Green Technology Feasibility Study for the Torres Martinez Reservation

Study prepared for US EPA Region IX

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Green Technology Feasibility Study
for the
Torres Martinez Reservation

This report prepared for

US EPA Region 9

By

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Executive Summary

Background

The Torres-Martinez Reservation in Riverside County has been the dumping ground for large amounts of illegal waste in the Coachella Valley. Under the direction of the Torres Martinez Solid Waste Collaborative, a 25 member collaborative with representatives from the Tribe, federal, state, regional and local agencies, and community-based organizations, 27 illegal dump sites were identified and an action plan developed to address the issue. Since the formation of the collaborative, 20 sites have been cleaned up with only one reporting any new dumping. However, according to US EPA staff and other county and Collaborative members, unless the sites are put into alternative use, they are likely to return to their former illegal use.

Therefore, the Environmental Finance Center, Region 9 (EFC9) applied for and was awarded a grant from the U.S. EPA to conduct an analysis evaluating the feasibility of developing a small environmental pilot project on one of those sites that could be scaled up and be self-supporting in the long-run. The concept was to identify and evaluate potential technologies that could convert the waste streams (green waste and construction and demolition debris) into economically viable products such as energy, fertilizers and building materials. The results of report are not intended to dictate a future use of the former dump sites, but to provide information about possible options.

Findings

A total of twenty potential technologies were identified and evaluated based on their ability to satisfy sixteen feasibility conditions outlined by the tribe. Of these, the research team concluded that the following eight best met the tribe's criteria: household composting; wood chipper; gasifier; panel dissassembler; rock crusher; waste storage units; recycling, collection & transfer station; and demolition teams. A Green Technology Dashboard, pages 4-5, summarizes this analysis.

Following this assessment, the team then looked "outside the box" to identify potential Green Technology Enterprise Opportunities that might also satisfy the tribe's conditions and came up with the following: small scale solar home energy system installation; small scale wind turbines; wetlands cultural ecodge; and regional resource recovery and reuse business. This last option -- a multi-technology resource recovery and recycling station would include all of the technologies that met the tribe's conditions and could serve as a community education hub.

The projects could be developed by the tribe or by a third party. To assist in the process, EFC9 identified potential funding sources ranging from third party developers to bonds, loans and grants from public and private sources.
The following dashboard summarizes the technology feasibility analysis. The technologies are described in detail on pages 13-24. Sixteen feasibility conditions, found on page 12, were grouped into four categories: tribal, regional site and technology. The technologies were assigned one to three stars depending upon their feasibility, with 3 stars representing most feasible and one star least feasible. Technologies that met the following three conditions received no stars: 1) it is experimental; 2) it is not suitable as a pilot and 3) it is a large composting facility. Estimated cost was broken into three levels: low <$50,000, medium $50,000-$100,000 and high >$100,000.

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<th>TRIBAL</th>
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<th>SITE</th>
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Additional Notes & Assumptions on the Dashboard:

1) It was assumed that financing would be sufficient to cover project costs.

2) Gasifier plants range from the size of a car to a large multi-acre facility; size affects price. For this analysis, it was assumed that the project would start with a small plant as a pilot.

3) The ability to move a gasifier depends upon the size of the plant and the scope of the business.

4) Gasifiers are alternative energy sources. To be considered “green”, gasifier operation would need to comply with all environmental regulations and to use only “green” biomass sources.

5) The 25 acre potential project site is prone to flooding. The cost and impact of improvements to mitigate episodic flooding on business operations was not evaluated.

6) Large-scale composting facilities, not evaluated in this report, are required to install ground lining to prevent leaching into groundwater. It is not known whether this requirement could be waived on tribal land thereby making the operation less costly. Nonetheless moving the facility would be cumbersome post-site improvements.

7) Operating a soil recovery business may generate similar impacts as large-scale composting, which would make this technology (trommel/retort) less viable. Additional research is required to determine at what scale this enterprise would be profitable and whether or not it could satisfy the condition to be a pilot project.

8) Regarding any operation related to tires, the storing and piling of tires may be a concern. Additional research would be necessary to determine how easily these types of facilities could be moved.
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Introduction

The Torres Martinez Desert Cahuilla Indian Reservation covers 12,000 acres in a checkerboard pattern in Southern California’s Coachella Valley. The reservation is located in and abuts the north and south ends of the Salton Sea. There are 250 tribal members 12,500 non-tribal members (mostly immigrants working in agriculture) living on the reservation.

The waste infrastructure for the greater Palm Springs area is nearing capacity. Massive development in the area is increasing inflows of debris from the agriculture and construction sectors. This, coupled with declining landfill capacity throughout southern California has resulted in higher tipping fees throughout the region. Additionally, many from the agricultural and construction sectors have turned to illegal dumping to handle their waste. There is also significant green waste flowing in from a variety of sectors, such as golf course clippings, yard waste, and landscaping. Illegal dumping has engendered serious environmental hazards and unsightliness on the reservation.

The Torres Martinez Reservation is located inside Riverside County. Due to the largely rural and undeveloped nature of this part of the County, it is generally difficult to monitor the land to prevent illegal dumping. Spurred into action by a high school film project that exposed the problem, a 25 agency Solid Waste Collaborative was created to help resolve waste problems on the Torres Martinez Reservation. This collaborative was spearheaded by U.S. EPA Region 9 and included a variety of federal, state, regional, local, tribal and environmental justice organizations. Since the formation of the collaborative, of 27 illegal dumpsites, 20 have been cleaned up with only one site reporting any new dumping.

In response to the rapid regional growth, the Tribe anticipates an increasing demand for legal methods for disposing of green waste and construction and demolition debris as well as an increasing demand for fertilizer and other landscaping material and building material for these new developments. In addition, according to US EPA staff and other county and Collaborative stakeholders, unless the illegal dumpsites are put into alternative use, they are likely to return to their former illegal use following clean up.
Therefore, the Environmental Finance Center, Region IX (EFC9) applied for and was awarded a grant from U.S. EPA to lay the ground work for a green technology/business pilot project to help build assets for Torres Martinez.

**Green Technology Feasibility Study**

The Torres Martinez Tribe anticipates an increasing demand for legal methods of disposing green waste, construction and demolition debris, fertilizer and other landscaping and building material from new developments. This report is the culmination of a feasibility assessment by the Environmental Finance Center, Region IX to evaluate technologies capable of processing organic and/or inorganic input streams into viable commodities for the Torres Martinez Tribe and to identify potential funding sources for establishing a pilot project. The goal of the project is to support the tribe’s decision-making process for determining how to move forward with an appropriate business model that both meets their needs and fits the scope of their resources. This study is not intended to dictate a future use, but rather to be a valuable tool in the decision-making process. Once the tribe determines the approach they wish to pursue, a strategic business planning process can be developed.

**Research Methodology**

The research team undertook the following steps to meet the project scope.

1. Identified and researched available technologies - *see Technology Overview & Feasibility Assessment.*

   We reviewed technologies that offer alternatives for green (agriculture & landscaping) and construction and/or demolition input streams. Generally this fell into either organic or inorganic waste streams. We also looked at technologies – or enterprise approaches – that could handle mixed streams. Our research was framed by a general understanding of key input streams in the Coachella Valley and the conditions for feasibility laid out by the Torres Martinez Tribe.

2. Examined case studies of tribal waste management and business ventures - *see Attachment 1: Tribal Case Studies.*

3. Conducted site visits & interviews with industry professionals and tribal staff - *see References & Research p. 78-80.*

4. Attended conferences, forums, and/or meetings - *see References & Research p. 78-80.*

5. Identified / researched funding structures and sources - *see Financing p 39-74.*
In the final analysis, the team created a filter using qualitative and quantitative criteria for testing feasibility. In addition to technologies that can address a waste stream, the team also included a few examples of technologies using an asset-building framework to highlight how the Torres Martinez Tribe could build their financial, natural, physical, social, cultural, institutional, and legal and political assets through careful use of strategies that enhance tribal control of these assets.

Site visits to the Cabazon and Torres Martinez reservations, along with stops at two regional waste processing businesses (Western Environmental Inc. and California BioMass, Inc.) informed the analysis of the findings as they provided a context in which to scope feasible technologies. This context also allowed for a ‘real life’ examination of the implementation process.

The team reviewed technologies that offer alternatives for green (agriculture & landscaping) and construction and demolition input streams. Generally this fell into either organic or inorganic waste streams. In addition, the team examined technologies or enterprise approaches that could handle mixed streams. The research was framed by a general understanding of key input streams in the Coachella Valley and the following conditions for feasibility laid out by the Torres Martinez Tribe.

Findings & Discussion

The research focused on technologies that can be used to process either or both organic and inorganic waste. The primary resource waste streams in the area are generated from regional construction/demolitions works\(^1\) (wood, soil, asphalt/concrete) and agriculture\(^2\) or landscaping\(^3\). There are a number of businesses in the area already using various technologies to process different aspects of the waste streams into secondary commodities. The team looked at organic,

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\(^1\) Regional construction debris is generated from throughout Southern California with dumpers coming from Los Angeles and as far south as San Diego.

\(^2\) Agriculture wastes in the area come primarily from sod and palm date farms – the two largest commodities grown in the area. Whereas much of the palm date “waste” is suitable for a gasifier application, sod and other agriculture waste is better suited for composting activities.

\(^3\) There are over 200 golf courses in the greater Palm Springs Desert area. Many of these facilities engage in a course management practice referred to as “scalping” whereby the grass and top part of the soil are removed before new sod is laid down. This is performed typically twice a year.
inorganic and mixed resource waste streams. The challenge was to find out what is in play in the area and what is generally available in the market, in order to find a fitting opportunity for Torres Martinez based on their expectations, financial threshold and willingness to allocate known assets toward a business that can address (in part) the waste problem affecting the Coachella Valley.

Testing for Feasibility

At the beginning of this project, Alberto Ramirez, the Torres Martinez Tribal Environmental Director, laid out the conditions (see below) that needed to be met in order for the technology/business proposal to be accepted by the tribal council. Based on these conditions, the team created a filter (see Torres Martinez Feasibility Filter) in order to rank the technologies according to the scope of resources (institutional, cultural, financial, human, land and other) that the tribe would need.

Feasibility Filter

The filter includes the 17 conditions set forth by the tribe. The first filter, “It Makes Sense to the Tribe”, will be addressed by the tribe in conjunction with the information presented in this report leaving 16 conditions that were applied in the feasibility test. The team further assumed that the tribe would have no financial outlay for this business no matter what their choice and that it would be funded either through grants or a 3rd party partnership or a combination thereof. Nonetheless, the team included this in the test and assumed that all technologies met financial considerations. In terms of employment, whether or not the employment required was skilled or unskilled, the team assumed that if staff was required that some employment
would be available for Torres Martinez tribal members. If the condition was determined to be “Non Applicable” (N/A) the team counted this as supporting the favorability of the technology.

Based on level of agreement, the technology was awarded ★, ★★ or ★★★ stars.

Three stars represent the highest level of agreement or “feasibility” within the tribal conditions. However, even with a 3 star rating, certain technologies would also fail if they tested against one of three trump conditions:

1. The technology is experimental and there are insufficient results to assure the tribe that it is viable.
2. In order to make the technology work as a business it cannot be tested at the level of a “pilot” project.
3. The technology is a large-scale compost, i.e., windrows type facility.
Technology Overview & Feasibility Discussion

Anaerobic & Aerobic Technologies to Process Wet & Green Waste

**ANAEROBIC DIGESTER**

This technology is fed by a wet waste stream such as cow manure and is usually physically co-located with the relevant source of waste due to issues related to transportation. This technology has the beneficial attributes of portability and scalability. Employment of tribal members is possible but it is more likely that hiring a firm to manage it which has the skilled labor to run this technology would be needed – so for the test it was assumed that employment of tribal members is not possible. Additionally, since this technology is co-located with the appropriate waste stream, even if the tribe wanted to invest in this technology relying on a dairy farm outside of their region, it would be unreasonable for tribal members to be employed. Similar assumptions were made for the BioEnergy Solution and Nutribio technologies, which follow.

Ultimately it was concluded that due to the lack of available feed-stock necessary to make this technology function, (i.e., wet waste sludge) that employing an anaerobic digester is NOT feasible for the tribe.

**BIOEnergy Solution**

This organization turns methane into biofuel. Working directly with farmers/food producers and PG&E, Bioenergy Solutions provides the infrastructure and financing necessary to create renewable natural gas from the methane produced by cows at their expense. Revenues from the sales of gas and carbon credits are then shared with the farmer/food processor. While an innovative venture, this technology requires a partnership, and a farm or land where cows graze and produce methane. As of now, Torres Martinez is not in a position to enter into this business.
This technology works by expediting the composting process and producing a consistently high-quality fertilizer through the application of a proprietary technology: **Biyofolik Solution**. This is a non-toxic herbal plant fiber extract that has no residual effects on soil or water. The basic chemical formulation contains beneficial nutrients that initiate maximum degradation of organic substances while eliminating harmful disease producing organisms and sulfuric odors coming from stagnant water, organic waste, agricultural waste, and decaying matter.

There were a number of conditions that did not test out and ultimately it would require the tribe to establish in a large (at least 10-20 acre) compost facility. Furthermore, there is insufficient data available to prove viability.

**Windrows**

This is an outdoor compost facility processing various kinds of wet and dry organic (green) waste into agriculture and landscaping compost for sale. Large piles called “windrows” are made to process the organic material over a period of time.

**Household Composting**

This option is considered an “Appropriate Technology” (AT) which would address a local input stream on the Torres Martinez reservation, and in particular, inside the trailer parks. There are a number of ways to approach household composting. The benefit would be particularly heightened if community gardens were constructed in these areas to build food security for the tribe and people living on the reservation. Household composting would also reduce the flow of organic material into the BurrTec landfill.
Technologies to Process & Remediate Soils

**Microbes**

Microorganisms can be applied to certain kinds of contaminated organic waste streams, e.g., soils and woody biomass (after it is chipped). This would require skilled labor and certification of the treated material by a 3rd party prior to sale. The point of scale where this technology is profitable is unclear at this time; hence the viability of a pilot was not assessed. Another uncertainty is whether the tribe would be receptive to the required piling of materials in windrows. Western Environment, Inc., operating on Cabazon land, attested that using microbes was giving them a leading edge over other similar competitors in terms of price.

A question for the Torres Martinez Tribal Council is whether they want a materials staging area that piles resource stocks similar to a compost windrow facility. The answer to this question may also be influenced by the types of resource stocks piled. Some site improvements and technology purchases to make the system work would require using a 3rd party with skill and experience. Application of the microbes requires a trommel.

**Trommel**

A trommel is a piece of large industrial equipment that processes mixed composite material and separates out fine soil suitable for adding to composting or soil mixtures. It has a built in apparatus that can apply microorganisms to the soil as it is processed in order to transform the hazardous material. Often this soil will need to be further treated before it can be certified as safe, so this technology works best when coupled with microbes and heat pasteurization. A potential downside is that the operation would require the piling of stock materials for indefinite periods of time.
Heat is an alternative way to treat contaminated soil. The end product is sold as landscaping material. One challenge with this business according to Western Environment, Inc., is the unpredictable supply of stock material (contaminated soil) and the market demand for the treated product. This results in stockpiling of products waiting for a buyer. This technology can also treat municipal post sewer bio-solids that can subsequently be chipped and added into compost mixes.

