

Solar Technology and Power Generation in Closed Landfills

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Town of Shelter Island

Presentation Outline

Background Information and Introduction

- *Intro to Solar Power Production*
- *Solar on Landfills*
- *Community Benefits & Incentives*

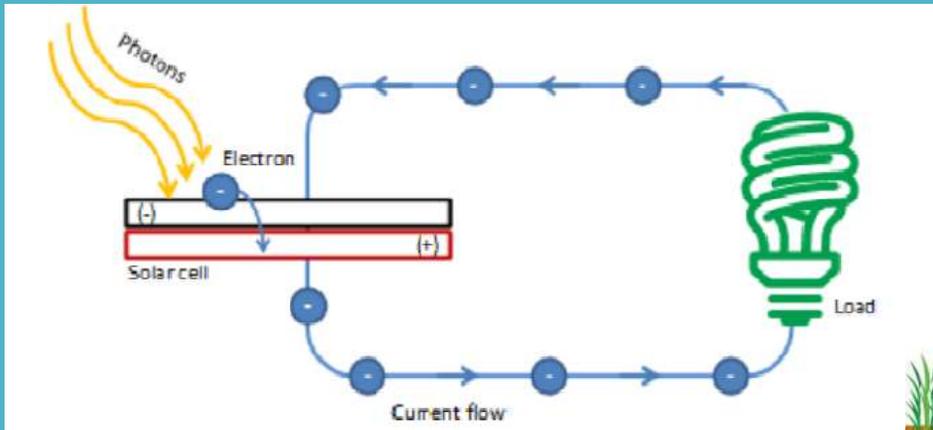
Current Assessment of Shelter Island Landfill

