



# Restoring Our Waterfront

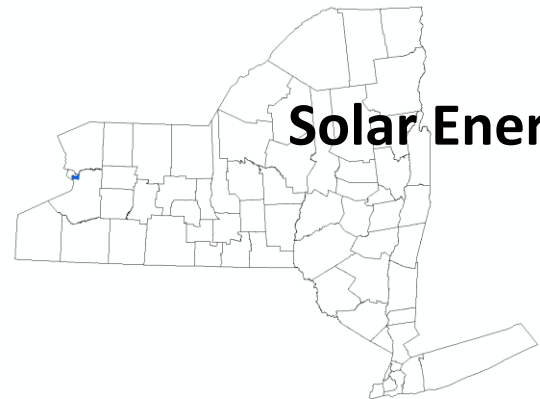
## Strengthening Tonawanda's Economy, Community and Environment

**Town of Tonawanda**

**Solar Energy Power Purchase Agreement and Site License for Solar Photovoltaic**

NY Solar Summit

Monday, June 20, 2016



# About Tonawanda, “swift waters”

- 1<sup>st</sup> ring suburb of Buffalo located along 6 miles of Niagara River in Western NY
- Population 73,567 in 2010 Census
- Share border with 5 other communities and Canadian international border
- 28,828 parcels, 92% Residential, 4.5% Commercial
- Formed in 1836
- Full service municipality including weekly sanitation/recycling pickup, Tree City USA forestry division, 165 miles of local streets, waste water recovery facility, water treatment plant, sanitary sewer collection system, water distribution system, storm sewer system, two 18 hole golf courses, extensive recreation
- Operated municipal landfill from 1930's to late 1980's
- Eastern portion of landfill capped in 2012

# Town Electrical Usage

- 76 Buildings or Facilities – Civic buildings and facilities, Pump Stations, Plants, Libraries, Flow Meters, Pools, Skating Rinks, etc.
- Street Lighting – 112 Consolidated Districts and General Highway Lighting
- Traffic Signals – 29
- Security Cameras and radar system
- Total KWH in 2013 – 27,304,478 (3.21 MW/year)
- Total electric bill in 2013 - \$3,926,857.58 includes co-op program cost & NG delivery costs

# Power Purchase Agreement - Background

- Vendors began approaching town in 2014 and alerted us to possible arrangements
  - TM Montante Solar, June 2014, Year 1 PPA Rate offer \$0.11/kWh
  - Solar Liberty, May 2015, Year 1 PPA Rate offer \$0.1027/kWh
- Attended NY-Sun PVTN Municipal Solar Procurement webinar March 11, 2015
- Attended NY-Sun PVTN Intro to Solar Policy Workshop May 8, 2015
- Began working with NY-Sun PVTN Technical Assistance provider, Meister Consultants Group using provided PPA template
- Customized PPA template and solicited Request for Proposals May 27, 2015

