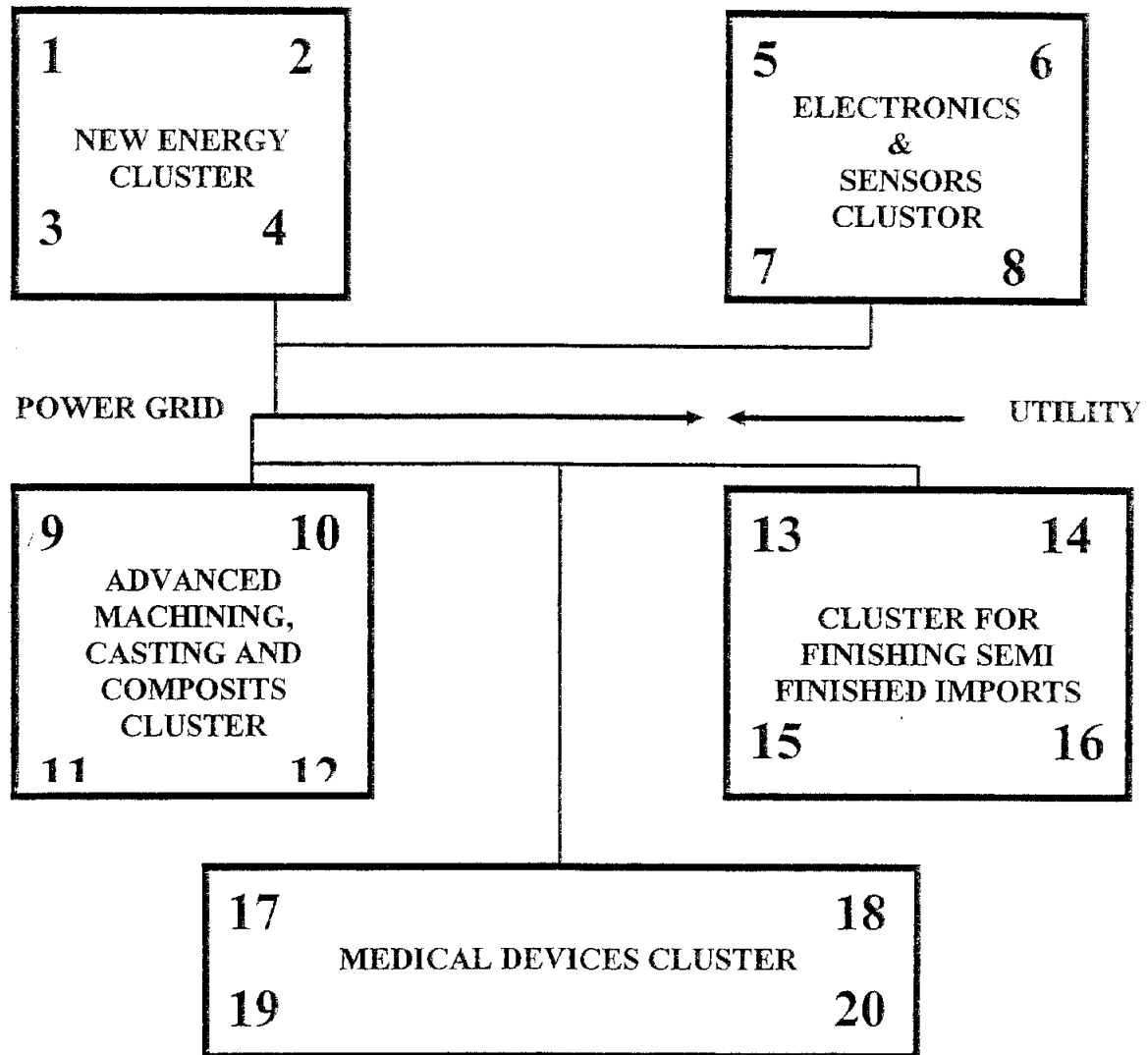


Figure 14: An Outline of a Complete Cluster That Include Virtual Components

ARCHITECTURE FOR CARSON CLUSTER SYSTEM



NOTES: NUMBERS STAND FOR UNITS WITHIN THE CLUSTER

1: PHOTOVOLTAIC PRODUCTION, 2: MICRO-TURBINE PRODUCTION
3. FUEL CELL PRODUCTION, 4: CAPTIVE NEW ENERGY POWER PLANT

5: PROGRAMMABLE ELECTRONICS, 6: PHYSICAL SENSORS AND INSTRUMENTATION;
7: SENSORS AND RADARS; 8: CAPTIVE NEW ENERGY POWER PLANT.

9. CNC AND MICRO MACHINING; 10 ADVANCED CASTING; 11: COMPOSITES
FANRICATION; 12: CAPTIVE NEW ENERGY POWER PLANT

13: CONSUMER ELECTRONICS, VIDEO GAMES ETC.; 14 ENGINEERING GOODS; 15:
APPAREL AND TEXTILE; 16: CAPTIVE NEW ENWERGY POWER PLANT

17, 18 AND 19: MEDICAL DEVICES UNITS
20: CAPTIVE NEW ENERGY POWER PLANT

FIGURE: 15

B. Incorporating Concept of Distributed Energy

The industrial buildings will be designed for energy utilization efficiency not only by architecturally proper orientation of building structure but by minimizing energy loss at every step and ensuring use of energy efficient equipment. Furthermore, each cluster is planned to have a captive renewable energy hybrid power plant to produce power for its own use and selling excess energy to the utility through an integrated grid system.



CHAPTER V

INVENTORY OF AVAILABLE INDUSTRIAL LAND IN CARSON

All the research in the technologies and companies of 2011 and beyond will not be of any use unless Carson has industrial vacant land to build the new age industrial clusters. Luckily, during inventory taking of land in Carson and review of maps and data from the Carson Redevelopment Agency and Carson General Plan it was discovered that Carson is one of the few cities which still has plenty of buildable industrial land which can be harnessed to rebrand the city into a center for new technology and manufacturing, thereby generating high paying job opportunities and increasing the living standards of its residents.

During land inventory taking process Shell Oil's proposed development project to be located on the existing Shell Carson Distribution Facility was also reviewed and discussion was held with Shell Oil's official who seemed favorably inclined towards the type of industrial clusters planned for this project. Extensive discussions took place with city of Carson's Economic Development and Planning Departments. The objective was to identify all buildable industrial land whether they were clean, blighted or landfills because in this effort extensive remediation work is planned.

The combined effort of the city's Planning Department, Economic Development Department and this contractor's project team was successful in identifying six sizeable plots of land (not including Shell Oil's property) with an impressive combined total of one hundred eighty eight and three quarters (188.76) acres, the smallest and largest lot sizes being 8.5 acres and 92.5 acres respectively. Please refer to the Figures 16A and 16B, titled Carson's Vacant and Under Utilized Industrial Land Map, and Figures 17 through 22 depicting blown up maps of six plots of land.



As shown in Figure 21 and 21 B Shell Oil project has allocated approximately 40 acres to Revitalization Areas dedicated as industrial, details of which is provided in Figure 21 B . This 40-acre allocation is in addition to 188.76 acres the city has identified. It must be noted that only 10.48 acres located at 2400 Dominguez Street, is owned by the city and is currently home of city of Carson's Parks and Recreation Yard. Shell Oil's Development Project has allocated land for a new Parks and Recreation yard for the city. Rest of the identified land belongs to private owners who will have to be brought on board.

**THE FOLLOWING PAGES IN THIS CHAPTER PRESENT THE
FIGURES PERTAINING TO LAND. THEY ARE FIGURES 16A TO 22.**

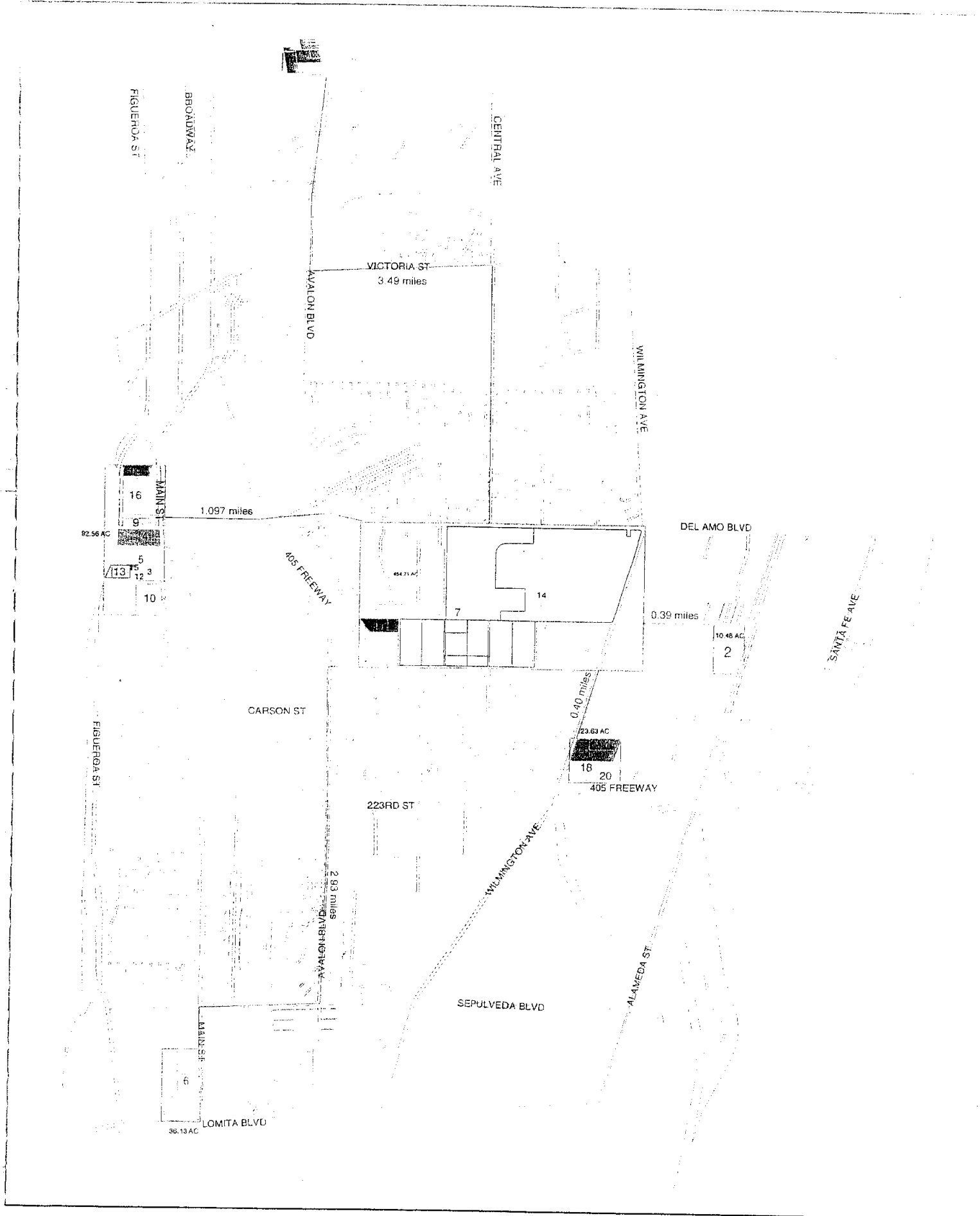


Figure 16 A
Carson's Vacant and Under Utilized Industrial Land Map

APN	County	Address	Address	Owner/Name	APN	County
17316025061	ML	21930 S WILMINGTON AVE	1820 S SOTO ST	ALPERT AND ALPERT IRON AND	308579.21204	7.0840038498
7316025061	ML	21900 S WILMINGTON AVE	1820 S SOTO ST	ALPERT AND ALPERT IRON AND	133813.963322	3.0719458981
7316025097	ML	2061 E 220TH ST	1820 S SOTO ST	ALPERT AND ALPERT IRON AND	388139.460196	8.9104559274
27316026900	MH-D	2400 E DOMINGUEZ ST	2400 E DOMINGUEZ ST	CARSON CITY	456654.520285	10.4833452774
37336003029	ML-ORL	225 W TORRANCE BLVD	10751 WILSHIRE BLVD STE 1207	CARSON EL CAMINO LLC	236638.864012	5.4324808084
47336003037	ML-ORL	20500 FIGUEROA ST	8447 WILSHIRE BLVD # 100	CARSON STORAGE VENTURE	139809.752921	3.2095902874
7336003038	ML-ORL	20501 MAIN ST	8447 WILSHIRE BLVD # 100	CARSON STORAGE VENTURE	108917.453744	2.5004006828
7336003039	ML-ORL	20501 MAIN ST	8447 WILSHIRE BLVD # 100	CARSON STORAGE VENTURE	196037.55937	4.5004031077
7336003040	ML-ORL	20501 MAIN ST	8447 WILSHIRE BLVD # 100	CARSON STORAGE VENTURE	108614.065235	2.493435841
57336003030	ML-ORL	0	7 ARGONAUT	CARSON VALLEY LLC	624200.254645	14.3296660846
67406026918	MH	0	515 S FIGUEROA ST 1400	CO SANITATION DISTRICT NO 8	735580.151315	16.8865966785
7406026916	MH	24327 MAIN ST	515 S FIGUEROA ST 1400	CO SANITATION DISTRICT NO 8	419761.617144	9.6364007609
7406026917	MH	24721 MAIN ST	515 S FIGUEROA ST 1400	CO SANITATION DISTRICT NO 8	418355.855235	9.6041289081
77327002019	MH	0	PO BOX 4369	EQUILON ENTERPRISES LLC	419984.62274	9.6415202649
7318018006	MH	0	PO BOX 4369	EQUILON ENTERPRISES LLC	5087545.48019	116.793973744
7327002013	MH	0	PO BOX 4369	EQUILON ENTERPRISES LLC	855105.774619	19.6305274247
7327002014	MH	0	PO BOX 4369	EQUILON ENTERPRISES LLC	853019.859318	19.5826413985
7327002021	MH	0	PO BOX 4369	EQUILON ENTERPRISES LLC	251365.270724	5.7705525878
7327002017	MH	0	PO BOX 4369	EQUILON ENTERPRISES LLC	51851.6875843	1.1903509546
7327002008	MH	0	PO BOX 4369	EQUILON ENTERPRISES LLC	661021.034184	15.1749548711
7327002012	MH	0	PO BOX 4369	EQUILON ENTERPRISES LLC	7806.48583253	0.1792122551
7327002015	MH	0	PO BOX 4369	EQUILON ENTERPRISES LLC	190676.030246	4.3773193353
7327002016	MH	0	PO BOX 4369	EQUILON ENTERPRISES LLC	188801.30171	4.3342814901
86125013026	ML	16315 S AVALON BLVD	6021 KATELLA AVE STE 200	EVERGREEN AMERICAN CORP	92620.5388003	2.1262749954
6125013025	ML	16325 S AVALON BLVD	6021 KATELLA AVE STE 200	EVERGREEN AMERICAN CORP	205409.540887	4.7155541985
6125013039	ML	0	6021 KATELLA AVE STE 200	EVERGREEN AMERICAN CORP	23473.5370321	0.5388782606
6125013042	ML	16325 S AVALON BLVD	6021 KATELLA AVE STE 200	EVERGREEN AMERICAN CORP	91605.6899469	2.1029772715
6125013040	ML	0	6021 KATELLA AVE STE 200	EVERGREEN AMERICAN CORP	31619.9176462	0.7258934262
6125013041	ML	0	6021 KATELLA AVE STE 200	EVERGREEN AMERICAN CORP	45349.7971533	1.0410880889
6125013018	ML	455 E GARDENA BLVD	6021 KATELLA AVE STE 200	EVERGREEN AMERICAN CORP	20155.2938669	0.4627018794
97336004010	ML-ORL	20331 MAIN ST	2215 N GAFFEY ST	GAUDENTI AND GAUDENTI	236024.923085	5.418386664
107336002065	SP-3	0	225 W TORRANCE BLVD # D	GLORY CHRISTIAN FELLOWSHIP	364036.484716	8.3571277483
7336002064	SP-3	0	225 W TORRANCE BLVD # D	GLORY CHRISTIAN FELLOWSHIP	92453.1256967	2.1224317194
7336002061	SP-3	0	225 W TORRANCE BLVD # D	GLORY CHRISTIAN FELLOWSHIP	32811.4116747	0.7532463654
7336002060	SP-3	0	225 W TORRANCE BLVD # D	GLORY CHRISTIAN FELLOWSHIP	14184.4818633	0.3256308968
7336002031	SP-3	0	225 W TORRANCE BLVD # D	GLORY CHRISTIAN FELLOWSHIP	17855.2406886	0.409899924
7336002062	SP-3	0	225 W TORRANCE BLVD # D	GLORY CHRISTIAN FELLOWSHIP	31405.3055901	0.7209666113
7336002034	SP-3	306 TORRANCE BLVD	225 W TORRANCE BLVD # D	GLORY CHRISTIAN FELLOWSHIP	83844.2075713	1.9247981536
7336002063	SP-3	0	225 W TORRANCE BLVD # D	GLORY CHRISTIAN FELLOWSHIP	90077.7690589	2.0679010344
117327001008	CR-D-ORL	0	PO BOX 421126	INTER GROUP INVESTMENT INC	262915.093162	6.0357000267
7327001007	CR-D-ORL	0	PO BOX 421126	INTER GROUP INVESTMENT INC	104202.632401	2.3921632783
127336003042	ML	315 W TORRANCE BLVD	315 W TORRANCE BLVD # A	INTERNATIONAL PRINTING MUSEUM	41669.7126682	0.956604974
137336003028	ML-ORL	405 W TORRANCE BLVD	415 W TORRANCE BLVD	MISION EBEN EZER FAMILY CHURCH	204306.919544	4.6902414955
7336003027	ML-ORL	20740 FIGUEROA ST	415 W TORRANCE BLVD	MISION EBEN EZER FAMILY CHURCH	38366.2511043	0.8807679317
147318018007	MH	20945 S WILMINGTON AVE	PO BOX 4854	SHELL OIL CO	9168171.03579	210.4722460007
7326001003	MH	0	PO BOX 4854	SHELL OIL CO	851454.983769	19.5467167991
7326001004	MH	0	PO BOX 4854	SHELL OIL CO	853384.463837	19.5910115665
157336003041	ML	329 TORRANCE BLVD	10665 W LOYOLA DR	SNOW, RONALD E TR	42499.8187629	0.9756615878
167336004016	ML-ORL	20151 MAIN ST	150 PELICAN WY	SOUTHBAY CARSON LLC	1070245.30819	24.5694515195
176125013057	ML	425 E GARDENA BLVD	501 1/2 MARGUERITE AVE	SPENCER, CATHERINE M TR	205225.345149	4.7113258462
6125013010	ML	0	435 E GARDENA BLVD	SPENCER, CATHERINE M TR	44885.9059787	1.0304386129
187316027015	ML	2020 E 220TH ST	2032 E 220TH ST	STEIN, RONALD S TR	69009.4827798	1.5842397332
197336005053	MH-D	321 W FRANCISCO ST	PO BOX 1450	USA WASTE OF CALIFORNIA INC	257826.732225	5.918887333
207316027016	ML	2032 E 220TH ST	2032 E 220TH ST	WILLIAM D LEVINE FAMILY	130360.928829	2.9926751338

