City Council Workshop | Agenda Item #2

August 22, 2016 | Solar Landfill Project

The Sustainability Office is bringing forward a revised proposal to site a solar array on the City's capped landfill. This current proposal is part of a joint project with the City of Portland who would build an identical array on their capped landfill should the cities choose to move forward. These arrays, consisting of 2,960 panels, would each generate 1.2 million kWh of clean, renewable electricity each year. This would offset almost 12% of South Portland's (including schools) annual electricity consumption from the grid.

At a workshop on March 14, 2016, staff and Revision Energy introduced the project and discussed two key challenges to address before bringing it forward again for Council action. Since then, staff have worked with their counterparts in Portland and the Revision team to address these challenges by negotiating better financial terms.

At this workshop Revision Energy, Julie Rosenbach and Greg L'Heureux will be present to elaborate on the current project proposal and answer questions.

In addition, the following documents are attached to this Position Paper. Please refer to these documents for more information about the project:

1) Memorandum describing the project's evolution
2) Project terms sheet
3) Revision Energy project summary
4) Financial pro forma
5) Project financing options

Donald H. Gerrish

Interim City Manager

SUSTAINABILITY OFFICE

JULIE A. ROSENBACH
Sustainability Coordinator

To: City Council members; Don Gerrish, Interim City Manager; Josh Reny, Assistant City Manager

From: Julie Rosenbach, Sustainability Coordinator

CC: Tex Haeuser, Director of Planning & Development; Greg L'Heureux, Director of Finance; Doug Howard, Director of Public Works

Date: August 22, 2016

Subject: Solar Landfill project

The purpose of this workshop is to discuss the revised solar landfill project proposal submitted by Revision Energy on July 7, 2016. This current proposal is part of a joint project with the City of Portland who would build an identical array on their capped landfill should the cities choose to move forward.

Developing solar on the City's closed landfill is one of our climate action plan goals, and staff have been working closely with our counterparts in Portland and the Revision team during the past year in order to bring this project to fruition. At the last workshop on March 14, 2016, we reviewed the project and discussed two challenges we wanted to address before bringing the project forward again. First, we wanted to do better on the pricing. Second, we were awaiting the outcome of regulatory processes that could impact this project.

Staff believe we have negotiated financial terms that will allow the cities to move forward in spite of continued regulatory uncertainty, and we look forward to discussing the details of this current project proposal with the City Council. In preparation for this discussion I have prepared a summary of the project's evolution:

Project History

City commissions a landfill feasibility study	April, 2014
City completes a geotechnical assessment	March, 2015
City issues an RFP for solar projects	August, 2015
City receives two proposals, both are rejected	October, 2015
South Portland requests to join the Portland project	December, 2015
Portland and South Portland request a revised joint proposal from Revision	January, 2016
City Council workshop to review joint proposal	March, 2016
ME Legislature final vote on Solar Bill (LD1649)	May, 2016
Revision offers revised project proposal	July, 2016
Portland Energy & Sustainability Committee unanimously approved proposal	July, 2016

SUSTAINABILITY OFFICE

JULIE A. ROSENBACH
Sustainability Coordinator

Project Summary

Revision Energy would install a 920 kW DC (660 kW AC) solar array consisting of 2,960 panels on South Portland's landfill at the same time they install an identical system on Portland's Ocean Ave landfill. The arrays would each generate 1.2 million kWh of clean, renewable electricity each year. This would offset almost 12% of South Portland's (including schools) annual electricity consumption from the grid.

In order to monetize the value of a federal investment tax credit (which as a non-profit the City cannot take advantage of) and bring the overall project cost down, the City would not take ownership of the solar array for at least six years. Instead, the City would enter into a power purchase agreement (PPA) with the private owner – Revision Energy – to purchase the electricity generated by the system. In year seven, the City has the option of buying out the system at a reduced cost. At this point the project would be cash positive and pay for itself annually because energy savings would exceed the cost of debt service and operations and maintenance.

Evolution of Negotiations

By partnering with Portland to combine our projects, Revision was able to reduce their initial construction costs by $325,700 (or 12.5%) for each system. In the first joint proposal, Revision offered an initial PPA rate of $0.1245 per kWh of electricity with a 2% annual escalator, which would translate into an annual premium of close to $50,000 in the first six years. The City would recoup the cost of the project (ROI) in year 17.