Ideally heat / pasteurization would be combined with microbes in the same business in order to be competitive.

Technologies to Recover Fibrous Materials (Woody Biomass)

Wood Chipper

A wood chipper option met many of the criteria as an asset for the tribe. A small chipper can also be portable and requires a smaller capital outlay compared to some of the other technologies. Small and portable wood chippers are available for as little as $800. The chipper could enable the tribe to manage random woody debris around the reservation and turn it into wood chips that could be used for mulch. A truck with a hitch would be required to move it.

Alternatively, a larger industrial wood chipper able to process around 5 tons per day coupled with a gasifier would enable the tribe to produce electricity. There is an ongoing supply of woody biomass that needs to be chipped; Colmac Energy\(^4\) is currently turning material away.

\(^4\) [http://www.aciinc.inet/CEI.html](http://www.aciinc.inet/CEI.html)
The Cabazon Tribe is working with Colmac Energy to produce significant electricity on their reservation through gasification. The Colmac Energy plant is particularly large – gasifiers come in a wide range of eco logical footprints. Given that there is a steady flow of woody biomass, this is a particularly interesting possibility for Torres Martinez to engage in at a smaller level. In addition to the gasifier, this operation would require an industrial size wood chipper. Employment of tribal members is unknown as skilled labor is likely required. Presumably, this approach would be successful by contracting with a third party to manage it on behalf of the tribe or the tribe could consider leasing the land to an owner/operator with an additional clause to either offset the power requirements for the tribe or by providing a percentage of profits to the tribe.

This company, located in Colorado, is innovating a carbon negative gasification technology that has a simultaneous capacity to produce agricultural char (agchar/Biochar) that can be combined with soil and/or compost as an aggregate. This technology is modeled after an indigenous

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5 This is a 48MW plant that produces enough power to run 40,000 homes per day. It consumes on average 550 tons of woody biomass per day and has the capacity to handle 780 tons per day.
Amazonian agricultural technique (*terra preta*) to amend acidic soils. The application of agchar increases water retention in the soil and improves fertility by optimizing the conditions for soil microorganisms.

This option could generate two revenue streams – sale of energy to Southern California Edison and sale of Biochar soil amendment either directly to farmers or indirectly to a soil/composting firm as a filler aggregate for their mixes.

This product is early in its development cycle. Despite the compelling nature of this technology it does not meet the ability to pilot using a known technology. Thus it does not pass the feasibility test. Still this technology may be appropriate to consider it as part of a 5 year strategic plan.

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### Batch Char Maker

A Batch Char Maker produces about 1 ton of Biochar per 5/day week. The Biochar yield is approximately 25%, so the BCM would consume 4-5 tons of biomass (wood chips) per day to make 1 ton of Biochar per week. This unit will go to researchers at universities and will also be offered commercially at a smaller scale that will make 250 lbs per week. This technology is currently being used in a Bureau of Land Management research project. The estimated cost of this technology is $50k.

### Pyroformer System

This makes a combination of energy and Biochar from woodchips (plans include a pyroformer that operates on woody biomass other than wood chips in the next 2-3 years). A 250kW system housed in a shipping container is planned for the market in 2009 at $500k. This system consumes 6-10 tons per day of biomass and generates approximately 6MWhr of electricity, plus about the same amount of co-gen heat, and around 2 tons per day of Biochar.

### MicroPyroformer System

This is a much smaller gasifier that will generate about 40kW, consuming about 1 ton per day of woodchips to produce almost 1MWhr per day along with about 500lbs of Biochar. Est $100k.

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6 *Terra preta* (“dark soil” in Portuguese) refers to expanses of very dark, fertile anthropogenic soils found in the Amazon Basin. It owes its name to its very high charcoal content. It is also known as “Amazonian dark earth” or “Indian black earth”. In Portuguese its full name is “Terra preta do indio” or “Terra preta de indio”.

7 [http://www.sce.com/](http://www.sce.com/)
Technologies to Recover Inorganic & Mixed Waste

**Tire Shredders**

Shredded rubber is used in making pseudo-green products like asphalt and bumpers or septic systems. It can also be burned in a tire incinerator. While this type of business does not require many employees, it does require a large facility, which therefore prevents it from being a pilot project or eventually movable to a new location. Another consideration is the unsightly nature of large tire piles on the reservation.

**Tire Incinerators**

While tire incinerators can burn tires for electricity and divert them from the landfill, tires are inherently very toxic and incinerators are expensive to build, manage, and operate according to regulatory guidelines. This technology does not meet the necessary criteria from the team’s perspective. It is neither a green technology nor part of a green business.

**Tire Reconditioning/Retreading**

Used tires, particularly from work trucks and farm equipment, can be retreaded and sold back. While there is no demand from the public market, industrial tires are designed to be re-treaded. If there are no shops of this kind in the area this could be a good business as there are a preponderance of commercial trucks and farm vehicles in the area.
BOARD REDUCER OR PANEL DISASSEMBLER

This technology would allow the tribe to process drywall from construction waste streams and realize two commodities – crumbled gypsum and the gypsum dust -- both of which can be sold into agricultural markets. The volume of drywall and scale of the operation necessary to realize a profit is unclear at this time. The technology meets the feasibility conditions and would be an asset to a mixed-business model. Having a flatbed or other hauling truck that could travel to construction sites and provide a service to contractors could be a good addition to the concept and ensure that the material is not otherwise land filled. Providing this kind of service could also be a business advantage where the tribe could undercut competitors by reducing the tipping fee while simultaneously providing a service benefit that reduces hauling and transportation costs for contractors and developers. This technology could be coupled with a Torres Martinez Demolition Team (see Demolition Team description below).

ROCK CRUSHER (Concrete / Asphalt)

Having a rock crusher – especially at the Lawson site would allow the tribe to immediately begin developing a rock aggregate to build rural roads as well as for other regional uses. The Torres Martinez Tribe could manage this project or could hire an independent operator to manage the system. There is potential for employment of some tribe members. Additional equipment would be required to move the debris to the machine staging area. Rock-crushing equipment can be purchased through the U.S. General Services Administration’s (GSA’s) surplus program. Depending on the size of the equipment it will cost between $60,000-200,000. Besides the Lawson site, the tribe could allocate a portion of the proposed site for this purpose on an ongoing basis, as there is a steady stream of this kind of material available to them.

MUNICIPAL SOLID WASTE (MSW) PELLET COMPACTER

This technology allows untreated municipal waste to be compacted into pellets. The pellets can then be sold to electricity generating stations that can burn them to create energy. This would require setting aside land for storing municipal solid waste (MSW) waiting to be compacted. A
just-in-time delivery system could be developed at a facility large enough to handle the waste volumes that would make this profitable. Western Environment, Inc. is expecting to install this technology at its facility on the Cabazon Reservation. This may be an opportunity for Torres Martinez to see how the technology works in actuality.

Technology for Non-Treatment Options

**LANDFILL**

While available landfills throughout the region are declining, some version of landfill may be an option for the tribe. Any landfill construction falls under the direct jurisdiction of the U.S. EPA which has stringent requirements. Technically the permitting process takes 90 days. The reality, though, is that compliance with all aspects of the permit process often takes much longer. The Campo Band of Indians in southern California (see Attachment 1) began the permit process in 1993 and went to court 3 years later. It took 2 years for the U.S. EPA to approve the permit. Siting a landfill can be a complicated, lengthy capital-intensive process. Still, the tribe could consider developing a landfill for a specific resource streams, such as one focusing exclusively on concrete and asphalt to crush and sell as road aggregate.

In terms of feasibility for this study, a landfill is not a green business or green technology. To be a green business it would have to be designed to capture methane gas in conjunction with a recovery program designed to separate any and all items that can be resold, reconditioned or disassembled for sale to diverse industrial markets. Still, as a landfill it is categorically linked to over-consumption and therefore not shifting behavior towards a green future. Furthermore, it also

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8 In 1990, Mid-American Waste Systems, Inc. proposed developing a 600-acre landfill in the southeast corner of the Campo reservation. As proposed by Mid-American, the landfill would have a 28-million-ton capacity to be used over approximately 30 years. According to the petitioners, the landfill would be the nation's largest solid-waste facility on an Indian reservation. The Bureau of Indian Affairs estimated the Band's share of facility revenues would be about $1.6 million a year. Also in 1990, the tribe's General Council adopted the Tribal Environmental Policy Act of 1990 and a Solid Waste Management Code governing the construction and operation of solid-waste facilities on the reservation. These in turn established the Campo Environmental Protection Agency. In a draft application filed with the EPA in June 1993, the Campo Band sought approval of its solid waste program under section 6945(c). [http://caselaw.lp.findlaw.com/cgi-bin/getcase.pl?court=dc&navyby=case&no=951343a](http://caselaw.lp.findlaw.com/cgi-bin/getcase.pl?court=dc&navyby=case&no=951343a)

fails on the ability to use the proposed 25 acre site—it cannot be relocated and it cannot be started as a pilot.

**WASTE STORAGE DEBRIS BOXES**

Waste debris boxes come in multiple sizes. While they don’t provide an alternative for waste, they could serve as a local solution assisting BurrTec Waste Industries Inc. in preventing illegal dumping (of non-toxic waste streams). The bins could be bought outright by the tribe or an arrangement forged with BurrTec to place more bins on-site could be made.

In the case study of the Fort Peck reservation of Montana, waste storage bins were used on roll off sites, where a tribal gatekeeper was posted to manage incoming materials and screen for hazardous waste. The entire operation was maintained by revenue generated from charging a nominal fee of $15/month to tribal members and $300/month from business and contractors.

**Enterprise Options for Optimizing Waste / Resource Streams**

**COLLECTION & TRANSFER STATION**

Transfer stations are a more expensive alternative. This option would not be conducive as a pilot project and could not easily be moved if the tribe wished to re-appropriate the land. At a transfer station, scale operators weigh each collection truck as it enters the facility and then deposits its loads onto a tipping floor. Transfer station employees (possibly filled by Torres Martinez tribal members) would examine the trash and pull out non-recyclables. Recyclable materials would be sent to another site for next level use and trash would be land filled. Potentially if BurrTec Waste Industries Inc. was interested in having a transfer station in this area, a business like this could work whereby BurrTec would lease the proposed 25 acre site and pay for site improvements.

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10 BurrTec Waste Industries, Inc. provides solid waste transfer and diversion services to communities throughout Southern California. [http://www.burrtec.com/2_transfer.php](http://www.burrtec.com/2_transfer.php)
**RECYCLING COLLECTION & TRANSFER STATION**

To set up a small-scale recycling collection and transfer station for regional residents and businesses would have a relatively low capital requirement. A California Refund Value (CRV) license would enable the tribe to pay for recyclables and thereby create an incentive to use the facility. *(see Attachment 3 for more information)* This station could focus on plastic (especially from beverage and food containers), metal (rebar in particular which can be resold to a smelter), used oil, aluminum and glass\(^\text{11}\). The entire facility could be integrated with other businesses and tribal members could manage this portion.

**DEMOLITION TEAMS**

The Oneida tribe of Wisconsin *(see Attachment 1 for more information)* created a tribal enterprise that retrieved resources from construction and demolition sites. While this kind of approach is not located at a site, it could definitely benefit by having access to the proposed 25 acre site to store and process their materials. If they had access on the backside to a board reducer and/or rock crusher, this could be a good business for a team of Torres Martinez tribal members. It is likely that some training would be needed to help optimize this business and provide a valuable service to contractors and builders.

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\(^{11}\) That is the overall finding of the U.S. Recycling Economic Information Study commissioned by the U.S. EPA and various states in cooperation with the National Recycling Coalition. According to the study, the recycling industry plays a vital role in boosting the U.S. economy through economic development and job creation. [Http://www.greenforall.org/resources/cleaning-up-environmentally-and-economically](http://www.greenforall.org/resources/cleaning-up-environmentally-and-economically)
**Green Technology Enterprise Opportunities**

**SOLAR ENERGY**

**Med - Large Installations to Generate Power for the Grid**

Used on tribal lands across the US, solar power generation offers a steady source of revenue and energy. Initial investment depends on the scale of the project but an alternative notion of leasing land to a solar company could be possible, thus mitigating the need to invest directly in solar technology. The desert lands within the Torres Martinez reservation are optimal sites to implement such a venture. The most likely buyer of energy would be Southern California Edison. To pursue this venture successfully, the tribe would need to work with a 3rd party who could operate and implement the project generating lease income and a percentage of sales.

*Engaging in a competitive process using a Request for Proposal (RFP) may be one way to find a partner that best matches the needs and expectations of the tribe.*

CASE STUDY

Alternative Energy on the Ramona Band of Cahuilla Indian Reservation. A brief video on YouTube highlights their reasoning and success.

http://www.youtube.com/watch?v=NMd7_amitfM

A good example of solar in the Mojave Desert can be found at:

http://www.borregosolar.com/solar-power-systems/case-studies/client-hacienda.php. This system was designed to supply power to a mobile home park. This could support the trailer parks, for example, on the Torres Martinez Reservation.
Another potential venture is to develop a team – similar in concept to the Demolition Team\textsuperscript{12} – to provide home solar panel installation or perhaps to train the Demolition Team to provide this service. Team members would have to be trained in order to pass a test and receive a state license. Innovative solar design firms such as Sungevity\textsuperscript{13} in Berkeley, CA work in tandem with independent installation teams. This business could help develop skilled labor within the tribe around a vital and growing industry in California. If the state requires installation of solar systems in new homes, this could generate a supply of customers for the tribe. It is also likely that the increasing numbers of baby boomers with a conscious who are building new homes and renovating in the greater Palm Springs area would be a market base for this type of enterprise. Small micro systems for the trailer parks to increase energy independence on the reservation and simultaneously increase the quality of life for some of the most marginalized people in the region would be a major asset improvement.

\textbf{Costs of Solar Power from Photovoltaics}

The cost of electricity from photovoltaic (PV) systems has dropped 15- to 20-fold; and grid-connected PV systems currently sell for about $5-$10 per peak Watt (20 to 50¢/kWh), including support structures, power conditioning, and land. They are highly reliable and last 20 years or longer.

Hundreds of applications are cost-effective for off-grid needs. However, the fastest growing segment of the market is grid-connected PV, such as roof-mounted arrays on homes and commercial buildings in the United States. California and other states are currently subsidizing PV systems because it is considered cost-effective to reduce their peak daytime loads for air-conditioning, which matches PV output.

- \url{http://www.eere.energy.gov/tribalenergy/}

\begin{quote}
“A 10 kW solar array option can produce approximately \textbf{14,000 kWh} annually…and reduce carbon emissions by 33 tons. Solar power has the potential to save $0.12 per kWh for the life of the panels. For a 20-year period, that is a net savings of $\textbf{33,600} for a 10 kW array.”