Figure 16 B
Carson's Vacant and Under Utilized Industrial Land Map

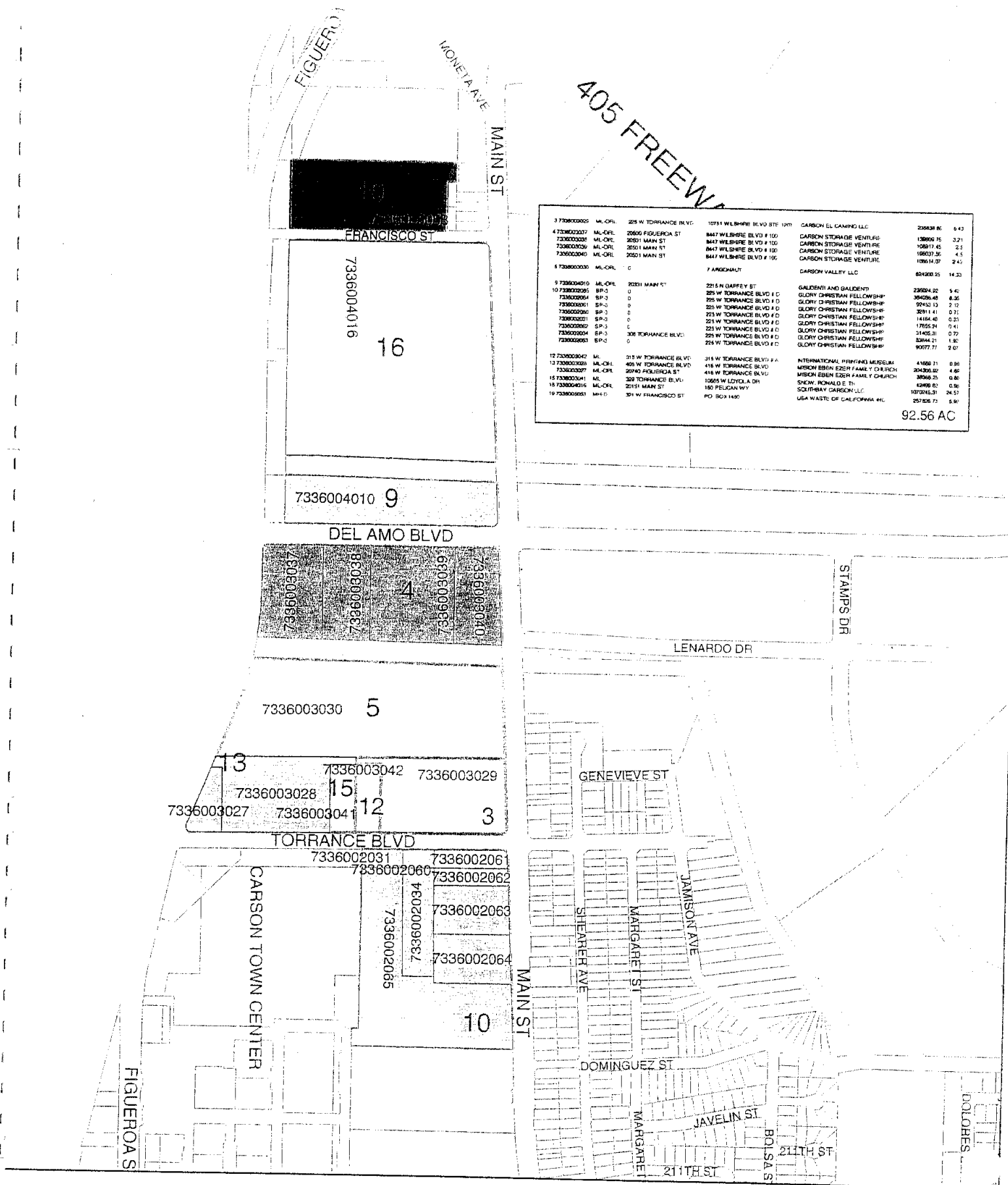


Figure 17
A Combined Total Of NinetyTwo And A Half(92.56) Acres On Main St

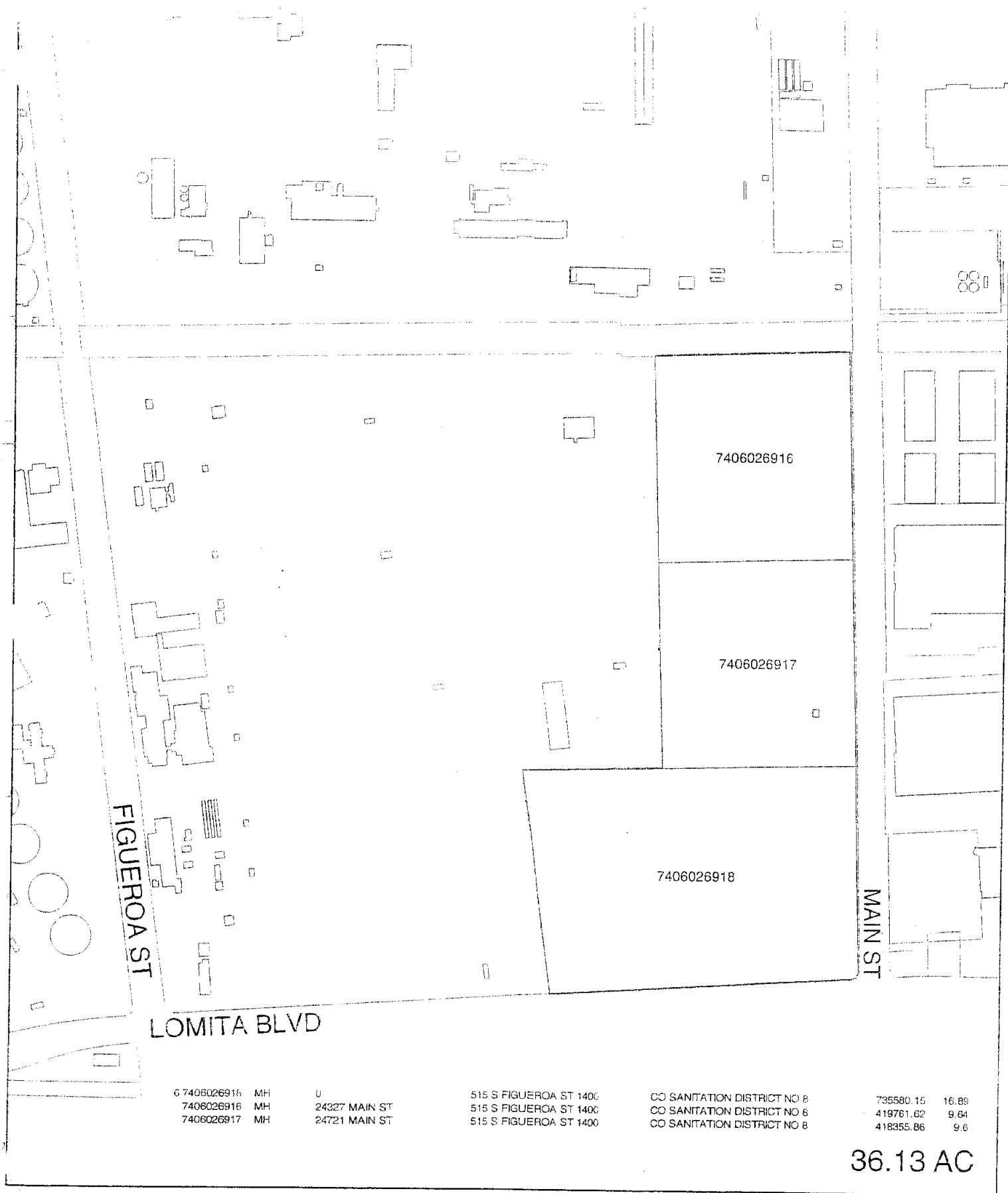


Figure 18
A Thirty Six (36.13) Acres On The Intersection Of Main And Lomita

17 012501305/ M. 812501306/ M.	435 E GARDENA BLVD. 435 E GARDENA BLVD.	501 1/2 MARQUETTE AVE. 435 E GARDENA BLVD.	SPENCER, CATHERINE M TH. SPENCER, CATHERINE M TH.	205225.26 44865.91	4.71 1.02
-----------------------------------	--	---	--	-----------------------	--------------

17.46 AC

ALONDRA BLVD

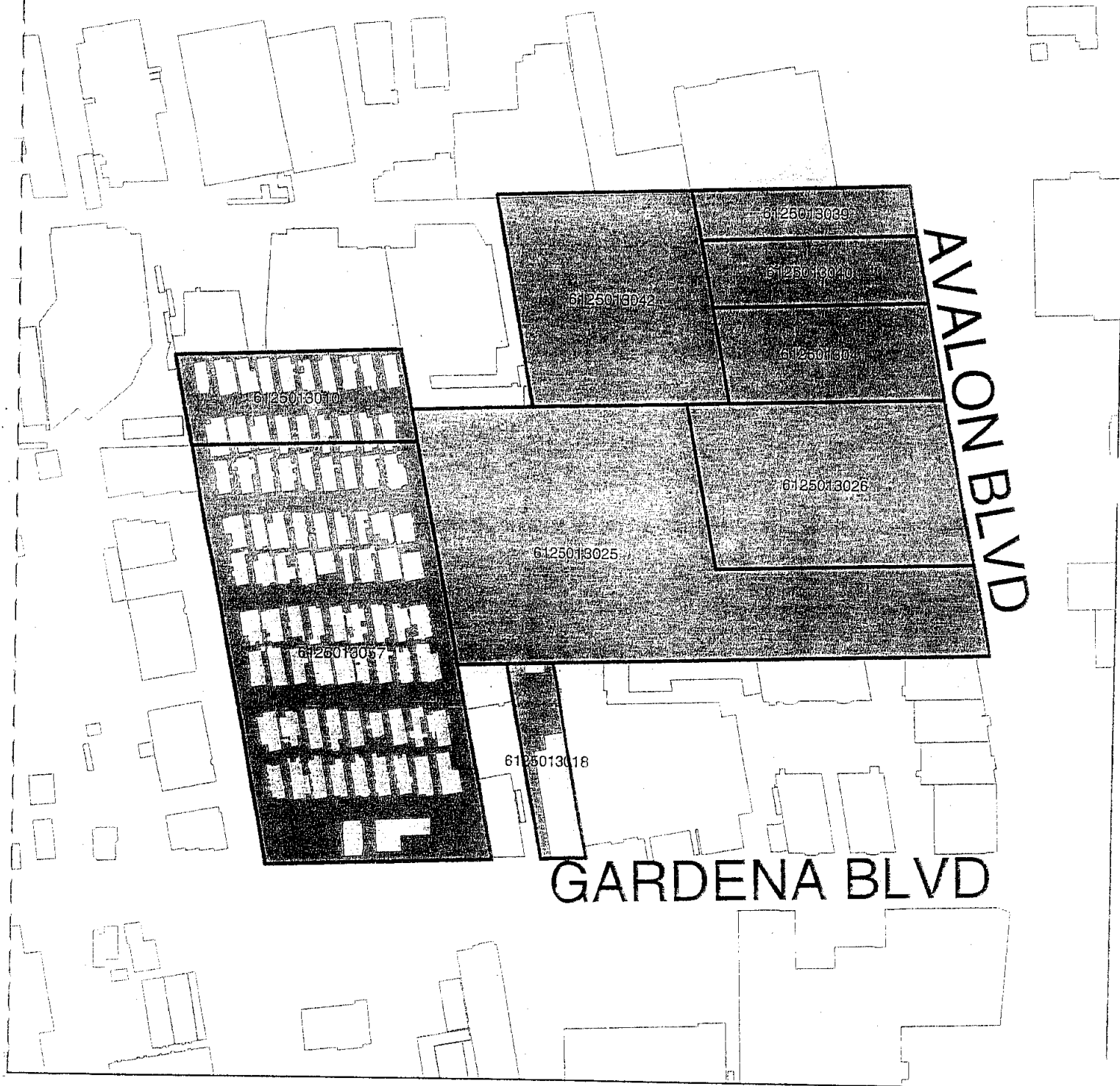


Figure 19
A Seventeen And A Half(17.46) Acres On Avalon

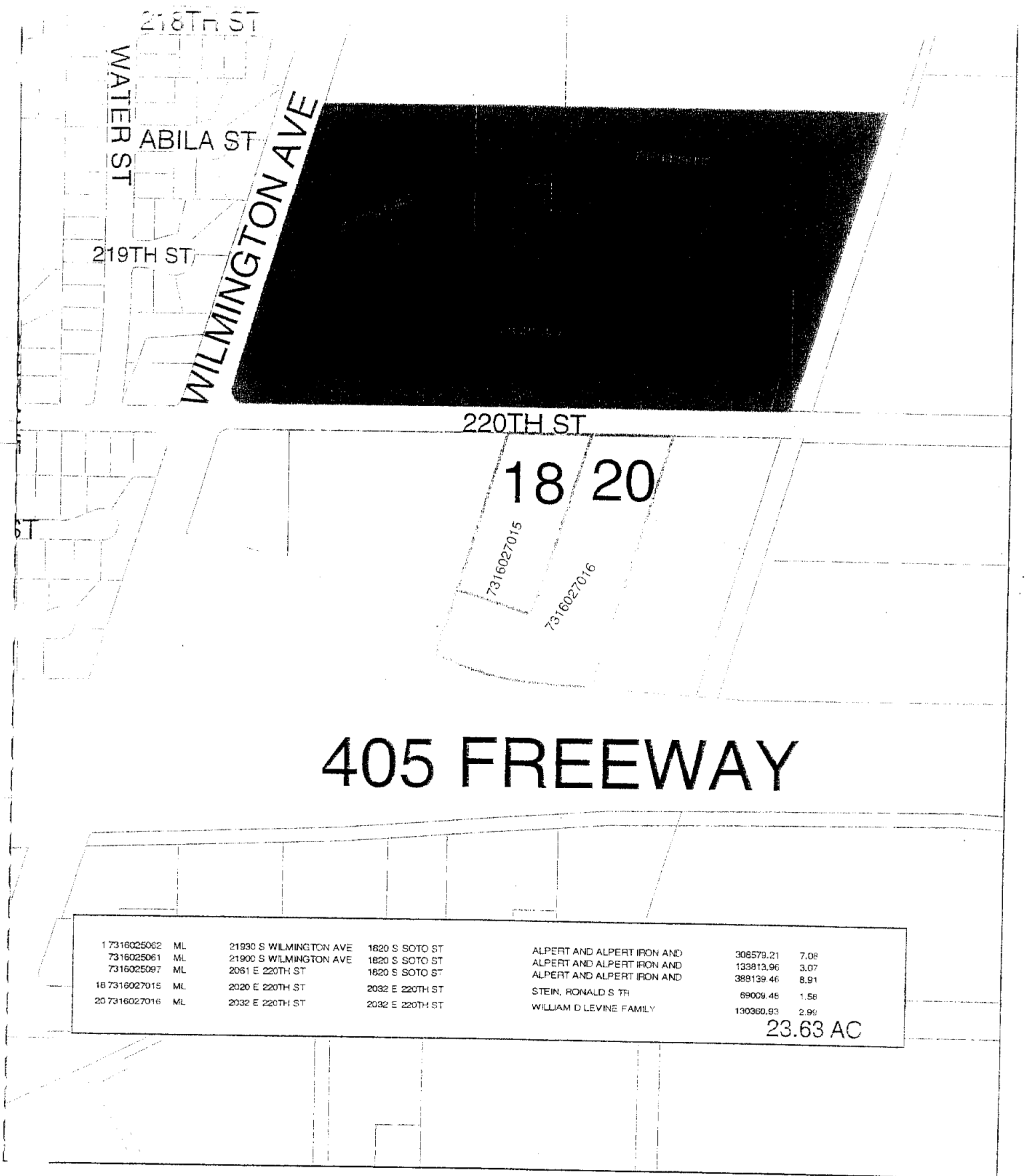


Figure 20
Twenty Three And A Half Acres (23.63) on Wilmington Ave

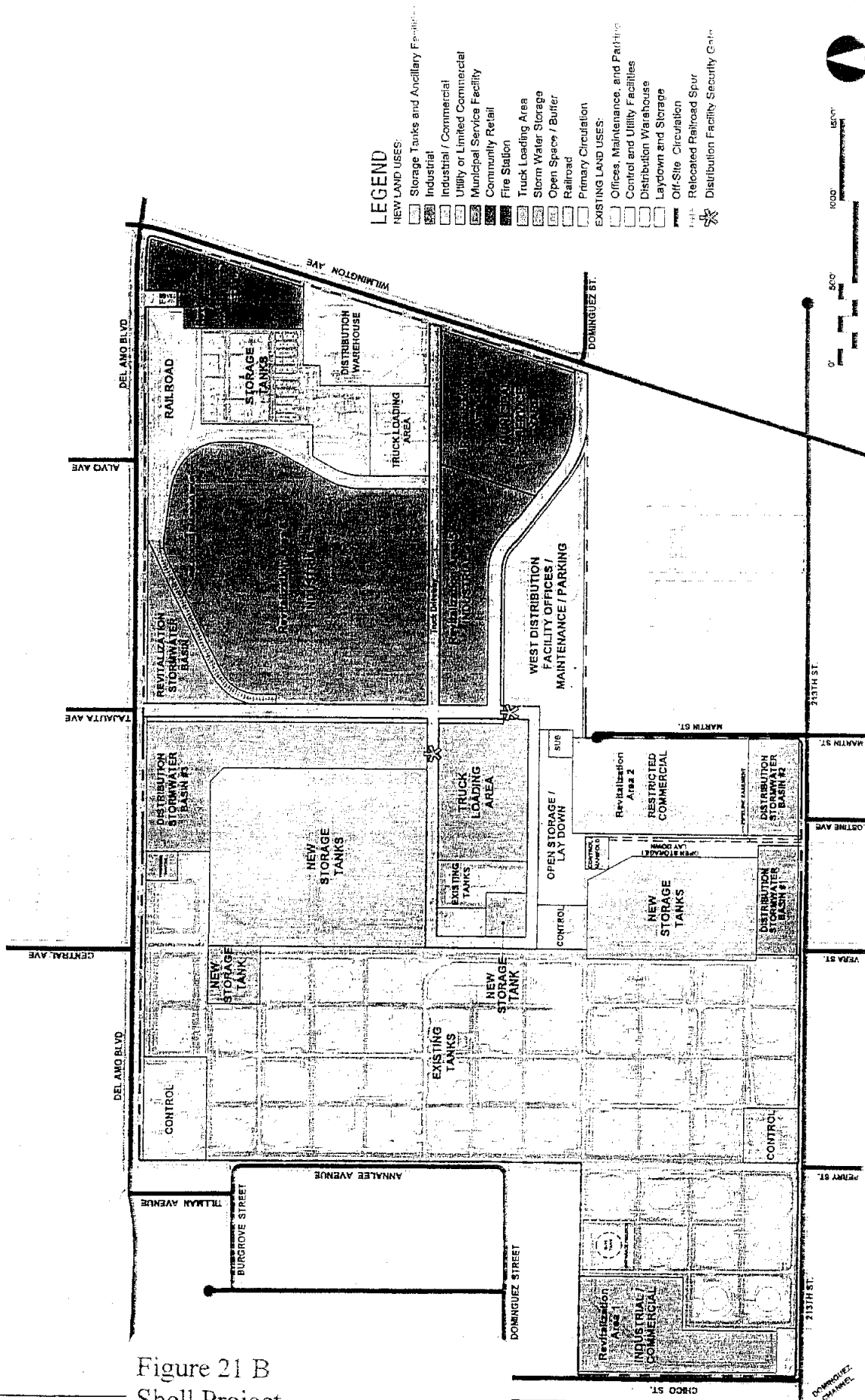


Figure 21 B
Shell Project
Land Use Concept Map

FIGURE 3
Land Use Concept Map

Source: AECOM, 2010.

PBS

100003653

Shell

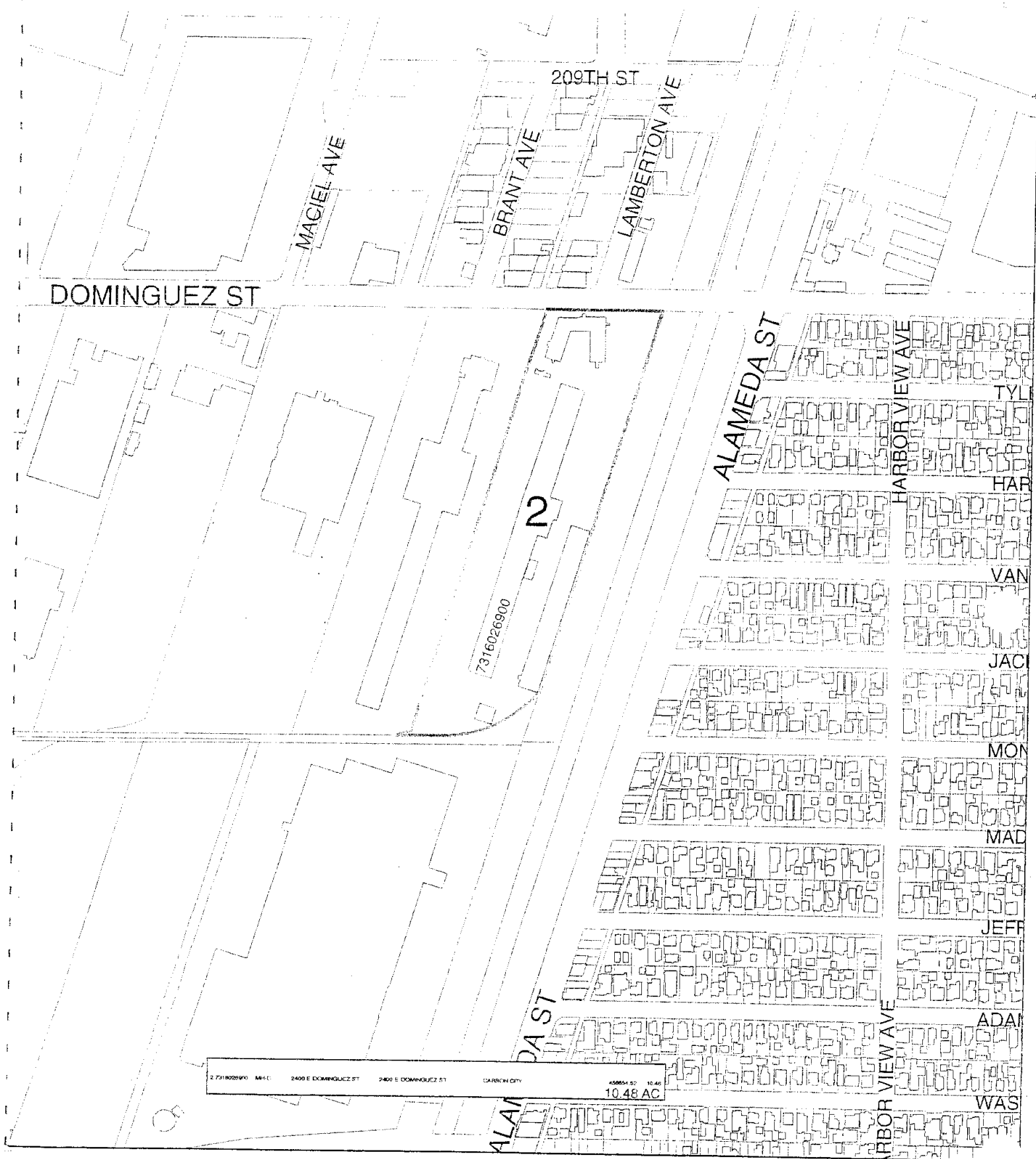


Figure 22
Ten And A Half (10.48) Acres At Dominguez(City Corporate Yard)

CHAPTER VI

PROJECT FINANCING METHODOLOGY AND FEASIBILITY

Overall Financing Strategy

An important part of financial planning for this project, whose financing model requires it to be on a stand alone basis, is to arrange for maximum possible Government grants and Subsidies. Federal funds, and to some extent state funds, are available to local governments for innovative projects that could aid revitalizing the economy, create jobs especially high paying manufacturing jobs, help production of alternative energy, reduce energy consumption, mitigate pollution, remediate blight and improve American competitiveness in the world market. The new age industrial cluster project is ideal for receiving grants because it does almost every thing that Government wants done in the communities and the country. The grant money will be used for the seed capital and down payment, hopefully between 20 to 40 percent of the project cost. Rest of the project cost will be raised through mortgage or revenue bonds by collateralizing the real estate and the long-term lease income from highly rated company clients.

Grants Opportunities:

Each project is expected to require multiple funding from several government agencies at different stages of completion. Depending on the perceived economic profile and impact of the project the matching funds requirement could be reduced to a minimum, and that too can be obtained from other sources. It is clear from the information gleaned that each agency's overall funding objective is also to support the programs of other departments. Therefore, bundling of funding emanating from different agencies may not be that difficult. The following summarizes the grant making policies of several federal departments.

Environmental Protection Agency / Recovery Act

1. Types of Grants for Brown-Fields:

(a) **Assessment Grants:** Assessment Grants provide funding for developing inventories of brown-fields, conducting site assessments, and planning for clean up endeavor.

Assessment Grant Option Summary

Community	Site-Specific	Coalition Three or more eligible entities which are not different departments of one entity
Up to \$200,000 for hazardous substance and \$ 200,000 for petroleum	Up to \$200,00 for hazardous substances or petroleum	Up to \$ 1,000,000 for hazardous substances and/or petroleum
No waiver of funding limit	May request a waiver up to \$350,000	No waiver of funding limit
Maximum combined grant \$ 400,000	Maximum amount \$350,000	Maximum Amount \$ 1,000,000
May also apply for site specific grant but not as a member of a coalition.	May also apply for a community-wide grant but not as a member of a coalition	May not apply for another grant as a part of another coalition

(b) **Site Clean up Grants:** Provides funds to carry out clean up activities at specific brown-field site owned by the applicant.

Description of grant: An applicant can apply for up to \$200,000 for each brown-field and can submit up to 3 site-specific proposals the applicant must be the owner of the site. Cost share of 20 percent is required, which may be in the form of labor, material etc.

© **Brown-field Revolving Loan Fund Program:** Provides funding to the applicant to make sub grants for brown-field clean up.

Description of grant: An applicant may apply for a grant up to \$ 1,000,000.

A matching share of 20 percent is required.

2. U. S. Department of Housing and Urban Development (HUD) / Recovery Act

Type of Grants:

(a) **Block Grants:** HUD makes yearly grants to local governments with entitlement communities. Most urban cities have some low and moderate income communities or entitlement communities. The definition of entitlement communities seems flexible within limits. Eligible activities are:

- Acquisition of real property
- Rehabilitation of residential and non-residential structures
- Construction of public facilities such as water and sewer facilities, streets and neighborhood centers, and construction of school buildings for eligible purposes.
- Public services within limits
- Activity relating to energy conservation and renewable energy sources
- Assistance to businesses to carry out economic development and job creation / job retention activities.

Process for applying: Submit a comprehensive planning document with application.

There is no official limit on the grant amount

(b) **Section 8 Loan Guarantee Program:** This program provides communities with a source of financing large scale physical development projects over and above the activities covered by the block grant program. It allows local governments to transform a small portion of the CDBG grant into federally guaranteed loans large enough to pursue physical and economic development projects that can renew entire neighborhoods.

This program requires the local governments to pledge current and future CDBG allocations to cover the loan amount as a security. But to mitigate risk, section 108 loan commitments are often paired with Economic Development Initiative (EDI) and Brownfield Economic Development Initiative (BEDI).



EDI: provides additional security to the borrowing entity by creating a loan loss reserve or by making debt service.

BEDI: The BEDI funds are provided as stimulus to the local government entities and private sector parties to commence development projects or to commence or continue phased redevelopment effort on brown-fields where development plans exist. Through this program the local governments can re-loan a part of 108 funds and BEDI funds to a business or another entity to carry out the project.