In the current proposal, Revision has lowered the initial PPA rate to $0.1056 with a 2.5% annual escalator, reducing the annual premium in the first six years by half. With current assumptions (see the attached pro forma), the project is expected to be revenue positive in year 7 and provide a full return on investment in year 11. Over the life of the project, the City would save over $3 million.

Both scenarios assume the City will purchase the array at the beginning of year 7 for a reduced amount (Year 7 Buyout) with a 20- year bond at 3% interest.

Summary	**1st Joint Proposal**	**Current Joint Proposal**
PPA Rate	$0.1245	$0.1056
Year 7 Buyout	$1,570,000	$1,598,423
ROI	17 years	11 Years
Savings over 40 years	$2.9 million	$3.3 million

SUSTAINABILITY OFFICE

JULIE A. ROSENBACH
Sustainability Coordinator

Solar Policy in Maine

Over the past two years there have been several state-level policy efforts regarding solar energy. The Public Utilities Commission (PUC) is in the process of taking up a mandatory review of state's net metering program, triggered by solar reaching 1% of the transmission and distribution utility's peak demand. The PUC will review whether the state's net metering program should continue or be modified. South Portland has submitted comments as part of the Municipal Street Lighting group, and staff will be happy to elaborate on this process at the workshop.

Conclusion

The generation of renewable solar energy on the City's capped landfill is one of South Portland's climate action goals. Staff are pleased to present the Council with a revised proposal that may bring this to fruition. We view our collaboration with Portland as a great opportunity to take a leadership role and accelerate the adoption of renewable solar energy in our region.

Both City staff and Revision Energy will be present at the workshop to elaborate on the project and answer questions.

Requested Action

If the Council views this as a favorable project to proceed with, staff recommend putting this on the September 7, 2016 meeting agenda for Council approval. This is the same day Portland's City Council will be voting on the proposal, and will allow the project to move forward collaboratively and expeditiously. To note: Portland's Energy & Sustainability Committee unanimously approved the proposal in July.

At the September 7 meeting, staff will ask the City Council to authorize the City Manager or a designee to negotiate terms of a power purchase agreement, any appropriate lease or license agreements, and to issue necessary permits. The order would authorize the City Manager to negotiate these documents within the parameters of the attached term sheet presented by Revision Energy. These documents would subsequently be presented to the City Council for approval likely in October.

Professional design, installation and service of solar energy systems

Julie Rosenbach, Sustainability Coordinator
City of South Portland
25 Cottage Rd.
South Portland, Maine 04106

August 2, 2016

Dear Julie,

On behalf of ReVision Energy, I am pleased to provide the following terms for a proposed Power Purchase Agreement (PPA) for a photovoltaic solar energy project at the former Highland Avenue landfill site.

Project Description: 920.7 kWdc solar array, with estimated production of 1,203,570 kwh/year.

- (2,970) Q-cell 310-watt solar electric modules, or equivalent, with 25-year performance warranty;
- (25) SMA STP24000TL-US-10 and (3) SMA STP20000TL-US-10 inverters, or equivalent, with 15-year performance warranty;
- Revenue grade electric metering and remote system monitoring to allow real-time online access to solar energy generation;
- Maine DEP approved site design with ballasted ground mounted array, wind rating of 120 mph;
- Balance of system components including all wiring, hardware and fittings needed to provide a National Electrical Code and NABCEP compliant installation.

Power Purchase Agreement: ReVision Energy and/or its financing partner will finance, build, own and operate the system for life of PPA. The City will provide for a line extension and new electrical service to access the landfill and will purchase all power produced under the following terms:

Power price: 10.56¢/kWh in year one, to increase by 2.5% annually.

Term: 25 years, with option to extend to 30 years. At end of term, City can elect to take over system or have it removed and the property restored to prior conditions at no cost

Buyout Options: The City will have an option to purchase in Year 7 or 10, and at regular intervals thereafter, at fair market value or the following schedule, whichever is higher.

Estimated Y7 Buyout: $1,598,423

Estimated Y10 Buyout: $1,365,670

ReVision Energy is the largest full service renewable energy contractor in northern New England. Since 2003, ReVision has installed more than 5,000 solar systems for commercial, residential, municipal, educational and non-profit clients. Our professional installation team includes master electricians and NABCEP certified solar installers and technicians, and is backed by a 24-hour service guarantee.