[Environmental Law Society, University of Colorado; Proposal for 10 kW Solar Array for Wolf Law Building]
\end{quote}

\textsuperscript{12} Or it is possible to establish multi-purpose crews capable of installation/design of water catchment systems, installation of home solar panels, provision of home lighting efficiency advice, design and installation of xeriscape landscaping in addition to providing deconstruction/construction services.

\textsuperscript{13} \url{http://www.sungevity.com/}
**WIND ENERGY**

This technology is feasible on land where there is a high wind factor and requires a substantial monetary investment. Safety standards also dictate that sufficient land be allotted to surround the turbines to prevent accidents and injuries. Regular maintenance of technology is mandated. Funding is available to native tribes through the organization Native Energy which is running a successful project on the Rosebud Sioux reservation\(^{14}\). Energy created by wind turbines could meet the needs of the Torres Martinez reservation, and/or be sold to Southern...

\(^{14}\) On February 27, 2003, the first utility-scale Native American 750-kilowatt (kW) NEG MICON wind turbine was installed on the Rosebud Sioux Indian Reservation. Its installation marks the end of an eight-year preparation that began in 1995 when the Rosebud Tribe, the Tribal Utility Commission, and the Rosebud Casino began measuring the wind resources. Read the rest of the case at: [http://www.eere.energy.gov/windandhydro/windpoweringamerica/na_rosebud.asp](http://www.eere.energy.gov/windandhydro/windpoweringamerica/na_rosebud.asp)
California Edison. Large scale wind power, according to the distribution of wind resource shown on the chart\textsuperscript{15} is not an option for Torres Martinez. However, small windmills may be viable for local electricity generation.

\begin{center}
\begin{tcolorbox}[title=Costs of Wind Power]
Wind technology is competitive today in bulk power markets with support from the production tax credit, and in high-value niche applications or markets that recognize non-cost attributes.

The worldwide annual market growth rate for wind technology is about 30\% with new markets opening in countries throughout the world. Domestic public interest in environmentally responsible electric generation technology is reflected by new state energy policies and in the success of "green marketing" of wind power across the country.

http://www.nrel.gov/gis/solar.html
\end{tcolorbox}
\end{center}


http://www1.eere.energy.gov/tribalenergy/guide/pdfs/wind_california_1.pdf
Regional Resource Recovery & Reuse Business Case Studies

Two regional businesses turn organic and inorganic waste streams into marketable commodities and thereby avoid the landfill. The following descriptions of those operations highlight what it would look like to run resource recovery and repurposing businesses at scale so that the Torres Martinez Tribe can evaluate these as possible models.

*Western Environment, Inc. & Waste Recovery Technologies Corp.*

Under the company umbrella of Alliance Environmental Technology two sister companies, Western Environment, Inc. and Waste Recovery Technologies Corp. (WRT) each lease 25 acres of land and co-manage the 50 acre facility on the Cabazon Indian Reservation.

Annually a maximum of half a million tons of CAL Hazardous Title 22 soils and Non Hazmat hydrocarbons soils flow into the Western Environment, Inc.’s facility. Soil treatment, remediation and recovery are customized to soil types; thermally treating petroleum and pesticide contaminated materials and chemically fixating lead and other heavy metal pollutants preventing them from migrating out of the soil. Bio-remediation using naturally occurring microbes that live on petroleum hydrocarbons is a cost effective alternative methodology. For all processes a poly flex liner protects the ground water table beneath.

Outflows of the treated soils are products targeted to supply the increasing demand of industries using road base, construction fill, landscaping and recycled soil.

The Waste Recovery Technologies facility transforms a multitude of waste streams from construction and demolition sites into marketable products or as inputs to other processes. On the tour it seemed as though there was nothing that came in, that could not be used. Tires, household wastes, concrete, rebar, construction lumber, tires, plastics, oil filters etc.

Revenue streams are volatile in the reclamation/recycling industry. As of this writing the best positive cash flow was being generated by the construction/demolition side of the business. Trucks from as far away as Los Angeles County are bringing inflows. Technical and non-technical staff is necessary for efficiency and innovation - the keys to the success of this entrepreneurial green business.

A scaled down version of many of the input waste streams could be a potential green business model for the Torres Martinez Tribe. Similar to the Cabazon tribe, leasing land or partnering with a company like Western Environment, Inc., may be an option that warrants further legal/economic due diligence. Location is one of the keys to the success of
Western Environment, Inc. Clients prefer to have easy drop-off locations. Acting as a transfer station for Western Environment, Inc., or enticing WEI to relocate to the Torres Martinez reservation may be cost effective assuming the Environmental Director and support staff can absorb the new workload.

*California BioMass, Inc.*

Founded in 1990, California BioMass was prompted by the regulatory environment and tax incentives to enter the composting business.

State regulatory minimum diversion requirements (now 50% /AB939) play a significant role in the profitability of composting, and rumors of an increase to 75% could mean a surge in business for California BioMass and the industry. However, today's regulatory climate also complicates business operations and compliance. The decisive advantage for this company stemmed from the fact that they began their operation before there were many regulations and business requirements in place so the barrier to entry was significantly smaller than it is today. However, the founding entrepreneur still reported that he spends roughly a third of his time responding to regulatory requirements.

Inflow into the facility is approximately 50,000 - 60,000 tons of solid green waste and 1.5 million gallons of liquid waste each month. Entrepreneurial innovation uses the liquid waste to supplement the 6 million gallons of "canal" water consumed during operations.

30% of all business is driven by commercial haulers, which includes contracted waste streams from golf courses. Curbside food and yard waste collected from La Quinta, Coachella, Indio, and Thermal is also processed at this site. Another significant source over the years has been construction waste such as calcium sulfate (drywall), which California BioMass resells as second-generation gypsum. The decline in new housing starts impacted business operations in 2005-06, forcing the business to scale back and seek out innovations to take advantage of new waste streams. **An acquisition or partnership offer would fit the business strategy of Biomass, especially as it appears that competition in the region is limited.**

Note: Both businesses mentioned *incentives* as a requisite for entrepreneurial expansion either from the supply or demand chain perspective.
Asset Building

Wetlands Cultural Ecolodge

Building on the wetlands project already in existence on the Torres Martinez reservation, is the concept of creating a Cultural EcoLodge for tourists. Ideally this would cater to the middle to upper end ecotourism market and to a percentage of the Palm Springs tourism market that would enjoy an eco alternative and the simultaneous benefit of learning about and supporting an indigenous tribe. Birders may also be enticed to spend time at the Salton Sea. Employing tribal members, particularly youth and elders, as guides and hosts, would help to preserve cultural heritage, share tribal knowledge among generations, provide a unique tourist attraction not duplicated in the region and create a new revenue stream for the tribe. This project couples environmental preservation with economic opportunity. Furthermore, the wetlands themselves could serve as food producing sites for the tribe, growing an array of berries, shellfish, wild rice, medicinal plants, and timber.

Wetlands are living systems that cleanse water and create a diverse habitat of flora and fauna. They provide zones of transition between the flow of water, cycling of nutrients and the sun’s energy, in order to produce an ecosystem that is uniquely characterized by its hydrology, soils, and myriad vegetation. Also key for absorbing and slowing floodwaters, their potential to help alleviate property damage and loss can save lives, as well as provide recreational spots for fishing, canoeing, hiking, bird watching, and environmental education.

Eco-tourism- A Case Study for Asset Building

Just as wetlands are natural assets that protect the environment, eco-tourism offers sustainable enterprise opportunities focused on environmental integrity, cultural preservation, and mindful and participatory recreation. The Torres Martinez Cultural EcoLodge would build financial, physical, cultural, social and other assets, all of which would afford tribal leadership with asset control and leverage that can be utilized for expanding other community initiatives.

16 Photo sourced from: www.tripadvisor.com
Aided by funding from the U.S. Department of Energy’s Tribal Energy Program, and US Department of Agriculture’s Rural Development Program, the Ramona Band of Cahuilla Indians in Anza, California, started a stand-alone micro energy system to supply their eco-tourism business. Using photovoltaic solar panels, wind turbines, and backup generators, they have created a means for producing clean, efficient, and renewable energy.

Eco tents, shaped as yurts, resemble the kish huts of the Ramona Band’s ancestral past, and form the eco-suite clusters that shape the landscape around the wetlands. Activities for tourists include horseback riding, hiking, bicycling, swimming and photography. A training center, restaurant, gift shop and set of administrative offices are also on site, all powered by alternative energy and soon to be co-managed with the US Forest Service and Bureau of Land Management. Other agencies involved in the project are the Bureau of Reclamation, U.S. EPA, and Indian Health Service.

As part of a ‘master plan’, the Ecolodge was built to serve a three-fold purpose:

1. To create a high-end renewable energy destination resort atmosphere that is interactive with guests Teach people Cahuilla culture including: basketry, pottery, gathering, health & healing; And flora & fauna.
2. Teach people about Cahuilla culture including: basketry, pottery, gathering, health and healing as well as local flora and fauna.
3. Offer an experience that is life changing.

Torres Martinez is aptly positioned to expand the current wetlands project. For further investigation into this opportunity, groundwork preparation should involve:

1. Coordinating multi-funding opportunities.
2. Conducting an environmental review.
3. Developing public relations and marketing plans.
4. Designing the ecolodge concept.
Self-Sustaining Multi-Technology Business Concept

The intention of this section is to illustrate possible enterprise parameters for a solution to illegal dumping on the Torres-Martinez Reservation. As the discussion above regarding different technologies revealed, meeting all of the conditions set forth by the tribe was difficult. Different technologies, however, can be combined in a multi-technology resource recovery (collection) and recycling station that could simultaneously serve as a community education hub for the tribal members as well as the many people living on tribal lands. What we have done below is characterized the possibilities for how multiple technologies could be combined in an innovative way to create an effective business that also generates community assets. This is not intended to be a decision making tool for the tribe; this is a sketch of a multi-technology business concept that could generate multiple assets for the tribe while optimally using a 25 acre land parcel on their reservation.

Table: Enterprise Business Elements

<table>
<thead>
<tr>
<th>INPUT</th>
<th>OUTPUT</th>
<th>BUSINESS</th>
<th>TECHNOLOGY</th>
<th>COST/ FUNDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste</td>
<td></td>
<td>In the short term, this could be mulch for tribal purposes, or sold to landscapers. This could scale to feed a gasifier.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concrete/</td>
<td>Aggregate for Road</td>
<td>CUSTOMER: Regional Road Construction</td>
<td>Industrial Rock Crusher <a href="http://wwwglobalsources.com/manufacturers/Rock-Jaw-Crusher.html">http://wwwglobalsources.com/manufacturers/Rock-Jaw-Crusher.html</a></td>
<td>Potentially the BIA can finance since they have some responsibility around this site.</td>
</tr>
<tr>
<td>Asphalt</td>
<td>Base</td>
<td>This would be an adjunct piece of the station and would operate independently at Lawson dump site. An RFP could be circulated to find an independent owner/operator who could manage this operation.</td>
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</tr>
<tr>
<td>INPUT</td>
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</tbody>
</table>
| Plastic                | Plastic Chip            | **CUSTOMER: Industrial Manufacturing**  
Chipped plastic can be sold for making flexible curb and other products. | **Plastic Shredder**  
http://www.badgershredding.com/  
http://conceptproducts.com/Shred-All-SA7200.htm  
http://www.norcalcompactors.com/html/OTHER%20SHREDDERS.htm | The technology would need to be financed (and likely managed) by a 3rd party. To be determined if the tribe could be trained and then manage the system independently. |
| Rebar & Scrap Metal    | Rebar & Scrap Metal     | **CUSTOMER: Smelters**  
This would be transported once there was a full truck-load to a recycler who would pay for the material. | Storage pallets and a flat bed or hauling truck. | http://www.tamcosteel.com/compiinfo.html |
| Mixed use recycling / beverage containers | Aluminum, Glass, Plastic | **CUSTOMER: Individuals and potentially households on the reservation.**  
TM collects the material and another entity picks it up. This can be funded through a grant. The tribe could also consider running a collection facility and getting a CRV license. It may make sense to even actively due the recycling pick up on the tribal land. More research on how this would interact with BurrTec would need to be done. | http://www.remfg.com/REMtext/ez.htm | Grants & CRV income ongoing |
<table>
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</thead>
<tbody>
<tr>
<td>Electronics</td>
<td>Electronics</td>
<td><strong>CUSTOMER: Individuals / businesses</strong></td>
<td>Storage / collection bin</td>
<td>Cleaner Earth pays .10/pound</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The facility has an ongoing electronics drop off and resale program.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household Hazardous Waste</td>
<td>Household Hazardous Waste + community education materials + CFLs + leased battery rechargers</td>
<td><strong>CUSTOMER: Regional Households</strong></td>
<td>Storage / collection bin</td>
<td>This could be grant funded and managed by a tribal member.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The facility has an ongoing household hazardous waste drop off. It collects things like paint, batteries, CFLs, adhesives etc. This can be coupled with community education and CFL giveaways + recycling information; rechargeable batteries could be leased to people.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used Tires</td>
<td>Used Tires</td>
<td><strong>CUSTOMER: Regional Individuals</strong></td>
<td>Pallets</td>
<td>Grants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ongoing tire amnesty program.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used Tires</td>
<td>Retreaded tires</td>
<td><strong>CUSTOMER: Regional Individuals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>People pay a small amount to have their tires retreaded.</td>
<td><strong><a href="http://www.retrade.org/">http://www.retrade.org/</a></strong></td>
<td><strong><a href="http://www.twequip.com/Equipment/tirerecycling.htm">http://www.twequip.com/Equipment/tirerecycling.htm</a></strong></td>
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<tr>
<td>Long - Term Parking</td>
<td>Lease Income &amp; energy sales</td>
<td><strong>CUSTOMER:</strong> Individuals; contractors, industry, utility vehicles etc</td>
<td>Solar panel modules</td>
<td>There are numerous incentives for solar energy installation. A company could be hired - or a strategic partnership to do the installation and ongoing management of the solar system.</td>
</tr>
</tbody>
</table>

People pay to store RVs, industrial work vehicles etc on a long term basis. Shade can be provided by solar panels over the parking area. The LA Convention Center has a 300kW parking structure. See attached PDF. The energy produced by the structure would feed into the grid and the tribe would make additional revenue through this application. [Desert landscaping for water conversation measures could be added to market a tribal xeriscape landscape & design business and water harvesting / grey water for trailers & community gardens.]
<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Car oil / Oil Filters (and potentially other car fluids that need to be changed)</td>
<td>Minimally: used oil &amp; Potentially: Filters (aluminum, charred fabric—for charcoal briquettes or tire manufacturing, separated oil)</td>
<td>CUSTOMER: Tribal members, trailer park residences, low-income individuals.</td>
<td>Optimal equipment for performing oil changes, other car fluids. Most likely requires a shop that a car can drive into.</td>
<td>This micro enterprise could be grant funded and then would be financially self-sustaining.</td>
</tr>
<tr>
<td>INPUT</td>
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<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Conservation Car Wash &amp;</td>
<td>Grey Water</td>
<td><strong>CUSTOMER:</strong> Tribal members, trailer park residences, low-income individuals.</td>
<td>Hoses, solar water system / pumps, vacuum, brushes, special foundation to collect water run - off.</td>
<td>This is a micro enterprise that could employee high-school youth and be managed by a tribal member.</td>
</tr>
<tr>
<td>Detail</td>
<td></td>
<td>This service would be provided for a small fee. Cars would be washed using water conservation methods and biodegradable soaps. Interiors are cleaned with non-toxic chemicals. Energy for the vacuums comes from local solar. Grey water collection would be used to grow plants at the facility.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulky Waste Items</td>
<td>Landfill</td>
<td><strong>CUSTOMER:</strong> Any individual / business throughout so.cal region.</td>
<td>Storage / collection bin / debris box</td>
<td>A strategic partnership with BurrTec.</td>
</tr>
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<td></td>
<td></td>
<td><a href="http://www.burrtec.com/2_bur_hauling.php">http://www.burrtec.com/2_bur_hauling.php</a></td>
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</tr>
<tr>
<td>Reusable Items</td>
<td>Reusable Items</td>
<td><strong>CUSTOMER:</strong> Tribal members, trailer park residences, low-middle income individuals &amp; households, farmers, landscapers, regional builders. Resell / scenario There would need to be a building/ warehouse structure to store and allow people to browse; however, it could be entirely an outdoor space for things like landscaping and building materials etc.</td>
<td>Modeled after Urban Ore in Berkeley, CA that diverts use-able items from windows, doors &amp; bricks, to ta- bles, chairs and landscaping materials.</td>
<td>This is a microenterprise that could be managed by a tribal member and started with seed grant funding.</td>
</tr>
</tbody>
</table>
Additional Business Design Elements

No Tipping Fee for Pre-Sorted Materials
This gives the tribe a competitive advantage since it undercuts competitors. And even though it reduces their income, it is absolutely reduces illegal dumping. In some cases the tipping fee could be subsidized through grants for specific resources.