3. Department of Energy (DOE) / Recovery act

Types of Grants:

DOE and Recovery Act funding is generally available for projects in the fields of Energy Efficiency, Smart Grid, Solar Power, Wind and Water Power, Geothermal Energy, Bio-Fuels, Carbon Capture and Storage, and weatherization of Buildings. City of Carson can plan projects in the following fields

- Energy Efficiency for Buildings: Retrofitting or New Building Design, Development of Codes for Energy Efficient Buildings.
- Smart and Energy Efficient Grids: Smart Traffic Lights
- Solar Panels for Local Heating and Cooling
- Waste Management: Conversion of Waste into Energy

An important source of grants within Department of Energy is the Office of Energy Efficiency and Renewable Energy (EERE). As a matter of fact, the grant for installing solar panels on the Carson Community Center Building has come from EERE. EERE also accepts Unsolicited Proposals, a recommended approach for this program.

Under State Energy Program (SEP), EERE makes yearly formula award. In the year 2010 award cycle they made 56 awards for a total amount of \$ 25,000,000.

4. Department of Commerce Grants:

For this plan two offices in U.S. Department of Commerce (DOC) are of interest:

(a) Economic Development Administration (EDA)

(b) International Trade Administration. (ITA)

EDA: provides grants to states and local governments and others to support the development and implementation of economic development strategies. Their Public Works and Economic Development Program supports the construction, expansion and upgrade of essential public infrastructure and facilities. The city of Carson can expect EDA's significant contribution in implementation of the proposed plan.

ITA: helps export oriented business in every aspects, technically, financially and communication through their domestic offices and foreign missions. It seems that support from them should be expected if the city decides to set up a foreign trade park as suggested in this plan.

5. Department of Labor (DOL) Grants:

Between February 2009 and February 2010 DOL gave California \$1, 723, 130, 605 in grants for recovery activity, workforce investment, workforce security and other workforce related activity. Although most grants are competitive, it appears that unsolicited proposals can be made to DOL's Education and Training Administration. In implementation of the proposed plan the city of Carson can ask for funds to train workers to be employed in the planned energy, technology and international trade oriented industrial units.

6. Department of Transportation and Recovery Grants:

Department of Transportation (DOT) has made large Recovery Act Grants to various infrastructure projects throughout USA. One of them is Alameda Corridor project in which city of Carson is probably a beneficiary. There is also room for project grants that

deals with smart transportation technology. If there is a industrial park project that houses manufacturing and trading units that deal with smart batteries. collision avoidance sensors, high energy efficient batteries, electronic toll booth collectors and accessories for smart vehicles for surface, sea or air transportation, there is every likelihood that DOT will support that project.

Project Financing Calculation

FINANCING MODEL FOR INDUSTRIAL CONSTRUCTION

ON BLIGHTED LAND

(A) With Government Grants for Economic Development and Energy Efficiency

(B) Without any Grant

A hypothetical Case for the city of Carson

Objective is to build 100,000 square fit of modern energy efficient industrial and manufacturing property on a land area of 150,000, 000 square ft., using rest of the land for parking space. The land is blighted and requires remediation. Cost of land and construction is based on estimates.

Cost of 150,000 sq. ft of blighted land @ \$ 30 per sq. ft.	=	\$ 4,500,000
Cost of 100,000 sq. ft of industrial construction @ 80 per sq. ft	=	\$ 8,000,000
Land Remediation Cost =		\$ 1,500,000
Total Cost =		\$ 14,000,000

(A) With Government Grants

Remediation Grant (EPA)	\$ 1,500,000
Economic Development Grant (EDA)	\$ 1,500,000
Energy Efficiency Grant (DOE)	\$ 1,000,000
108 Block Grant (HUD)	\$ 2,000,000

Total Grant = \$ 6,000,000

Cost to the Agency	= \$ 8,000,000
Project Cost / sq. ft. of building	= \$ 8.0
Lease rate / sq. ft/ year (market rate)	= \$ 7.0

COST TO AGENCY CAN BE FINANCED THROUGH INDUSTRIAL DEVELOPMENT/ REVENUE BOND WITH NO LIABILITY TO THE CITY IF TENANTS WITH A CREDIT RATING SIGN AT LEAST 10 YEAR LEASE IN ADVANCE.

MORTGAGE FINANCING MAY ALSO BE USED FOR A 30 YEAR FINANCING OF \$ 6,500,000 AT 4.5% INTEREST YEARLY PAYMENT WILL BE: $PMT(4.5\%, 30, 6,500,000) = \$ 491,132$. OR, $PAYMENT / SQ. FT = \$ 4.91$ THAT MEANS CITY CAN CHARGE RENT FROM 4.91 TO 7 DOLLARS PER SQ. FT WITHOUT LOSING MONEY.

(B) Without any Grant

PAYMENT PER YEAR: $PMT(4.5\%, 30, 14,000,000) = \$ 859,481.60$
OR, LEASE RATE TO BREAK EVEN = \$8.59 / SQ.FT. WHICH IS ALMOST MARKET RATE

The examples of grants cited above are probably two extremes, i.e. 43% to 0% and in both the scenarios the project is not undoable, which is good news. For this project to succeed commitment from tenants with AAA credit rating is critical since long-term lease commitment from them will be valuable security for the bond underwriting or mortgage lenders. For established companies to be interested in the project a well defined project plan, commitment from the city and the land owner will be required.



CHAPTER VII

WHAT SHOULD CARSON DO TO ATTRACT NEW AGE INDUSTRIES

To attract new age industries to Carson the city has to show seriousness towards commitment to this project as a policy and its preparedness to deliver this project to the community. Preparedness will include development of a detailed plan, and a positive outcome of cost and benefit and risk analysis, environmental impact evaluations, getting the land owners on board, project financing plan, and legal issues and implications. However, most of these are mechanistic issues and can be resolved with effort.

This project is designed as a stand alone endeavor as far as possible, excepting initial planning and organizational expenses. It is also proposed that it should be executed incrementally taking advantage of the lesson learnt from every major step taken. The analysis shows that if the city is able to attract high credit rating companies to Carson the project financing can be arranged without the city assuming any direct liability.

Most importantly the project should be a declared policy of the city government backed by political will. For this transformation to occur, the city will need to officially adopt the recommendations of the report or the basic tenet of rebranding and setting up new age industrial clusters. Once the policy issue is decided and the details of the plan are ready there will be a need to construct a cohesive message and communicate the message to the industrial community and the governmental agencies in the most effective manner. If all these steps are properly implemented the industry and the prospective companies will start noticing.

The implementation will require the government to be in the driver seat as a facilitator of economic development far beyond implementing the usual developer

dependent infrastructure and affordable housing projects, into planning and effecting the best industrial and commercial land usage that would aid strategic capture of the new age sustainable technologies by inducing their employers to set up shop on the city land and help create wealth from within, leading to a timely modernization of economic, cultural and place capabilities. In short, there is need for a paradigm shift in city's policy from simply aiding consumption with income earned somewhere else to aiding production and ensued income earned within the city. With that goal in mind it is recommended that the city should:

1.0 Officially declare its policy to establish new age industrial clusters on the land identified in chapter VII.

2.0 Fund development of a detailed plan for establishing the clusters which should include details of proposed industrial units, their technology fields, their sizes and architectural configurations, unit expansion provisions and other relevant details which brings out definition. The plan should also develop project cost estimates.

3.0 Commence a negotiation process with current land owners leading to Memorandum of Understandings (MOUs). Start the process of environmental clearance processes.

4.0 Apply for Brownfield assessment grants.

5.0 Apply for Brownfield Revolving Loan Fund Grant.

6.0 Develop Strategy for HUD Block Grants and funds utilization

7.0 Develop strategy for taking advantage of for HUD Section 8 Loan Guarantee Programs, including EDI and BEDI.

8.0 Research and plan for EDA grants for purchase of property and construction

9.0 Research International Trade Administration Grants (ITA) for setting up Export based industries and the semi-finished goods importation cluster.

- 10.0 Research and Plan for Department of Energy (DOE) Grants for Energy Efficient Buildings, Smart and Energy Efficient Grids and installing Renewable energy hybrid power plants.
- 11.0 Investigate and Research state assistance all matters listed above.
- 12.0 Research resources for matching funds
13. Aggregate all the grants possibilities and start making proposals..
- 14.0 Develop the Project Financing Model.
- 15.0 Make offers to land owners subject to availability of financing.
- 16.0 If accepted start architectural and engineering work
- 16.0 If accepted start a Project Promotion Campaign and Branding.
- Advertising in Select Publications
 - Developing Brochures and Mailing to prospective companies.
 - Attending Trade Shows.
 - Sponsoring Seminars and Conferences.
- 17.0 Start the process of booking space

CHAPTER VIII

THE NEXT IMMEDIATE STEPS

It is important that immediate steps are taken to establish the initial feasibility of the conceptual plan. The most important thing is financing and hence it is critical that a project is conceived which is flexible enough to be adjusted and changed in the future, and a step by step process is followed to actually experience what grants can be realistically expected. Although chapter VI provides details about the government grants that are normally available from different federal agencies, that information is not specific. In order to get a better handle on the feasibility of the concept the following immediate steps are strongly recommended:

1. Assume a 20 acre site of a rectangular configuration.
2. Take the current facility sizes of 2-4 prospective industrial tenants for a New Energy Cluster.
3. Outline a modern energy efficient industrial enclave to accommodate these industrial units with double the size of their existing facilities.
4. Assume parking space in accordance with the city's standards.
5. Describe the manufacturing activities of these industrial units and estimate the number of jobs created.
6. Assume that this enclave will be built on a brown field.
7. Estimate project cost and a schedule.
8. Research and determine how many grant application can be made for this project and for how much.
9. Make those grant applications and follow up for results.
10. Make as many unsolicited grant proposals as possible
11. Obtain as many letter of intents for grants as possible
12. From the lessons learnt develop an outline of the real project

It is not necessary for all the above steps are completed before work on the main project is started. Every one of the steps described above will generate a real world experience. All these steps do not have to be taken sequentially; many of the steps can



be started consecutively since they are not mutually inclusive or dependent on each other. Furthermore, the lesson learnt from each step, if it is positive, will enhance confidence level to start the incremental process of the main project. It will also provide a signal towards the amount of effort needed to develop that part of the main project.

If the research on sources of grants look encouraging in terms or whether a particular grant is currently available and a particular part of the projects fits the agency's requirement, it will give an indication if the matter is proceeding in the right direction. There are many grants which do not require specific site selection right away, applications for these grants can be made on principle with sufficient details about the project, its objectives, cost estimates and a plan for how the total project cost is planned to be obtained, along with some proof of availability of required land. If these grant applications produce positive response it will be a positive signal for the main project. Under those circumstances the city can start making plans towards making definitive policy decisions. Process for negotiations with land owners may also start at that time.

CITY OF CARSON

ATTRACTING NEW AGE INDUSTRIES
TO
21ST CENTURY CARSON

*PRELIMINARY FEASIBILITY ANALYSIS OF SETTING UP
AN INDUSTRIAL CLUSTER IN SHELL'S
REVITALIZATION PROJECT AREAS*

*INCLUDING
DEVELOPING A TEMPLATE FOR GRANT PROPOSAL
TO ECONOMIC DEVELOPMENT AGENCY (EDA)*

Prepared and submitted

By

Sinha & Company

December 28, 2011



EXECUTIVE SUMMARY

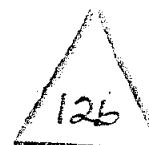
This document starts the implementation process of the Strategic Plan, developed earlier, to attract New Age Industries to the City of Carson. The Strategic Plan had pointed out to the industrial space made available in Shell's Carson Revitalization Project. Encouraged by the progress made by Shell in submitting the Specific Plan for the Carson Revitalization Project to the City of Carson and the progress made at the City's Planning Department in processing the Specific Plan, city's Economic Development Team involved with the Project for attracting New Age Industries to Carson decided to task Sinha & Company (SAC) to investigate feasibility of setting up an New Age Industrial Cluster in one of the spaces allocated by Shell for industrial use.

The evaluation of the feasibility by SAC concluded that it is quite feasible to set up one of the industrial clusters identified in the Strategic Plan with an added advantage that this approach will enable the city to have an early start of the Strategic Plan implementation since most of the time consuming land uses and environmental investigations will be completed by the year 2012-2013 period. The evaluation also determined that it will be the best to start with the New Energy Cluster at the Revitalization Area 1 of the Shell Project.

Furthermore, this study develops a feasible stand-alone financing model for the project without using the usual tax-increment mechanism with no impact of fiscal liability on the city, and puts together a process and content template to apply for substantial grant from the Economic Development Department (EDA) of the U.S. Department of Commerce.

TABLE OF CONTENT

Introduction	5
Overview	6
Establishing Feasibility	8
Discussion with Shell	12
Selection Criteria for New Energy Cluster	15
The New Energy Cluster	15
Project Cost and Lease Rate Estimate	21
Project Cost	21
Project Financing	22
Economic Development Agency's (EDA'S) Grant Application	23
The Next Funding Cycle	23
The Type of Grant for the Current Project	23
Size of Grant	24
Application Requirements	24
Investment Rate	25
What Comprises Grant Application	25
Other Documents Required Before Funding	26
Pre-Application Consulting with EDA	27
EXHIBIT A	28
EXHIBIT B	79



LIST OF FIGURES

Figure 1: Architecture for Carson Cluster System	7
Figure 2: Regional and Vicinity Map	11
Figure 3: Land Uses Concept Map	14
Figure 4: Proposed New Energy Cluster – An Aerial View	17
Figure 5: Proposed New Energy Cluster- Building Elevation	18
Figure 6: Proposed New Energy Cluster – Entrance on Chico Street	19
Figure 7: Proposed New Energy Cluster – Shell Property Interfaces	20

Introduction

Sinha & Company is pleased to present to the city of Carson the findings of the feasibility evaluation conducted under the tasking "Preliminary Feasibility Analysis of Setting Up An Industrial Cluster in Shell's Carson Revitalization Project Areas" as a part II sub-task of the on-going main tasking "Conducting Analysis of How to Attract and Grow Right Type of Companies for 21st Century Carson". The evaluation concluded that not only it is feasible to establish one of the industrial clusters proposed in the Strategic Plan developed earlier; setting up a cluster in the revitalization area 1 of the Shell Project will enable an early start of the whole plan. The evaluation further concluded that the New Energy Cluster should be located in the revitalization area 1. The effort conducted under this task can be divided into three major categories.

The first category of the evaluation effort involves (i) Studying (a) Shell's Notice of Preparation for Environmental Impact Report developed as a promotional document for the Carson Revitalization Project and (b) Shell's Cason Revitalization Specific Plan in general (ii) Discussing with Shell's Project Manager regarding City of Carson's thinking of setting up an industrial cluster in Shell's Revitalization Project Areas under overall city of Carson's Strategic Plan for attracting New Age companies to Carson, (iii) verbal responses from Shell, (iv) Selecting a possible Industrial Cluster to be set up by City of Carson at the Shell's facility, and why New Energy Cluster was the natural choice, (v) Developing conceptual configuration of the land usage for the industrial cluster and establishing essential physical features of the New Energy Cluster enclave, (vi) Discussing with the city planning department to seek their approval with regard to compatibility of the city's rules and the Sell's Specific Plan, (vii) Seeking agreement

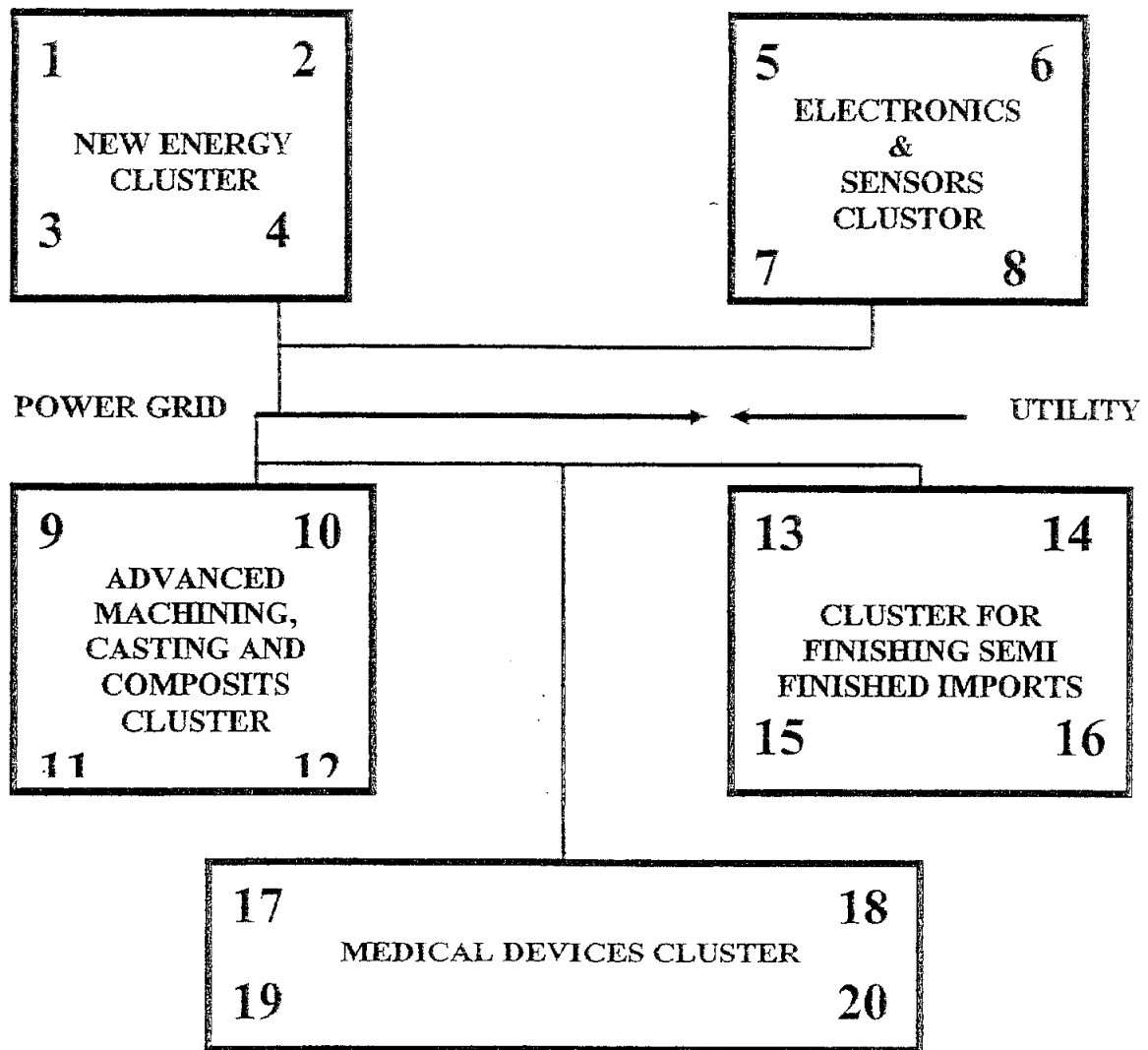
from Shell that the land usage configuration is conformant with their envisioning of the Specific Plan.

The second category of the evaluation is comprised in (viii) Developing the Financing Model for the project which justifies that the project is feasible in practice. The third part of the evaluation is centered on feasibility and the process of obtaining federal grants. Since the project is envisioned to be partially funded by grants from the federal government, there is a specific tasking to determine the range of possible grants from Economic Development Agency (EDA) of the U.S. Department of Commerce, and to develop a template for a typical grant application for EDA.

Overview

As stated earlier, an assignment by the city of Carson, Sinha & Company (SAC) developed a strategic plan to attract new age jobs intensive companies, especially technology driven manufacturing ones, to the city. The plan identified several technologies and processes along with American companies involved in mastering them, Furthermore, the plan assembled a list of companies which could be likely candidates to move to Carson and are poised to play leading roles in spurring the industrial innovations having global markets, thereby becoming creators of high paying jobs during the coming decades and beyond. In order to attract some of these promising companies, the plan puts forward concepts of industrial clusters that may be of interest to these companies, and identified underused or unused industrial land to the tune of 187 acres, still available within Carson City limits which can house the industrial clusters. The Strategic Plan selected five industrial clusters for the city of Carson as described in Figure 1.

ARCHITECTURE FOR CARSON CLUSTER SYSTEM



NOTES: NUMBERS STAND FOR UNITS WITHIN THE CLUSTER

1: PHOTOVOLTAIC PRODUCTION, 2: MICRO-TURBINE PRODUCTION
3. FUEL CELL PRODUCTION, 4: CAPTIVE NEW ENERGY POWER PLANT

5: PROGRAMMABLE ELECTRONICS, 6: PHYSICAL SENSORS AND INSTRUMENTATION;
7: SENSORS AND RADARS; 8: CAPTIVE NEW ENERGY POWER PLANT.