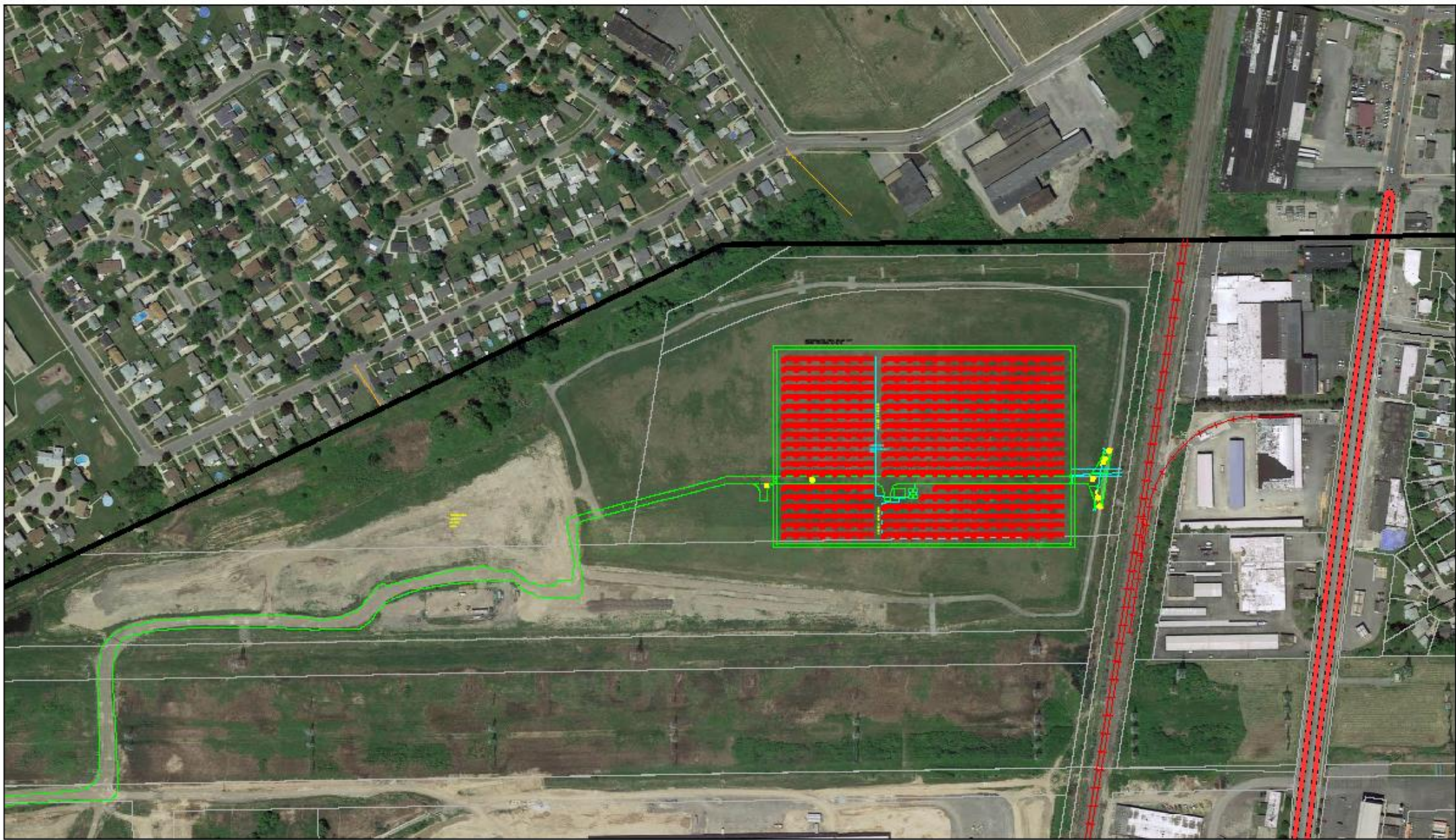
# Request for Proposal

- Identified region on town owned landfill to support 8 – 10 acre array
- Worked with landfill consultant and town attorney on feasibility of array being supported on landfill cap and NYSDEC experience
- Issued RFP on May 27, 2016
- Advertised on NY State Contract Reporter
- Conducted mandatory site meeting, 9 providers attended
- Addendum 1, August 3, 2016 – clarifications on project description, site description, special requirements (monitoring & reporting of town's existing rooftop arrays), SEQRA review, requirement to use prevailing wage rates and miscellaneous background items
- Addendum 2, August 5, 2016 – updated target timeline and proposal due date
- Received 8 proposals, August 25, 2016

# Proposal Elements

- Included provisional price adjustment securing either Block 1 or Block 2 incentives, assumed 2% baseline utility rate escalator
- Utilizes Remote Net Metering, established master meter account
- Exempt from property tax
- 20 year PPA with up to 3 - five year extensions
- System size 2,635 kW (DC)
- Provisioned for costs of interconnection (\$175,000)
- Include all costs required for permitting, construction & decommissioning, tying in 5 existing rooftop sites for monitoring
- Attachments
  - Site description
  - Town Energy Use (2013)
  - Provider Information Form
  - Pricing Proposal Template (NY-Sun PVTN )
  - Model Power Purchase Agreement (NY-Sun PVTN )





