

Anar Solar



Whitepaper v.5

Solutions for Housing and Societal Issues Made Possible by the Solarization of Municipal Side-Slope Landfills

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DRAFT

1. ABSTRACT

The purpose of this brief is to introduce new and innovative solutions to address the current and persistent social problems of homelessness, affordable subsidized living, transitional housing, drug and alcohol abuse, and mental health treatment.

2. OUTLINE

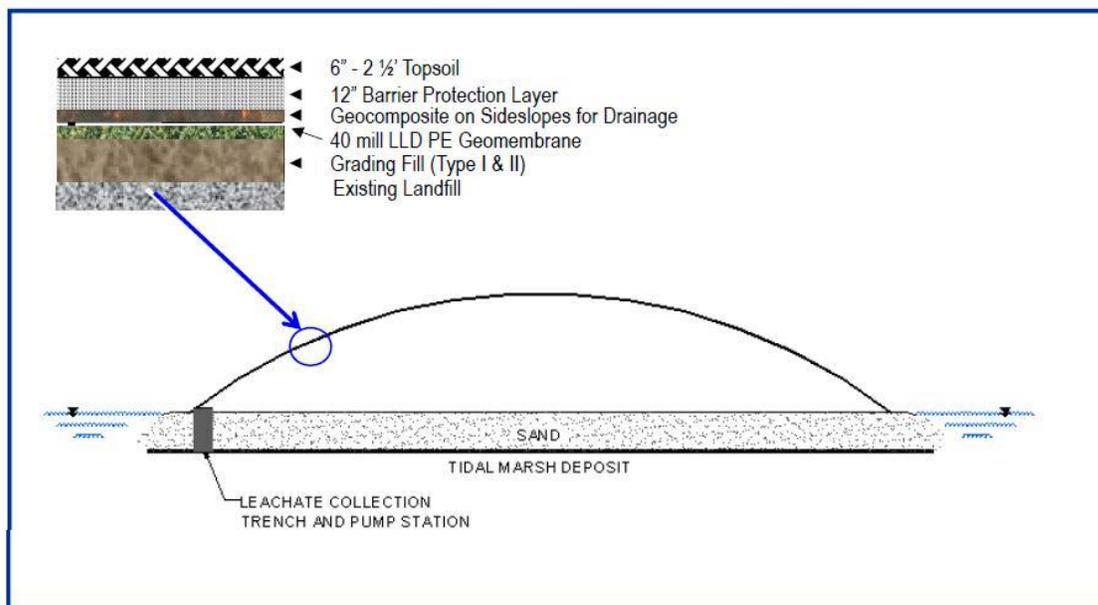
Low paying jobs, high rent costs, and the shortage of available low-income housing are barriers to the upward mobility of much of today's middle-class workforce, and as such they are the cause of many of today's most challenging social problems. After significant analysis of these issues by the Anar Solar leadership team, it became obvious that a solution to these social problems resulting from low wage jobs and the lack subsidized housing can in fact be overcome.

3. EXECUTIVE SUMMARY

Typical Capped Landfill (See Figure 1):

Many cities and towns have landfills sites that serve no useful purpose once they are closed and sealed i.e. "capped"), and they remain a liability for the community as there are costs for the closure and ongoing maintenance of each site. When properly developed and managed, these capped "trash heap" locations can provide a recurring revenue stream on a long term (20-year) basis through solar development.