9. CNC AND MICRO MACHINING; 10 ADVANCED CASTING; 11: COMPOSITES
FANRICATION; 12: CAPTIVE NEW ENERGY POWER PLANT

13: CONSUMER ELECTRONICS, VIDEO GAMES ETC.; 14 ENGINEERING GOODS; 15:
APPAREL AND TEXTILE; 16: CAPTIVE NEW ENWERGY POWER PLANT

17, 18 AND 19: MEDICAL DEVICES UNITS
20: CAPTIVE NEW ENERGY POWER PLANT

FIGURE: 1



Over and above the described land inventory, Shell Oil Revitalization Project, the Specific Plan for which is currently being evaluated by the city, has dedicated about 40 acres of land in the Shell Carson Distribution facility for mixed industrial and commercial activity. Since the city is interested in industrial sites which can be developed on an expedited basis, Shell's allocation of land uses in their Specific Plan for industrial purposes evoked an interest in the city's team engaged in planning for attracting new age companies to the city of Carson. City Authorized SAC to perform the following specific Tasks;

1. Assess the feasibility of establishing an industrial cluster, especially the New Energy Cluster, at Shell Project Location.
2. Develop a template for a grant application to Economic development Agency (EDA) for the project

Establishing Feasibility

Upon authorization and encouragement from the authorities in the city's Economic Development Department, SAC started researching Shell's Specific Plan, Shell's proposal for Environmental Impact Report for the project, and most importantly aesthetic and environmental implications of setting up a state-of-the-art industrial cluster close to petroleum storage tanks and a petroleum distribution facility. The following information from Shell's Specific Plan and SAC's research provide positive assurances that pursuing one of the revitalization areas of Shell's project may provide an earlier opportunity to build one of the industrial clusters:

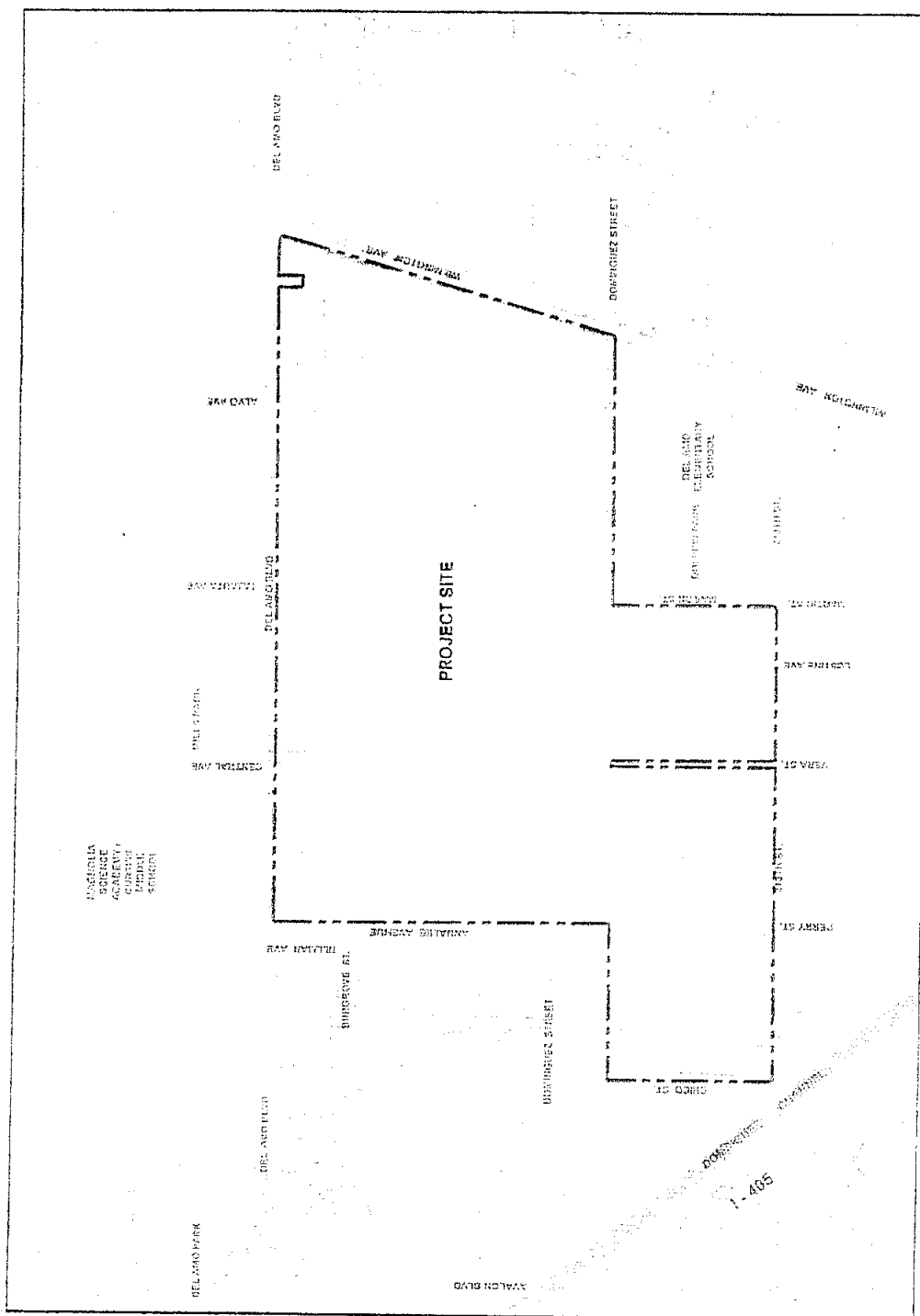


- Shell facility has existed on this location (see figure 2) since 1924 and over time became a distribution center from a refinery. A distribution center is comparatively environmentally more benign operation than a refinery. Separated by wide roads, businesses, industries and single family homes have existed in close proximity to the distribution center for some time. Plans for these projects and the environmental impact reports must have undergone review and approval process of the city of Carson.
- The Environmental Impact Report for Shell's Carson Revitalization Project, under preparation, is expected to "ensure that the project development is consistent with the policies established by the city of Carson (Shell Specific Plan, p.1-7). For example, the Environmental Impact Report will consider factors such as "Aesthetics, biological Resources, Cultural Resources, Geology/Soil, Greenhouse Gas Emission, Hazards / Hazardous Materials, Hydrology / Water Quality, Land Use / Planning, Noise, Public Services, transportation / Traffic, Utilities / Service Systems and Mandatory Findings of Significance." (Shell's Notice Of Preparation of Environmental Report, p. 6)
- The Environmental Impact Report is expected to be completed during 2012, and review of Shell's Specific Plan by city of Carson may also be completed in 2012.
- Although Shell's Specific Plan expects the Revitalization Project to be completed in 20 years or more as the plan will develop depending on the market demands, and for project areas deep inside the facility it will



depend on Shell's creation of access roads and other facilities, some revitalization areas, especially project area 1, located on the edges can be available for development just after Specific Plan and the Environmental Impact Report are approved, which could be as early as 2013.

- Carson Revitalization Project (Figure 2) is not located within any identified hazard areas such as the 100-year flood plain or specific fault locations. (Specific Plan, p.1-6).
- The Specific Plan area is located within a 60 dBA noise contour associated with surrounding roadways and the Southern Pacific Railroad. The Specific Plan area does not fall under the noise contour of any airport. (Specific Plan, p. 1-7)
- Development Standards and Design Guidelines of the Specific Plan are consistent with the goals of Cason Redevelopment Agency - increasing the utilization of the area and improving its character. (Specific Plan, P.1-8).
- Specific Plan allows extensive landscaping. The intent of the landscaping design is to direct the focus of the viewer to aesthetically pleasing areas and maximize effectiveness of each element of the landscape. For example, spatially constrained edge areas "would be planted with appropriate plant material that is attractive but also controls access (species with thorns), provides screening (evergreen species) and entrance's visibility (species that mature with appropriate height). (Specific Plan, p.5-21)

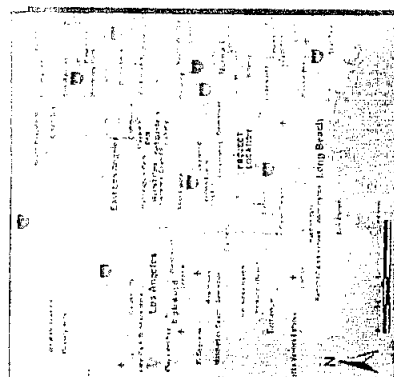


Source: AECOM, 2010.

FIGURE 2
Regional and Vicinity Map



£99£000011



0' 400' 800' 1200' 1600'



Discussions with Shell

Discussions were held during three meetings with the project manager of the Shell Oil Revitalization Project on the topic that city of Carson might be interested in establishing a light engineering and manufacturing cluster, preferably the New Energy Cluster, at the Shell Revitalization Project Site. Important points that came out of the meetings are:

First Meeting

- Shell would most likely prefer to have a technology based industrial facility at the Revitalization Project site. Shell suggested Revitalization Area 1(See Figure 3 to locate Revitalization Area 1) for the project and the fact that it might be available just after the city approves the Specific Plan including the Environmental Impact Report.
- Shell indicated that Shell's interest is in either selling or leasing the land at a fair market price.

Second Meeting

- .The subject was revisited with the new Shell's project manger and more substantive discussion took place in light of the strategic plan developed by the city. Shell affirmed its previous position and became more interested in the project. It was suggested that city should put something in writing in a proposal form.

Third Meeting

- By this time SAC had developed a facility and land usage configuration for the New Energy Cluster to be housed in Revitalization Area 1 after including input from city's planning department to make sure that the configuration for the New Age Energy Cluster meets city's requirements and the usage recommendations of Shell's Specific Plan. This Facility and Land usage configuration was discussed with Shell in the meeting and it was agreed that the configuration will be quite suitable for the Revitalization area 1, and is in accordance with the requirements of the Specific Plan.
- Detailed discussion took place with regard to access to Revitalization Area 1, circulation, interfaces with Chico Street and rest of the project site. Special attention was paid to the fact that currently project area 1 is primarily used as water retention / detention basin where storm water is pumped after collection; the fact that Shell was planning another basin for this purpose and the soil needed to fill the basin in Revitalization Area 1 would most likely come from the land where a new basin would be created.
- City personnel were given a tour of Revitalization Area 1 which was extremely helpful in assessing the feasibility of the site. City informed Shell that city would be interested in a leveled and cleaned up property.

Shell Project Land Use Concept Map

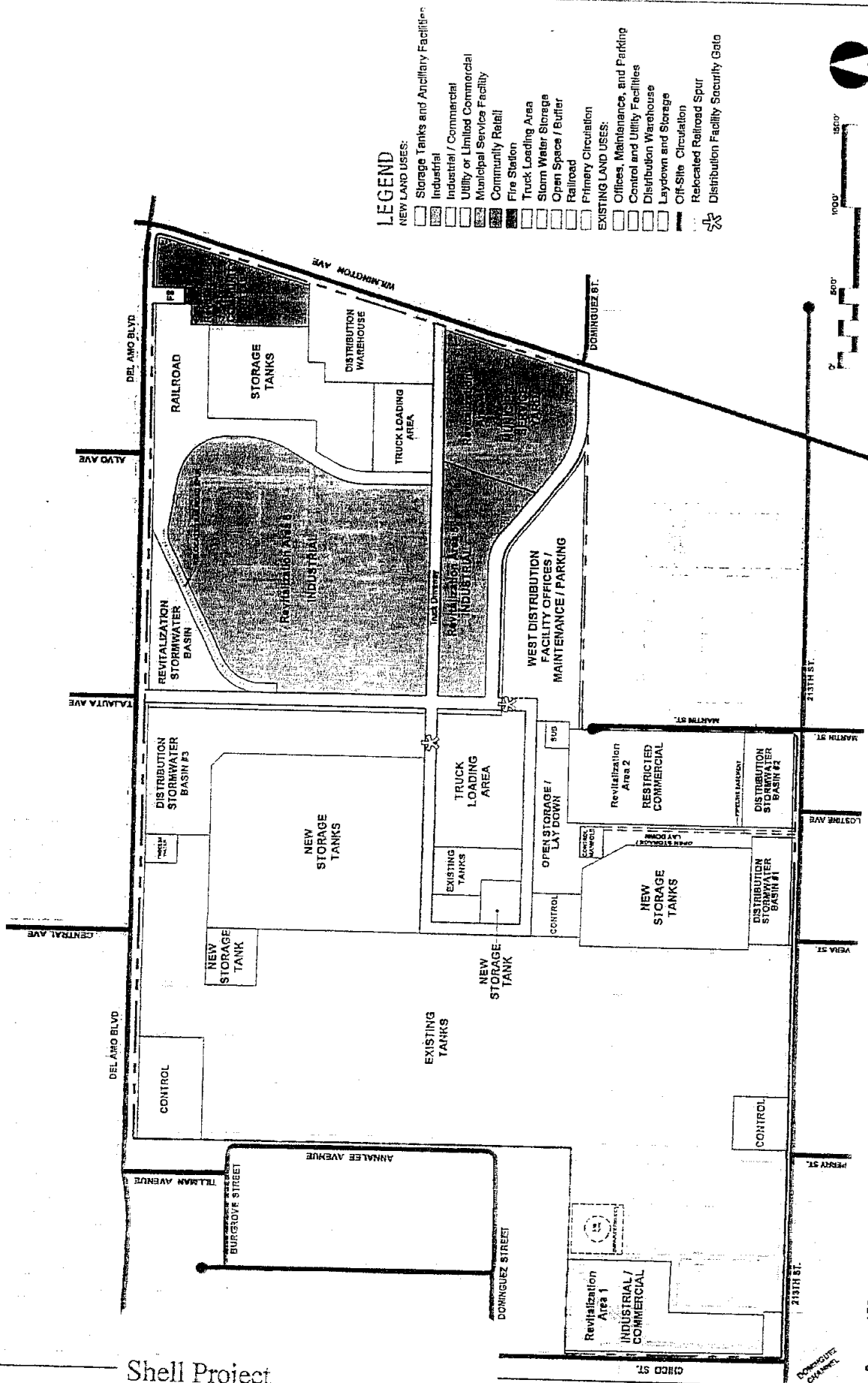


FIGURE 3
Land Use Concept Map

Source: AECOM, 2010.

100003663

Selection Criteria for New Energy Cluster:

SAC has concluded that the industrial cluster that should be considered for the Revitalization Area 1 of the Shell Revitalization Project is the New Energy Cluster. The reasons are as follows:

1. New Energy Cluster has the potential for more number of grants from U.S. Departments of Energy, Commerce, Housing and Urban Development and others not only for the project but also for the tenant companies since proliferation of technologies associated with production, transmission and conservation of energy is the top priority of the U.S. Government.
2. New Energy Cluster involves the most technological challenges and will require the maximum time to complete. Revitalization area 1 can be available to build by 2013. All the initial environmental and planning investigations will be completed by then. This will put city's project at a great advantage.
3. Early completion of New Energy Cluster will go a long way in branding city's technological environment.
4. Shell is considering a solar power plant in the Revitalization Area 2 and some collaboration with the proposed power plant is possible.
5. Shell Distribution Center is an energy establishment. New Energy Center being closer to that establishment will offer advantages.

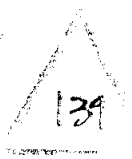
The New Energy Cluster

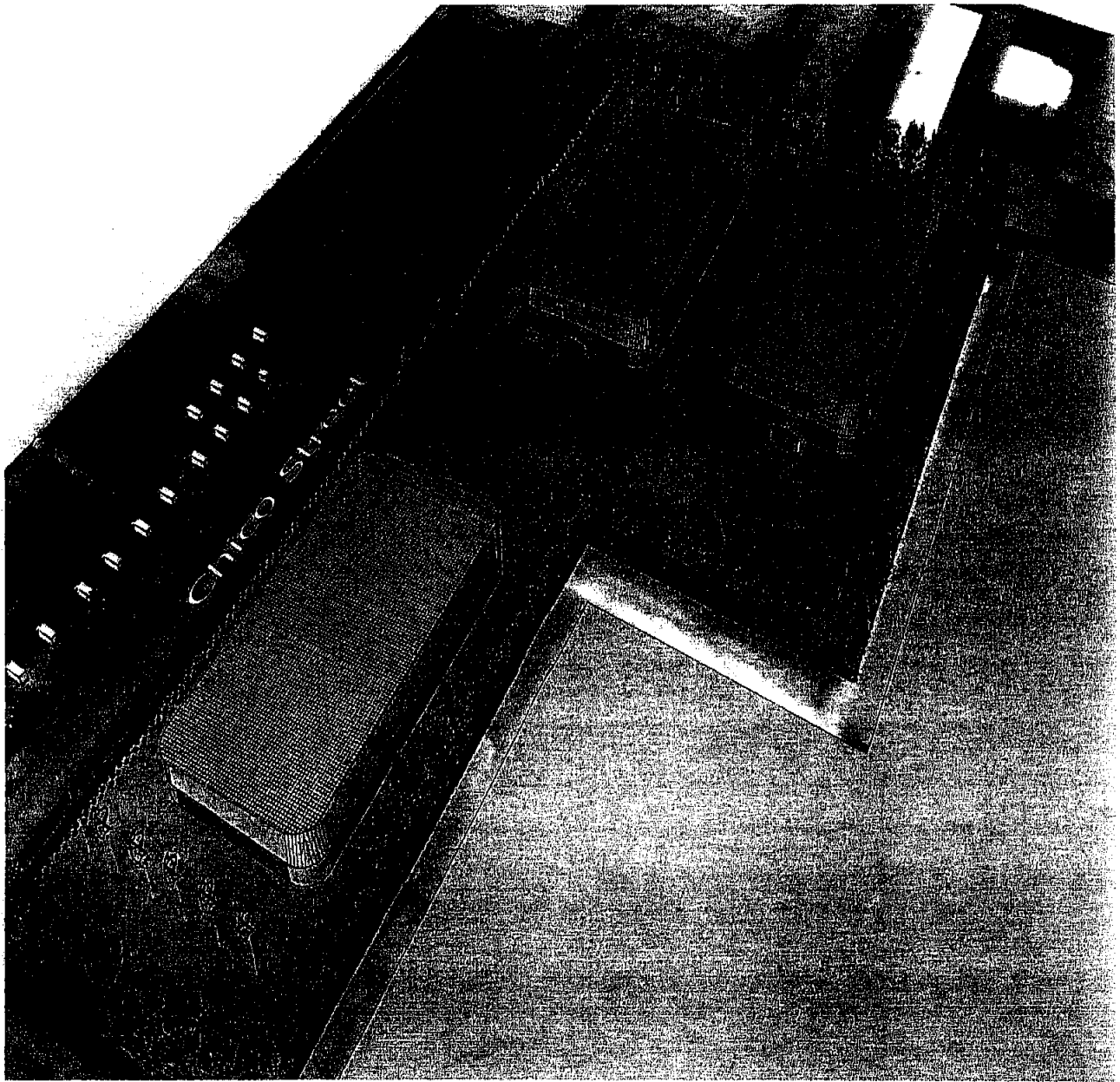
The New Energy Cluster will consist of three technology-driven manufacturing units in the new energy field:

1. A thin-film solar system manufacturing unit with research and development capability
2. A fuel cell manufacturing unit with research and development capability.
3. A wind power micro turbine manufacturing unit with research and development capability.

Each unit will be housed in a 50 ft high double story state-of-the-art 80,330 sq ft ground floor covered area building with a total working floor area of 160,660 sq ft. (see figures 4, 5, 6 and 7). These buildings will be located on 10.3 acres of land (Revitalization Area 1) resulting in Floor Area Ratio of 0.45, which provides a generous space for parking, landscaping and transportation equipment movement. The structural design of the buildings will assume that main manufacturing will be conducted on the ground floor; the second floor will be used for executive, engineering and design offices, and testing laboratories. No heavy equipment or carts will be permitted on the second floor. Since it is proposed that tenancy of the buildings will be confirmed before construction starts, internal customization of the buildings is possible at special rental rates.

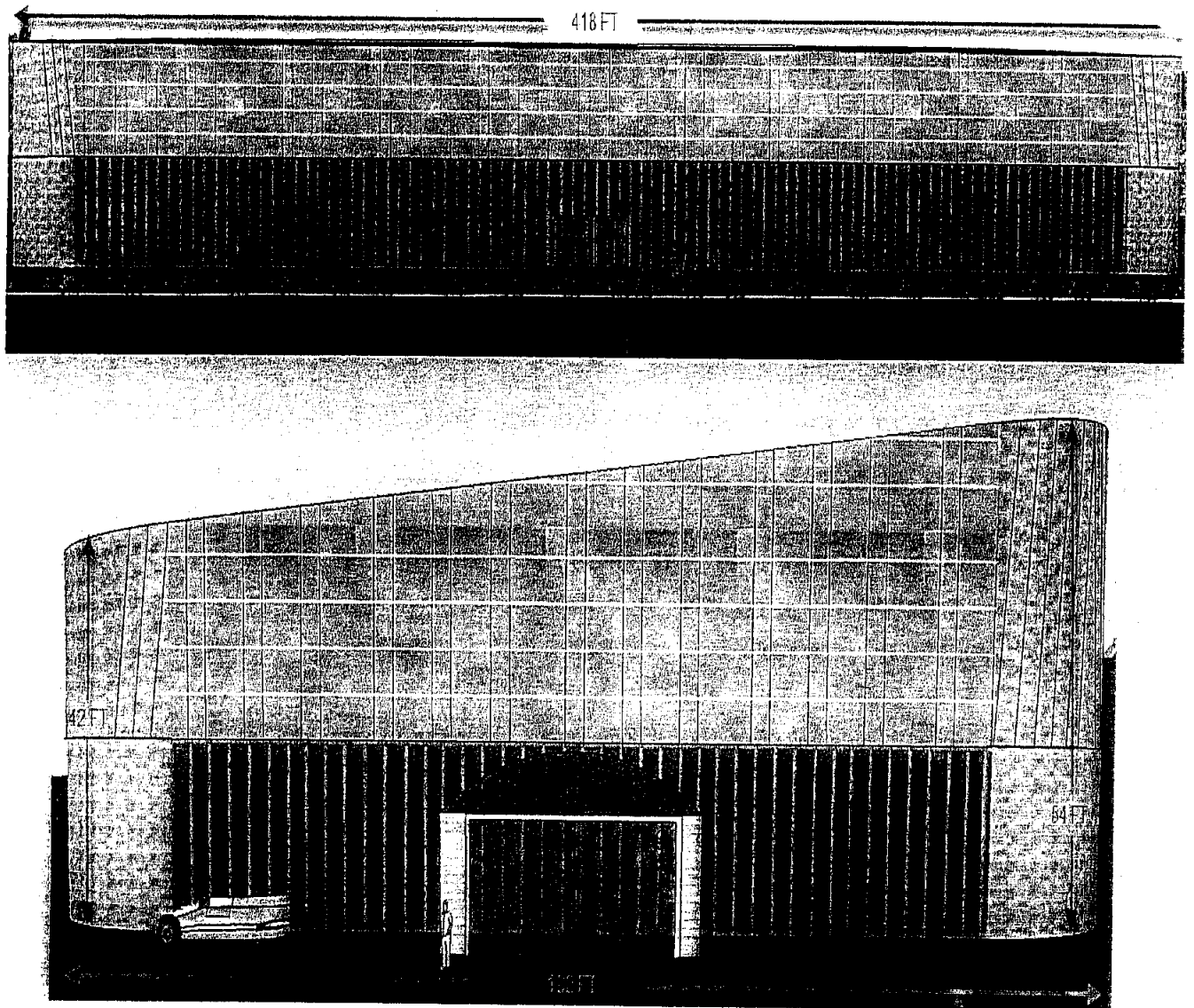
It is planned that a new energy power plant will be set up either on the same or a separate near by location. The New Energy Custer will generate its own energy for its tenants and offer excess energy to the utility grid. Roof of the buildings will be covered with thin and efficient solar energy absorption – efficient surface. There will also be single axis micro wind turbines installed in safe locations at the site. Cluster Configuration lay out in Figure 4 displays locations of these installations.