Discounted Tipping Fee for Unsorted Materials
Ideally this pays for the labor involved - it requires a seed grant for start-up operating and capital costs.

Waive Proof of Residency
The goal of this element is to end illegal dumping. It also results in a social justice benefit especially to individuals who may not have legal proof of residency. The concept is to remove barriers to legal waste disposal.

(Waste) Recycling & Education Printed in English and Spanish
• Sell / Give Household Composting Supplies, Organic Seeds, Water Harvesting Information and Supplies
• Place a Windmill on site - generate energy for the facility / Education on Alternative Energy
• Solar panels on the Building / Garage

Other Considerations

Real Estate & Land
• While there is a demand regionally for agriculture & landscaping soils and compost, there is a general opposition among tribal members to this business opportunity because of the land use impact and possibly due to lingering perceptions from the past of inappropriate land uses. Opinions within the tribe regarding how the land should be used are diverse (some opposed the use of public education billboards against illegal waste, for example).
There is an assumption that value of the land for alternative uses, (e.g., housing developments) make using Tribal Trust Land for a large-scale composting venture less viable from a perspective of maximizing profits.

5000-6000 new houses (theoretically) will be built next to the Torres-Martinez Reservation by Pardee Homes. These are intended to be middle-income homes. Obviously 20,000+ people living in the immediate vicinity will generate more waste and it is a potential opportunity for a Torres Martinez enterprise.

The current allocation of a 25-acre parcel for the site of this pilot project is based on the expectation that other land sites are better suited for future real estate development. Given the lagging housing market and increasing water problem for California and for this region, it is anticipated that housing and new developments will be significantly impacted.

However, if these homes are built, the tribe may want to establish small green businesses that can provide value for the new residents, e.g., organic food markets, green (xeriscaping) landscaping business, green oil change and car details, green restaurants, water harvesting system design and installation, solar panel installation & design. See Attachment 2 for more details.

**Water & Agriculture**

- All plans need to consider long-term viability of water in a desert environment.
- Agriculture is predominant in the Coachella Valley with sod farms, date palms plantations and table grape vineyards representing the major crops grown.
- Any enterprise based on regional agriculture may be subject to decline if water resources become unavailable.

No data was found forecasting the future of agriculture in the region and the availability of woody biomass. Currently, a significant volume of woody biomass is generated from the date palm farms. This crop uses significant quantities of water so that in the long run as water resources are depleted, a business requiring woody biomass as a material inflow will be adversely impacted. In the short term crop failure due to water shortages would temporarily increase available materials.
There is an immediate need for Torres Martinez to establish water rights by use to ensure a long-term access to water. The water could be used to develop small-scale organic agriculture and thereby promote food security for the tribe especially if they were able to employ dry farming techniques. The tribe would need to determine the quantity of water it needs to ensure water rights vis-a-vis the amount of land that would need to go under intensive cultivation in a focused organic system. There is an opportunity to develop community gardens at the Tribal Council facility as well as at all of the trailer parks to promote healthier diets and food security.

**Energy**
- Alternative energy projects may be a possibility, assisted by government funding.

As a stand alone this approach would not eliminate illegal dumping unless it could be operated with drastically reduced tipping fees or subsidized tipping fees to make legal disposal of woody biomass financially attractive. In this way the gasifier could be coupled with diverting construction and agricultural waste from illegal dumping and/or landfills. In the meantime, the tribe could use the income from electricity generation to build its financial and institutional assets for the tribe that could be applied to other kinds of issues, e.g., waste.

**Green Business & Asset Building**

A green business is a way of approaching economic opportunities with the goals of ensuring a healthy quality of life for human communities, a thriving environment and a profitable undertaking.

Energy and resource management goals in the business community have recently seen a great deal of popularity buoyed by enormous financial gains through energy efficiency measures. However, the benefits of green business go beyond streamlining operations in the context of sustainable community development. Ideally, a sustainable community supports companies...
that bring value to the whole system, and not just purchasing their products or services. In return, businesses support their communities. Where corporate culture has encouraged bottom-line solutions, sustainable culture demands triple top-line innovation that recognizes financial, social and environmental variables.

Torres Martinez can benefit from such a venture because of the immediate potential for asset leverage on the reservation. Developing a source of revenue from existing assets increases the value of the land and strengthens the tribe's self-sufficiency. Resource recovery efforts address sustainable living from both ends, while keeping the land waste free and the air free of emissions, there is also a chance to convert various inputs into valuable raw materials for resale. In addition to self-reliance, renewable energy infrastructure on the reservation would foster new partnerships, and/or increase assets.

The business climate has grown receptive to green ideals partially due to incentives and regulations that support sustainable development. Whether using tax incentives to build a large facility or initiating a small-scale self-run enterprise, Torres Martinez can harness the benefits of a growing green economy while taking control of its impacts on the land.
Financing

Financial / Administrative Structure

As described earlier in the report, financial/administrative structures for developing the on-reservation green technology projects can range from:

(i) a passive lease or grant of easement from the tribe to a private developer; to

(ii) a lease/easement relationship with a private developer in which the tribe also provides services, capital, or other value to the project in addition to the site and is compensated on a negotiated basis; to

(iii) a joint venture in which both the private developer and tribe participate as owners of the development entity with rights and interests which are negotiated; and,

(iv) full tribal ownership, which may include contracts with private parties for technical assistance, services, financing, and/or capital on a negotiated basis, but without any equity in the generation facility being held by such private parties.

The choice of a particular structure may be evaluated on a range of criteria including tax, legal, and financial implications as well as non-economic such as employment generation and long-term implications. According to Colin Cloud Hampson of Sonosky, Chambers, Sachse, Endreson & Perry, LLP, the passive lease is the most common arrangement used for energy generation projects based on tribal lands.

The project can be established as a tribal government project, an independent for-profit enterprise, a non-profit enterprise or a for-benefit enterprise.

A for-benefit corporation is an organization driven by both social purpose and financial promise that falls somewhere between traditional companies and charities. A hybrid organization distinct from the government, business and nonprofit sectors, its goal is to harness the power of private enterprise to create social benefit. An effort is underway to promote the growth of these “B Corporations” by establishing specific social and environmental performance standards. For the
time being there are no tax advantages to being a B Corporation, however there are specific institutions focused on financing to B Corporations.

**Sources of Capital Financing - Overview**

If the project is developed under a lease, then it is the job of the lessee to find the necessary capital to move the project forward. If the tribe is involved, then the tribe will need to help line up the financing. Possible financing sources include bonds, loans (commercial, government & investments), and grants. Which source is appropriate will depend upon the project that is undertaken as well as the type of financial and administrative structure chosen. For example, certain grants are only available to non-profit organizations.

**Bond Financing**

A bond is a written promise to repay borrowed money on a definite schedule, and usually at a fixed rate of interest, for the life of the bond. Bonds are loans to governmental entities, but with longer repayment terms and, usually, lower interest rates than are available to most individuals or businesses through traditional funding sources. Unlike bank loans, there is flexibility in the terms of the bond financing which can be structured to meet the needs of the borrowing entity. Additionally, under most circumstances interest on tribal bonds is tax-exempt to the purchaser, resulting in a lower interest rate (cost of borrowing) for the tribe issuing the bonds. The means of repayment, security, and other terms of the transaction can be as complicated, or as simple, as needed to accomplish the tribe’s goals. Tribes are eligible to issue taxable and tax free bonds under certain circumstances. For example, under the Energy Policy Act of 2005 tribes are eligible to issue Clean and Renewable Energy bonds which provide a credit for holders to offset interest income.

Bonds represent a large source of capital, but can be expensive to access. The high expense results from the legal and other fees and administrative time required for issuing bonds.

Should the Torres Martinez Tribe decide to explore the option of bond financing, it will be important to solicit the opinions of the tribe’s general legal counsel and the tribe’s principal financial officer. If the tribe decides to pursue this option, they will need to assemble a “transaction team” which would also include an independent financial advisor and bond counsel who
specialize in this type of transaction and are able to help the tribe’s navigate through the legal issues which are unique to the process of issuing tribal bonds.

**Commercial Loans**
Most commercial banks and financial institutions in the United States have public finance departments that provide tribal governments with loans to finance a wide variety of capital projects and purchases. Tribal governments tend to use commercial loans when lower-interest financing is unavailable and/or to fill short-term financing needs in anticipation of revenues from other sources (i.e., so-called bridge loans). Commercial loans are usually provided at set costs keyed within a range of market-based interest rates. They tend to have higher interest rates and less favorable payback terms as compared to government loans. Commercial lenders such as banks are very low-risk lenders and they usually seek to protect themselves and their loans by securing collateral in one or more of three ways: primary collateral in the form of assets (preferably liquid), secondary collateral such as guarantees, and cash flow. For governments, a portion of future revenues or taxes often represents the ultimate security for commercial loans. The application process for commercial loans tends to be much faster than for government loan programs. Commercial lenders usually have no set eligibility criteria and may have no predetermined limits on the total amounts of loan capital that they make available.

The American Bankers Association (ABA), the largest banking trade association in the United States, provides training and other resources to assist businesses with financing. The ABA Website provides information on topics such as survey reports comparing banks to their peers, consumer education, and the performance of farm banks in providing agricultural loans. American Bankers Association Website: [http://www.aba.com/default.htm](http://www.aba.com/default.htm)

**Government Loans**
Interest rates on government loans may be subsidized, particularly for small communities. Like grants, government loans are made with very specific goals in mind, are often accompanied by specific mandates, and are limited by legislatively appropriated dollar amounts. Most government loans have complicated application procedures and deadlines. Commercial loans are more flexible than government loans, but are typically more expensive for public and private borrowers.
Private Investment Funds

Private investment is defined here as loans and other financial assistance originating from sources other than commercial banks and/or finance companies. Sources of private investment can include, but are not limited to, insurance companies, pension funds, venture capital funds, individual venture capitalists, corporation partners, and general capital investors. Private investment funds billions of dollars worth of new business start-ups in the United States each year. The entrepreneurial ventures funded with this private investment include the environmental goods and services sector as well as other environmental protection related activities. The potential uses of private investment for supporting environmentally-related businesses and/or activities are only limited by the degree of profit associated with them. If it can be demonstrated that an idea or activity will make money, then private investment can be found to support it. The application process for private investment is typically much faster than for government loan programs. Private investors usually have no set eligibility criteria and may have no predetermined limits on the total amount of loan capital available. Private investors tend to demand a significantly higher rate of return on their money than other sources of capital.

Funding information on venture capital funds is available in directories such as, Who’s Who in Venture Capital, April 2005, Grey House publishing, available at: 
And the Venture Capital Resource Directory: 

Foundation Investment Funds / Program Related Investments

A program related investment is a loan or other investment made by a foundation to a business or nonprofit organization for a project related to the foundation’s stated purpose and interests. Program related investments often take the form of loans with limited or below-market interest, loan guarantees, equity investments, asset purchases, linked deposits, purchases of stock, or other forms of financial support. Foundations make program related investments mainly to maximize the impact of their programs, provide an alternative form of financing when grants are inappropriate or insufficient, and, in the case of loans, recycle dollars to increase funding availability. Program related investment dollars are often used to provide capital to intermediary
organizations, such as revolving loan funds and development banks, which in turn lend funds to
development agencies and service providers.

Grants
Grants are generally regarded as more desirable than loans and bonds. However, since grants are
designed by the awarding agency or organization to meet certain, often specific, goals, they may
carry additional mandates as compared to loans and bonds; and those mandates may be costly to
meet. Grants tend to have difficult application procedures and deadlines. Grant money often
comes from tax dollars. The redistribution of federal and state tax revenues to some communi-
ties and not others can be controversial. Many grant programs must be approved annually by
legislative bodies.

Grants.gov is a searchable database with comprehensive information on over 1,000 grant pro-
grams offered by all federal grant making agencies.

Summary
All of the means for acquiring capital covered in this section (bonds, loans, and grants) are avail-
able for use alone or in combination to fund specialized initiatives. An example of combining
different financing mechanisms is when an agency utilizes loans or bonds to acquire dollars
needed for matching fund requirements on grants. When they are carefully matched with the re-
cipient’s needs; bonds, loans, and grants, whether used alone or in combination, can all be very
effective financial tools for achieving the desired end goal.

Potential Lessees
Should the tribe favor a lease agreement with a private developer, it will first need to receive the
necessary approvals from the land owner prior to soliciting bids. Since this project focused on
land held in trust by the tribe and controlled by the council, it will require their approval. The
bid solicitation can specify exactly what the tribe expects to have developed and how it should
operate as well as all other terms and conditions. A tribe or individual Indian can lease trust or
restricted land under the 1955 Indian Long-Term Leasing Act (25 U.S.C. 415) and a tribe can
enter into a contract under the 2000 Indian Tribal Economic Development and Contract Encour-

**Renewable Energy Projects**
The following are companies that have developed and currently operate facilities that generate
renewable energy either from solar, wind or biomass energy. They have contracts to sell the en-
ergy to Southern California Edison. Should the Torres-Martinez Tribe decide to offer some of
the vacant parcels up to be developed for the generation of renewable energy, the process would
be to work with a consultant to solicit bids from a range of companies, including those listed be-
low.