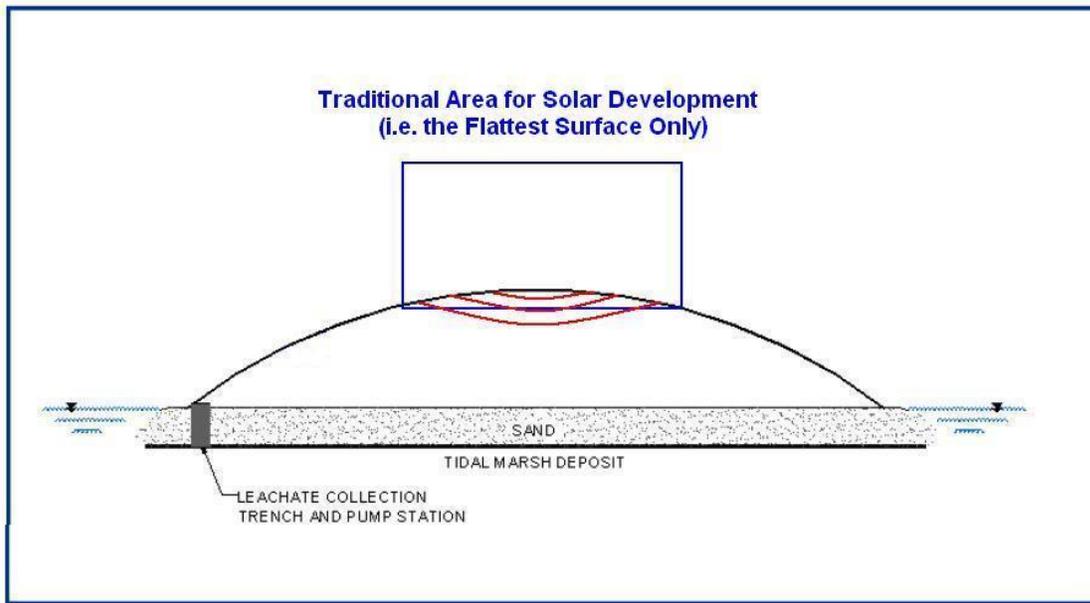
Figure 1: Typical Capped Landfill



Traditional Solar Development on a Capped Landfill (See Figure 2):

The current approaches and practices for landfill solar construction allow only the flattest areas of the landfill to be developed, which is only a small portion of the total available area. This traditional approach provides a land-lease model that generates 1a). low-cost sustainable electricity for the community and b). the resale of excess electricity and tax credits for the developers.

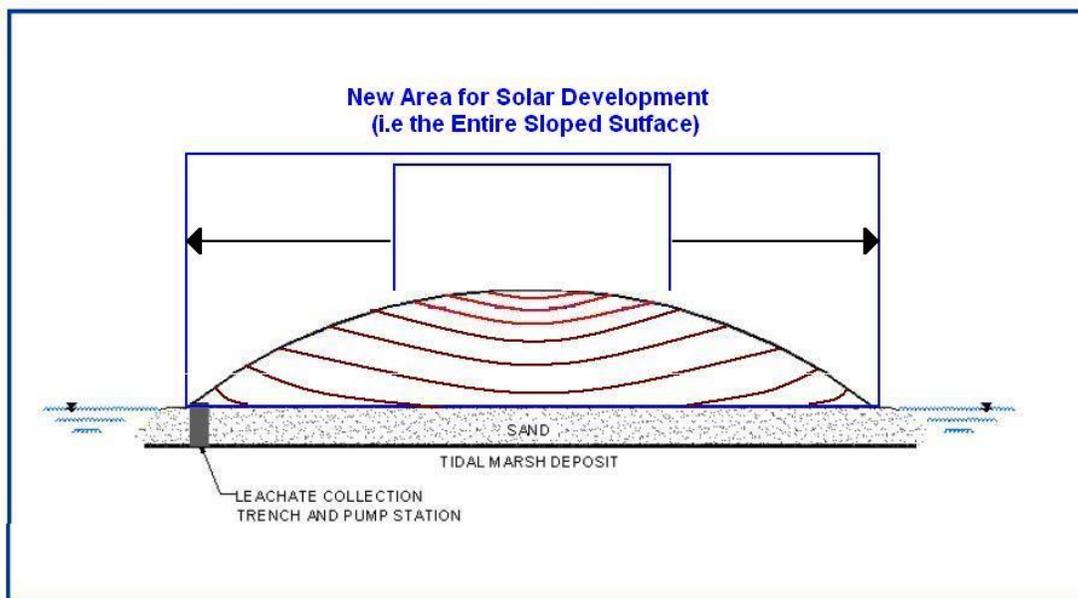
Figure 2: Traditional Solar Development



Increased Solar Development (See Figure 3):

Anar Solar has developed a system that allows for the development of the sloped areas of landfills. This significantly increases the power and revenue generation capabilities of every solar landfill. The additional energy created can be sold to the grid or to other off-takers at a reduced rate which provides a significant revenue stream for the typical 20 year land-lease period. This new approach provides low-cost sustainable electricity for all, and additional revenue for much-needed social programs.