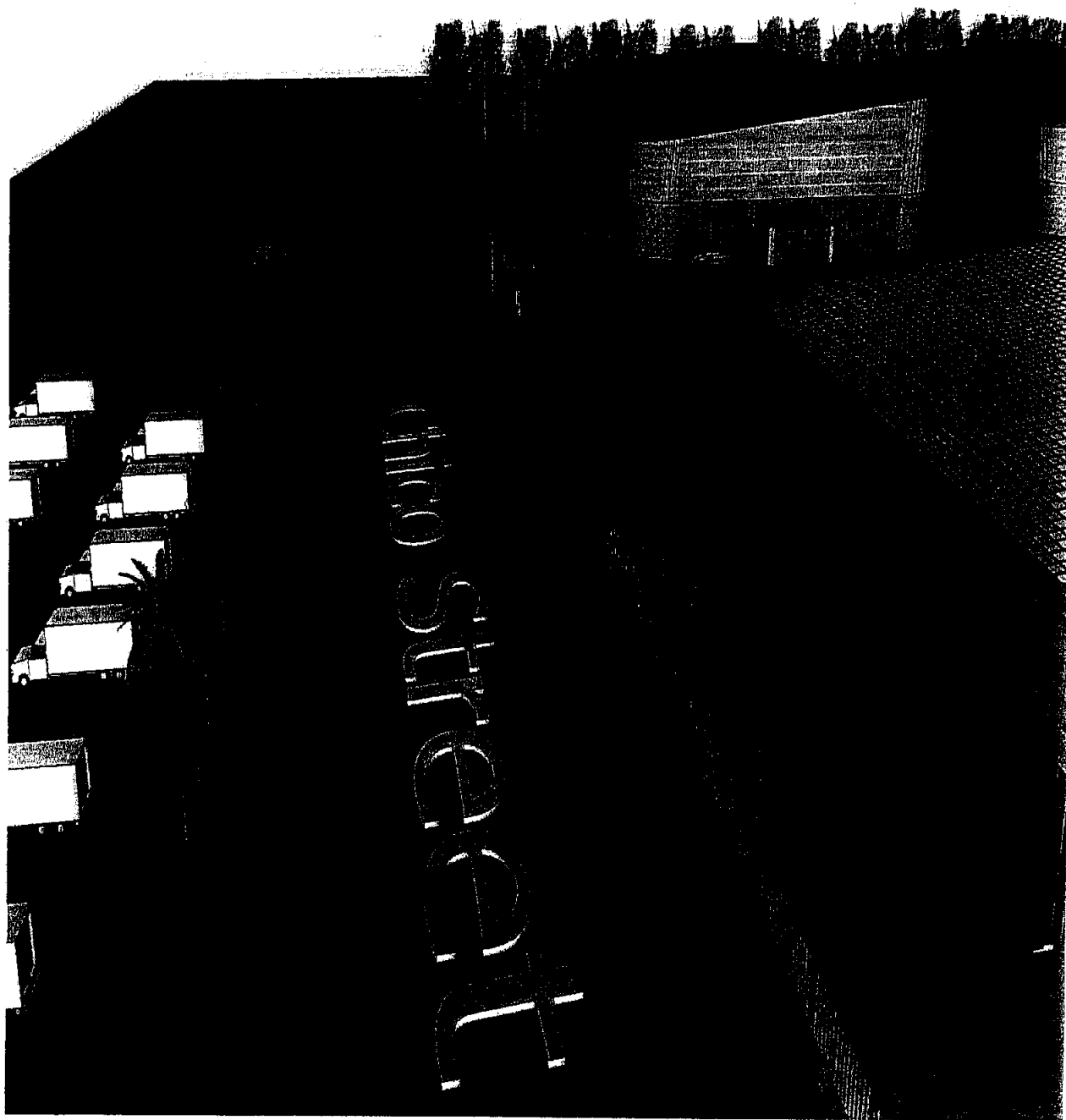
Proposed New Energy Cluster: An Aerial View
Location: Shell Revitalization Area 1
Economic Development Department
City of Carson
Concept by: Sinha & Company

Figure 4



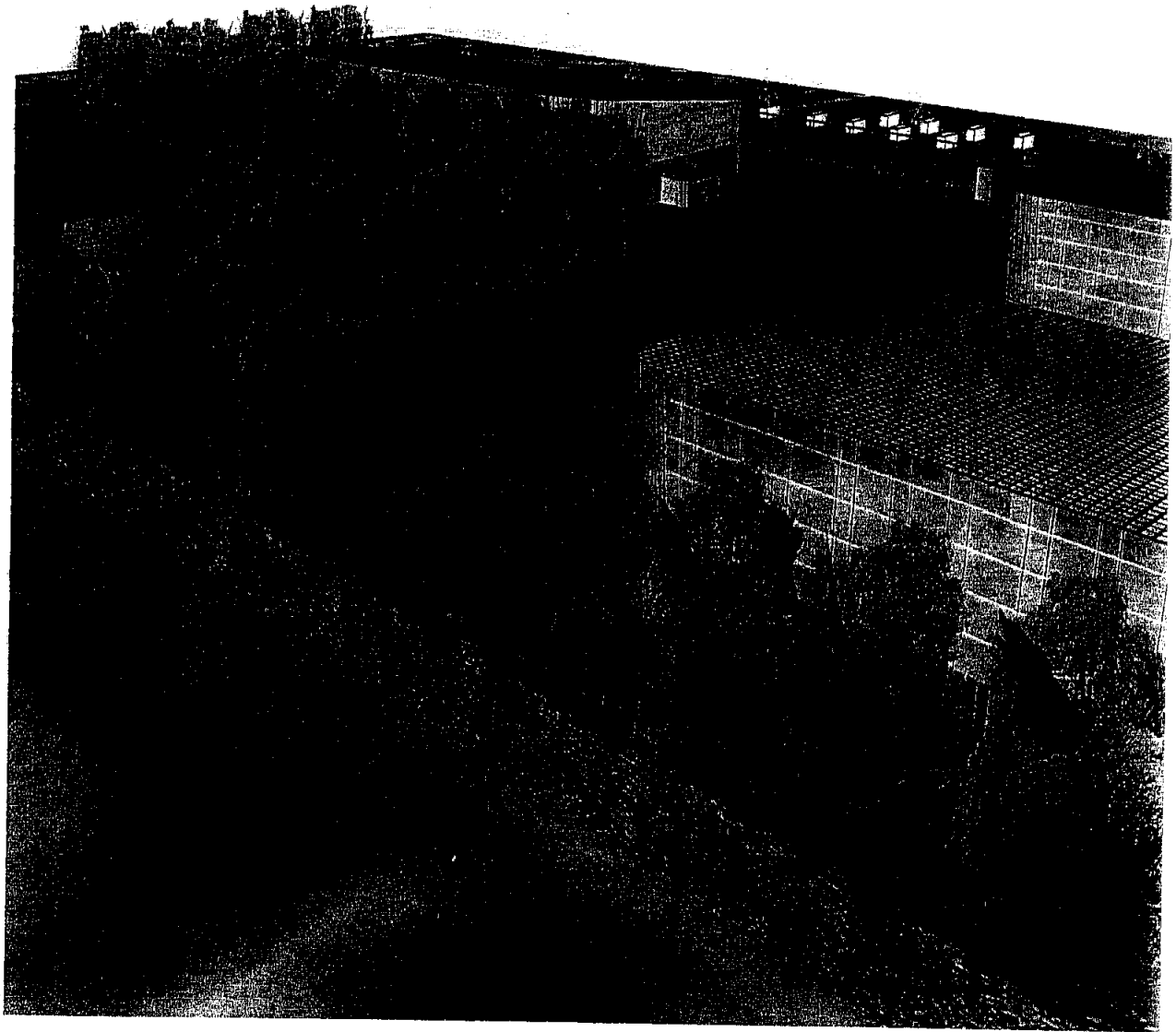
Proposed New Energy Cluster: Building Elevation
 Location: Shell Revitalization Area 1
 Economic Development Department
 City of Carson
 Concept by: Sinha & Company

Figure 5



Proposed New Energy Cluster: Landscaping, Fencing and Entrance on Chico Street
Location: Shell Revitalization Area 1
Economic Development Department
City of Carson
Concept by: Sinha & Company

Figure 6



Proposed New Energy Cluster: Landscaping on the Shell Property Interfaces
Location: Shell Revitalization Area 1
Economic Development Department
City of Carson
Concept by: Sinha & Company

Figure 7

New Energy cluster will be a secured facility with single gated entrance from Chico Street which will have fencing of sufficient height, together with aesthetic plants' landscaping. There will be tall plants and unpenetratable shrubs of suitable heights aesthetically installed on other sides including the Shell facility interfaces.

Project Cost and Lease Rate Estimate

Project Cost

Representative Land Price; (Source: www.realtor.com. See Exhibit 2)

Two land units were listed for sale in close by locations in Carson. They can be considered to have similarity with the Revitalization Area 1 of the Shell Project.

1. 5.36 acre lot in Carson CA 90745, listed for \$ 12.9 million, or \$2.41 million per acre.
2. 0.44 acre lot at 21919 South Figueroa Street, Carson, CA 90748, listed for \$ 1.5 million, or 3.41 per acre.

Based on these comparable rates, and the required downward adjustment because the Revitalization Area 1 is a larger lot of 12.3 acres which will generally yield lower per acre price than the smaller and cleaner lots, SAC estimates that a reasonable land price for the Revitalization Area 1 is \$ 2 per acre.

Construction cost per sq. ft. of a double storey light industrial building calculated using ground floor area only is \$ 100.00 per sq ft. (Source: Design Cost Data, <http://www.dcd.com>)

The above assumptions lead to the project cost for New Energy Cluster as follows:

Land Cost @ \$1.5 million per acre for 12.3 acres	= \$ 24,600,000
Building cost @ \$ 100.00 per Sq. Ft. for 241,000 Sq. Ft.	= \$ 24,100,000
Miscellaneous (parking, fencing, landscaping and others)	= \$ 3,000,000
Design and Planning	= <u>\$ 2,500,000</u>
Total Project Cost	= \$ 54,200,000
EDA Grant	= (\$ 6,000,000)
Other Grants	= (\$ 6,000,000)
Effective Project Cost	= \$ 42,000,000

Project Financing

A stand alone financing of the project is envisaged, with no fiscal liability to the city.

There are two possibilities:

1. A commercial Mortgage for the Effective Project Cost assuming that the grant money is the project down payment of 22% $\{(12/54.2)*100\}$. The financing can be further collateralized by the long term lease contracts from established companies.

Financing cost assuming 30 year mortgage at 4.5% interest = $PMT(4.5\%, 30, 42000000)$
 $= \$ 2,590,723/442,200 = \$ 5.86$ per sq. ft. per year,. The financing cost is quite low as compared to the market lease rate of \$ 8 -10 per sq. ft. enabling the city to offer lucrative lease rate to the right companies.

2. Bond Financing: Issuance of revenue bonds backed by the long term lease contract from established companies. These bonds will bear no fiscal liability of the city. Study of bond as a financing tool is not within the limited scope of this study but looks very likely

that with a down payment 22% highly rated companies signing long term leases, underwriting of a suitable bond is possible.

Economic Development Agency's (EDA's) Grant Application

Applicable EDA grant mechanism for this project is **Public Works and Economic Development Facilities Program** (CFDA No. 11.300; 13 C.F.R. , part 305). City of Carson's eligibility emanates from EDA's Rule Section § 300.3 which states that eligible recipient may be "City or other political subdivision of a State...". **Under this program EDA will provide strategic Public Works Investments to support the construction or rehabilitation of essential public works infrastructure and facilities to help communities and regions leverage their resources and strengths to create new and better jobs, drive innovation, become centers of competition in the global economy, and ensure resilient economies."**

The Next Funding Cycles

The deadlines for the remaining funding cycles of FY 2012 and the first funding cycle of FY 2013 are listed below:

- March 9 for funding cycle 3 of FY 2012
- June 8 for funding cycle 4 of FY 2012
- September 15 for funding cycle 1 of FY 2013

Type of grant suitable for the current project

Public Works and Economic Development Facilities (CFDA No. 11.300 implementing regulations in 13 CFR, part 305.)

Size of the grant:

There is no size limit on the grant. Discussions with EDA officials indicate that although average grant size is about 3 million dollars, there is no official limit on the grant size and it go up to 5-10 million dollars. EDA is looking for some exciting projects.

§ 305.2 Specific Award Requirements:

(a) Project Scope:

- Acquisition or development of land and improvements for use in public works, public service or **any type of development facility**.
- Acquisition of design, engineering, construction, rehabilitation, alteration, expansion or improvement of such a facility.

(b) Project Requirements: The project will directly or indirectly:

- Improve the opportunities for the successful establishment or expansion of industrial and commercial plants or facilities in the Region or where the Project is located.
- Assist in the creation of additional long – term employment opportunities in the region.

§ 305.3 Application Requirements: Each Applicant must:

- Include Evidence of Eligibility
- Demonstrate how the proposed project meets the criteria of § 305.2
- Include a Comprehensive Economic Development Strategies (CEDS) consisting of:
 1. A background of the economic development situation of the Region with a discussion of the economy, population, geography, workforce

development and use, transportation access, resources, environment and other pertinent information.

2. An in-depth analysis of economic and community development problems and opportunities.

§ 301.4 Investment Rate:

As a general rule EDA's investment rate shall not exceed 50 percent except in special need case where additional 30 percent may be provided.

§ 301.5 Matching Share Requirements:

The required Matching Share of a Project's eligible costs may consist of cash or in-kind contribution. **Recent discussions with EDA officials have confirmed that other funds for the Project raised through loan, mortgage or bonds will be considered a matching fund.**

What comprises a grant application:

All applicants must complete the *Application for Investment Assistance* (Form ED 900 which is presented in Exhibit A) as apart of the application package. **Although ED 900 itself provides space for responses that seeks information on need and impact of the proposed project, the applicant should substitute an expanded narrative as a separate attachment that provides a clear and compelling justification for the project. Applicants are strongly encouraged to include a high-quality narrative that compellingly articulates a clearly defined regional economic gap, how the proposed project will meet this need, and the expected outcomes from the project.**

There are other forms as well, that are required to be submitted along with ED-900. They are:

- SF - 424 (*Application for Federal Assistance*)
- SF - 424C (*Budget Information --- Construction Programs*)
- SF - 424D (*Assurances --- Construction Programs*)
- CD - 511 (*Certification Regarding Lobbying*)

What other supporting documentation are required before funding?

- **Documentation concerning non-EDA funding:** For example, letters of commitment and other documentation as necessary. If bonds are contemplated as a match, counsel's opinion of the applicant's bonding authority and eligibility of the bonds for use as match, along with full disclosure of the type of bonds and schedule of the intended bond issue, are required.
- **Maps of the project site:** U.S. Geological Survey (USGS) maps, and Federal Emergency Management Agency (FEMA) floodplain maps with project components and beneficiary noted.
- **Letters of Commitment and assurance of compliance** (Exhibit A to Form ED-900) from beneficiaries of the proposed project identified in section B.5. of ED-900 providing the economic justification for the project.
- **A preliminary Engineering Report:** All required elements of the report are listed in section M.3. of Form ED-900.
- **An Environmental Narrative:** Enough information to be provided that will enable EDA to comply with its National Environmental Policy Act (NEPA) responsibilities. The application does not need to include at the time of submission all applicable approvals. However, applicants must include



Applicant's Certification Clause (described above) to the environmental narrative.

- **Copies of any existing Correspondence or Sign-offs from other agencies as required.**
- **Copies of other environmental studies** that have been completed for the project.

Pre-Application Consultation with EDA:

EDA gives opportunity to applicants to submit a pre-application package before the funding cycle deadline for a written feedback on their respective application. EDA will conduct a preliminary eligibility and technical review and perform an initial project analysis within 15 days of its receipt of the information provided. The pre-application package must contain the following documents as a minimum.

- One Form ED-900 (*Application for Investment Assistance*)
- One Form SF-424 (*Application for Federal Assistance*)
- One form SF-424C (*Budget Information*)

In reply applicant will be told if their application is complete, eligible, and whether or not EDA would forward the application in its current state to the Investment Review Committee. Based on the feed back the applicant may revise or supplement the application or submit a substantially revised application.



EXHIBIT A

Grant Application Package





Form EDA-100 (Rev. 12/07)
 OMB Control No. 0010-0094
 Expires 05/31/2013

ECONOMIC DEVELOPMENT ADMINISTRATION

APPLICATION FOR INVESTMENT ASSISTANCE

The Economic Development Administration (EDA) uses the Application for Investment Assistance to evaluate applications under EDA's economic development assistance programs. EDA may ask applicants to provide supplemental information as needed during the evaluation and selection process. Please visit our Internet website at www.eda.gov for more information on EDA's programs, selection and evaluation criteria, and application procedures, as set forth in applicable Federal Funding Opportunity (FFO) announcements. These FFO announcements are also published annually in the *Federal Register*.

PWEDA Section 201 (CFDA No. 11.300) Public Works and Economic Development Program	Section A - To Be Completed by All Applicants
PWEDA Section 203 (CFDA No. 11.302) Planning Program	Section B - Regional Eligibility (Public Works and Economic Adjustment Assistance)
PWEDA Section 207 (CFDA No. 11.303) Local and National Technical Assistance and University Center Economic Development Program	Section C - Technical Assistance & Research/Evaluation Assistance
PWEDA Section 207 (CFDA No. 11.312) Research and Evaluation Program	Section D - To Be Completed by All Non-Governmental Applicants (excluding Public Universities)
PWEDA Section 209 (CFDA No. 11.307) Economic Adjustment Assistance Program	Section E - Budgeting and Staffing/Non-Construction Assistance
	Section F - Partnership Planning Assistance
	Section G - Short-Term Planning Assistance
	Section H - State Planning Assistance
	Section I - Local or National Technical Assistance
	Section J - University Center Program Assistance
	Section K - Economic Adjustment Assistance
	Section L - Revolving Loan Fund (RLF) Assistance
	Section M - Construction Assistance
	Section N - Design and Engineering Assistance

Application for Investment Assistance (Form IED-900)

OMB Control No. 0540-0034

Expires 10/5/2013

Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information that is subject to the requirements of the Paperwork Reduction Act, unless the collection of information displays a currently valid OMB Control Number.

The information requested in this Application for Investment Assistance is required to obtain or retain benefits from EDA pursuant to the Public Works and Economic Development Act of 1965 (PWEDA) as amended (42 U.S.C. 5121 et seq.). The reasons for collecting this information are to enable applicants to submit applications for financial assistance and to assist EDA in determining applicants' eligibility and compliance with legal and programmatic requirements. The information submitted on this application and in accompanying documents is subject to public disclosure under the Freedom of Information Act as amended (5 U.S.C. 552) unless exempt from disclosure as trade secrets or privileged or confidential commercial or financial information under 5 U.S.C. 552(b)(4).

The public reporting burden for this collection of information is estimated to average 22 hours per response, including time for reviewing instructions, gathering data, and completing the application. Comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing paperwork burden may be sent to: Economic Development Administration, U.S. Department of Commerce, 1401 Constitution Avenue, N.W., Washington, D.C. 20230, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503.

INSTRUCTIONS FOR ELECTRONIC AND HARDCOPY FORMATS

Electronic Submissions: Please visit <http://www.grants.gov/assets/FindApplyUserGuide.pdf> for detailed instructions on electronic submissions. This form is designed to be completed in **Adobe Acrobat Reader, versions 8.1.1 and above**. If using Adobe Acrobat Reader version 8.1.1 or above, all interactive features will work. Responses may be composed in a separate word processing program and then copied and pasted into the appropriate response field. NOTE: Applicants who would like to save a copy for their records must save a copy to their local hard drive under a unique name. Additional documentation or information applicants must provide may be submitted as electronic attachments using the 'Attachments' form that is part of the application package downloaded from www.Grants.gov.

Hardcopy Submissions: EDA encourages applicants to submit applications in electronic format via www.Grants.gov. However, if the applicant is unable to complete this application using the latest compatible Adobe Reader version, the applicant may send in a hardcopy application. If submitting a hardcopy application, the applicant should print this application (ED-900), the SF-424, and either the SF-424A (Non-construction investments) or the SF-424C (Construction Investments), and either the SF-424B (Non-Construction Investments) or the SF-424D (Construction Investments), and the CD-511, and type or print the responses. Applicants should mail the completed application to the appropriate Regional Office. See EDA's internet website (www.eda.gov) for a listing of Regional Offices.

NOTE ON EDA'S APPLICATION PROCESS

To limit the burden on the applicant, EDA only requests certain items of documentation if EDA determines that the applicant's project merits further consideration. Applicants should note that the following items will be subsequently requested if, and only if, EDA selects their project for further consideration:

For all types of projects:

- A copy of the region's Comprehensive Economic Development Strategy (CEDS) or alternate EDA-approved planning document
- Letters of commitment to document non-EDA funding

For construction projects only:

- USGS map of project site
- Letters of commitment from private beneficiaries of the proposed project
- Comments from the metropolitan area review/clearinghouse agency
- A legal opinion and other documentation, as necessary, verifying the applicant's answer to questions regarding project ownership, operation, maintenance, and management
- An engineering report
- An environmental narrative
- Documented approval from the State Historic Preservation Officer (SHPO)

For Revolving Loan Fund projects only:

- Revolving Loan Fund Plan

For non-profit applicants only:

- Certificate of good standing from the state
- A copy of the organization's Articles of Incorporation and By-Laws
- Resolution from a general purpose subdivision of government of a state acknowledging that the organization is acting in cooperation with officials of that subdivision
- Comments from a general purpose government entity (construction projects only)

SECTION A - TO BE COMPLETED BY ALL APPLICANTS

General Instructions

Please answer all questions completely and accurately and provide a concise narrative statement for each question below. Most narratives need not exceed one paragraph. Any attachments to this application may either be attached electronically through www.Grants.gov or submitted in hardcopy to the Regional Office (www.eda.gov/AboutEDA/Regions.xml) that processes applications for your state. Applicants should consult EDA's program requirements and evaluation criteria set forth in 13 C.F.R. Chapter III (EDA's regulations), as supplemented by the applicable Federal Funding Opportunity Announcement (FFO) on www.Grants.gov, when completing this application. (EDA's regulations begin on page 20 of the Federal Register notice posted at www.eda.gov/ImageCache/EDAPublic/documents/pdfdocs2006/2006final_20rule_2epdf/v1/2006final_20rule.pdf.) Applicants are encouraged to contact an EDA representative (see list of Regional Offices above) for assistance in completing this application. Preparation of an application may involve coordination with other local, state and federal agencies. Public Works and Economic Adjustment Assistance projects must satisfy regional eligibility requirements (see 13 C.F.R. § 304.1). Legal citations referencing EDA's regulations are included for the applicant's information; however, all of the information needed to complete this application is contained within the form itself or within the web links included in this form. Legal assistance is not generally required to complete this form, although applicants may need to consult with an attorney concerning any legal issues implicated by the receipt of federal assistance.

Please indicate the type of EDA investment assistance for which you are applying. If you change the type of EDA Investment Assistance for which you are applying, make sure you save the application under a different file name.

<input type="checkbox"/> Public Works	(Complete Sections A, B, and M and Exhibits A, D and E.)
<input type="checkbox"/> Economic Adjustment	(Complete Sections A, B, and K and Exhibit C. Also Complete Sections M and Exhibits A, D, and E if request has construction components, and Section N if request has only design/engineering requirements. Complete Section E if request has no construction components.)
<input type="checkbox"/> Partnership Planning	(Complete Sections A, C, E, and F and Exhibit C.)
<input type="checkbox"/> Short-term Planning	(Complete Sections A, C, E, and G and Exhibit C.)
<input type="checkbox"/> State Planning	(Complete Sections A, C, E, G, and H and Exhibit C.)
<input type="checkbox"/> University Center	(Complete Sections A, C, E, and J and Exhibit C.)
<input type="checkbox"/> Local Technical Assistance	(Complete Sections A, C, E, and I and Exhibit C.)
<input type="checkbox"/> National Technical Assistance	(Complete Sections A, C, E, and I and Exhibit B.)
<input type="checkbox"/> Research and Evaluation Assistance	(Complete Sections A, C, E and Exhibit B.)
<input type="checkbox"/> Revolving Loan Fund	(Complete Sections A, B, E, K, and L and Exhibit C.)
<input type="checkbox"/> Design and Engineering	(Complete Sections A, B, and N and Exhibit C.)

Please indicate which type of applicant you are:

- ☐ Governmental (or quasi-governmental, to include District Organizations, universities, or public institutions of higher learning)
- ☐ Non-governmental (e.g. private or public non-profit organizations, for-profit organizations)

In addition to the sections specific to the program for which you are applying (see above), non-governmental applicants also must complete Section D.

A.1. Investment (Project) Region

Identify and describe the region where the project will be located, identify and describe the region that will benefit from the project (if different from or in addition to the region in which the project will be located), and discuss the project's expected economic impact. For purposes of this application, a region is defined as "an economic unit of human, natural, technological, capital or other resources, defined geographically. Geographic areas comprising a region need not be contiguous or defined by political boundaries, but should constitute a cohesive area capable of undertaking self-sustained economic development." (See 13 C.F.R. § 300.3 for the definition of "Region.")

A.2. Investment (Project) Description

Provide a detailed description of the complete scope of work for the proposed EDA investment. If you are proposing a construction project, please include specific construction components. Also, for National Technical Assistance, Training and Research and Evaluation Projects, provide a description of the methodology to be used to complete the project.

Note: If EDA determines that your project merits further consideration, and if your project includes construction, you will be required to provide a USGS map of the site. You may provide this now using the 'Attachments' form that is part of the application package downloaded from www.Grants.gov or in hard copy.

A.3. Economic Development Needs

- a. Does the region in which the project will be located have a Comprehensive Economic Development Strategy (CEDS)? (See www.ceds.gov/imageCache/EDAPublic/documents/pdfiles/2006/cedsflyer081708_2.pdf.) (Note: Except for strategy grants as described in 13 C.F.R. § 303.7, the region in which Public Works or Economic Adjustment projects will be located must have a CEDS with which the project is consistent.)