Alta Windpower Development LLC, a subsidiary of Allco Financial Group Inc. of Australia
(ASX: AFG.AX)
Allco is a fully integrated global financial services business, listed on the Australian Stock Ex-
change and specializing in asset origination, funds creation, and funds management.

Oak Creek Energy Systems Inc.
14633 Willow Springs Rd
Mojave, CA 93501
(661) 822-4181
www.oces.com
OCES is a partner with Allco in the development, construction, and operations of a wind power
generation project.

Colmac Energy Inc.
62300 Gene Welmas Dr
Mecca, CA 92254
760-396-2554
http://www.aciinc.net/CE1.html
Colmac Energy Inc. is generating electricity using gasifier technology on the Cabazon Indian
Reservation.
SCE is the nation’s leading purchaser of renewable energy. As such SCE may provide funding for project development and establish contracts to purchase renewable energy from the Torres-Martinez Tribe.

Edison Mission Group (EMG),
EMG is the power generation, capital, and financial services arm of Edison International. It owns or leases interests in 34 power generation facilities, with an ownership capacity share of 9,645 megawatts.
Phone: (800) 655-4555

**Resource Recovery Facilities**
The following are companies that have developed and currently operate facilities that process organic and/or inorganic waste in the Coachella Valley. Should the Torres-Martinez Tribe decide to offer some of the vacant parcels up to be developed for resource recovery and/or waste processing, the process would be to work with a consultant to solicit bids from a range of companies, including those listed below.

BurrTec Waste Industries Inc.
41-575 Eclectic St
Palm Desert CA 92260
Phone: 760-340-2113
http://www.burrtedesert.com/
Headquartered in Palm Desert, California, Burrtec Waste and Recycling Services serves the communities of Cathedral City, Coachella, Indian Wells, Indio, La Quinta, Palm Desert, Rancho Mirage, Salton Sea, Twentynine Palms, Yucca Valley as well as areas of unincorporated Riverside and San Bernardino County. The company provides collection, recycling, and disposal services to public sector, commercial, industrial and residential customers throughout this area.
BurrTec could assume a lease for the collection & transfer station, recycling collection & transfer station, and/or resource recovery park
Western Environment Inc.
Phone: 760-396-0222
Fax: 760-396-4300
Email: information@wei-mecca.com
http://www.wei-mecca.com/

Torres-Martinez could contract with WEI to process and remediate soils.

California Biomass Inc.
Coachella Valley Facility
83-109 Avenue 62
Thermal, CA 92274
Phone: 760/399-4128
Fax: 760/399-4131
http://www.californiabiomass.com

California Bio-Mass, Inc. (CBM) was founded in 1990 by Dave and Mike Hardy. The "Hardy Boys," as they are often referred to, based their organics and recycling company on the principal good business and sound environmental practices do mix. The slogan, "Finally! A way to save money and the environment" created by the company still serves as the guiding business philosophy today. Torres-Martinez could contract with CBM to provide composting services using new technologies such as MicroPyroformer Systems, and for construction waste processing.

**Bonds & Private Sector Loans**

Bonds
Should the tribe decide to finance the project with bonds, the first step is to assemble the transaction team. The team should include the tribe’s general legal counsel and the tribe’s principal financial officer as well as an independent financial advisor and bond counsel. It is critical that the tribe select a financial adviser and bond counsel in whom it can place its trust and confidence. Only then will the financing team function smoothly.
This team will later select the other necessary members of the financing team, including the underwriter, the rating agency, and the bond insurer.

There are a number of measures that can enhance the attractiveness of bonds ranging from bond guarantees, bond insurance, and letters of credit. The transaction team will determine which measures to adopt.

**Private Sector Loans**

Loans typically involve fewer and lower transactions costs than bonds. Should the tribe decide to solicit financing from traditional lenders, it is preferable to work with institutions that allocate a portion of their loans to “green” projects. A number are listed below.

Enterprise Funding Corporation  
300 E. State Street, Suite 230  
Redlands, CA 92373  
Office: 909.792.3803  
Fax: 909.792.3813  
SBA Lender Headquartered in the Inland Empire, Enterprise Funding, is a certified development company that has infused more than half a billion dollars into the local economy.

1st Regional Bank  
Founded in 1979, this bank focuses on serving the Southern California market.

Bank of the West  
[www.bankofthewest.com](http://www.bankofthewest.com)  
Bank of the West is a high-performance, full service regional financial services company with over $61 billion in assets, more than 700 commercial and retail banking locations and approximately 10,700 employees.
California Bank & Trust
http://www.calbanktrust.com/
California Bank & Trust (CB&T) is among the leading banks in California with over $10 billion in assets and branch offices located throughout the state.

CEDLI
http://www.cedli.com/
CEDLI, the California Economic Development Lending Initiative, is a multibank community development corporation established in 1995 to invest capital in small businesses and nonprofit community organizations throughout California in both urban and rural communities. They are committed to increasing access to capital for small businesses and community organizations to allow them to grow, create jobs and to facilitate community economic development. CEDLI maintains branch offices in Oakland and Los Angeles and works with many partners throughout the state.

CoBank
http://www.cobank.com/
CoBank is a private financial institution that offers a broad range of flexible loan programs, specially tailored financial services, and leasing services to agribusinesses, rural communications systems, Farm Credit Associations, and water, waste disposal, and energy systems. CoBank operates as a financial cooperative and is part of the Farm Credit System, a $140 billion national network of independently owned and operated credit and financial institutions providing services to agriculture and aquatic producers and rural homeowners. A broad range of competitively priced and flexible short-term, intermediate and long-term loan programs are offered through CoBank. Short-term loans, which usually mature within 12 to 18 months, are available through CoBank to finance current or seasonal assets, inventories, accounts receivable, commodities and other short-term needs. Intermediate and long-term loans are available for the construction of new facilities, the remodeling or expansion of existing facilities, land or equipment purchases, and the financing of other long-term assets and working capital. Short-term loans and intermediate and long-term loans are available at fixed and variable rates.
Farm Credit Services Website: http://www.farmcredit.com/.
New Resources Bank
http://www.newresourcebank.com/
Founded by entrepreneurs, business leaders and experienced bankers, they focus on how banking can empower businesses, organizations and individuals to make greater impact on their efforts.

Union Bank of California
https://www.uboc.com/uboc/home/home.html
Union Bank of California is among the 25 largest banks in the United States, based on assets. The bank has 334 branch offices in California, Washington and Oregon; and two international offices. It is the primary subsidiary of UnionBanCal Corporation (NYSE: UB), a bank holding company, with assets of $57.9 billion at March 31, 2008.

Wells Fargo
https://www.wellsfargo.com/
Wells Fargo & Co. is a diversified financial services company based in the United States with operations around the world. Wells Fargo is the 5th largest bank in the US by assets and the 9th largest bank in the world by market cap. It is the only bank in the United States to be rated AAA by Standard & Poor’s.

Government Loans & Grants
Federal, state and local government agencies provide loans and grants for a variety of projects. A number are listed here. It should be noted that funding programs come and go, depending upon availability of finances. In addition they may have application deadlines. Research is necessary to determine the suitability and availability of these resources.

Federal Agencies
Catalog of Federal Domestic Assistance
http://12.46.245.173/cfda/cfda.html
The Catalog of Federal Domestic Assistance (CFDA) is an online database listing all federal programs, projects, services, and other initiatives providing financial benefits and other forms of
assistance to the public. The CFDA contains detailed information on financial and non-financial assistance programs administered by departments, agencies, commissions, and other federal government establishments. The CFDA includes grants and loans. The document also includes forms of non-financial assistance, such as loans of equipment and provision of specialized services. The information provided for each assistance service includes program objectives, types of assistance, use and restrictions, eligibility requirements, application and award processes, and post assistance requirements. In addition, financial information such as range and average financial assistance is provided, followed by program accomplishments; regulations, guidelines, and literature; information contacts, and examples of funded projects. A printed copy of the Catalog may be purchased from the Government Printing Office (GPO) by calling toll free 1-866-512-1800 or by logging on to the GPO's website at http://bookstore.gpo.gov/.

U.S. Department of Agriculture Business and Cooperative Programs:
Economic Development Loans
These zero interest U.S. Department of Agriculture loans are used to promote sustainable rural economic development and job creation projects. Loans may be used to fund business expansions, startups, and incubator projects, community facilities, medical facilities, community infrastructure necessary for economic development and job creation purposes, and educational facilities and equipment. Most of the environmental projects funded involve water or wastewater systems. The maximum loan amount is $740,000. These loans are also listed in the Catalog of Federal Domestic Assistance (CFDA), and on the Catalog's Website at http://12.46.245.173/cfda/cfda.html, search on program # 10.854.

U.S. Department of Agriculture Business and Cooperative Programs:
Renewable Energy and Energy Efficiency Program
http://www.rurdev.usda.gov/rbs/farmbill/
The Farm Security and Rural Investment Act of 2002 established the Renewable Energy Systems and Energy Efficiency Improvements Program under Title IX, Section 9006. This program provides direct loans, loan guarantees, and grants to agricultural producers and rural small businesses to assist them with purchasing renewable energy systems and making energy efficiency improvements. The minimum amount of these loans is $5,000, less any project grant amounts,
and the maximum loan amount is $10 million. Funds are awarded through this program for the installation of a wide range of wind, solar, biomass, geothermal, and conservation technologies. Guaranteed loans can be used for making capital improvements to existing renewable energy systems, but direct loans cannot. Applications should be submitted to the U.S. Department of Agriculture Rural Development state office in the state where the project is located. This program is listed on the Catalogue of Federal Domestic Assistance at http://12.46.245.173/cfda/cfda.html, search on program # 10.775.

U.S. Department of Agriculture Rural Development: Intermediary Relending Program
http://www.rurdev.usda.gov/rbs/busp/irp.htm
The U.S. Department of Agriculture (USDA) Rural Development Intermediary Relending Program (IRP) was established for the purpose of alleviating poverty and increasing economic activity and employment in rural communities. The IRP provides loans to local organizations that act as intermediaries for the establishment of revolving loan funds. These revolving loan funds are used to help finance businesses and economic development activities for the purpose of creating or retaining jobs in disadvantaged and remote communities with populations of 25,000 or less. The intermediaries are encouraged to work in accord with state and regional strategies, and in partnership with other public and private organizations that can provide complimentary resources. Intermediary recipients of these loans include private non-profit corporations, public agencies, Indian tribes, and cooperatives. An intermediary may borrow up to $2 million for its first financing and up to $1 million for any financing thereafter. Total aggregate debt for any intermediary is capped at $15 million. Environmental protection related initiatives that are financed with these loans include purchases of easements to protect land from development and pollution control and abatement projects. Organizations must contact their USDA Rural Development State Offices to apply for loans through this program. To locate the Website of a USDA Rural Development State Office, see http://www.rurdev.usda.gov/recd_map.html.

U.S. Department of Agriculture
Rural Business Opportunity Grants (RBOG)
www.rurdev.usda.gov/rbs/busp/rbog.htm
Rural Business Opportunity Grants are aimed at promoting sustainable economic development in rural communities, which includes supporting technical assistance for rural businesses and training for rural entrepreneurs or economic development officials. Activities funded by the RBOG include real estate acquisition, building construction, and development. The maximum grant amount for projects serving one state is $50,000 or $150,000 for those serving two or more states. Eligible applicants must be public entities, nonprofit corporations, Indian tribes, or cooperatives with primarily rural members.

U.S. Department of Agriculture
Community Food Projects Competitive Grants Program
http://www.csrees.usda.gov/nea/food/in_focus/hunger_if_competitive.html
The CFPCGP has existed since 1996 as a program to fight food insecurity through developing community food projects that help promote the self-sufficiency of low-income communities, such as small-scale organic farming, community gardens and food processing. Preferred projects also develop linkages between two or more sectors of the food system, support the development of entrepreneurial projects, develop innovative linkages between the for-profit and nonprofit food sectors, encourage long-term planning activities and multisystem, and build long-term capacity of communities to address the food and agricultural problems of communities, such as food policy councils and food planning associations. These grants are intended to help eligible private nonprofit entities that need a one-time infusion of federal assistance to establish and carry out multipurpose community food projects. Projects are funded from $10,000-$300,000 and from 1 to 3 years.

U.S. Department of Commerce
Economic Development Administration (EDA)
www.eda.gov
The Economic Development Association provides grants to communities to leverage commercial and industrial investment and job creation. It is designed to serve rural and urban areas experiencing high unemployment, low income, or other indicators of severe economic distress.

The EDA has several grant programs that could support food retail projects. The Public Works and Economic Development Program funds state and local governments to revitalize and expand
physical infrastructure to help draw new business and private investment. Local Technical Assistance provides grants to a wide range of applicants (including nonprofit organizations) to support economic development conferences and seminars, local planning and development projects, and feasibility studies. The focus is to build and improve the knowledge base of local, public, and private nonprofit sector leaders.

U.S. Department of the Treasury
New Markets Tax Credits (NMTC)
www.cdfi fund.gov/what_we_do/programs_id.asp?programID=5
Through the New Markets Tax Credits (NMTC) program—one of the largest federal economic development programs—privately managed investment institutions known as community development entities (CDEs) make loans and capital investments in businesses in underserved areas. These CDEs must use at least 85 percent of their proceeds to make qualified low-income community investments. An organization wishing to receive funds under the NMTC program must be certified as a CDE by the U.S. Department of the Treasury. Private for-profit and nonprofit businesses in geographically targeted communities may receive loans from these CDEs.

U.S. Department of Energy:
Financial Opportunities Website
http://www.eere.energy.gov/finacing/.
The U.S. Department of Energy’s Office of Energy Efficiency and Renewable Energy (EERE) offers federal financial assistance to businesses, industries, universities, states, tribes, and others for the development and demonstration of renewable energy and energy efficient technologies. EERE’s Financial Opportunities Website helps eligible parties to find and apply for the financial assistance that EERE offers. The Website also provides direct links to current and past solicitations of specific financial awards for businesses, industries, and universities.

The specific types of financial assistance opportunities described on the Website include grants, cooperative agreements, continuation and renewal awards, unsolicited proposals, cooperative research and development agreements, laboratory subcontracts and sub awards. The Website also provides information on several financing measures to help federal energy managers pay for en-
ergy related projects, including performance contracts, services contracts, and state and local energy efficiency incentive programs.

Funding and award process questions can be directed to the Office of Program Execution Support, EERE, ee-3A/Forrestal Building, DOE, Washington, DC 20585, (202) 586-9957 or (202) 586-8180.

US Department of Energy
Loan Guaranty Program
http://www.lgprogram.energy.gov/
DOE's Loan Guarantee Program encourages the commercial use of new or significantly improved energy technologies that avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases.

US Department of Energy
Indian Energy Education Planning and Management Assistance Program
The Energy Policy Act of 2005 created a number of programs for energy development on tribal lands, including the IEEPMAP. However, to date, those authorized programs have received minimal or no funding appropriations. At some point funds may be available.