- *Existing Conditions*
- *Potential Output*
- *Southold Landfill Project*

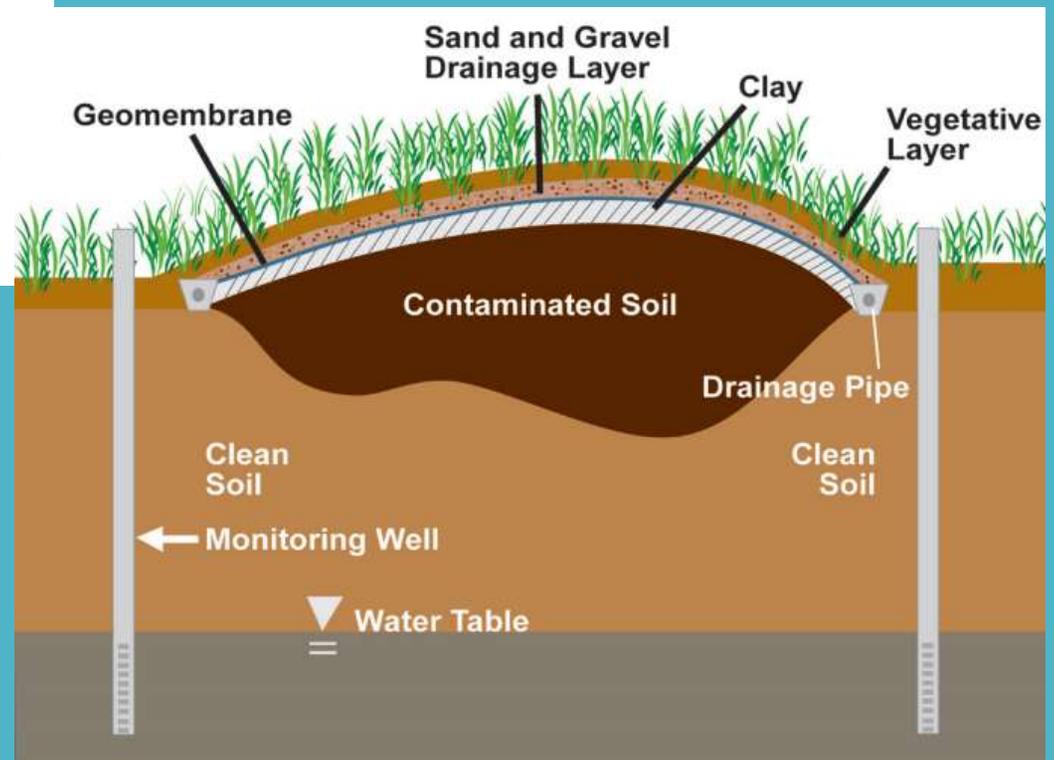
Recommendations and Next Steps

- *Stakeholder and Strategic Partner Engagement*

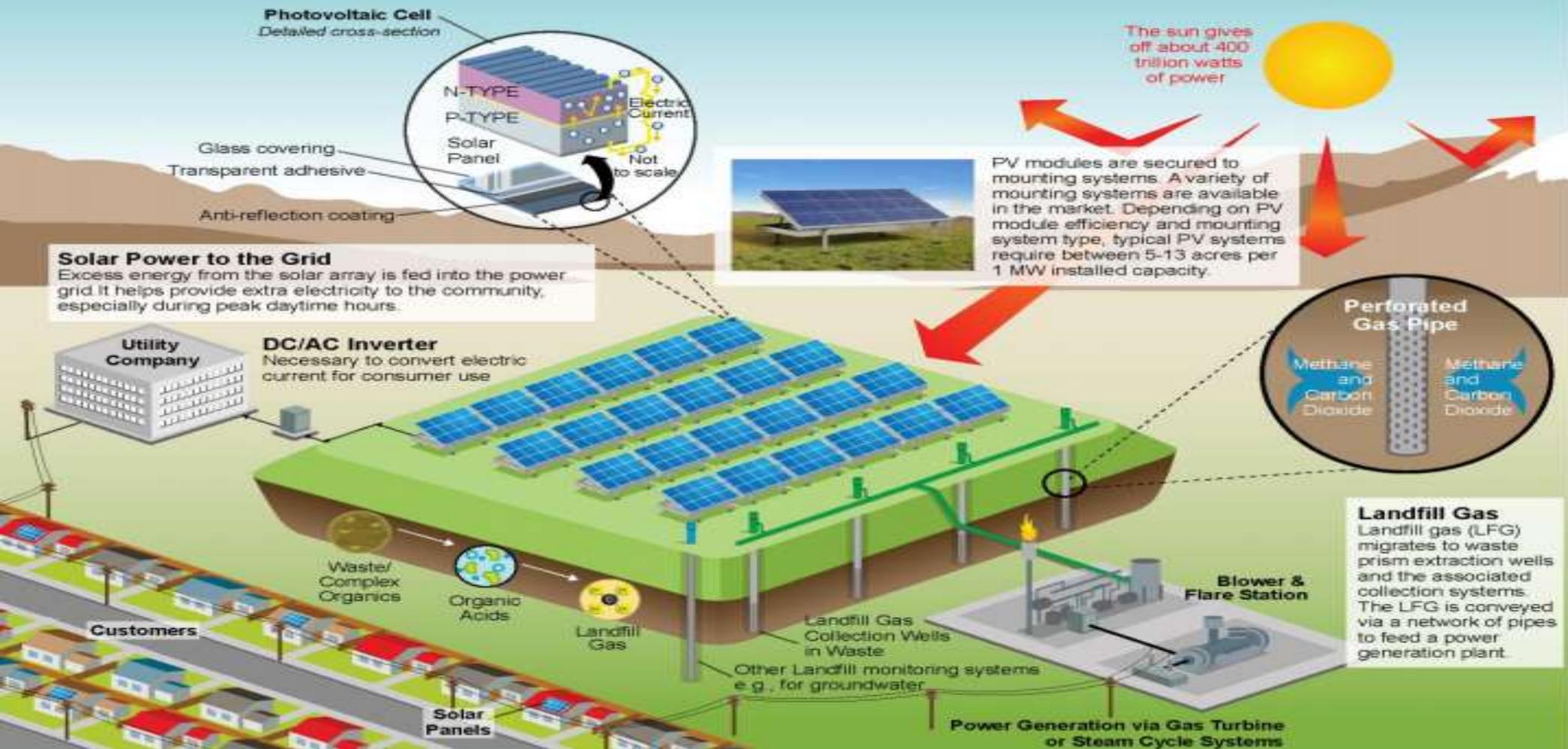
Intro To Solar



Intro To Landfills



Intro To Landfill Solar



Challenges of Landfill Solar Systems

Capped Landfills for Power Generation

Pros

- Land availability – typically unused
- Limited, if any, use conflict
- Monetize otherwise vacant space

Cons

- More complex regulatory process – permitting, leasing, etc
- Higher EPC Capital Cost
- Limited on-site power demand – transmission required
- Landfill liability issues may limit field of investors

Landfill Solar Design Challenges

- Design will maintain landfill integrity with no penetrations of cap
- Design will allow for continued landfill cap maintenance
- Design will maintain systems such as gas collection, groundwater/ leachate collection, and other remediation systems
- Design considers potential differential settlement at landfill surface
- Health and safety of workers considered in design plan

Landfill Solar Design Considerations

- Existing solid waste operations;
- Landfill property deed;
- Environmental site assessment;
- Closure permit and certification;
- Post-closure use design plan;
- Storm water drainage/run-off control plan;
- Storm water erosion control plan;
- Landfill gas control and monitoring plan;
- Geotechnical stability and settlement analysis;
- Capping system interface;
- Network or grid connection;
- Environmental monitoring plan;
- Qualitative health and environmental risk assessment;
- Post-installation monitoring and maintenance plan;
- Financial assurance;