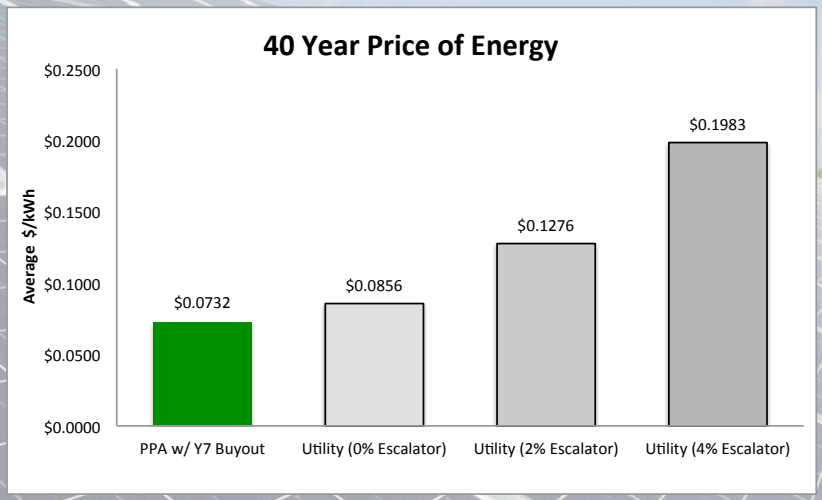
Sincerely,

Steve Hinchman, Director of Financing
ReVision Energy, LLC
207.837.8637
steveh@revisionenergy.com

South Portland Landfill Solar Array

	PPA Offer
Size	920.7 kW DC
	660 kW AC
Annual Generation	1,203,355 kWh/year
Solar Modules	2,960 panels (Q Cell, 310-watt)
Inverters	28 String Inverters (SMA, 20 & 24 kW)
Racking	Ballasted Ground Mount
CO2e Emissions Reductions	1,308,097 lbs/year
	654 tons/year
PPA Rate	10.56¢/kWh, rising by 2.5% annually
Year 7 Purchase Option	$1.59 million
Initial Cost	$2.56 million

Landfill Array – Solar v. CMP



Lifetime Savings: **$544,536** **$2,380,074** **$5,471,387**

40 Year Lifecycle Cash Flow Analysis - South Portland Landfill Solar

August 17, 2016

Assumptions (black fixed, blue variable)

Solar kW	920.7	REC Income	$ 25
Solar kwp	1307	REC Term	10
Solar kWh	1,203,355	REC Exp	2%
Derate	0.50%	O&M ($/kW)	$5
PPA Rate	0.1056	Loan Term	20
PPA Escalator	2.5%	Loan Rate	3.00%
Market Rate	0.0842	Buyout Amount	$ 1,598,423
Market Escalator	2.68%	Inverter ($/watt)	$ 0.10

Market Rates		Supply	T&D	Total
CMP SGS	18%	0.06443	0.059564	0.1239940
CMP MGS	82%	0.06870	0.006815	0.0755150
Weighted Average				0.08424122