US Department of Energy
Tribal Energy Program
http://www.eere.energy.gov/tribalenergy/government_grants.cfm
Funding through the Tribal Energy Program is through a competitive process. Each funding opportunity announcement will include instructions on how to apply, application content, and the criteria by which applications will be selected for funding. The announcements specify the type of project eligible for funding; these may vary.

US Department of the Interior
Bureau of Indian Affairs
There are 52 Bureau of Indian Affairs federal grants, government grants and loans. For detailed information on Bureau of Indian Affairs grants including eligibility requirements or financial in-
The following are specific programs that might be suitable for helping finance some of the projects described in this report

Indian Economic Development
The purpose of this program is to assist Federally Recognized Indian Tribal Governments to develop resources to improve their economies through administration of credit programs and other economic development assistance activities. Funds are used to administer tribal revolving loan programs and guaranty loan programs in order to develop resources to improve access to capital in tribal economies. Final approval of loan guarantees is restricted to the Bureau of Indian Affairs.

Fish, Wildlife, and Parks Programs on Indian Lands
The objective of these Programs is to promote the conservation, development, and utilization of fish, wildlife, and recreational resources for sustenance, cultural enrichment, economic support, and maximum benefit of Indians. Tribes address fish, wildlife, and outdoor recreation issues and participate in associated resource management planning and other activities with their State and Federal counterparts. Also, funds are provided to restore bison to Indian homeland. Appropriations generally support continuous tribal programs and staffs, and are not usually available for new projects.

Indian Loans-Economic Development
These loans provide assistance to Federally Recognized Indian Tribal Governments, Native American Organizations, and individual American Indians in order to help them obtain financing from private sources to promote business development initiatives on or near Federally Recognized Indian Reservations. Loans may be used to finance commercial, industrial, agricultural, or business activities organized for profit. Loan guarantees to private lenders will only be provided if funds otherwise would be unavailable to the borrower. Funds may not be used for speculation. The financial assistance must be used on or near an Indian Reservation.
Office of Indian Energy and Economic Development
Mr. Darryl Francois
Office of Indian, Energy and Economic Development,
1849 C St., NW., Mail Stop 2749-MIB, Washington, DC 20240.
telephone (202) 219-0740
darryl.francois@mms.gov

The Office of Indian Energy and Economic Development was established to provide high-level support for the Department’s goal of serving tribal communities by providing access to energy resources and helping tribes stimulate job creation and economic development, and supporting the President’s National Energy Policy by fostering development of domestic energy resources to reduce the nation’s dependence on foreign energy sources. The office oversees a variety of programs to help create businesses and jobs across Indian Country. Check with the Office’s Director to assess availability of funding.

US Environmental Protection Agency
http://www.epa.gov/tribalportal/grantsandfunding/index.htm
The Grants & Funding portion of the Tribal Portal provides information about tribal grants resources and is intended to help tribes and individuals to find all topics in one location. They are sorted by topic.

U.S. Small Business Administration:
Prequalification Loan Program
http://www.sba.gov/services/financialassistance/sbaloantopics/prequalification/index.html
The U.S. Small Business Administration (SBA) Prequalification Loan Program uses intermediary organizations to assist prospective borrowers in developing viable loan application packages and securing loans. Through this program, loans are awarded to low income borrowers, disabled business owners, new and emerging businesses, veterans, exporters, and rural and specialized industries. The role of the intermediary organization is to work with the loan applicant to make sure the business plan is complete and that the application is eligible and has credit merit. The intermediaries send the loan applications to the SBA when they are satisfied that they have a
chance for approval. If the SBA approves the loan application, the intermediary then helps the borrower locate a lender offering the most competitive rates. Unlike the Small Business Development Centers serving as intermediaries for this loan program, for profit organization intermediaries do charge a fee. The maximum loan amount offered through this program is $250,000. Businesses providing environmental protection related services and products could potentially be awarded these loans. Call the SBA at 1-800-U-ASK-SBA (1-800-827-5722) to locate a prequalification intermediary.

U.S. Small Business Administration:
Certified Development Company/504 Loan Program
http://www.sba.gov/services/financialassistance/sbaloantopics/cdc504/index.html
The Small Business Administration (SBA)’s Certified Development Company/504 Loan Program is a financing tool for economic development within a community. Under the 504 Program, nonprofit corporations called Certified Development Companies (CDCs) work with the SBA and private-sector lenders to provide long-term, fixed-rate financing to small businesses for substantial fixed assets, such as land and buildings. Section 504 of the Small Business Investment Act requires the SBA to sell debt instruments called debentures to investors. A project financed by the 504 Program generally includes a loan secured with a senior lien from a private-sector lender covering up to 50% of the project costs, a loan secured with a junior lien from a CDC (backed by a 100% SBA-guaranteed debenture) covering up to 40% of the cost, and a contribution of at least 10% equity from the small business being helped. The maximum SBA debenture is $1.5 million when meeting the job creation criteria or a community development goal and $2 million when meeting a public policy goal. Generally, a business is required to create or retain one job for every $50,000 provided by the SBA under this program. SBA phone: 1-800-U-ASK-SBA (1-800-827-5722).

U.S. Small Business Administration:
Basic 7(a) Loan Program
http://www.sba.gov/services/financialassistance/sbaloantopics/7a/index.html
The U.S. Small Business Administration (SBA) Basic 7(a) Loan Program is the most basic and most used type of SBA’s business loan programs. The program is regulated under Section 7(a) of the Small Business Act (Public Law 85-536, as amended). To be considered for financing un-
der the Basic 7(a) Loan Program, businesses must show that they lack the internal resources (business or personal) to provide financing and demonstrate that they cannot get financing on reasonable terms via any other lending channels. Basic 7(a) loans are only made available on a guaranty basis and they have a maximum loan amount of $2 million. The SBA’s maximum exposure for 7(a) loans is $1.5 million. Thus, if a business is awarded a 7(a) loan of $2 million, the maximum guaranty to the lender is $1.5 million. Most American banks participate in the 7(a) program, and there are some non-bank lenders as well. Interest rates on 7(a) loans may be fixed or variable, and they vary depending upon the size and terms of the loan. Basic 7(a) loans could be used for environmental protection purposes such as the purchase of equipment needed to meet Clean Air Act or Clean Water Act requirements. To locate a lender, call the SBA at 1-800-U-ASK-SBA (1-800-827-5722).

U.S. Small Business Administration:
Microloan Program
http://www.sba.gov/services/financialassistance/sbaloantopics/microloans/
The U.S. Small Business (SBA) Administration Microloan Program provides very small loans to start-up, newly established, or growing small businesses. The SBA Microloan Program is regulated under Section 7(m) of the Small Business Act (Public Law 85-536, as amended). Under this program, the SBA awards funds to nonprofit community based lenders (intermediaries) which, in turn, make loans to eligible borrowers in amounts up to a maximum of $35,000. The average sized SBA microloan is about $13,000. The maximum term permitted for microloans is six years. Interest rates on these loans vary, depending upon the intermediary lender and the costs to the intermediary from the U.S. Treasury. The interest rates are generally between 8% and 13%. Many different types of small businesses can meet SBA eligibility requirements and qualify for a microloan. Microloans can provide needed capital to start or expand businesses in the environmental goods and services industry. Call the SBA at 1-800-U-ASK-SBA (1-800-827-5722) or see the listing on the SBA Website to locate an SBA microlending intermediary.

U.S. Department of Treasury:
Community Development Financial Institutions Fund
http://www.cdfifund.gov/
The Community Development Financial Institutions (CDFI) Fund, a program of the U.S. Department of Treasury, promotes economic revitalization and community development through investment in and assistance to community development financial institutions (CDFIs). The CDFI Fund was established by the Reigle Community Development and Regulatory Improvement Act of 1994. The Fund’s mission is to expand the capacity of financial institutions to provide credit, capital, and financial services to underserved populations and communities in the U.S. It does this by: 1.) directly investing in, supporting, and training CDFIs that provide loans, investments, financial services and technical assistance to underserved populations and communities; 2.) providing tax credits to community development entities, 3.) providing incentives to banks to invest in their communities and in other CDFIs, and 4.) providing financial assistance, technical assistance, and training to Native American CDFIs and Native American entities proposing to become or create Native American CDFIs. Since it was created, the CDFI Fund has awarded $820 million to community development organizations and financial institutions. With support from the CDFI Fund, CDFIs can increase financing for businesses providing environmental protection related goods or services.

**State Agency Grants & Loans**

California Alternative Energy & Advanced Transportation Financing Authority (CAEATFA)  
Attn: Katrina Johantgen, Executive Director, 304 S. Broadway, Suite 550, Los Angeles, CA 90013, Telephone: 213-620-4467; Fax: 213-620-6309  
CAEATFA was established to promote energy sources designed to reduce the degradation of the environment, and to promote the development and commercialization of advanced transportation technologies. CAEATFA is able to issue tax-exempt and taxable bonds for projects that qualify. CAEATFA offers financing at lower than conventional costs as the interest on the bonds is exempt from federal and state taxes. Applicants should consult with legal counsel and financial consultants to determine if the tax-exempt securities option is the best for the project. Currently unfunded, CAEATFA will have funds when budget the state budget is approved. Their focus is on creating green collar jobs.

California Energy Commission  
[http://www.energy.ca.gov/renewables/](http://www.energy.ca.gov/renewables/)
The California Energy Commission's was placed in charge of a new Renewable Energy Program. It was begun to help increase total renewable electricity production statewide. This followed decades of bi-partisan legislative and gubernatorial support for renewable energy helping to make California a recognized leader in the field. Grants may be available for projects on the reservation that support the Commission’s goals. To search for grants, type grants into the search box on the Commission’s website.

California Integrated Waste Management Board
http://www.ciwmb.ca.gov/grants/
The Board promotes a Zero Waste California in partnership with local government, industry, and the public. This means managing the estimated 92 million tons of waste generated each year by reducing waste whenever possible, promoting the management of all materials to their highest and best use, regulating the handling, processing and disposal of solid waste, and protecting public health and safety and the environment. Grants may be available from the CIWMB for reconditioning tires, recycling used oil, as well reuse of construction and demolition debris, including processing drywall.

California Department of Agriculture
http://www.cdfa.ca.gov/
The California Department of Food and Agriculture strives to support the state’s tradition of innovation and agricultural diversity by working with private industry, academia and public sector agencies. These partnerships allow the department to adapt public policy to a rapidly changing industry. To achieve this end, the Department provides grants to support small-scale organic farming, community gardens and organic food processing. To search for grants, type grants into the search box on the Department’s website.

California Department of Conservation
http://www.conservation.ca.gov/index/Pages/qh_grants.aspx
The Department of Conservation offers grants and other funding programs to further California's goals toward beverage container recycling, agricultural land conservation and watershed restoration and management. On their website one can find an overview of each DOC grant program and links to more information.
California Department of Toxic Substance Control
http://www.dtsc.ca.gov/
The mission of the Department of Toxic Substances Control is to provide the highest level of safety, and to protect public health and the environment from toxic harm. DTSC offers grant funding for hazardous household waste and electronic waste collection services. To search for grants, type grants into the search box on the Department’s website.

California Department of Transportation
http://www.dot.ca.gov/
Caltrans manages more than 45,000 miles of California's highway and freeway lanes, provides inter-city rail services, permits more than 400 public-use airports and special-use hospital heliports, and works with local agencies. Caltrans carries out its mission of improving mobility across California with six primary programs: Aeronautics, Highway Transportation, Mass Transportation, Transportation Planning, Administration and the Equipment Service Center. For creating material for road construction, such as road crusher and tire shredding. To search for grants, type grants into the search box on the Department’s website.

California Public Utilities Commission
Self-Generation Program
http://www.sce.com/RebatesandSavings/SelfGenerationIncentiveProgram/
The Self-Generation Incentive Program is designed to encourage customers of PG&E, SDG&E, Southern California Edison, and Southern California Gas to install "self-generation" units to lessen the electricity load on the grid through distributed power generation. Qualifying systems include photovoltaics, wind turbines, fuel cells, micro turbines, small gas turbines and, internal combustion engines. Contact: Southern California Edison Telephone: 800-736-4777 or E-mail: greenh@sce.com; Telephone: 866-DG-REBATE or E-mail: selfgeneration@socalgas.com

Private Investment Funds
Private investment sources range from individuals to investment firms. Which source is appropriate to approach will depend upon the particular project and its anticipated return.
Angel Investors

An angel investor, or “angel,” is an individual who buys into a company, usually in its early stages, as a private investor. Angels provide capital for businesses to start up, usually in exchange for ownership equity. Many angel investors are retired business owners or executives. Angels usually invest their own money. However, a small but growing number of angel investors are organizing themselves into angel networks or angel groups to share research and pool their investment capital. For small businesses and environmental firms, investor angels represent a large source of capital. They are ideal for start-up companies who are too new to qualify for bank loans, expanding companies with growth potential who are too small to attract traditional venture capital, and companies needing only a small amount of money. Professional angel investors seek investments that have the potential to return at least 10 times their original investment within 5 years, through a defined exit strategy, such as a plan for an initial public offering or an acquisition. Most angels invest only in companies that are physically located within 50 miles of where they live or work. The following websites provide lists of angel investors.

Daily Resource for Entrepreneurs:
Gathering of Angels Website: http://www.gatheringofangels.com/
Angel Investor News Website: http://www.angel-investor-news.com/

Active Capital Website: http://activecapital.org/
Active Capital is a Website for entrepreneurs seeking private investment and private investors seeking deals in a secure and protected environment consistent with all investment laws. Active Capital is the replacement for the Angel Capital Electronic Network (ACE-Net), which was created by the U.S. Small Business Administration in 1995. ACE-Net was changed to Active Capital to express more accurately its proactive role in helping small businesses to connect with private capital. Active Capital is the only low-cost internet-based option for registering securities for sale; and it allows registrations of up to $5 million per year. Active Capital’s cost effectiveness rests on the fact that it allows entrepreneurial companies seeking equity capital for growth to gain legal access to a nationwide network of investors by answering single sets of questions derived from their business plans. Once accepted into the network, the companies are granted
exempt status according to state and federal regulators. This exempt status allows them to go directly to Angels (investors) to acquire capital for their businesses, without having to go through brokers that would require them to pay fees. This exempt status is very beneficial to small businesses with a limited amount of capital.

Small Business Investment Companies
http://www.nasbic.org/

Small Business Investment Companies (SBICs) are privately organized and managed venture capital firms licensed by the Small Business Administration’s SBIC Program to make equity capital and long-term loans available to small companies. Using private capital and capital borrowed at favorable rates via the federal government, SBICs channel monies to small, fast-growing companies, both new and established. The SBIC program has provided $48 billion in financing to more than 100,000 small U.S. companies since the program’s creation in 1958. SBICs specialize in small business financing and have considerable experience/expertise in that area. In addition to loans, they provide expert management assistance to qualifying businesses. Many SBICs make investments or loans in cooperation with other public or private parties. As profit-motivated entities, SBICs expect to share in the success of the small businesses in which they invest. SBICs could be formed for the express purpose of providing capital to small businesses in the environmental goods and services industry, and/or to specific sub-segments of that industry; and they could focus their investments on start-up companies and/or on promoting environmental technology innovation.