**Job 2963 Solar Energy Power Purchase Agreement and Site License for Solar Photovoltaic  
Town of Tonawanda Landfill - SolarCity**

200 100 0 200  
Feet  
Prepared by Technical Support  
June 2016



# Solar Power Purchase Agreement Bid Evaluation Tool

## Inputs

Discount Rate (Override if Alternate Value Preferred)	5%
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Proposal Number	1	2	3	4	5	6	7	8	9	
Contractor Name	Provider 1	Provider 2	Solar City 1	Solar City 2	Provider 4	Provider 5	Provider 6a	Provider 6b	Provider 7	
Estimated Annual Electric Output (kWh/year)	3,111,000	3,143,797	3,281,900	3,281,900	2,818,791	2,298,000	3,136,372	3,136,372	2,574,400	
Guaranteed Annual Electric Output (kWh/year)	2,488,000	0	3,281,900	3,281,900	2,536,912	1,953,300	2,665,916	2,665,916	3,218,000	
Annual System Degradation Factor (%/year)	0.50%	0.75%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	
First Year Electricity Price (\$/kWh)	\$0.0490	\$0.0670	\$0.0690	\$0.0650	\$0.0890	\$0.1049	\$0.1145	\$0.1015	\$0.0995	
Electric Price Increase Escalator (%/year)	2.00%	2.00%	1.00%	2.00%	2.00%	1.90%	0.00%	2.00%	2.00%	
Annual Lease Payment (\$/year)	\$0	\$0	\$0	\$0	\$10,000	\$1	\$0.00	\$0.00	\$10,000	

## Outputs

Levelized Cost of Energy (1)	\$0.0593	\$0.0810	\$0.0758	\$0.0787	\$0.1040	\$0.1258	\$0.1145	\$0.1229	\$0.1164	
Net Present Value of 20-Year Energy Costs (2)	\$2,140,103	\$2,891,150	\$2,932,091	\$2,994,865	\$3,397,395	\$3,356,629	\$4,298,518	\$4,469,224	\$3,471,527	
Net Present Value per First-Year kWh (3)	\$0.034	\$0.046	\$0.045	\$0.046	\$0.060	\$0.073	\$0.069	\$0.071	\$0.067	

1. The Levelized Cost of Energy is the average per-kwh price (undiscounted, in nominal terms) that the municipality will pay for energy over the life of the contract. This is the best metric to use to understand how proposals with
2. The 20-Year NPV is the total estimated amount of money that the municipality will pay to the developer through the contract, discounted to it's present value today. This is the best metric to understand the total dollar value o
3. The per-kWh NPV is the same calculation divided by the estimated first-year production of the system. This allows you to compare the total value of contracts that offer you different system sizes and energy generation levels.



# Review & Award

- Compiled proposal summary (Bid Evaluation Tool)
- Review team evaluated proposals and short listed 4 potential providers for interviews
- Conducted interviews with 7 providers October 2015: SolarCity got second interview
- SolarCity provided PPA and Performance Guarantee Agreement (PGA)
- PPA included NY-Sun PVTN Block 1, 20 year pricing and Block 2 contingency pricing
- PPA & PGA approved November 20, 2015

## Town of Tonawanda

### Landfill - Ground Mount - SolarCity PPA Savings Summary



#### Town of Tonawanda

Landfill  
795 East Park Road, Tonawanda NY, 14150  
System Size: 2635 kW DC

National Grid (Niagara Mohawk)

#### Solar PV Technical Summary

Project Type	Ground Mount
System Size (kW <sub>DC</sub> )	2,635.00
System Yield (kWh/kW)	1,246
1st Year Production (kWh)	3,283,210
Annual System Degradation (%)	0.50%

#### SolarCity PPA Structure Summary

PPA Rate (\$/kWh) \$	0.071
Annual PPA Rate Escalation	2.00%
PPA Term (years)	20

### Annual Savings Estimates



#### Model Assumptions

Grid Avoided Cost (\$/kWh)*	\$	0.125
Discount Rate*		6.00%
Annual Reduction in Production		0.50%
Utility Escalation Rate		2.00%

#### PPA Financial Results Summary

Estimated 1st Year Savings \$	177,942
Savings Over 20 Years \$	4,110,631
NPV of Savings over 20 Years \$	2,291,830

#### SolarCity PPA Information

Performance Guarantee	Included
Payback	Immediate
Operations & Maintenance	Included

This analysis is illustrative only and has been prepared in good faith by SolarCity to provide conceptual project modeling. These numbers are not for contract, nor are they binding.