☐ Yes

☐ No

If Yes, what is the source? *Note: If you are unsure if your region has a CEDS, please contact your local District Organization.*

If No, what alternate strategic planning document do you wish to govern this investment? *Note: You will be asked to provide a copy of this planning document if your project is selected for further consideration. You may provide this now using the 'Attachments' form that is part of the application package downloaded from www.Grants.gov or in hard copy.*

- b. Briefly describe the economic development needs of the region and how the proposed investment addresses the goals and objectives of the CEDS for the region or the alternate strategic planning document as noted above. (See 13 C.F.R. part 303.)

- c. Briefly describe the economic conditions of the region described in A.1, as well as the economic adjustment problems or economic dislocations the region has experienced (or is about to experience) and the regional impact of these conditions.

A.4. Investment (Project) Impact and Fit with EDA Funding Priorities

Discuss how the proposed investment satisfies EDA's Investment Policy Guidelines as set forth in 13 C.F.R. § 301.8, as well as the EDA funding priorities set forth in the applicable Federal Funding Opportunity (FFO) announcement on www.Grants.gov.

A.5. Applicant's Capability

Briefly describe the applicant's capability to administer, implement, and attract private sector investments to the project.

A.6. Proposed Time Schedule for the Project

Provide a proposed time schedule for completion of the project, including when (month/year) the project will begin and end. Explain any potential issues that could affect project implementation.

A.7. Civil Rights

- a. Does the applicant understand and agree to comply with all applicable civil rights requirements (see 13 C.F.R. § 302.20), including the requirement to provide signed assurances of compliance? ☐ Yes ☐ No (explain below)

- b. Do identified "Other Parties" as defined in 13 C.F.R. § 302.20(b) understand and agree to comply with all applicable civil rights requirements, including the requirement to provide signed assurances of compliance?

☐ Yes ☐ No (explain below) ☐ Not Applicable (No Other Parties Identified)

A.8. Proposed Project Budget

- ☐ For Construction investments, complete Form SF-424C.
- ☐ For Non-Construction investments, complete Form SF-424A.

Note: If you are applying in hardcopy, you may download these forms from www.Grants.gov/techlib/SF424A-V1.0.pdf and www.Grants.gov/techlib/SF424C-V1.0.pdf, or go to EDA's website at www.eda.gov.

A.9. Non-EDA Funding for the Project

a. Identify the source, nature and amount of all non-EDA funds, including in-kind contributions (non-cash contributions of space, equipment, services, or assumptions of debt; see definition of "In-Kind Contribution(s)" in 13 C.F.R. § 300.3). Explain the status of all funding commitments, including the date the funds will be available from each source, and describe any conditions or restrictions on the use of such funds. If in-kind contributions are included, explain the basis on which they are valued.

- b. Are all non-EDA funds committed to the project, available as needed, and not conditioned or encumbered in any way that would preclude their use consistent with the purpose of the project? (See 13 C.F.R. § 301.5.) ☐ Yes ☐ No (explain below)

Note: If EDA determines that your project merits further consideration, and if your project includes construction, you will be required to provide letters of commitment. You may provide these now using the 'Attachments' form that is part of the application package downloaded from www.Grants.gov or in hard copy.

- c. Discuss the actions that need to be taken and the timing required to secure the non-EDA funds.

- d. Does the applicant plan to seek other federal financial assistance as part of or in connection with this project? If so, please describe the source, amount and any terms and conditions of the funding, and when the funding will be available for use by the applicant.

☐ Yes (explain below) ☐ No

- e. Is the requested EDA investment assistance available from any other federal economic development program? ☐ Yes (explain below) ☐ No (explain below)

If Yes, identify the source and provide an explanation of why EDA investment assistance is required.

If No, explain your efforts to identify and obtain funding from other sources.

A.10. Lobbying Certifications

All applicants for federal financial assistance must certify that federal funds have not been used and will not be used for lobbying in connection with this request for federal financial assistance (Form CD-511). If non-federal funds have been or are planned to be used for lobbying in connection with this request for federal financial assistance, Form SF-LLL also must be completed. Please certify to the following:

- | |
|--|
| <input type="checkbox"/> Applicant's "Certifications Regarding Lobbying" (Form CD-511) is completed. (If applicant is applying in hardcopy, access the form at www.Grants.gov or at EDA's website at www.eda.gov .) |
| <input type="checkbox"/> Applicant's "Disclosure of Lobbying Activities" (Form SF-LLL) is attached, if required. (If not required by law, also check the box. If applicant is applying in hardcopy, access the form at www.whitehouse.gov/omb/grants/sflll.pdf .) |

Note: Applicants must comply with 13 C.F.R. 302.10 regarding attorneys' and consultants' fees and the employment of expeditors. This regulation requires that applicants identify and disclose the amount of fees paid to anyone engaged to assist the applicant in obtaining assistance under the Public Works and Economic Development Act of 1965 (PWEDA), as amended.

A.11. Compliance with Executive Order 12372, State Single Point of Contact (SPOC)

- a. Does the state in which the project will be located have a project review process that requires submission to a Single Point of Contact (SPOC)? (See 13 C.F.R. § 302.9(b).) *Note: If you are unsure if your state has a Single Point of Contact, or do not know who this individual is, please refer to OMB's SPOC list (www.whitehouse.gov/omb/grants/spoc.html).*

<input type="checkbox"/> Yes	<input type="checkbox"/> No (go to A.12)
------------------------------	--

- b. If **Yes** to A.11(a) above, does this request for EDA investment assistance meet the SPOC process established by the state?

<input type="checkbox"/> Yes	<input type="checkbox"/> No (go to question A.11.d)
------------------------------	---

- c. If **Yes** to A.11(b) above, were SPOC comments/clearance received?

<input type="checkbox"/> Yes, and the comments/clearance are attached.
--

<input type="checkbox"/> No, the review period has expired and no comments were received.

- d. If **No** to question A.11(b) above, please explain any known reason for the lack of comments.

--

A.12. Justification for Sole Source Procurement

- a. Will you subcontract work to complete part or all of this project?

<input type="checkbox"/> Yes	<input type="checkbox"/> No
------------------------------	-----------------------------

- b. If **Yes**, will contracts be awarded by competitive bid?

<input type="checkbox"/> Yes	<input type="checkbox"/> No
------------------------------	-----------------------------

- c. If contracts will **not** be awarded by competitive bid, please provide a justification. A cost analysis will be necessary when adequate price competition is lacking, and for sole source procurements, including contract modifications or change orders. (See 15 C.F.R. § 14.40-14.48 or § 24.36, as applicable.)

--

A.13. Assurances

For Construction investments, complete Form SF-424D.

For Non-Construction investments, complete Form SF-424B.

Note: If you are applying in hardcopy, you may access these forms as part of the application package downloaded from www.Grants.gov, from www.Grants.gov/techlib/SF424B-V1.1.pdf and www.Grants.gov/techlib/SF424D-V1.1.pdf, or go to EDA's website at www.eda.gov.

SECTION B - REGIONAL ELIGIBILITY: TO BE COMPLETED BY APPLICANTS FOR PUBLIC WORKS OR ECONOMIC ADJUSTMENT ASSISTANCE ONLY

Public Works and Economic Adjustment Assistance projects (including Revolving Loan Fund Assistance and Design and Engineering Assistance) must satisfy regional eligibility requirements (see 43 C.F.R. part 301). This section will assist EDA in determining if the proposed project satisfies these eligibility requirements. Please answer all questions completely and accurately and attach explanations and supporting documentation where applicable.

1. Identify the region upon which the applicant is basing the eligibility calculation.

- a. If this region is **different** from the region described in Section A of this application, please explain.

- b. If this region is **not** defined by political boundaries (e.g., it is a neighborhood within a large city rather than an autonomous town), provide a description of the project region and documentation to show that: (i) the region is of sufficient size appropriate for the proposed project, and (ii) the area used for regional eligibility is the same as the area that will benefit from the proposed project.

2. Source of data provided for regional eligibility determination. Check the source of data used to determine regional eligibility, and **attach an explanation and a copy of this data** (additional documentation or information applicants must provide may be submitted as electronic attachments using the 'Attachments' form that is part of the application package downloaded from www.Grants.gov). The explanation must: (i) identify the data used (e.g., American Community Survey (ACS)); (ii) if the data used are other than the ACS, explain why ACS data were not used; and (iii) if the data used are other than federal data, explain why federal data were not used and identify the source of the non-federal data. ACS data (www.census.gov/acs) should be used whenever possible, but if such data are not available, the order of data preference is as listed below.

- ☐ a. The most recent ACS data published by the U.S. Census Bureau.
- ☐ b. The most recent other federal data for the region in which the project is located (e.g., U.S. Census Bureau or the Bureaus of Economic Analysis, Labor Statistics, Indian Affairs, etc.)
- ☐ c. If no federal data are available, the most recent data available through the state government for the region in which the project is located.
- ☐ d. Other data to substantiate regional eligibility based on a "Special Need" as defined in 13 C.F.R. § 300.3.

3. **Economic Distress:** Check all that apply in establishing regional eligibility (see 13 C.F.R. § 301.3 (a)(1)):

- ☐ A. **Unemployment rate:** The project is located in a region that has an unemployment rate that is, for the most recent 24-month period for which data are available, at least one percentage point above the national unemployment rate.
- ☐ B. **Per capita income:** The project is located in a region that has a per capita income that is, for the most recent period for which data are available, 80 percent or less of the national average per capita income.
- ☐ C. **Special need:** The project is located in a region that has experienced or is about to experience a "Special Need" (as defined in 13 C.F.R. § 300.3) arising from actual or threatened severe unemployment or economic adjustment problems resulting from severe short-term or long-term changes in economic conditions, including:
 - ☐ Substantial out-migration or population loss;
 - ☐ Underemployment; that is, employment of workers at less than full-time or at less skilled tasks than their training or abilities permit;
 - ☐ Military base closure or realignment, defense contractor reductions-in-force, or U.S. Department of Energy defense-related funding reductions;
 - ☐ Natural or other major disasters or emergencies;
 - ☐ Extraordinary depletion of natural resources;
 - ☐ Closing or restructuring of an industrial firm or loss of other major employer;
 - ☐ Negative effects of changing trade patterns; or
 - ☐ Other circumstances set forth in the applicable FFO (please explain below).

4. **Substantial Direct Benefit:** A project located within an Economic Development District (EDD) that is located in a region that does not meet the economic distress criteria set forth in section B.3 above, is also eligible for EDA investment assistance if EDA determines that the project will be of "substantial direct benefit" to a geographic area within the EDD that meets the distress criteria set forth in question B.3 above by providing significant employment opportunities for unemployed, underemployed, or low-income residents of the distressed geographic area within the EDD. If applicable, identify the EDD in which the proposed project will be located, as well as the geographic area within the EDD that meets the economic distress criteria detailed in section B.3. above, and explain how the proposed project will provide a substantial direct benefit to this geographic area within the EDD. (See 13 C.F.R. § 301.3 (a)(2).)

<input type="checkbox"/>	No, not applicable. The project is located in a region that meets the economic distress criteria in section B.3.
<input type="checkbox"/>	Yes, this project will provide a "substantial direct benefit" to residents of an area meeting the economic distress criteria. Please provide an explanation below.

If Yes,
explain:

--

5. **Project Beneficiaries:** Identify private sector employers that will benefit from the project, and attach letters of commitment electronically (using the 'Attachments' form that is part of the application package downloaded from www.Grants.gov) or in hardcopy, if available. In the last column, select 'Committed' if the company has committed to being a partner in the project or 'Interest Only' if it has merely expressed interest. PLEASE NOTE: Exhibit A must be completed for EACH beneficiary listed in the chart below. The applicant must send an electronic or hard copy of Exhibit A to each beneficiary. Each beneficiary should then complete Exhibit A and return to the applicant. Once received, the applicant can attach Exhibit A (all copies) electronically using the 'Attachments' form that is part of the application package downloaded from www.Grants.gov or the applicant can submit Exhibit A (all copies) as part of a hard copy application.

☐ If none, check this box, do not complete this chart, and go to Section C.

Company	Products and Services Produced by Company (5 digit NAICS code)	Number of Jobs Saved by Project	Number of Jobs Created by Project	Amount of Company Investment (\$)	Company Committed or Only Interested?

Note: If EDA determines that your project merits further consideration, you will be required to provide letters of commitment from the project's beneficiaries, verifying the above information.

SECTION C - MAXIMUM ALLOWABLE EDA INVESTMENT RATES - TO BE COMPLETED BY PLANNING, TECHNICAL ASSISTANCE, UNIVERSITY CENTER PROGRAM, AND RESEARCH/EVALUATION APPLICANTS ONLY

According to EDA's regulations, the maximum allowable EDA investment rate for Planning Investments, Local and National Technical Assistance, the University Center Program, and Research and Evaluation Investments shall be based on the relative needs of the Region that the project will serve. However, a project of a national scope may be eligible for up to a 100 percent investment rate if the project will be of no or only incidental benefit to the eligible recipient or if the project merits, and is otherwise infeasible without further EDA assistance. Please answer the following questions completely to determine eligibility for an EDA investment rate greater than 50 percent.

1. Is this project national in scope?

☐ Yes ☐ No (go to Section D)

2. Please describe how the project is national in scope.

3. Will the project be of no benefit or only incidental benefit to the applicant?

☐ Yes (go to question C.4) ☐ No (explain below)

4. Is the project not otherwise feasible without an EDA investment rate greater than 50 percent?

☐ Yes (explain) ☐ No

If Yes, explain why the project merits an EDA investment rate greater than 50 percent.

5. All applicants for EDA National Technical Assistance, Training, and Research and Evaluation Assistance must complete the EDA National Technical Assistance, Training, and Research and Evaluation Investments Additional Assurances form. See attached Exhibit B of this application.

☐ Yes, the applicant's Additional Assurances form is completed.

☐ Not applicable; the applicant is not applying for National Technical Assistance, Training, or Research and Evaluation investment assistance.

**SECTION D - TO BE COMPLETED BY ALL
NON-GOVERNMENTAL APPLICANTS (EXCLUDING
PUBLIC UNIVERSITIES AND DISTRICT ORGANIZATIONS)**

1. All non-governmental applicants for federal financial assistance must provide a 'Name Check' form (Form CD-346) completed by each officer, the executive director, and the chief financial officer of the applicant organization, unless: (i) proposed award amounts are \$100,000 or less; or (ii) applicants have been recipients of DOC financial assistance for three or more consecutive years without any adverse programmatic or audit findings.

Unless you meet one of the two exemption criteria listed above, please list the names of your organization's Chief Financial Officer, Executive Director, and all other officers.

- ☐ Yes, applicant's "Name Check" form(s) is/are attached. (Download form from www.doc.gov/forms/direct.htm.) Additional documentation or information applicants must provide may be submitted as electronic attachments using the 'Attachments' form that is part of the application package downloaded from www.Grants.gov.

- ☐ No, applicant's "Name Check" form(s) is/are not attached. If No, explain below.

2. Non-profit organization applicants must provide a current Certificate of Good Standing from the State in which they are incorporated.

Can you provide a Certificate of Good Standing (or its legal equivalent) from the State in which your organization is incorporated?

- ☐ Yes ☐ No (explain below)

Note: You will be asked to provide this at a later date if your project is selected for further consideration. You may provide this now using the 'Attachments' form that is part of the application package downloaded from www.Grants.gov or in hard copy.

3. New non-profit organization applicants must provide their Articles of Incorporation and By-Laws. Non-profits with an active EDA grant must either provide a) a revised copy of their Articles of Incorporation or By-Laws if these have been amended or b) a statement certifying that there has been no change in the organization's Articles of Incorporation or By-Laws.

Can you provide this?

- ☐ Yes ☐ No (explain below)

Note: You will be asked to provide this at a later date if your project is selected for further consideration. You may provide this now using the 'Attachments' form that is part of the application package downloaded from www.Grants.gov or in hard copy.



4. Will you be able to provide a resolution passed by (or a letter signed by) an authorized representative of a general purpose political subdivision of a State (e.g., local government entity), acknowledging that the applicant is acting in cooperation with officials of the political subdivision? EDA may waive this requirement for certain projects of significant regional or national scope. (See 13 C.F.R. § 301.2(b).)

☐ Yes ☐ No (explain below)

Note: You will be asked to provide these comments at a later date if your project is selected for further consideration. You may provide this now using the 'Attachments' form that is part of the application package downloaded from www.Grants.gov or in hard copy.

5. If you are applying for a construction or RLF investment, you must afford the appropriate general purpose governmental authority a minimum of 15 days to review and comment on the proposed project. (See 13 C.F.R. § 302.9(a).) *Note: You will be asked to provide this at a later date if your project is selected for further consideration.*

Will you be able to provide these comments?

☐ Yes
☐ Not applicable, because I am not applying for a construction or RLF grant.
☐ No, for another reason (explain)

**SECTION E - BUDGETING AND STAFFING SUPPLEMENT
TO BE COMPLETED BY APPLICANTS
FOR NON-CONSTRUCTION ASSISTANCE ONLY**

1. Explain the proposed use of any amounts budgeted for "Equipment," "Contractual," or "Other," if any, on Form SF-424A, 'Budget Information - Non-Construction Programs.'

2. Explain the types of indirect costs, if any, on Form SF-424A.

Note: A completed Indirect Cost Rate Agreement or other documentation applicable to an indirect cost rate determination will be requested if EDA selects the project for further consideration.

3. Identify key applicant staff who will undertake and complete project activities. Include a description of the knowledge, organizational experience, and expertise of individual staff members. In addition, explain how organizational resources will be used to complete project activities. For National Technical Assistance, Training and Research and Evaluation projects, specify which positions will be charged to the federal and non-federal portion of the project budget. If project is construction ONLY, enter "Not Applicable."

**SECTION F - TO BE COMPLETED BY APPLICANTS
FOR PARTNERSHIP PLANNING ASSISTANCE ONLY**

1. Explain how the proposed scope of work will develop, implement, revise, or replace a Comprehensive Economic Development Strategy (CEDS) for the region and be part of a continuous planning process. The CEDS must comply with EDA's requirements. (See 13 C.F.R. § 303.7.)

2. Provide a list of the applicant's Strategy Committee members. The Strategy Committee must represent the main economic interests of the region and must include private sector representatives as a majority. In addition, the Committee should include public officials, community leaders, representatives of workforce development boards, institutions of higher education, minority and labor groups, and private individuals. A State or Indian tribal planning organization should contact the appropriate EDA Regional Office if it needs to vary the composition of its Committee. (See 13 C.F.R. §§ 303.2 and 303.6(a).)

3. Provide a list of the applicant's governing board members. Board membership must comply with EDA's regulations at 13 C.F.R. § 304.2(c)(2).

SECTION G - TO BE COMPLETED BY APPLICANTS FOR SHORT-TERM OR STATE PLANNING ASSISTANCE

1. Explain how the proposed scope of work will develop the economic development planning capacity of the State, local government, university, or non-profit organization to assist in institutional capacity building or to undertake innovative approaches to economic development in economically distressed regions. If a CEDS exists for the region in which the project will be located, explain how the proposed scope of work relates to the CEDS. (See 13 C.F.R. § 303.9.)

2. Explain how the proposed scope of work will function in conjunction with any other available federal, State, or local planning assistance.

3. Explain what performance measures will be used to evaluate the success of the project.

SECTION H - TO BE COMPLETED BY APPLICANTS FOR STATE PLANNING ASSISTANCE

1. Does a State CEDS already exist that satisfies EDA CEDS requirements?
(See 13 C.F.R. § 303.7.) ☐ Yes ☐ No
2. If **Yes**, please attach a copy of the CEDS. You may provide this using the 'Attachments' form that is part of the application package downloaded from www.Grants.gov or in hard copy.
If **No**, is the proposed project for the development of a CEDS?
☐ Yes ☐ No
3. If the proposed project is for the development of a CEDS, explain how the State CEDS will incorporate existing local CEDS, as well as input from other State agencies, local governments, and District Organizations.

SECTION I - TO BE COMPLETED BY APPLICANTS FOR LOCAL OR NATIONAL TECHNICAL ASSISTANCE ONLY

1. Describe how the proposed project will strengthen the capacity of local, State, or national organizations and institutions to undertake and promote effective economic development programs targeted to regions of economic distress.

2. Describe whether and how the proposed project will benefit distressed regions.

3. Describe any innovative approaches that will be used to stimulate economic development in distressed regions.

4. If applicable, describe how the proposed project is consistent with an EDA-approved CEDS for the region in which the project will be located. (See 13 C.F.R. § 306.2.)

SECTION J - TO BE COMPLETED BY APPLICANTS FOR UNIVERSITY CENTER PROGRAM ASSISTANCE ONLY

1. Explain how the proposed project will address the economic development needs, issues, and opportunities of the region and benefit distressed areas of the region.

2. Describe how the proposed project will provide services that are unique and maximize coordination with other organizations in the region.

3. Discuss how the proposed project activities are consistent with the expertise, programs, and other available resources of the sponsoring institution.

4. Describe the commitment and support (both financial and non-financial) for the proposed project by the sponsoring institution's senior level management.

5. Describe the sponsoring institution's past experience in administering technical assistance programs. (See 13 C.F.R. § 306.5.)

SECTION K - TO BE COMPLETED BY APPLICANTS FOR ECONOMIC ADJUSTMENT ASSISTANCE ONLY

Are you applying for a "Strategy Grant" under 13 C.F.R § 307.3. ?

☐ Yes

☐ No

1. Explain how the proposed project will assist in overcoming major obstacles already identified in a CEDS (or other strategic planning document), expand the capacity of public officials and economic development organizations to work effectively with employers, enable the region to plan and coordinate the use of available resources to support economic recovery and the development of a regional economy, and/or develop innovative approaches to economic revitalization in the region.

2. Explain how the proposed project will help the region meet a "Special Need".
(See 13 C.F.R. §§ 300.3 and 307.2(b).)

SECTION L - TO BE COMPLETED BY APPLICANTS FOR REVOLVING LOAN FUND (RLF) ASSISTANCE ONLY

1. Explain the need for a new or expanded public financing tool to enhance other business assistance programs and services targeting economic sectors described in the CEDS (or alternate EDA-approved plan or economic development strategy) for the region.

Note: A strategy other than a CEDS must be approved by EDA.

2. Explain the types of financing activities anticipated.

3. Describe the capacity of the RLF organization to manage lending activities, create networks between the business community and other financial providers, and implement the CEDS (or alternate EDA approved plan or strategy). (See 13 C.F.R. § 307.4 (c)(2)).

If EDA determines that your project merits further consideration, you will be asked to provide a Revolving Loan Fund Plan. This Plan must comply with EDA's RLF Plan requirements set forth in 13 C.F.R. § 307.9. Also, please note that you will be asked to provide a copy of the CEDS or alternate EDA-approved economic development plan or strategy for your region at a later date if your project is selected by EDA for further consideration.

SECTION M - TO BE COMPLETED BY CONSTRUCTION ASSISTANCE APPLICANTS ONLY

Are you applying for Construction Assistance?

☐ Yes

☐ No

M.1. Metropolitan Area Review

- a. Projects involving the development of hospitals, airports, libraries, water supply and distribution facilities, sewage and waste treatment works, highways, transportation facilities, water development, or land conservation within a metropolitan statistical area (MSA), require comments from the metropolitan area clearinghouse/agency. Does the proposed project involve any of the above identified developments within an MSA?

☐ Yes

☐ No

- b. If Yes, please indicate which of the following you will be able to provide:

- ☐ Comments from the responsible metropolitan area clearinghouse/agency and a statement that such comments have been considered; or
- ☐ An explanation as to why comments are not available; or
- ☐ A statement indicating the date the application was made available to the appropriate metropolitan area clearinghouse/agency and units of general local government for review and certifying that the application has been before the metropolitan area clearinghouse/agency for a period of 60 days without comments or recommendations.