Investment Networks

Investment networks are business services that match the interests of investors with businesses seeking capital. These networks help new investors to enter into venture capital markets. They also help businesses to attract investment capital. Investment networks provide a confidential way for companies and investors to broaden their range of business contacts. For example, the Capital Network is an investment network that educates and connects entrepreneurs seeking between $50,000 and $4 million who are building fundable businesses toward an exit strategy. Specialized investment networks could be formed for businesses such as recycling companies, pollution prevention enterprises, and environmental remediation technologies firms. The Investors’ Circle (IC) Network is an example of an investment network that uses private capital to

Private Placements
A private placement is the direct sale of a limited number of shares of stock in a company to a relatively small number of pre-selected buyers, often institutional investors. The most common type of private placement is the limited partnership. A typical limited partnership involves one general partner who holds full authority for all business decisions, and a number of limited partners who serve as angel investors. Private placements are used by new companies that are not likely to attract a single investor to come up with the entire amount of money that they need. They are also used by established businesses that want to acquire money without the scrutiny, expense, and paperwork involved with public offerings. Businesses providing environmental protection related services and products could raise funds using private placements. Private placements can normally be used to raise between $100,000 to $1,000,000, and sometimes more. Successful private placements require very good business plans. For more information, visit the “Private Placement Letter” Website: http://www.privateplacementletter.com/protected/current_issue.cfm

Venture Capital
Venture capital is a type of private equity capital typically provided by professional, institutionally-backed outside investors to new businesses with high growth potential. Individuals who make these types of investments are called venture capitalists. Venture capital funds are pooled investment vehicles (often partnerships) that invest in enterprises considered too risky for standard capital markets or bank loans. Professionally managed venture capital firms are generally private partnerships or closely-held corporations. Some examples of venture capital firms with an environmental focus include Alyra Renewable Energy Finance, LLC and EnerTech Capital. Alyra provides financial advisory services to businesses in the renewable energy sector. EnerTech helps entrepreneurs create companies that deliver profitable, differentiated energy
technologies such as wind power and solar power. See the EcoBusinessLinks Environmental Directory for a directory of green venture capital firms: http://www.ecobusinesslinks.com/green_venture_capital.htm.

See the vFinance, Inc. Website for a directory of venture capital firms: http://www.vfinance.com/.

National Venture Capital Association Website: http://www.nvca.org/def.html.

EnerTech Capital Website: http://www.enertechcapital.com/.

Alyra Renewable Energy Finance, LLC Website: http://www.alyra.net/.

**Fourth Sector Funds**

Organizations driven by both social purpose and financial promise that fall somewhere between traditional companies and charities have been deemed to be part of the “fourth sector”. They are hybrid organizations distinct from those operating in the government, business and nonprofit sectors. Also known as “for-benefit corporations”, their goal is to harness the power of private enterprise to create social benefit. An effort is underway to promote the growth of these by creating a “B Corporation” label, a new type of corporation meeting specific social and environmental performance standards. The following are potential resources for funding and supporting B Corporation-type projects.

Social Venture Network
http://www.svn.org/

SVN is a network to leverage members’ collective strengths of leadership, knowledge and enterprise for a more just and sustainable economy.

Corporation for Enterprise Development (CFED)
http://www.cfed.org/

CFED (Corporation for Enterprise Development) expands economic opportunity by helping Americans start and grow businesses, go to college, own a home, and save for their children’s and own economic futures. They identify promising ideas, test and refine them in communities to find out what works, craft policies and products to help good ideas reach scale, and develop partnerships to promote lasting change. They bring together community practice, public policy and private markets in new and effective ways to achieve greater economic impact.
Good Capital
http://www.goodcap.net/
Good Capital is an investment firm that accelerates the flow of capital to innovative ventures and initiatives that harness the power of the market to create sustainable solutions to some of society’s most challenging problems.

Investors’ Circle Foundation
http://www.investorscircle.net/our-impact/members
The IC Network is comprised of angel investors, professional venture capitalists, foundations, family offices and others who are using private capital to promote the transition to a sustainable economy.

Merrill Lynch Community Development Company
http://www.ml.com/index.asp?id=7695_8134_13653_71392
The Merrill Lynch Community Development Company (MLCDC) provides financing solutions and support to under served communities. Leveraging Merrill Lynch's intellectual and financial capital, the MLCDC establishes strategic partnerships with business and community leaders to develop projects that benefit low- and moderate-income areas and individuals.

Native Energy
http://www.nativeenergy.com/
Native Energy helps build Native American, farmer-owned, community based renewable energy projects that create social, economic, and environmental benefits. Native Americans and farmers traditionally care for and care about the environment because they are also very dependent on the gifts of the Earth for their survival. They are seeking a way to build their economies and their communities. Native Energy has funded wind turbines, anaerobic digesters on reservations and could be a source of support for solar panels

Opportunity Fund
http://www.opportunityfund.org/
With their motto as “Working capital for working people”, the Opportunity Fund provides enterprising families with financial training and access to capital to build self-sufficiency, with a strong commitment to impact measurement and accountability.

Pacific Community Ventures
www.pacificcommunity
PCV provides resources and capital to businesses that bring economic gains to low- and moderate-income communities in California.

RSF Social Finance
http://www.rsfsocialfinance.org/
RSF Social Finance provides socially responsible investors, donors, for-benefit organizations, and social enterprises innovative investing, lending, and philanthropic services to promote environmental, social, and economic sustainability.

TBL Capital
www.tblcapital.com
TBL Capital has developed an intentional, patient capital venture fund focused on the needs of the entrepreneur with a balanced emphasis on people, planet and profits. This firm invests in entrepreneurs who are committed to building companies with strong triple bottom line returns.

Underdog Ventures
http://www2.underdogventures.com/
Underdog Ventures has developed a new model of customized community venture capital funds, combined with a model of customized philanthropy. Underdog Ventures partners with a group of investors committed to financial, community and environmental results. They create innovative and customized investments to meet the specific needs of their investors, each of whom has a dedicated fund that invests in areas that they choose.

Foundation Loans
Some foundations offer Program Related Investments (PRI). PRIs enable non-profit organizations or commercial ventures that further the foundations’ goals to access capital typically under
favorable terms. PRIs may fund capital projects, provide bridge loans, or offer liquidity to loan funds, among others. PRIs employ financing methods such as loans (senior and subordinated), loan guarantees, lines of credit, linked deposits, or equity investments.
Source: [http://primakers.net/](http://primakers.net/)

Foundations that make program-related investments include the Ford Foundation, [http://www.fordfound.org/program/community.cfm](http://www.fordfound.org/program/community.cfm), the John D. and Catherine T. MacArthur Foundation, [http://www.macfound.org](http://www.macfound.org), and the Met Life Foundation, [http://www.metlife.com/Applications/Corporate/WPS/CDA/PageGenerator/0,4132,P263,00.html](http://www.metlife.com/Applications/Corporate/WPS/CDA/PageGenerator/0,4132,P263,00.html)

Program related investments can be a source of low cost debt or equity capital to support an organization’s environmental projects.

**Private Grant Resources**

The following are a number of the corporate, community, family, public and private foundations that could provide grant funding.

Community Foundations

A community foundation is a federally tax-exempt, non-profit organization that makes grants for charitable purposes in a specific community or region. The funds available to a community foundation are usually derived from many donors and held in an endowment that is independently administered. Income earned by the endowment is used to make discretionary grants meant to build, strengthen and improve the community through environmental protection initiatives and other measures. Although a community foundation may be classified by the Internal Revenue Service as a private foundation under Section 501(c)(3) of the tax code, most are classified as public charities and are thus eligible for maximum tax-deductible contributions from the general public under Section 170 of the code. Community associations’ basic appeal to donors is their flexibility. Donors can choose between many different ways of giving tax deductible charitable gifts. The donor can also specify how these donations will be used. This flexibility allows many individuals, through gifts and bequests, to establish permanent endowment funds within one community foundation.
Bank of America Foundation
http://www.bankofamerica.com/foundation/
Bank of America is committed to creating meaningful change in the communities they serve through their philanthropic efforts, associate volunteerism, community development activities and investing, support of arts and culture programming and environmental initiatives.

Calvert Foundation
http://www.calvertfoundation.org/
The Calvert Foundation is a nonprofit organization focused on community investment and providing investors with innovative financial products and services that channel flexible, affordable capital to underserved communities.

Citigroup Foundation
http://www.citi.com/citigroup/corporate/foundation/
The Citi Foundation is committed to enhancing economic opportunities for underserved individuals and families in the communities where they work throughout the world.

San Diego Community Foundation
http://www.sdfoundation.org/
The San Diego Foundation is San Diego's leading resource for information about charitable giving and community needs. They encourage and support meaningful dialogue on issues affecting each of their communities and work with philanthropists to develop creative solutions to meet critical community needs. They support a number of tribal initiatives.

Southern California Grantmakers
http://www.socalgrantmakers.org/
SCG’s mission is to support and advance effective and responsible philanthropy for the public good. It consists of 134 members. Members include individual philanthropists, family foundations, private independent foundations, community foundations and public foundations, as well as corporate foundations and giving programs that donate at least $25,000 annually in the Southern California. Members are located in five Southern California Counties: Los Angeles, Orange,
Riverside, San Bernardino and Ventura. Members’ assets total more than $53 billion with the largest number of members (38%) holding assets between $25 million and one billion.

**Individual and Corporate Donations**

Individual and corporate donations, particularly those which are tax deductible, are a popular means for supporting many nonprofit environmental organizations and some government programs. In addition to financial donations, corporate and individual donations may take the form of in-kind payments or special services. Many nonprofit organizations’ operating budgets come largely from individual donations, and to a lesser extent, corporate donations. Private sector corporations and/or foundations frequently match individual financial donations. Donations are frequently used to finance environmental programs that attract significant public interest, such as programs for the conservation of scenic natural habitats, or programs protecting animals that people like to observe on outdoor expeditions, such as whales or sea turtles.
Conclusion & Next Steps

Based on the conditions outlined by the tribe, the research team evaluated a range of technologies and concluded that the following best met the tribe's criteria: household composting; wood chipper; gasifier; board reducer or panel disassembler; rock crusher; waste storage bins/unit; collection & transfer station; recycling collection & transfer station; and demolition teams. Following this assessment, the team then looked "outside the box" to identify potential Green Technology Enterprise Opportunities that might also satisfy the tribe's conditions and came up with the following: small scale solar home energy system installation; small scale wind turbines; wetlands cultural ecolodge; and regional resource recovery and reuse business. This last option -- a multi-technology resource recovery and recycling station would include all of the technologies that met the tribe's conditions and could serve as a community education hub.

The projects could be developed by the tribe or by a third party. To assist in the process, EFC9 identified potential funding sources ranging from third party developers to bonds, loans and grants from public and private sources.

The opportunity to address the needs of the Torres Martinez Tribe lies in having a strong connection to the land. Careful resource stewardship also requires a process of 'buoyant thinking', or employing a practice of holistic analysis that considers how management and development of resources either builds and creates or extracts and exchanges tribal assets. Evaluating asset strategies takes into account the following set of development elements:

- Economic and financial changes
- Leadership, community, institutional capacity and security
- Social, political, and cultural changes
- Planning, opportunities and sustainability

These categories offer another filter through which top technologies and business ventures reviewed in this report can be assessed. Having incorporated an asset building framework into the analysis further enables feasibility testing, through the added lens of seeing how these technologies build the capacity to control, retain, utilize, leverage, increase and create new assets. Ques-
tions to pursue for further insight into asset development ask for careful consideration of the conse-
quences (intended and unintended) and implications that a new technology and/or business may have in increasing tribal productivity, revenue streams, cultural integrity and social respect.

Noting the contrast between the culture of Cabazon and Torres Martinez, Torres Martinez may want to consider how it wants the world to view this tribe and what it would like to communicate to the world about its culture and about the future. Where the Cabazon Band of Cahuilla Indians was able to take Indian Gaming to the Supreme Court and earn its fame, Torres Martinez also has this opportunity to achieve national prominences by leveraging the Salton Sea Wetlands project. This will be a major reputational asset for the tribe; and arguably is already. By coupling the wetlands with solar, alternative energy generation and an ecolodge and other green technologies and development projects, Torres Martinez can move towards a regenerative future that honors culture and the natural world while increasing its financial wealth and opportunities for tribal members to live amazing and abundant lives.

www.familytravelfiles.com
www.bwbtours.com
www.richard-seaman.com

Next Steps

Based on the report findings, the team proposes the following next steps to assist in the decision-making process.

• **Contact & meet with tribal members/council.** Contact & meet with tribal members/council from the Ramona Band of Cahuilla Indians, in Anza, California to learn about their wetland eco-lodge.

• **Explore tribal funding opportunities.** Explore tribal funding opportunities through state, federal, and foundation grants and loans as well as enterprising partnerships.
• **Conduct further research.** Conduct further research into tribal case studies of alternative energy usage and sustainable business for waste issue improvements/solutions, as an asset building initiative.

• **Explore the possibility of working with Biomass Energy & Carbon.** Explore the possibility of working with Biomass Energy & Carbon as a medium term asset building strategy. Contact the company to learn more about the 20 foot container option to process biomass, make agchar and produce a local independent and green energy stream.

• **Explore additional opportunities to expand solar technology.** An 1MW solar installation is in the process of being installed at the wetlands. Explore additional opportunities to expand on this technology and to use the Torres Martinez Tribal Lands to produce alternative energy and financial assets for the tribe.

• **Prepare a business plan.** Determine the most appropriate approach and prepare a business plan for successful implementation.
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1. Environmental Justice Symposium; Berkeley, CA; April 2008
   - Researched specific legal conditions for renewable energy projects on tribal lands
   - Hampson, Colin C.; “Tax, Legal and Funding Considerations in Developing Renewable Energy on Tribal Lands”; Sonosky, Chambers, Sachse, Endreson & Perry, LLP  
   - Made contact with legal advocates experienced in tribal law and energy incentives

2. US Composting Council Conference; Oakland, CA; March 2008
   - Researched aerobic and anaerobic options for organic waste diversion
   - Collected leads from composting entrepreneurs and scientists.

INTERVIEWS
Alberto Ramirez, Environmental Director, Torres-Martinez Desert Cahuilla Indians  
Gerardo Bojorquez, Environmental Coordinator, Torres-Martinez Desert Cahuilla Indians  
Gary Kelly, Environmental Coordinator, Cabazon Band of Mission Indians  
John McKinnis, General Manager, Western Environmental  
Mike Hardy, Co-Owner, California BioMass  
Debi Livesay, Project Director / Water Operator, White Water River Wetlands Restoration Project
Attachment 1: Tribal Case Studies Waste Management

7 Case Studies from Tribal Communities Across the U.S.
Highlighting Approaches to Illegal Dumping & Alternative Waste Streams

1. **Native Tribe:** Fond du Lac of Lake Superior Chippewa in Minnesota  
   **Technology:** Recycling Program-Concrete & Ashpalt  
   **Benefit:** Saved money, curbed illegal dumping.  
   **Source:** *Tribal Waste Journal, June 2006*

   This tribe launched a *concrete and asphalt-recycling program* by obtaining rock-crushing equipment through the U.S. General Services Administration’s government surplus program. Recycling concrete and asphalt not only saves the tribe money in waste transportation and disposal costs, but also curbs illegal dumping and reduces the environmental impact of road construction.