\* Model Assumptions are inputs that should be mutually agreed upon by the customer and SolarCity. The customer may request any changes to more closely model their specific situation.

SolarCity has used good faith efforts to represent the savings from this project before state and federal income tax.

Please consult your tax advisor regarding your specific tax situation.

# Town of Tonawanda

## Landfill - Ground Mount - SolarCity PPA Savings Cash Flow Table



### Town of Tonawanda

Landfill  
795 East Park Road, Tonawanda NY, 14150  
System Size: 2635 kW DC

National Grid (Niagara Mohawk)

### Results Summary

Year 1 Savings: \$ 177,942  
Total Savings: \$ 4,110,631  
NPV of Total Savings: \$ 2,291,830

### Model Assumptions

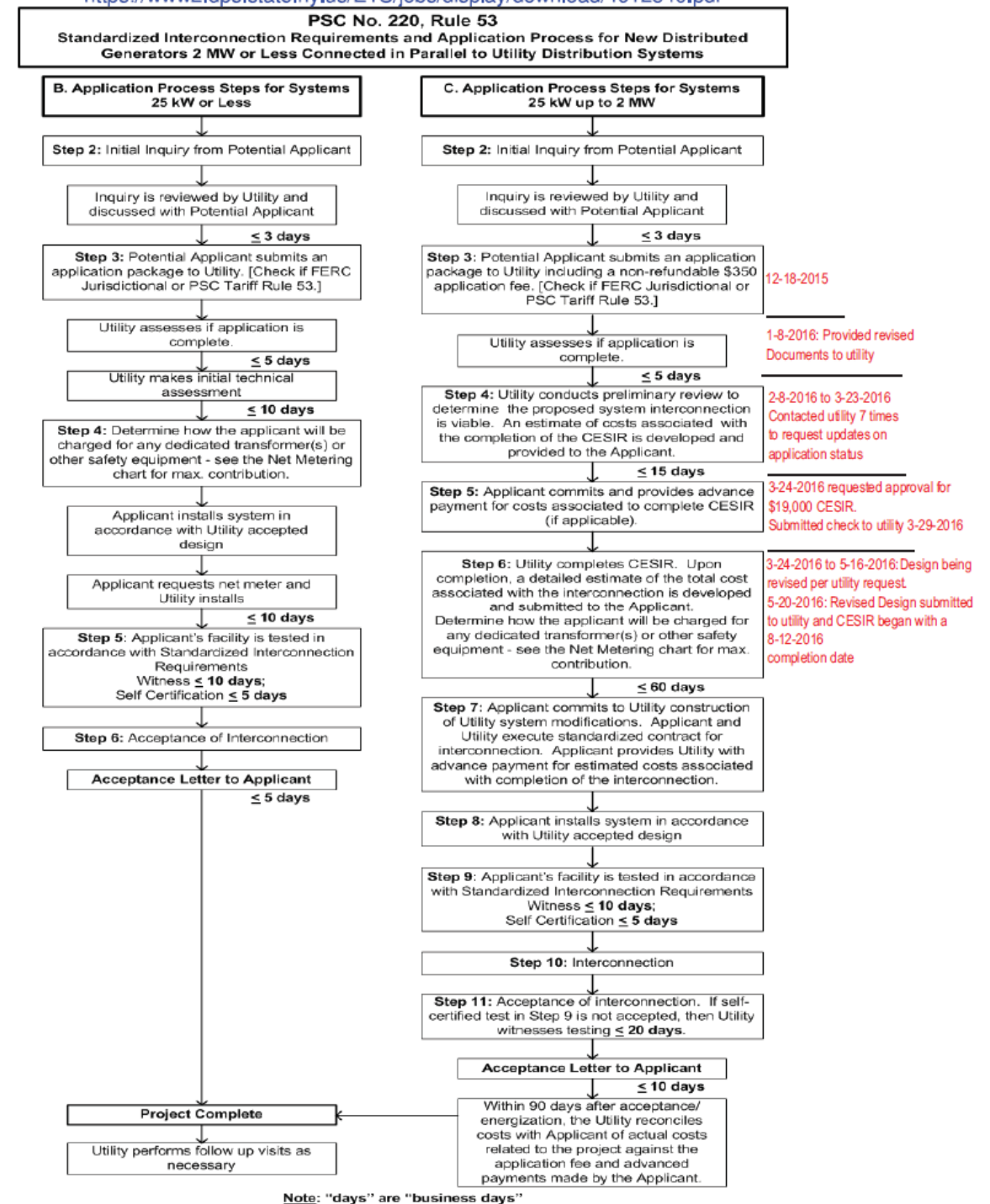
Monetary Credit Value (\$/kWh) \$0.125  
Discount Rate\* 6.00%  
Annual Reduction in Production 0.50%  
PPA Escalation Rate 2.00%  
PPA Term 20  
Utility Escalation Rate 2.00%