Figure 3: Increased Solar Development



Landfill Project Financial Model:

The landfill market involves a complicated business model involving three (3) “players”:

1. Site Owners
 - a. Municipalities
 - b. State/Federal (Superfund Sites)
 - Note: Sites vary in size from 1 MW – 7MW or larger.

The site owners generate revenue by

- a. leasing the site land to developers through PPAs (Power Purchase Agreements) ;
- b. generating low-cost electricity to replace or offset their own electricity needs;
- c. re-selling any excess electricity that is generated over and above what is used.

2. Solar Developers:

The developers are responsible for recruiting the project’s investors and the energy off-takers.

They generate revenue through:

- a. the resale of excess power generated through solar (i.e. “Net Metering”) ;
- b. the trading of Solar Renewable Energy Credits (SRECS/RECS) ;
- c. available tax credits ;
- d. available Solar development rebates and incentives (if any).

3. The “EPC”:

“EPC is an abbreviation for “Engineering, Procurement, and Construction,” i.e. the contracted company that procures and installs the solar equipment and related components. The equipment and components needed for a typical landfill project are:

The typical construction costs for a traditional landfill project include:

- Racking System
- Mounting / Ballast System
- Components:
 - Solar Panels/Modules
 - Inverters
 - Monitoring hardware
- Conduit and conductors
- Labor:
 - Site design
 - Installation labor
- Site work:
 - Leveling & Trenching
 - Road construction (if needed)
- Grid Tie-In:
 - Impact Studies
 - Application fees
 - Low voltage equipment
 - High voltage equipment
- Other:
 - Equipment rentals, Storage, etc.
 - Security fence (if needed)
 - General & Administrative (i.e. “soft costs”)

4. PROBLEM STATEMENT

Today's government and community leaders are charged with "stemming the tide" of many challenging, troubling and interconnected society issues. Among these concerns are:

1. Low-wage jobs
2. The lack of affordable or subsidized housing & Homelessness
3. Drug/opiod & alcohol abuse
4. Crime and punishment
5. Mental health treatment
6. Veterans affairs

Our goal is two-fold:

1. To provide on-the-job training and job creation in the green energy and construction industries for the following members of society:
 - Returning Veterans
 - The unemployed
 - Single-parent families on state aid
 - Department of Youth Correctional Facility members
 - Recently-released incarcerated persons
 - Rehabilitated drug and alcohol abusers
2. To provide this same group with new opportunities for transitional and permanent housing.

5. SOLUTION

By utilizing a landfill's previously unusable sloped surfaces for solar development, the additional revenue generated can be used by municipalities to fund many of the important but underfunded social programs available today.

Revenue Estimates:

A landfill solar field creates annual revenue priced by the watt, and this revenue could be divided to reflect the needs of each program on an annual basis. In some years, the landfill will produce more energy than other years, so the division of funds from the solar field should be done on a per-watt percentage. This will ensure that the each program will get its annual funding based on the power generated by the solar field for duration yet to be determined.

The typical term of a land lease/PPA agreement is 20 years. Some programs will not need 20 years of funding, but some may. Programs that do not require significant time or have been proven to be successful will be subsequently terminated, and their portion of the funds will be released for redistribution to other programs

Financial Projections (See Table 1):

The financial projections modelled in Table 1 (below) show that a small (i.e. ~1 MW) landfill in Zone 5 (Northeast US) stands to generate an estimated ~ \$ 260,610.00 annually (~ \$5.2 M over 20 years) based on resale at \$0.17 per kWh. These revenues will increase significantly when larger sites are developed, as more sites come online over time, and in other geographical locations where daylight hours are longer.