M.2. District Organization Project Administration

Will the District Organization for the region in which the project will be located administer the project for the applicant?

☐ Yes

☐ No

If Yes, you must certify to all of the following and indicate your certification by checking each box.

- ☐ The administration of the project is beyond the capacity of the applicant's current staff and would require hiring additional staff or contracting for such services;
- ☐ No local organization/ business exists that could administer the project in a more efficient or cost-effective manner than the District Organization; and
- ☐ The District Organization will administer the project without subcontracting the work.

If the project will be administered by the District Organization and you did not certify to all of the above, explain below.

M.3. Engineering Report

An engineering report must be submitted if EDA selects the project for further consideration and must include (at a minimum) the following information:

1. A statement of project components. Indicate if the proposed project involves the construction of a new facility or facilities or the enlargement, expansion, renovation, or replacement of an existing facility or facilities. Describe the existing facility and proposed project components in terms of dimensions, capacities, quantities, etc.
2. Clear copies of sketches or schematics showing the general layout and location of the project components.
3. A feasibility analysis. Include a review of existing conditions. Discuss any potential problems that might delay construction and affect project components.
4. A proposed method of construction. Indicate whether the project will be constructed by competitive bid, single contract, or multiple contracts. Indicate if any portion of the construction work is proposed to be done by design/build, construction management at risk, or by the applicant's own forces.
5. An estimate of useful life of the facility and an explanation of basis on which it is determined.
6. A current detailed construction cost estimate for each of project component, showing quantities, unit prices, and total costs.
7. A list of all permits required for the proposed project and the status of each permit.
8. An estimate of the number of months for each of the following: (i) design period, (ii) solicitation of bids and awarding of contracts, and (iii) construction period.

Will you be able to provide this information? ☐ Yes ☐ No (explain below)

Note: If this information is available at this time, you may submit it as an electronic attachment through www.Grant.gov or in hardcopy.

M.4. Title Requirements

- a. Does the applicant currently hold title to all project facilities, underlying land, necessary easements, and rights-of-way required for the project?

☐ Yes (go to question M.4.d) ☐ No (explain below)

- b. If **No**, does the applicant plan to obtain title?

☐ Yes

How and when will the applicant obtain title? (After answering this, go to question M.4(d))

☐ No

Please explain why, no (and answer question M.4(c))

- c. If you indicated that the applicant does not currently have title and does not intend to obtain title, does the applicant hold a long-term lease or hold interest in project property for a period not less than the estimated useful life of the project?

☐ Yes

☐ No

If No, Please explain below why EDA should not require the applicant to have title to or a long-term leasehold interest in the property.

- d. Describe any required State permits, easements, rights-of-way or leases necessary to construct, operate, and maintain the project.

- e. Describe any liens, mortgages, other encumbrances, reservations, reversionary interests or other restrictions on the applicant's interest in the property.

- f. Is the project located on a military or Department of Energy installation that is closed or scheduled for closure or realignment?

☐ Yes

☐ No

- g. Does the project involve construction within a railroad's right-of-way or over a railroad crossing?

☐ Yes (explain below)

☐ No

- h. Does the project include construction of a highway owned by a State or local government (other than the applicant)?

☐ Yes (explain below)

☐ No

M.5. Sale or Lease

- a. Does the applicant intend to sell, lease, transfer, dedicate or otherwise convey any interest in the project facilities, underlying land, or any land improved with EDA investment assistance?

☐ Yes (explain below)

☐ No

- b. Is the purpose of the project to construct facilities to serve industrial or commercial parks or sites owned by the applicant for sale or lease to private parties?

☐ Yes

☐ No

If Yes, identify the owners of the acreage, provide an estimate of the number of acres benefiting from the proposed investment and explain how EDA's requirements will continue to be met after any sale or lease.

Note: If EDA determines the project merits further consideration, the applicant will be asked to provide documentation that EDA's requirements will continue to be met after the sale or lease.

- c. Is the purpose of the project to construct facilities to serve privately-owned industrial or commercial parks or sites for sale or lease?

☐ Yes

☐ No

If Yes, identify the owners of the acreage, provide an estimate of the number of acres benefiting from the proposed investment, and explain below how EDA's requirements will continue to be met after the sale or lease. Note that EDA may require evidence that the private party has title to the park or site prior to such sale or lease and condition the award of investment assistance upon assurances given by the private party that EDA determines are necessary to ensure consistency with the project purpose(s). (See 13 C.F.R. § 314.7.)

- d. For privately-owned land, is the private owner willing to enter into an agreement to limit the sale price of the improved land to its fair market value before the improvements for a reasonable period of time?

☐ Yes (explain below)

☐ No

☐ Not applicable (no private owners)

- e. Is the purpose of the project to construct, renovate or purchase a building?

☐ Yes (explain below)

☐ No (go to M.6)

- f. Will the building be leased in whole or in part?

☐ Yes (explain below)

☐ No

- g. Is the purpose of the building to provide incubator space to new companies?

☐ Yes (explain below)

☐ No

7. Will there be limitations on the length of the lease term?

☐ Yes (explain below) ☐ No

8. Is the purpose of the project to provide building space to a single user or multiple users? In either case, explain below the terms of the proposed lease.

M.6 Ownership, Operation, Maintenance and Management

a. Briefly describe plans for the ownership, operation, maintenance and management of all project facilities, including any land, improved land, structures, appurtenances thereto, other improvements, or personal property.

Note: You will be asked to provide a legal opinion verifying your answers to these questions if EDA selects the project for further consideration.

b. Will real property or project facilities to be acquired or improved with EDA investment assistance be owned, operated, or maintained by an entity other than the applicant? (See 13 C.F.R. § 314.7.)

☐ Yes (explain below) ☐ No

c. Will real property or project facilities to be acquired or improved with EDA investment assistance, including any industrial or commercial park acreage, be mortgaged or used to collateralize any type of financing, including but not limited to bonds or tax credits, or is any real property to be used for the project currently mortgaged or being used as collateral?

☐ Yes (explain below) ☐ No

d. Will the applicant provide EDA a security interest or other statement of EDA's interest in the real property or in significant items of tangible personal property acquired or improved with EDA investment assistance? (See 13 C.F.R. §§ 314.8 and 314.9.)

☐ Yes ☐ No (explain below)

e. Is (or was) any real property to be acquired or improved with the proposed EDA investment assistance subject to eminent domain proceedings or the threat of such proceedings?

☐ Yes (explain below) ☐ No

Does the project include the acquisition or improvement of significant items of tangible personal property (i.e., items that are moveable and not permanently attached to the land, such as business equipment, furniture or vehicles)?

☐ Yes (explain below) ☐ No

M.7. Calculation of Estimated Relocation and Land Acquisition Expenses

All applicants must complete the "Calculation of Estimated Relocation and Land Acquisition Expenses" form (see Exhibit E), and enter the estimated total for "costs incidental to land acquisition" (line item 1) on line item 3 ("relocation expenses and payments") of Form SF-424C, 'Budget Information - Construction Programs.' This is separate from the estimated purchase price of the property.

a. Are relocation expenses part of the proposed project's EDA budget?

☐ Yes ☐ No

b. Will the proposed project cause the displacement of individuals, families, businesses or farms?

☐ Yes ☐ No

If Yes, explain how relocation procedures will comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1990 (13 C.F.R. § 302.5 ; see Certification #11 on Form SF-424D, 'Assurances - Construction Programs, for an explanation of this requirement.)

M.8. Environmental Requirements

a. Provide a brief physical description of the project site, noting topography, vegetation, bodies of water, and location and condition of any man-made structures or buildings. If available, provide a Geographic Information System (GIS) analysis of the sensitive environmental areas, including contaminated sites, archeological sites, properties or sites listed on the National Register of Historic Places, and wetlands that are within a two-mile radius of the project site.

b. Will the project be located in or adjacent to a floodplain or wetland area?

☐ Yes (explain)
☐ No

c. Will the project be located in or adjacent to an area with known hazardous or toxic contamination?

☐ Yes (explain)
☐ No

d. Will there be any toxic or hazardous waste or asbestos removal associated with the project?

☐ Yes (explain)
☐ No

- e. Will the project impact any archeological sites, buildings or structures older than 50 years or any properties listed or eligible for listing on the National Register of Historic Places?

☐ Yes (explain)

☐ No

Note: If EDA determines that the applicant's project merits further consideration, the applicant will be required to submit materials to the appropriate State Historic Preservation Officer (SHPO).

Regardless of whether the applicant believes historic or archaeological artifacts are present, the applicant will be required to provide the SHPO with: (i) a narrative description of the project's elements and its location; (ii) a map of the area surrounding the project that identifies the project site, adjacent streets, and other identifiable objects; (iii) line drawings or sketches of the project; and (iv) photographs of the affected properties if building demolition or renovation is involved.

Please note that the clearance process can be lengthy. When submitting this material to the SHPO, the applicant must request that the SHPO submit comments on the proposed project to the EDA Regional Office processing the application. If the applicant has already received comments from the SHPO, please provide as an electronic attachment (using the 'Attachments' form that is part of the application package downloaded from www.Grants.gov) or in hardcopy.

- f. Will this project result in any other adverse environmental impacts that could affect endangered or threatened species, scenic rivers, or other sensitive ecological habitats?

☐ Yes (explain)

☐ No

- g. Has an environmental impact statement or other similar analysis been completed for this proposed project or for other activities in the region?

☐ Yes (explain)

☐ No (explain)

Federal agencies are required by law to assess the expected environmental impacts associated with proposed federal actions.

IF EDA SELECTS THE PROJECT FOR FURTHER CONSIDERATION, EDA may request additional information to obtain an understanding of the current environmental conditions and the project elements that will affect the environment.

It is important to understand the comprehensive nature of the information required to complete an environmental review in accordance with the National Environmental Policy Act (NEPA). Information must be provided for the: (i) site(s) where the proposed project facilities will be constructed and the surrounding areas affected by its operation; and (ii) areas to be affected by any primary beneficiaries of the project. The information submitted must be sufficient to evaluate all reasonable alternatives to the proposed project and the direct and indirect environmental impacts of the project, as well as the cumulative impacts on the environment as defined in the regulations for implementing the procedural provisions of NEPA (see 40 C.F.R. parts 1500-1508). The level of detail should be commensurate with the complexity and size of the project and the magnitude of the expected impact. Previously completed environmental impact documentation (assessments, impact statements, etc.) for activities in the region in which the proposed project will be located may be used as documentation.

- h. Will you be able to provide the above information? ☐ Yes ☐ No (explain)

NOTE: If EDA selects the project for further consideration, the template for the environmental narrative that the applicant will be required to submit is available at the 'Funding Opportunities' portion of www.eda.gov. If you currently have this information, you may submit it as an electronic attachment (using the 'Attachments' form that is part of the application package downloaded from www.Grants.gov) or in hardcopy.

SECTION N - TO BE COMPLETED BY APPLICANTS FOR DESIGN AND ENGINEERING ASSISTANCE ONLY

Is the primary purpose of the EDA investment to accomplish only the design and engineering work required? ☐ Yes ☐ No

When the primary purpose of the EDA investment is to accomplish only the design and engineering work required for the construction of a complex or environmentally sensitive public works or development facility project, the following information must be provided. Note: EDA will award grants for design and engineering work only when there is a reasonable expectation that construction of the project can and will begin soon after the completion of design and engineering. EDA's funding of the project for design and engineering work does not in any way obligate EDA to fund construction of the project. (See 13 C.F.R. § 305.4.)

1. Provide a description of the components of the project for which the design and engineering work will be accomplished. Also, please describe any known environmental issues related to the site and/or project, including floodplains, wetlands, contamination, asbestos, endangered species, and/or archeological/historic sites.

2. Explain the reasons why such work needs to be accomplished separately from the project's construction phase. For example, describe the highly specialized features or complex or environmentally-sensitive nature of the project such that design and engineering work must be completed to determine the project's feasibility or to ensure that all required permits and approvals by State or federal regulatory authorities (e.g., the Environmental Protection Agency) can be obtained in the most effective and efficient manner possible.

3. Provide a statement regarding the proposed method of financing and funding sources that will be used to finance the construction of the project upon completion of the design and engineering work, including commitments made, if any, for the project's permanent financing and the likelihood that EDA or another federal assistance agency will be requested to provide funds for the construction of the project. Note: EDA cannot make a commitment against a future fiscal year's appropriation.

4. Provide an estimate of how many months will be required after the design and engineering work is completed for the project's construction phase to begin. Note: Even if the proposed project can be constructed in phases, the design and engineering work must be completed before construction can begin.

ASSURANCES OF COMPLIANCE
With Civil Rights and Other Legal Requirements
(To Be Executed by "Other Parties")

"Other Party" is herein defined as an entity that creates and/or saves (or intends to create and/or save) 15 or more permanent jobs as a result of the Economic Development Assistance (EDA) investment assistance, provided that such entity is also either specifically named in the application as benefiting from the project or is or will be located in a building, port, facility, or industrial, commercial, or business park constructed or improved in whole or in part with EDA investment assistance prior to EDA's final disbursement of funds. See 13 C.F.R. § 302.20.

Applicant's Name:

"Other Party" Name:

Address:

Street 1:

Street 2:

City:

County:

State:

Province:

Country:

Zip/Postal
Code:

Phone
Number:

The obligations incurred under this form apply only to the building, port, facility, or industrial, commercial or business park constructed or improved in whole or in part with investment assistance from the EDA. This form must be executed by an "Other Party" who satisfies the following conditions:

- ☐ The "Other Party" will (or intends to) create and/or save fifteen (15) or more permanent jobs (estimated number of jobs) as a result of the EDA investment assistance; and
(check applicable section below)
- ☐ (a) is specifically named in the application for EDA investment assistance as benefiting from the project; or
- ☐ (b) is or will be located in a building, port, facility, or industrial, commercial or business park constructed or improved in whole or in part with EDA investment assistance before EDA has made its final disbursement of EDA funds.

ASSURANCES OF COMPLIANCE WITH THE U.S. DEPARTMENT OF COMMERCE AND EDA REGULATIONS (13 C.F.R. § 302.20) UNDER SECTION 601 OF TITLE VI OF THE CIVIL RIGHTS ACT OF 1964, SECTION 112 OF PUBLIC LAW 92-65, TITLE IX OF THE EDUCATION AMENDMENTS OF 1972, SECTION 504 OF THE REHABILITATION ACT OF 1973, AND THE AGE DISCRIMINATION ACT OF 1975, ALL AS AMENDED.

The "Other Party" assures that it will comply with Section 601 of Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and the U.S. Department of Commerce's implementing regulations found at 15 C.F.R. part 8, and any amendments thereto.

The "Other Party" agrees to comply with the provisions of Section 112 of Public Law 92-65 (42 U.S.C. 3123) and 42 U.S.C. 6709, and the U.S. Department of Commerce's implementing regulations found at 15 C.F.R. §§ 8.7-8.15, and any amendments thereto.

The "Other Party" agrees to comply with Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794) and the U.S. Department of Commerce's implementing regulations found at 15 C.F.R. part 8b; Title IX of the Education Amendments of 1972 (20 U.S.C. 1681 et seq.); the Age Discrimination Act of 1975 (42 U.S.C. 6101 et seq.) and the U.S. Department of Commerce's implementing regulations found at 15 C.F.R. part 20, and the non-discrimination on the basis of age regulations found at 45 C.F.R. part 90.

Such requirements hold that no person in the United States shall on the ground of race, color, national origin, sex, handicap, or age be excluded from participation in, denied the benefits of, or otherwise subjected to discrimination under any program or activity for which federal financial assistance has been extended.

In accordance with these assurances and without limiting the above, the "Other Party" agrees that these assurances shall be binding upon it and any grantees, assignees, transferees, lessees, and successors in interest. These assurances shall also be binding through any modification or amendment to the financial assistance award or to the project.

The "Other Party" acknowledges that it is aware that if there appears to be a failure or threatened failure to comply with these assurances and the noncompliance or threatened noncompliance cannot be corrected by informal means, compliance may be effected by the suspension or termination of, or refusal to grant or to continue, federal financial assistance or by any other means authorized by law.

NOTICE

This form must be executed by an official authorized to make the aforementioned assurances, with full authority to bind the "Other Party" identified herein. If the "Other Party" is a corporation, this form must be executed by a corporate officer or person so authorized to make such assurances, and the title block must clearly indicate such authority. Assurance forms executed by employees other than corporate officers will not be accepted unless they are accompanied by a separate certification signed by a corporate officer or corporate counsel stating that the assessor has full authority to legally bind the "Other Party" identified below. In the case of an individual executing this assurance form as a sole owner, the sole owner's title must be indicated. For circumstances other than those discussed herein, contact the EDA Regional Office for instructions.

ACCEPTANCE OF ASSURANCES OF COMPLIANCE

These assurances are made binding for:

Name of "Other Party":

Address:

Street 1:

Street 2:

City:

County:

State:

Province:

Country:

Zip/Postal
Code:

Telephone
Number:

By:

Prefix:

First Name:

Middle Name:

Last Name:

Suffix:

*(Title of Corporate Officer)

(Signature of Official)

(Date)

* If the person signing this form is not a corporate officer, the company's corporate officer or corporate counsel must certify in writing that the signatory is authorized to legally bind the company. Such written certification should be included as an electronic signature through www.Grants.gov or in hardcopy.

--WARNING--

False statements or representations made in connection with the "ASSURANCES OF COMPLIANCE" are a violation of federal law punishable by a fine of not more than \$10,000 or by imprisonment for not more than five years, or both (see 42 U.S.C. 3220-18 U.S.C. 1001).

EDA NATIONAL TECHNICAL ASSISTANCE TRAINING AND RESEARCH AND EVALUATION INVESTMENTS ADDITIONAL ASSURANCES

As a duly authorized representative of the applicant, I further certify that the applicant:

1. Will comply with applicable regulations regarding indirect cost rates, if indirect costs are included in the application.
2. Will comply with the requirement that this investment assistance will not provide a proprietary benefit to a private individual, for-profit corporation, or other commercial entity.
3. Understands that attorneys' or consultants' fees, whether direct or indirect, expended for securing or obtaining EDA investment assistance are not eligible costs. See 13 C.F.R. § 302.10(a).
4. Understands that conflicts of interest or appearances of conflicts of interest are prohibited and may jeopardize this application or result in the forfeiture of investment funds. A conflict of interest occurs, for example, where a representative, official, employee, architect, attorney, engineer, or inspector of the applicant, or a representative or official of the federal, State or local government, has a direct or indirect financial interest in the acquisition or furnishing of any materials, equipment, or services to or in connection with the project. See 13 C.F.R. § 302.17.
5. Will comply with the reporting requirements under the Government Performance and Results Act (GPRA) of 1993 for measuring and reporting project performance.

Completed by Grants.gov upon submission

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL

TITLE

Completed by Grants.gov upon submission

APPLICANT ORGANIZATION

DATE



EDA CAPACITY BUILDING INVESTMENTS ADDITIONAL ASSURANCES

As a duly authorized representative of the applicant, I further certify that the applicant:

1. Will comply with applicable regulations regarding indirect cost rates, if indirect costs are included in the application.
2. Will comply with the requirement that this investment assistance will not provide a proprietary benefit to a private individual, a for-profit corporation or other commercial entity.
3. Understands that attorneys' or consultants' fees, whether direct or indirect, expended for securing or obtaining EDA investment assistance are not eligible costs. See 13 C.F.R. § 302.10(a).
4. Understands that conflicts of interest or appearances of conflicts of interest are prohibited and may jeopardize this application, or result in the forfeiture of investment funds. A conflict of interest occurs, for example, where a representative, official, employee, architect, attorney, engineer or inspector of the applicant, or a representative or official of the federal, State or local government, has a direct or indirect financial interest in the acquisition or furnishing of any materials, equipment, or services to or in connection with the project. See 13 C.F.R. § 302.17.
5. Will comply with the reporting requirements under the Government Performance and Results Act (GPRA) of 1993 for measuring and reporting project performance.

Completed by Grants.gov upon submission

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL

TITLE

Completed by Grants.gov upon submission

APPLICANT ORGANIZATION

DATE

EDA CONSTRUCTION INVESTMENTS ADDITIONAL ASSURANCES

As a duly authorized representative of the applicant, I further certify that the applicant:

1. Will operate and maintain the facility in accordance with at least the minimum standards as may be required or prescribed by applicable federal, State and local agencies for the maintenance and operation of such facilities.
2. Will require the facility to be designed to comply with the Americans with Disabilities Act of 1990 (ADA) (42 U.S.C. 12101 *et seq.*), the Architectural Barriers Act of 1968 (42 U.S.C. 4151 *et seq.*) and the Accessibility Guidelines for Buildings and Facilities regulations, as amended (36 CFR part 1191), and will be responsible for conducting inspections to insure compliance with these requirements.
3. For the two-year period beginning on the date EDA investment assistance is awarded, will refrain from employing, offering any office or employment to, or retaining for professional services any person who, on the date on which the investment assistance is awarded or within the one-year (1) period ending on that date, served as an officer, attorney, agent or employee of the Department of Commerce and occupied a position or engaged in activities that EDA determines involved discretion with respect to the award of investment assistance under PWEDA. See section 606 of PWEDA and 13 C.F.R. §302.10(b).
4. Will have no facilities under ownership, lease or supervision to be utilized in this project that are listed or under consideration for listing on EPA's List of Violating Facilities.
5. Will comply with Executive Order 12699, "Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction," which imposes requirements that federally-assisted facilities be designed and constructed in accordance with the most current local building codes determined by the awarding agency or by the Interagency Committee for Seismic Safety in Construction (ICSSC) and the most recent edition of the American National Standards Institute Standards A58, Minimum Design Loads for Buildings and Other Structures.
6. Will observe and comply with federal procurement rules, as set forth in 15 CFR parts 14 or 24, as applicable, for award of any contracts for architectural engineering, grant administration services, or construction financed with EDA investment assistance.
7. Understands that attorneys' or consultants' fees, whether direct or indirect, expended for securing or obtaining EDA investment assistance are not eligible costs. See 13 C.F.R. § 302.10(a).
8. Understands that conflicts of interest or appearances of conflicts of interest are prohibited and may jeopardize this application, or result in the forfeiture of investment funds. A conflict of interest occurs, for example, where a representative, official, employee, architect, attorney, engineer or inspector of the applicant, or a representative or official of the Federal, State or local government, has a direct or indirect financial interest in the acquisition or furnishing of any materials, equipment or services to or in connection with the project. See 13 C.F.R. § 302.17.
9. Will comply with the reporting requirements under the Government Performance and Results Act of 1993 (GPRA) for measuring and reporting project performance.

Completed by Grants.gov upon submission

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL

TITLE

Completed by Grants.gov upon submission

APPLICANT ORGANIZATION

DATE

**CALCULATION OF ESTIMATED RELOCATION
AND LAND ACQUISITION EXPENSES**

Are you applying for Construction Assistance?