YEAR	SOLAR PRODUCTION (kWh)	MONETARY CREDIT VALUE (\$/kWh)	ANNUAL UTILITY SAVINGS FROM SOLAR KWH	SOLARCITY PPA RATE (\$/kWh)	ANNUAL SOLARCITY PPA EXPENSE	TOTAL SAVINGS	CUMULATIVE CASH FLOW	PRESENT VALUE OF CASH FLOW	PRESENT VALUE OF CUMULATIVE CASH FLOW
1	3,295,229	\$ 0.125	\$ 411,904	\$ 0.071	\$ (233,961)	\$ 177,942	\$ 177,942	\$ 167,870	\$ 167,870
2	3,278,753	\$ 0.128	\$ 418,041	\$ 0.072	\$ (237,447)	\$ 180,594	\$ 358,536	\$ 160,728	\$ 328,598
3	3,262,359	\$ 0.130	\$ 424,270	\$ 0.074	\$ (240,985)	\$ 183,285	\$ 541,821	\$ 153,889	\$ 482,487
4	3,246,047	\$ 0.133	\$ 430,591	\$ 0.075	\$ (244,576)	\$ 186,015	\$ 727,836	\$ 147,342	\$ 629,829
5	3,229,817	\$ 0.135	\$ 437,007	\$ 0.077	\$ (248,220)	\$ 188,787	\$ 916,623	\$ 141,073	\$ 770,902
6	3,213,668	\$ 0.138	\$ 443,519	\$ 0.078	\$ (251,919)	\$ 191,600	\$ 1,108,223	\$ 135,070	\$ 905,972
7	3,197,600	\$ 0.141	\$ 450,127	\$ 0.080	\$ (255,672)	\$ 194,455	\$ 1,302,678	\$ 129,324	\$ 1,035,296
8	3,181,612	\$ 0.144	\$ 456,834	\$ 0.082	\$ (259,482)	\$ 197,352	\$ 1,500,030	\$ 123,821	\$ 1,159,117
9	3,165,704	\$ 0.146	\$ 463,641	\$ 0.083	\$ (263,348)	\$ 200,293	\$ 1,700,323	\$ 118,553	\$ 1,277,670
10	3,149,875	\$ 0.149	\$ 470,549	\$ 0.085	\$ (267,272)	\$ 203,277	\$ 1,903,600	\$ 113,509	\$ 1,391,179
11	3,134,126	\$ 0.152	\$ 477,560	\$ 0.087	\$ (271,254)	\$ 206,306	\$ 2,109,906	\$ 108,679	\$ 1,499,858
12	3,118,455	\$ 0.155	\$ 484,676	\$ 0.088	\$ (275,296)	\$ 209,380	\$ 2,319,286	\$ 104,055	\$ 1,603,914
13	3,102,863	\$ 0.159	\$ 491,898	\$ 0.090	\$ (279,398)	\$ 212,500	\$ 2,531,786	\$ 99,628	\$ 1,703,542
14	3,087,348	\$ 0.162	\$ 499,227	\$ 0.092	\$ (283,561)	\$ 215,666	\$ 2,747,452	\$ 95,389	\$ 1,798,931
15	3,071,912	\$ 0.165	\$ 506,665	\$ 0.094	\$ (287,786)	\$ 218,879	\$ 2,966,332	\$ 91,331	\$ 1,890,262
16	3,056,552	\$ 0.168	\$ 514,215	\$ 0.096	\$ (292,074)	\$ 222,141	\$ 3,188,472	\$ 87,445	\$ 1,977,707
17	3,041,269	\$ 0.172	\$ 521,876	\$ 0.097	\$ (296,426)	\$ 225,451	\$ 3,413,923	\$ 83,724	\$ 2,061,431
18	3,026,063	\$ 0.175	\$ 529,652	\$ 0.099	\$ (300,843)	\$ 228,810	\$ 3,642,733	\$ 80,162	\$ 2,141,593
19	3,010,933	\$ 0.179	\$ 537,544	\$ 0.101	\$ (305,325)	\$ 232,219	\$ 3,874,952	\$ 76,751	\$ 2,218,345
20	2,995,878	\$ 0.182	\$ 545,554	\$ 0.103	\$ (309,874)	\$ 235,679	\$ 4,110,631	\$ 73,486	\$ 2,291,830
			\$ 9,515,349			\$ 4,110,631	\$ 4,110,631		\$ 2,291,830