Table 1: Est. Power & Revenue Generation for Small Landfill (1 MW) in Zone 5 (New England)

Average Daily Sunlight Hours (Zone 5)			4.2	(Hours)
Power Generation			1,000,000	(1 MW)
Daily Power Production (Estimated)			4200	kWh
Annual Power Production (Estimated)		365	1,533,000	kWh
Daily Revenue (Estimated)	(Based on resale at \$0.17 per kWh)	0.17	\$ 714.00	
Annual Revenue (Estimated)	(Based on resale at \$0.17 per kWh)	365	\$ 260,610.00	
20-Year Revenue (Estimated)	(Based on resale at \$0.17 per kWh)	20	\$5,212,200.00	

Establish business partnerships through tax incentives:

The fact that this program helps people in need, benefits society, provides work force training, permanent living facilities, job placement, develops a skilled labor force is not enough. More is needed in the way of a financial incentives and beneficial exposure in order for local businesses, national foundations, and state/federal agencies to support the implementation of this program.

A tax break/incentive program that exceeds the current tax breaks allowed by state and federal statutes would encourage companies to provide the necessary appropriations to develop the aforementioned programs.

We propose that businesses will participate by providing a). supplemented or donated supplies for construction, b) locations for housing and treatment facilities, c). funds for manufacturing of the solar arrays, and d). assistance with administration support and other associated staffing.

Each state has an existing code for charitable tax deductions. If the tax benefits to participating businesses are significant enough, then their donations can be used to develop the projects associated with delivering this solution. In addition to the increased charitable tax break, each company will also benefit from the enhanced public relations and corporate branding opportunities that come with participation in this social solutions program.

Results:

1. Problem: The lack of affordable or subsidized housing & Homelessness

o Solution:

- There is a large supply of unused or vacant state and federal buildings available throughout the nation. These vacant buildings can be renovated into affordable housing units, treatment facilities, and homeless shelters.
- The affordable housing units and unused buildings can be designed to accommodate the different needs of people we intend to assist.
- Run-down, abandoned, and foreclosed homes and commercial properties possessed by banks, business owners, and towns can be renovated to provide transitional housing in areas where there is a shortage of suitable locations.

These abandoned buildings are an eye sore to the public, devalue local property values, and provide cover for potential criminal activity. Our vision is to retrofit these vacant properties to suit the needs of the different afflicted groups while providing OJT and job placement for those seeking employment, training and housing. In addition, these properties could be used as additional treatment facilities for drug/opioid and alcohol recovery.

2. Problem: Low-wage Jobs

- Solution: Job creation and training that allows re entry into the work force generated through:
 - Increased wages and better career opportunities that give workers upward mobility and the chance to make a better life for themselves.
 - Solar field construction and Anar Solar's planned manufacturing facility will provide "On-The-Job" ("OTJ") training and permanent job placement.
 - The remodeling and construction of the aforementioned vacant properties can be adapted for the purpose of suitable housing, and this also provides OTJ training, transitional and permanent housing, and job placement.

With the design aspect of solar fields on landfills for construction, associated manufacturing, assembly of solar arrays on landfills and/or non landfill locations, the construction and remodeling of housing units and vacant property, introduction of administration and support staff, on-site food and child care possibilities

6. CONCLUSION

For this proposal to become a reality, we must set the fiscal agenda to reflect the following;

- Construct solar fields on vacant unusable side slopes of landfills.
 - Generates revenue and electricity for ~20 years.
 - Produces green energy construction on unusable locations.
 - Allows for on the job training and skill development for those interested or required to participate.
 - Provides some relief to the strain on affordable housing through clean safe living quarters for those in need.
 - Cleans up the streets through renovation of vacant and abandoned buildings
 - Establishes collaboration between business and communities for the benefit of all.
- Use the revenue from the energy created to supply funding to multiple program initiatives:
 - Low income subsidized housing
 - Alcohol and substance abuse
 - Homelessness shelters
 - Veterans Services
 - Transitional housing for recently released state and federal incarcerated participants

Benefit to NH Economy & Business Tax Revenue/Spending

The following state agencies and departments will benefit through additional funds or reduced spending:

- Dept. of Employment Security (Unemployment)
- Medicaid
- Homelessness / Low-Income & Subsidized Housing
- Drug & Opioid Abuse / Treatment Programs
- Alcoholism Treatment Programs
- Law Enforcement & Department of Corrections (through reduced crime & recidivism)
- Veterans Administration (VA)

Benefit to Taxpayers

A natural, ongoing benefit of this program will be the lowering of the fiscal demand on taxpayer-funded state programs and services by allowing these afflicted citizens to re enter the work force and provide for themselves and their families.