<input type="checkbox"/> Yes	<input type="checkbox"/> No
------------------------------	-----------------------------

ITEM 1. COSTS INCIDENTAL TO LAND ACQUISITION - ESTIMATES

Number of land transactions involved (including options, easements and rights-of-way):

Recording fees, transfer taxes, surveys, appraisals, title
search and similar expenses-Section 303(1)

Penalty costs-Section 303(2)

Real Property taxes-Section 303(3)

Litigation expenses-Section 304(a)

Total - Estimated costs incidental to transfer of title

ITEM 2. RELOCATION - ESTIMATES

a. TENANTS - Estimates: Number of Claims

(1) Moving Expenses:

Actual Expenses-Section 202(a)(1)

In lieu payments-Section 202(b)

Total - Moving Expenses

(2) Replacement housing payments:

Rental payments-Section 204(1)

Down payment-Section 204(2)

Total - Replacement housing payments

Total - Estimated Tenants

b. OWNER-OCCUPANTS - Estimates: Number of Claims

(1) Moving expenses:

Actual Expenses-Section 202(a)(1)

In lieu payments-Section 202(b)

Total - Moving Expenses

(2) Replacement housing payments:

Purchase payments-Section 203(a)(1)

Reasonable replacement costs-Section 203(a)(1)(A)

Increased interest costs-Section 203(a)(1)(B)

Closing costs-Section 203(a)(1)(C)

Rental payments-Section 204(1)

Down payment-Section 204(2)

Total - Replacement housing payments

Total - Estimated Owner-Occupants

Moving Expenses:

Actual Expenses-Section 202(a)(1)

Actual loss of tangible personal property-Section 202(a)(2)

Actual searching expenses-Section 202(a)(3)

In lieu payments-Section 202(c)

Total - Estimated Business

d. NONPROFIT ORGANIZATIONS - Estimates: Number of Claims

Moving Expenses:

Actual Expenses-Section 202(a)(1)

Actual loss of tangible personal property-Section 202(a)(2)

Actual searching expenses-Section 202(a)(3)

In lieu payments-Section 202(c)

Total - Estimated Nonprofit Organizations

e. FARM OPERATIONS - Estimates: Number of Claims

Moving Expenses:

Actual Expenses-Section 202(a)(1)

Actual loss of tangible personal property-Section 202(a)(2)

Actual searching expenses-Section 202(a)(3)

In lieu payments-Section 202(c)

Total - Estimated Farm Operations

f. ADVISORY SERVICES - Estimates: Number of Claims

Total - Expenses of grantee/borrower-Section 205

g. ADMINISTRATION - Estimates: Number of Claims

Contracting with individual, firm, association, or corporation-
Section 212

Agreement w/ Federal or State government agency or
instrumentality- Section 212

Total - Estimated Administration

ITEM 3. GRAND TOTAL

Enter the sum of Items 1 and 2 (parts (a) through (g)) in this Item

GRAND TOTAL RELOCATION EXPENSES

Application for Federal Assistance SF-424

Version

* 1. Type of Submission:

- ☐ Preapplication
☐ Application
☐ Changed/Corrected Application

* 2. Type of Application:

- ☐ New
☐ Continuation
☐ Revision

* If Revision, select appropriate letter(s):

* Other (Specify)

* 3. Date Received:

Completed by Grants.gov upon submission.

4. Applicant Identifier:

5a. Federal Entity Identifier:

* 5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name:

* b. Employer/Taxpayer Identification Number (EIN/TIN):

* c. Organizational DUNS:

d. Address:

* Street1:

Street2:

* City:

County:

* State:

Province:

* Country:

USA: UNITED STATES

* Zip / Postal Code:

e. Organizational Unit:

Department Name:

Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:

* First Name:

Middle Name:

* Last Name:

Suffix:

Title:

Organizational Affiliation:

* Telephone Number:

Fax Number:

* Email:

Application for Federal Assistance SF-424

Version 02

9. Type of Applicant 1: Select Applicant Type:

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

* 10. Name of Federal Agency:

Economic Development Administration

11. Catalog of Federal Domestic Assistance Number:

11.300

CFDA Title:

Investments for Public Works and Economic Development Facilities

* 12. Funding Opportunity Number:

FY2012EDAP111811

* Title:

FY 2012 Public Works and Economic Adjustment Assistance Programs Opportunity

13. Competition Identification Number:

1

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

* 15. Descriptive Title of Applicant's Project:

Attach supporting documents as specified in agency instructions.

Add Attachments

Delete Attachments

View Attachments

Application for Federal Assistance SF-424

Version 02

16. Congressional Districts Of:

* a. Applicant:

* b. Program/Project:

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment

Delete Attachment

View Attachment

17. Proposed Project:

* a. Start Date:

* b. End Date:

18. Estimated Funding (\$):

* a. Federal

* b. Applicant

* c. State

* d. Local

* e. Other

* f. Program Income

* g. TOTAL

* 19. Is Application Subject to Review By State Under Executive Order 12372 Process?

- ☐ a. This application was made available to the State under the Executive Order 12372 Process for review on
- ☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.
- ☐ c. Program is not covered by E.O. 12372.

* 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes", provide explanation.)

☐ Yes

☐ No

Explanation:

21. *By signing this application, I certify (1) to the statements contained in the list of certifications** and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)

☐ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix:

* First Name:

Middle Name:

* Last Name:

Suffix:

* Title:

* Telephone Number:

Fax Number:

* Email:

* Signature of Authorized Representative:

Completed by Grants.gov upon submission.

* Date Signed:

Completed by Grants.gov upon submission.

Authorized for Local Reproduction

Standard Form 424 (Revised 10/2005)
Prescribed by OMB Circular A-102

Application for Federal Assistance SF-424

Version 02

*** Applicant Federal Debt Delinquency Explanation**

The following field should contain an explanation if the Applicant organization is delinquent on any Federal Debt. Maximum number of characters that can be entered is 4,000. Try and avoid extra spaces and carriage returns to maximize the availability of space.

CERTIFICATION REGARDING LOBBYING

Applicants should also review the instructions for certification included in the regulations before completing this form. Signature on this form provides for compliance with certification requirements under 15 CFR Part 28, 'New Restrictions on Lobbying.' The certifications shall be treated as a material representation of fact upon which reliance will be placed when the Department of Commerce determines to award the covered transaction, grant, or cooperative agreement.

LOBBYING

As required by Section 1352, Title 31 of the U.S. Code, and implemented at 15 CFR Part 28, for persons entering into a grant, cooperative agreement or contract over \$100,000 or a loan or loan guarantee over \$150,000 as defined at 15 CFR Part 28, Sections 28.105 and 28.110, the applicant certifies that to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, 'Disclosure Form to Report Lobbying,' in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

Statement for Loan Guarantees and Loan insurance

The undersigned states, to the best of his or her knowledge and belief, that:

In any funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this commitment providing for the United States to insure or guarantee a loan, the undersigned shall complete and submit Standard Form-LLL, 'Disclosure Form to Report Lobbying,' in accordance with its instructions.

Submission of this statement is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required statement shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure occurring on or before October 23, 1996, and of not less than \$11,000 and not more than \$110,000 for each such failure occurring after October 23, 1996.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure occurring on or before October 23, 1996, and of not less than \$11,000 and not more than \$110,000 for each such failure occurring after October 23, 1996.

As the duly authorized representative of the applicant, I hereby certify that the applicant will comply with the above applicable certification.

* NAME OF APPLICANT			
<div></div>			
* AWARD NUMBER		* PROJECT NAME	
<div></div>		<div></div>	
Prefix:	* First Name:	Middle Name:	
<div></div>	<div></div>	<div></div>	
* Last Name:		Suffix:	
<div></div>		<div></div>	
* Title:			
<div></div>			
* SIGNATURE:		* DATE:	
<div></div>		<div></div>	
Completed by Grants.gov upon submission.		Completed by Grants.gov upon submission.	

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0042), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the Awarding Agency. Further, certain Federal assistance awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance, and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project costs) to ensure proper planning, management and completion of project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will not dispose of, modify the use of, or change the terms of the real property title or other interest in the site and facilities without permission and instructions from the awarding agency. Will record the Federal awarding agency directives and will include a covenant in the title of real property acquired in whole or in part with Federal assistance funds to assure non-discrimination during the useful life of the project.
4. Will comply with the requirements of the assistance awarding agency with regard to the drafting, review and approval of construction plans and specifications.
5. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms with the approved plans and specifications and will furnish progressive reports and such other information as may be required by the assistance awarding agency or State.
6. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
7. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
8. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards of merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
9. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
10. Will comply with all Federal statutes relating to non-discrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681 1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal and federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

12. Will comply with the provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.
13. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333) regarding labor standards for federally-assisted construction subagreements.
14. Will comply with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
15. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the

National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).

16. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
17. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).
18. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
19. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

* SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	* TITLE
* APPLICANT ORGANIZATION	* DATE SUBMITTED
	Completed on submission to Grants.gov

SF-424D (Rev. 7-97) Back

BUDGET INFORMATION - Construction Programs

NOTE: Certain Federal assistance programs require additional computations to arrive at the Federal share of project costs eligible for participation. If such is the case, you will be notified.

COST CLASSIFICATION	a. Total Cost	b. Costs Not Allowable for Participation	c. Total Allowable Costs (Columns a-b)
1. Administrative and legal expenses	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/> 0.00
2. Land, structures, rights-of-way, appraisals, etc.	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/> 0.00
3. Relocation expenses and payments	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/> 0.00
4. Architectural and engineering fees	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/> 0.00
5. Other architectural and engineering fees	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/> 0.00
6. Project inspection fees	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/> 0.00
7. Site work	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/> 0.00
8. Demolition and removal	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/> 0.00
9. Construction	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/> 0.00
10. Equipment	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/> 0.00
11. Miscellaneous	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/> 0.00
12. SUBTOTAL (sum of lines 1-11)	\$ <input type="text"/> 0.00	\$ <input type="text"/> 0.00	\$ <input type="text"/> 0.00
13. Contingencies	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/> 0.00
14. SUBTOTAL	\$ <input type="text"/> 0.00	\$ <input type="text"/> 0.00	\$ <input type="text"/> 0.00
15. Project (program) income	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/> 0.00
16. TOTAL PROJECT COSTS (subtract #15 from #14)	\$ <input type="text"/> 0.00	\$ <input type="text"/> 0.00	\$ <input type="text"/> 0.00
FEDERAL FUNDING			
17. Federal assistance requested, calculate as follows: (Consult Federal agency for Federal percentage share.) Enter the resulting Federal share.	Enter eligible costs from line 16c Multiply X <input type="text"/> %		\$ <input type="text"/> 0.00

Previous Edition Usable

Authorized for Local Reproduction

Standard Form 424C (Rev. 7-97)
Prescribed by OMB Circular A-102

ASSURANCES OF COMPLIANCE
With Civil Rights and Other Legal Requirements
(To Be Executed by "Other Parties")

"Other Party" is herein defined as an entity that creates and/or saves (or intends to create and/or save) 15 or more permanent jobs as a result of the Economic Development Assistance (EDA) investment assistance, provided that such entity is also either specifically named in the application as benefiting from the project or is or will be located in a building, port, facility, or industrial, commercial, or business park constructed or improved in whole or in part with EDA investment assistance prior to EDA's final disbursement of funds. See 15 C.F.R. § 302.20.

Applicant's Name:

"Other Party" Name:

Address:

Street 1:

Street 2:

City:

County:

State:

Province:

Country:

Zip/Postal
Code:

Phone

Number:

The obligations incurred under this form apply only to the building, port, facility, or industrial, commercial or business park constructed or improved in whole or in part with investment assistance from the EDA. This form must be executed by an "Other Party" who satisfies the following conditions:

☐ The "Other Party" will (or intends to) create and/or save fifteen (15) or more permanent jobs (estimated number of jobs) as a result of the EDA investment assistance; and
(check applicable section below)

☐ (a) is specifically named in the application for EDA investment assistance as benefiting from the project; or

☐ (b) is or will be located in a building, port, facility, or industrial, commercial or business park constructed or improved in whole or in part with EDA investment assistance before EDA has made its final disbursement of EDA funds.

ASSURANCES OF COMPLIANCE WITH THE U.S. DEPARTMENT OF COMMERCE AND EDA REGULATIONS (15 C.F.R. § 302.20) UNDER SECTION 601 OF TITLE VI OF THE CIVIL RIGHTS ACT OF 1964, SECTION 112 OF PUBLIC LAW 92-65, TITLE IX OF THE EDUCATION AMENDMENTS OF 1972, SECTION 504 OF THE REHABILITATION ACT OF 1973, AND THE AGE DISCRIMINATION ACT OF 1975, ALL AS AMENDED.

The "Other Party" assures that it will comply with Section 601 of Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and the U.S. Department of Commerce's implementing regulations found at 15 C.F.R. part 8, and any amendments thereto.

The "Other Party" agrees to comply with the provisions of Section 112 of Public Law 92-65 (42 U.S.C. 3123) and 42 U.S.C. 6709, and the U.S. Department of Commerce's implementing regulations found at 15 C.F.R. §§ 8.7-8.15, and any amendments thereto.

The "Other Party" agrees to comply with Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794) and the U.S. Department of Commerce's implementing regulations found at 15 C.F.R. part 8b; Title IX of the Education Amendments of 1972 (20 U.S.C. 1681 et seq.); the Age Discrimination Act of 1975 (42 U.S.C. 6101 et seq.) and the U.S. Department of Commerce's implementing regulations found at 15 C.F.R. part 20, and the non-discrimination on the basis of age regulations found at 45 C.F.R. part 90.

Such requirements hold that no person in the United States shall on the ground of race, color, national origin, sex, handicap, or age be excluded from participation in, denied the benefits of, or otherwise subjected to discrimination under any program or activity for which federal financial assistance has been extended.

In accordance with these assurances and without limiting the above, the "Other Party" agrees that these assurances shall be binding upon it and any grantees, assignees, transferees, lessees, and successors in interest. These assurances shall also be binding through any modification or amendment to the financial assistance award or to the project.

The "Other Party" acknowledges that it is aware that if there appears to be a failure or threatened failure to comply with these assurances and the noncompliance or threatened noncompliance cannot be corrected by informal means, compliance may be effected by the suspension or termination of, or refusal to grant or to continue, federal financial assistance or by any other means authorized by law.

NOTICE

This form must be executed by an official authorized to make the aforementioned assurances, with full authority to bind the "Other Party" identified herein. If the "Other Party" is a corporation, this form must be executed by a corporate officer or person so authorized to make such assurances, and the title block must clearly indicate such authority. Assurance forms executed by employees other than corporate officers will not be accepted unless they are accompanied by a separate certification signed by a corporate officer or corporate counsel stating that the assessor has full authority to legally bind the "Other Party" identified below. In the case of an individual executing this assurance form as a sole owner, the sole owner's title must be indicated. For circumstances other than those discussed herein, contact the EDA Regional Office for instructions.

ACCEPTANCE OF ASSURANCES OF COMPLIANCE

These assurances are made binding for:

Name of "Other Party":

Address:

Street 1:

Street 2:

City:

County:

State:

Province:

Country:

Zip/Postal
Code:

Telephone
Number:

By:

Prefix:

First Name:

Middle Name:

Last Name:

Suffix:

*(Title of Corporate Officer)

(Signature of Official)

(Date)

* If the person signing this form is not a corporate officer, the company's corporate officer or corporate counsel must certify in writing that the signatory is authorized to legally bind the company. Such written certification should be included as an electronic signature through www.Grants.gov or in hardcopy.

--WARNING--

False statements or representations made in connection with the "ASSURANCES OF COMPLIANCE" are a violation of federal law punishable by a fine of not more than \$10,000 or by imprisonment for not more than five years, or both (see 42 U.S.C. 3220; 18 U.S.C. 1001).

EDA CONSTRUCTION INVESTMENTS ADDITIONAL ASSURANCES

As a duly authorized representative of the applicant, I further certify that the applicant:

1. Will operate and maintain the facility in accordance with at least the minimum standards as may be required or prescribed by applicable federal, State and local agencies for the maintenance and operation of such facilities.
2. Will require the facility to be designed to comply with the Americans with Disabilities Act of 1990 (ADA) (42 U.S.C. 12101 *et seq.*), the Architectural Barriers Act of 1968 (42 U.S.C. 4151 *et seq.*) and the Accessibility Guidelines for Buildings and Facilities regulations, as amended (36 CFR part 1191), and will be responsible for conducting inspections to insure compliance with these requirements.
3. For the two-year period beginning on the date EDA investment assistance is awarded, will refrain from employing, offering any office or employment to, or retaining for professional services any person who, on the date on which the investment assistance is awarded or within the one-year (1) period ending on that date, served as an officer, attorney, agent or employee of the Department of Commerce and occupied a position or engaged in activities that EDA determines involved discretion with respect to the award of investment assistance under PWEDA. See section 606 of PWEDA and 13 C.F.R. §302.10(b).
4. Will have no facilities under ownership, lease or supervision to be utilized in this project that are listed or under consideration for listing on EPA's List of Violating Facilities.
5. Will comply with Executive Order 12699, "Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction," which imposes requirements that federally-assisted facilities be designed and constructed in accordance with the most current local building codes determined by the awarding agency or by the Interagency Committee for Seismic Safety in Construction (ICSSC) and the most recent edition of the American National Standards Institute Standards A58, Minimum Design Loads for Buildings and Other Structures.
6. Will observe and comply with federal procurement rules, as set forth in 15 CFR parts 14 or 24, as applicable, for award of any contracts for architectural engineering, grant administration services, or construction financed with EDA investment assistance.
7. Understands that attorneys' or consultants' fees, whether direct or indirect, expended for securing or obtaining EDA investment assistance are not eligible costs. See 13 C.F.R. § 302.10(a).
8. Understands that conflicts of interest or appearances of conflicts of interest are prohibited and may jeopardize this application, or result in the forfeiture of investment funds. A conflict of interest occurs, for example, where a representative, official, employee, architect, attorney, engineer or inspector of the applicant, or a representative or official of the Federal, State or local government, has a direct or indirect financial interest in the acquisition or furnishing of any materials, equipment or services to or in connection with the project. See 13 C.F.R. § 302.17.
9. Will comply with the reporting requirements under the Government Performance and Results Act of 1993 (GPRA) for measuring and reporting project performance.

Completed by Grants.gov upon submission

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL

TITLE

Completed by Grants.gov upon submission

APPLICANT ORGANIZATION

DATE

CALCULATION OF ESTIMATED RELOCATION
AND LAND ACQUISITION EXPENSES

Are you applying for Construction Assistance?

☐ Yes ☐ No

ITEM 1. COSTS INCIDENTAL TO LAND ACQUISITION - ESTIMATES

Number of land transactions involved (including options, easements and rights-of-way):

Recording fees, transfer taxes, surveys, appraisals, title
search and similar expenses-Section 303(1)

Penalty costs-Section 303(2)

Real Property taxes-Section 303(3)

Litigation expenses-Section 304(a)

Total - Estimated costs incidental to transfer of title

ITEM 2. RELOCATION - ESTIMATES

a. TENANTS - Estimates: Number of Claims

(1) Moving Expenses:

Actual Expenses-Section 202(a)(1)

In lieu payments-Section 202(b)

Total - Moving Expenses

(2) Replacement housing payments:

Rental payments-Section 204(1)

Down payment-Section 204(2)

Total - Replacement housing payments

Total - Estimated Tenants

b. OWNER-OCCUPANTS - Estimates: Number of Claims

(1) Moving expenses:

Actual Expenses-Section 202(a)(1)

In lieu payments-Section 202(b)

Total - Moving Expenses

(2) Replacement housing payments:

Purchase payments-Section 203(a)(1)

Reasonable replacement costs-Section 203(a)(1)(A)

Increased interest costs-Section 203(a)(1)(B)

Closing costs-Section 203(a)(1)(C)

Rental payments-Section 204(1)

Down payment-Section 204(2)

Total - Replacement housing payments

Total - Estimated Owner-Occupants

BUSINESS - Estimates: Number of Claims

Moving Expenses:

Actual Expenses-Section 202(a)(1)

Actual loss of tangible personal property-Section 202(a)(2)

Actual searching expenses-Section 202(a)(3)

In lieu payments-Section 202(c)

Total - Estimated Business

d. NONPROFIT ORGANIZATIONS - Estimates: Number of Claims

Moving Expenses:

Actual Expenses-Section 202(a)(1)

Actual loss of tangible personal property-Section 202(a)(2)

Actual searching expenses-Section 202(a)(3)

In lieu payments-Section 202(c)

Total - Estimated Nonprofit Organizations

e. FARM OPERATIONS - Estimates: Number of Claims

Moving Expenses:

Actual Expenses-Section 202(a)(1)

Actual loss of tangible personal property-Section 202(a)(2)

Actual searching expenses-Section 202(a)(3)

In lieu payments-Section 202(c)

Total - Estimated Farm Operations

f. ADVISORY SERVICES - Estimates: Number of Claims

Total - Expenses of grantee/borrower-Section 205

g. ADMINISTRATION - Estimates: Number of Claims

Contracting with individual, firm, association, or corporation-
Section 212

Agreement w/ Federal or State government agency or
instrumentality- Section 212

Total - Estimated Administration

ITEM 3. GRAND TOTAL

Enter the sum of Items 1 and 2 (parts (a) through (g)) in this Item

GRAND TOTAL RELOCATION EXPENSES



EXHIBIT B

Carson Industrial Land Sale Data



Official Site of the
National Association of REALTORS®

Find
Add

Refine Your Search

Save This Search

Location

Carson, CA

Include Nearby Areas

Price

to

Bedrooms

(Select One)

☒ Any (6)

1+ (0)

2+ (0)

3+ (0)

4+ (0)

5+ (0)

Bathrooms

(Select One)

☒ Any (6)

1+ (0)

2+ (0)

3+ (0)

4+ (0)

More Options...

Featured Homes



Carson, CA
\$199,000
3 Bed, 2 Bath



Wildomar, CA
\$175,000
3 Bed, 3 Bath



Lancaster, CA
\$100,000
9.94 Acres

6 properties found Carson, CA Land for Sale

Sort by

Price High - Low

Need help with this search? Search

Carson, CA 90745



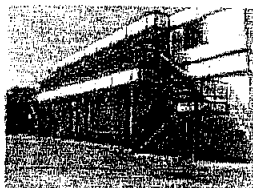
\$12,900,000

5.36 Acre Lot

Land

Brokered By: Cove Realty Co.

21919 South Figueroa Street Carson, CA 90745



\$1,500,000

0.44 Acre Lot

Land

Brokered By: Diamond Realty & Investment

Property Status

(Select One)

- ☒ Homes For Sale (6)
 New Construction
(0)
 Foreclosures (0)
☐ Not for Sale (2)
 Recently Sold (1)
 Rentals (0)

Property Types

(Select Multiple)

- ☒ Land (6)

Modify >>

Square Feet

(Select One)

- ☒ Any (6)
 600+ (0)
 1200+ (0)
 2000+ (0)
 4000+ (0)

More Options...

Listing Activity

(Select Multiple)

- ☐ Open Houses (0)
☐ New Listings (0)

Since:

- ☐ Price Reduced (0)

Property Features

(Select Multiple)

21025 Figueroa Street Carson, CA

\$265,000

7.405 Sq Ft Lot

Land

Brokered By: Mary Murat

23650 Old Road Road Perris, CA 90746

\$60,000

2.08 Acre Lot

Land

Brokered By: Prudential California Realty

PROBATE, SUBJECT TO COURT APPROVAL. SAID 'SELL IT' VACANT LAND, RR ZONING-P CALL CITY FOR MORE INFORMA... more

Monroe Carson, CA 90746

\$45,000

2,749 Sq Ft Lot

Land

Brokered By: Prudential California Realty

Nice vacant land for someone to build what they Buyers must determine for themselves what the more

South Broadway Street Carson, CA



\$6,900

3,492 Sq Ft Lot

Land

Brokered By: LAND22 REAL ESTATE

☒ Any (6)

Advanced Search

Get

new listings
when they hit the market

What can I
afford in
Carson, CA ?

Change Location

Get your **FREE**
home value report

- ☒ Single Family Home
- ☐ Condo/Townhouse

Found 6 matching properties

Featured Homes

New Home



Menifee, CA
\$260,000
4 Bed, 4 Bath



Carson, CA
\$170,000
2 Bed, 2 Bath



Norco, CA
\$330,000
4 Bed, 3 Bath