Financial Options

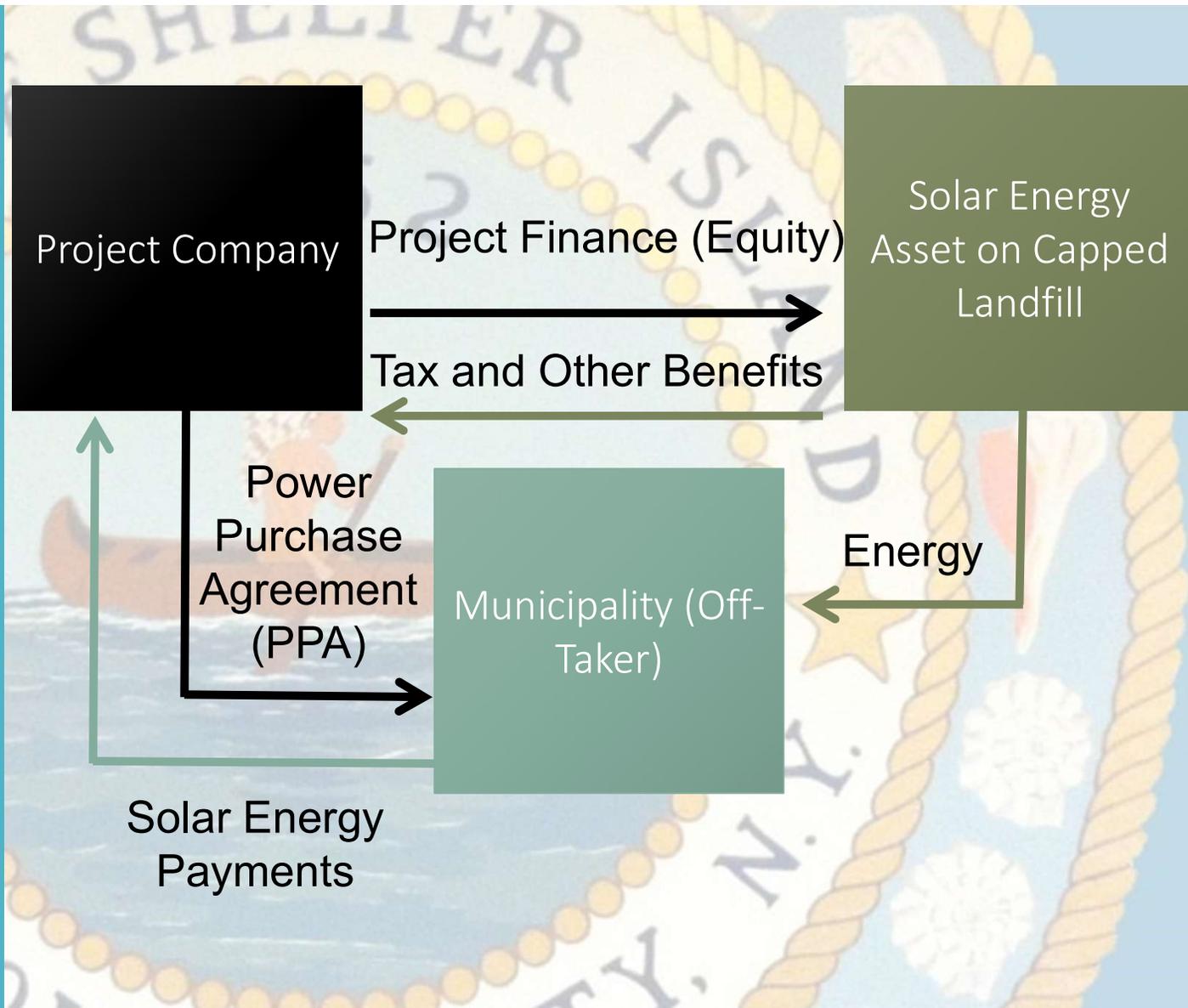
Option 1 - Develop, Own, and Maintain Facility

- *High upfront costs (millions)*
- *Municipalities barred from some tax incentives*
- *Municipality assumes as on-going maintenance and costs*

Option 2 - Lease land and purchase power* at reduced rate from 3rd party

- *Low upfront investment of time and resources*
- *Immediate revenue from land lease*
- *Savings from reduced cost of power (potentially)*
- *Developer maintains system, regulatory burden, grid connection*

Example Project Finance Model



Existing Conditions – SI Landfill



Potential Output

Maximum Area = 3.8 acres,
but likely 2+/- usable area
(6 acres/megawatt)

Generation 0.2-0.5 megawatts
or roughly 130-325 homes



Southold Town Landfill Solar Project

Project Specifications

- 21-acre award
- 3.5 megawatt installation
- 1 megawatt battery storage on site

Contract Details

- \$8,000/yr Hold option
- 25 yr lease w/ two 5-yr extensions
- Base rent rate of \$335,000/yr with 1.5% annual escalation
- Contract Value over \$15 million
- Current Awardee – Summit Ridge
- Previous Awardee – SunEdison (bankrupt)

Example
Photos -
Maryland



Example
Photos -
Maryland



Example
Photos -
Maryland



Example
Photos –
New York
(2mw)



Recommendations & Next Steps

- Continue internal discussions, examine possible regulatory conflicts
- Establish project constraints – must haves/non-negotiables
- Develop and issue RFP
- Leverage bidder expertise to design most suitable system and make most attractive offer

Questions?

Thank you