2. **Native Tribe:** Oneida Tribe of Wisconsin  
   **Technology:** Demolition Team/Recycling Operations  
   **Benefit:** Cost Savings, Waste reduction through Recycling  
   **Source:** [www.epa.gov/tribalmsw](http://www.epa.gov/tribalmsw)

   Guided by a tribal creation story where great respect for the Earth and ensuring its protection is of utmost importance, the Oneida created a *Demo(lition) Team* in order to manage *construction and demolition* materials from the renovation or demolition of dilapidated buildings on their land. They are helping to maintain cultural roots by adhering to a guiding principal of sustainable management and to provide cost savings for the tribe through *recycling operations*. Additionally, the tribe is purchasing land to fill in the *checkerboard pattern of rolling farmland on its reservation.*
3. **Native Tribe:** Fort Peck Reservation of Montana  
**Technology:** Waste Storage Units  
**Benefit:** Waste Management, Increased institutional assets  
**Source:** EPA region 8 (Assiniboine and Sioux Nations)

*Convenience* & *Affordability* are keys to successful solid waste service for the Fort Peck Reservation, which has a dispersed population of 10,300 people living on 2 million acres. Using a community solution to confront open dumping on their lands, roll off sites were created. The tribe employed waste storage units/containers (40 cubic yard debris bins) to capture non-toxic waste streams. A gatekeeper at each roll off site checks for permits, screens for unacceptable materials, (e.g., hazardous waste,) and educates residents about recycling as they bring their waste for storage collection. This operation is financed and maintained through revenue generated from the issuance of monthly permits that cost residents $15. Businesses and contractors pay $300 per month. The tribe also obtained a HUD Community Development Block Grant. Collected waste is then taken to a landfill. The tribe pays a per ton tipping fee. To speed up the decision-making of this project and streamline management of roll off sites, a tribal Public Works Committee Board was established.

4. **Native Tribe:** Eastern Band of Cherokee Indians in North Carolina  
**Technology:** Transfer Station, Tribal Trucking Co.  
**Benefit:** Tribal employment, Business Credibility, Waste Management  
**Source:** [www.epa.gov/tribalmsw](http://www.epa.gov/tribalmsw)

Scale operators weigh each collection truck as it enters the tribal transfer facility. Loads then empty onto a tipping floor and transfer station employees examine the trash and pull out non-recyclables. A front-end loader pushes waste off the tipping floor and a transfer trailer compacts it. The tribe uses Cherokee Boys Club Inc., a tribal trucking company, to haul waste to a nearby landfill. The company is paid on a per mile basis. The transfer station can handle 300 tons of waste per day and is open 7 days a week during summer months. Employee training and certification as transfer station managers/operators gave the tribal trucking company credibility among private haulers and in surrounding counties.
5. **Native Tribe:** Oglala Sioux Tribe/Pine Ridge Reservation in South Dakota  
**Technology:** Landfill  
**Benefit:** Waste management, Quality of Life  
**Source:** [www.epa.gov/tribalmsw](http://www.epa.gov/tribalmsw)  
This tribe decided to build a landfill because of their remote geography. Grant money from the US dept of Agriculture's Rural Utilities Service (RUS) helped fund the project. The tribe followed the Subtitle D of Resource Conservation and Recovery Act, which lays out the federal requirements for landfill design, construction, operation and closure, in their implementation process.

6. **Native Tribe:** Campo Band of Southeastern San Diego County  
**Technology:** Landfill  
**Benefit:** Tribal Employment, Increase Tribal Financial Assets, Develop Social Services on the Reservation  
**Source:** [http://gladstone.uoregon.edu/~uofla/Fall99/Tauber.html](http://gladstone.uoregon.edu/~uofla/Fall99/Tauber.html)  
*Alan Tauber: Sovereignty and Solid Waste: The Siting of Refuse Facilities on Native American Lands*  
The Campo Band chose to build a landfill because of surrounding development and landfill-overfill. The tribe developed an environmental program to deal with pushback (within and without their community,) as well as a regulatory agency to enforce established tribal environmental regulations (Campa Environmental Protection Agency). Developing a team of legal council, financial advisors and consultants from the solid waste industry, the tribe also created a development corporation wholly owned by the Campo Band with a board comprised mostly of tribal members. The tribe expects to employ its members to run the facility as well as use the revenue generated for future tribal projects, and will reinvest half of all capital gained for development of social services on the reservation.
7. **Native Tribe:** Campo Band of Southeastern San Diego County  
**Technology:** Wind Farm  
**Benefit:** Diversified Income, Employment, Training  
**Source:** “Tribes Go Green”- Article; Indian Voices, Summer 2007

The Campo Band also installed *wind turbines* that feed into San Diego Gas & Electric. 25 wind turbines individually capable of generating up to 2 megawatts of electricity are in use, each with 3 blades and 20 stories high. The wind farm also provides a diversified source of income as the land beneath the turbines is leased to a private company for other use. The company is Australian based owner-operator, Babcock & Brown. The energy produced with wind provides an additional income stream for the tribe aside from gaming as well as opportunities for jobs and training. For more information call: (619) 478-9046 x227.

8. **Native Tribe:** Cabazon Band of Mission Indians  
**Technology:** Resource Recovery Park  
**Benefit:** Economic diversity for the tribe, development & tax incentives; practical solutions to environmental and waste problems  
**Source:** [http://www.ciwmb.ca.gov/LGLibrary/Innovations/recuperypark/CaseStudies2.htm](http://www.ciwmb.ca.gov/LGLibrary/Innovations/recuperypark/CaseStudies2.htm)

First Nation Recovery Inc. (First Nation) is a wholly owned $10 million venture of the Cabazons. Through *state-of-the-art recycling processes*, First Nation can turn millions of scrap tires a year into useful products. First Nation obtains its tires from permitted and licensed scrap tire haulers in Southern California. These companies collect tires from tire shops, public works departments, and other scrap tire generators and deliver them to First Nation in Mecca. First Nation does not handle individual tire delivery. Some of the high-quality environmentally beneficial products that First Nation produces are: *Crumb Rubber, EcoPave TP, and EnviroTurf EQ*. Additionally, the Cabazons generate additional revenue from leasing land to *Colmac Energy, Inc.*, a 48-megawatt biomass-fueled power generation plant that provides power to Southern California Edison under a long-term contract.
Attachment 2: Overview of Real Estate Trends

Statistical data clearly shows California’s housing trend has worsened over the last three months. The scarcity of jumbo mortgages combined with the large number of real-estate owned (REO) homes has resulted in declines in California’s home sales and prices. Many new home builders have large inventories of mostly-complete-but-not-yet-sold homes.

High foreclosure rates have caused lenders to repossess large numbers of homes increasing the percentage of for-sale homes in several markets (up to and above 50 percent in some cases) negatively impacting home prices (Ibid).

Even though California’s commercial real estate markets have held up fairly well, financing has become much harder to obtain for most types of new commercial real estate projects (Id.).

Regional Sales & Price Activity - Palm Springs Desert Region

Table: Desert Area 2007 vs 2008 Monthly Residential Multiple Listing Activity

\[ \text{Table: Desert Area 2007 vs 2008 Monthly Residential Multiple Listing Activity} \]

17 http://www.calchamber.com/CC/Headlines/06112008TS.htm
March 2008

According to the California Desert Realtors Association, median price fell 29% and sales decreased 24.5% compared to the same time a year ago for California statewide. In the Palm Springs Desert region, median price fell 20.1% & sales declined by 27.1% from a year ago. Inventory remains high as the market continues to absorb properties the current owners can no longer afford (Ibid.).

According to the California Desert Realtors Association, median price fell 29% and sales decreased 24.5% compared to the same time a year ago for California statewide. In the Palm Springs Desert region, median price fell 20.1% & sales declined by 27.1% from a year ago. (Ibid.) Inventory remains high as the market continues to absorb properties the current owners can no longer afford. (Id.)

Desert Area MLS Residential For Sale Inventory

<table>
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<tr>
<th>Month</th>
<th>2006</th>
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<th>2008</th>
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<tr>
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<td>8598</td>
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<tr>
<td>January</td>
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<td>8490</td>
<td>9134</td>
</tr>
</tbody>
</table>

The struggling housing sector, problems in mortgage markets, tighter credit, volatile financial markets, high energy prices and draught risks may be indicators of decreased value for Torres Martinez land. The median price of $311,540 for the Palm Springs Lower Desert area dropped 27% from the prior year. These trends should be taken into consideration as the tribe considers options and timelines for implementation of business alternatives.

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18 http://www.caldesertrealtors.com/real.html
19 California Association of REALTORS® & National Association of REALTORS®
Attachment 3: CRV License & Recycling Center Information

The 1986 California Beverage Container Recycling and Litter Reduction Act is managed through the Department of Conservation. The program is funded by distributor payments to the state for aluminum, glass, plastic and bimetal beverage containers sold to dealers in California. The program certifies multiple types of recycling operations; drop-off or collection programs, community service programs, recycling centers and processing facilities.

Licensing, Permit and Certification Requirements

- Certification: Requires knowledge demonstration of department’s regulations and procedures to ensure regulatory compliance. Lead time approximately 60 days to begin operations. Department of Conservation.
- Business License per local government business regulation.
- Conditional Use Permit if type of business does not fall under established permit categories of the local city or county.
- Land Use Permit (depending on structure) (Not sure about if on a reservation).
- Scale Certification (annual fee and scale requirements) County Department of Weights and Measures through the State Department of Agriculture.
- Legal Documents like fictitious business names, FED employer ID etc.

A no fee application is required. These licenses and permits are the basic items that you need when starting a recycling business. They come from a variety of sources, but the local city hall, county administrative office or planning department should be able to help obtain necessary items within the community. For more information, please refer to the Department of Conservation-Division of Recycling, A Guide to Starting a Recycling Business, pg 13.

Recycling Centers

Operators of certified recycling centers pay CRV for beverage containers redeemed from the general public as well as from drop-off or collection programs, community service programs and other certified recycling centers. Some certified recycling centers are equipped with “reverse vending machines” that pay customers CRV for containers placed in the machine. Other operations include staffed centers with bins or a truck on site to pay the CRV. Up to $ 2,300 a month incentives called handling fees are available for Nonprofit Convenience Zone Recycling and Rural Region Recycling centers that process minimum volume of 60,000 containers. It is possible to group locations.

*A next step would be to clarify and/or determine how the reservation might qualify.
**Drop Off Location:**
A drop off- or Collection Program does not pay CRV. It may be operated by individuals, partnerships, husband/wife co-owners LLC companies or corporations, who manage. Under this scenario operators accept or collect donated materials and sell it to someone else for processing. Revenue is generated by the CRV or scrap value. The operator is responsible for getting containers to a certified recycling center or processor. Drop-off or collection programs may be eligible to receive annual supplemental payment if located in a rural region and designated to provide recycling in a specific residential neighborhood.

*A next step would be to clarify eligibility on the reservation.

**Community Service**
Community service programs are operated by a nonprofit/charitable organization with tax exempt status or a city, count or public agency. Operations and revenue generation are the same as a Drop-Off Location scenario.

*The non-profit that runs the wetland might also be eligible to be an umbrella for this type of project.

**Curbside Programs**
Lastly curbside programs collect CRV containers from residences and multi-family dwellings in bins set at the curb. *Approval for this program must come from local government.*

A CRV recycling business is quite scaleable and has minimal start up costs providing the opportunity for residents on the reservation to reduce litter and generate some revenue. Incentives and special circumstances for tribal land need to be evaluated in detail if this option is to be pursued.
Attachment 4: Alternative Energy: Ramona Band Cahuilla Mission Indians

Tribal Energy Program
Ramona Band of Cahuilla Mission Indians - 2002 Project

Project Overview
Tribe/Awardee: Ramona Band of Cahuilla Mission Indians
Location: Anza, CA
Project Title: Ramona Ecotourism Cultural Resort Macro-Grid Hybrid Renewable Energy Power System Project
Type of Application: Development/Demonstration
DOE Grant Number: DE-FC36-02GO12099

Project Amounts:
DOE: $291,538
Awardee: $237,700
Total: $529,238

Project Status: See project status
Project Period of Performance:
Start: September 2002
End: September 2004

Summary

The Ramona Band of Cahuilla Mission Indians ("Ramona Band" or "tribe") will be the first tribe to develop its entire reservation off-grid, using renewable energy as the primary power source. The tribe will purchase and install the primary components for a 65-80 kilowatt-hours per day central wind/PV/propane generator hybrid system that will power the reservation's housing, offices, ecotourism, and training businesses. The electricity is planned to be distributed through an underground mini-grid.

Project Description
Objective

The tribe's cultural and economic development strategy is to establish a highly profitable renewable energy-powered ecotourism business on their reservation. A secondary goal is to demonstrate how renewable energy power systems can be used to eliminate the environmental impact of electric grid power lines on Indian lands, National Forests, National Parks, other protected areas, and the general rural environment. Ninety percent of the electrical and thermal energy needed to power tribal housing, offices, and ecotourism and training businesses will come from
wind or solar energy. Propane will be used as a back-up energy source. Revenues to support the project in the long term will come primarily from tourism and training, not energy sales. Research and fund raising for this project have been underway for three years. The hybrid system will enable the reservation and ecotourism facility to operate entirely off-grid. The Ramona project will serve as a model and an important training tool for other Native Americans.

Scope

The Ramona reservation will not be dependent on the interstate electrical grid system for power, heat, and communications. This will be accomplished using proven commercially available renewable energy and building technologies that will provide all modern conveniences and tourism amenities without using outside utility-generated electricity.

The specific tribal objectives of this proposal are:

* To engineer, purchase, and install a 65-80 kw/hs/day wind/PV/propane generator hybrid system using tribal trainees and staff supervised by contractor and supplier personnel
* To interface the hybrid system with the ecotourism infrastructure buildings to create a reservation micro-electricity grid
* To develop a sustainable operations and maintenance plan that the tribe can execute with minimal outside expertise
* To train tribal members and staff that will be responsible for long-term operations and maintenance of the system.

Data logging systems will be installed or maintained to record the critical parameters necessary to assess the technical and cost performance of the hybrid system(s) and will also systematically collect data to determine the hybrid system's impacts on tribal member's lifestyles, social activities, and business profitability. The analysis will include "lessons learned" and will determine if the hybrid system met the required electrical and thermal loads and how it affected business performance.

Project Status

This project was competitively selected under the Tribal Energy Program's FY2002 solicitation, "Renewable Energy Development on Tribal Lands," and started in September 2002. For progress updates, see the November 2003 (PDF 988 KB), October 2004 (PDF 1.8 MB and PDF 1.3 MB), and October 2006 (PDF 8.3 MB) presentations.
For current project status or additional information, contact one of the project contacts.

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