# Niagara Mohawk Power Corp. Tariff PSC No. 220 Rule 53

## CESIR - Coordinated Electric System Interconnection Review

PPA estimated a \$175,000 allowance to make  
required adaptations

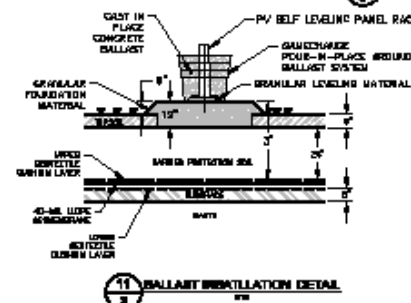
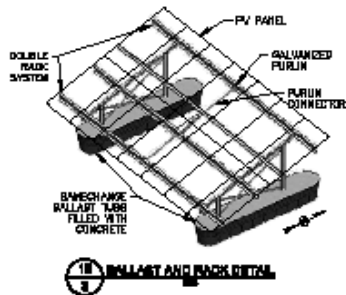
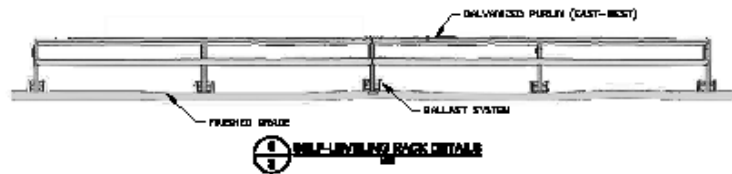
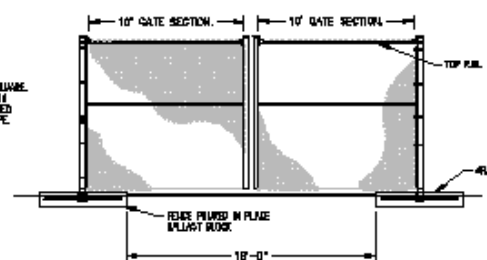
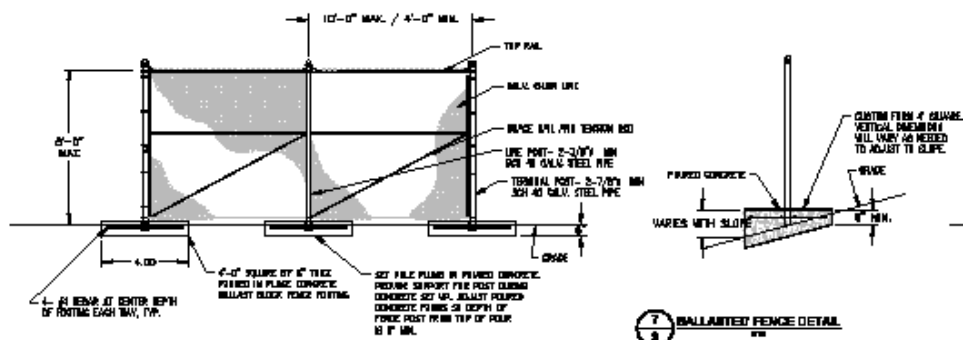
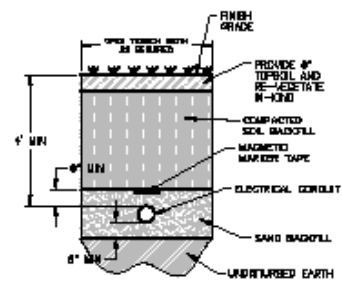
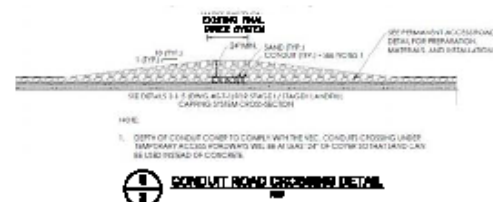
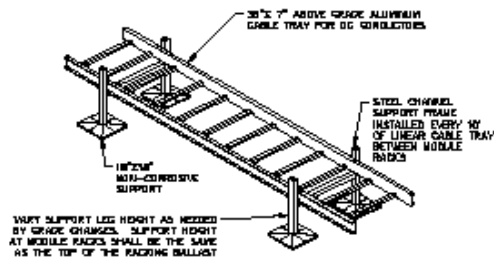
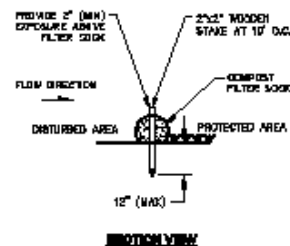
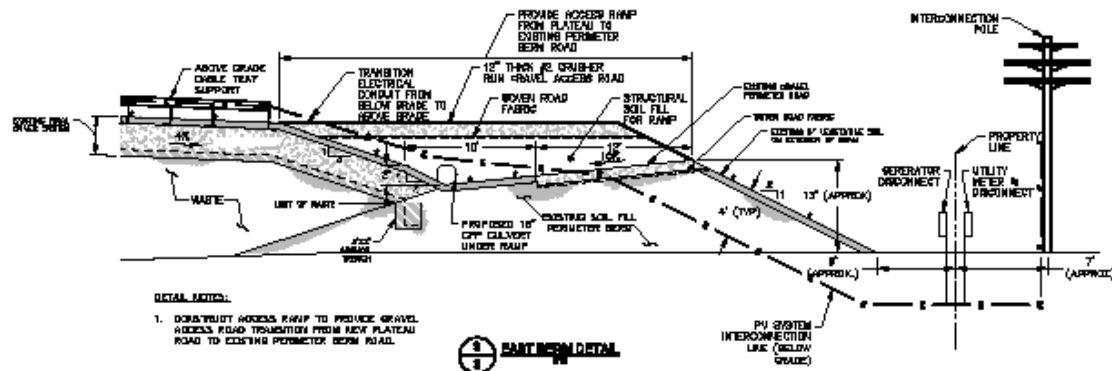




# Current Status

- SolarCity submitted initial interconnection application to National Grid December 18, 2015
- March 29, 2016 SolarCity commits CESIR application payment
- Planning Board approved Site Plan April 6, 2016
- NYSDEC engineering control changes to landfill – in progress
- National Grid CESIR anticipated August 12, 2016
- Construction October 13, 2016 – December 28, 2016
- Outside Commercial Operation Date – February 10, 2017



[illegible]



PERIMETER FENCE

SOUTHERN VIEW





PERIMETER FENCE

NORTHERN VIEW

# Questions ??

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