CO2 Emission Reduction Factor	**1.0870**	1,308,097	**lbs**
		654.05	**tons**

Pro Forma

	Solar kWh	PPA Rate	PPA Cost	Market Rate	Market Cost	Net Energy	Rec Income	**Total Income**	O&M	Interest	Principal	Inverter Replacement	**Total Expenses**	Annual	**Cumulative**
1	1,203,355	$0.1056	$127,074	$0.0842	$101,372	-$25,702		**-$25,702**					**$0**	-$25,702	**-$25,702**
2	1,197,338	$0.1082	$129,600	$0.0865	$103,568	-$26,031		**-$26,031**					**$0**	-$26,031	**-$51,734**
3	1,191,351	$0.1109	$132,176	$0.0888	$105,812	-$26,363		**-$26,363**					**$0**	-$26,363	**-$78,097**
4	1,185,395	$0.1137	$134,803	$0.0912	$108,105	-$26,698		**-$26,698**					**$0**	-$26,698	**-$104,795**
5	1,179,468	$0.1166	$137,482	$0.0936	$110,447	-$27,035		**-$27,035**					**$0**	-$27,035	**-$131,830**
6	1,173,570	$0.1195	$140,214	$0.0962	$112,840	-$27,374		**-$27,374**					**$0**	-$27,374	**-$159,204**
7	1,167,703			$0.0987	$115,285	$115,285	$28,609	**$143,894**	-$4,604	-$47,953	-$59,486		**-$112,043**	$31,851	**-$127,353**
8	1,161,864			$0.1014	$117,783	$117,783	$28,466	**$146,248**	-$4,604	-$46,168	-$61,271		**-$112,043**	$34,206	**-$93,147**
9	1,156,055			$0.1041	$120,334	$120,334	$28,323	**$148,658**	-$4,604	-$44,330	-$63,109		**-$112,043**	$36,615	**-$56,532**
10	1,150,274			$0.1069	$122,942	$122,942	$28,182	**$151,123**	-$4,604	-$42,437	-$65,002		**-$112,043**	$39,081	**-$17,452**
11	1,144,523			$0.1097	$125,605	$125,605	$0	**$125,605**	-$4,604	-$40,487	-$66,953		**-$112,043**	$13,563	**-$3,889**
12	1,138,800			$0.1127	$128,327	$128,327	$0	**$128,327**	-$4,604	-$38,478	-$68,961		**-$112,043**	$16,284	**$12,395**
13	1,133,106			$0.1157	$131,107	$131,107	$0	**$131,107**	-$4,604	-$36,409	-$71,030		**-$112,043**	$19,064	**$31,459**
14	1,127,441			$0.1188	$133,947	$133,947	$0	**$133,947**	-$4,604	-$34,278	-$73,161		**-$112,043**	$21,905	**$53,364**
15	1,121,804			$0.1220	$136,850	$136,850	$0	**$136,850**	-$4,604	-$32,083	-$75,356		**-$112,043**	$24,807	**$78,171**
16	1,116,195			$0.1253	$139,815	$139,815	$0	**$139,815**	-$4,604	-$29,823	-$77,616		**-$112,043**	$27,772	**$105,943**
17	1,110,614			$0.1286	$142,844	$142,844	$0	**$142,844**	-$4,604	-$27,494	-$79,945		**-$112,043**	$30,801	**$136,744**
18	1,105,061			$0.1321	$145,939	$145,939	$0	**$145,939**	-$4,604	-$25,096	-$82,343		**-$112,043**	$33,896	**$170,640**
19	1,099,535			$0.1356	$149,101	$149,101	$0	**$149,101**	-$4,604	-$22,626	-$84,813		**-$112,043**	$37,058	**$207,698**
20	1,094,038			$0.1392	$152,331	$152,331	$0	**$152,331**	-$4,604	-$20,081	-$87,358	-$92,070	**-$204,113**	-$51,782	**$155,917**
21	1,088,567			$0.1430	$155,631	$155,631	$0	**$155,631**	-$4,604	-$17,461	-$89,979		**-$112,043**	$43,589	**$199,505**
22	1,083,125			$0.1468	$159,003	$159,003	$0	**$159,003**	-$4,604	-$14,761	-$92,678		**-$112,043**	$46,961	**$246,466**
23	1,077,709			$0.1507	$162,448	$162,448	$0	**$162,448**	-$4,604	-$11,981	-$95,458		**-$112,043**	$50,406	**$296,872**
24	1,072,320			$0.1548	$165,968	$165,968	$0	**$165,968**	-$4,604	-$9,117	-$98,322		**-$112,043**	$53,925	**$350,797**
25	1,066,959			$0.1589	$169,564	$169,564	$0	**$169,564**	-$4,604	-$6,167	-$101,272		**-$112,043**	$57,521	**$408,318**
26	1,061,624			$0.1632	$173,237	$173,237	$0	**$173,237**	-$4,604	-$3,129	-$104,310		**-$112,043**	$61,195	**$469,513**
27	1,056,316			$0.1676	$176,991	$176,991	$0	**$176,991**	-$4,604	$0	$0		**-$4,604**	$172,387	**$641,900**
28	1,051,034			$0.1720	$180,826	$180,826	$0	**$180,826**	-$4,604	$0	$0		**-$4,604**	$176,222	**$818,122**
29	1,045,779			$0.1767	$184,743	$184,743	$0	**$184,743**	-$4,604	$0	$0		**-$4,604**	$180,140	**$998,262**
30	1,040,550			$0.1814	$188,746	$188,746	$0	**$188,746**	-$4,604	$0	$0		**-$4,604**	$184,142	**$1,182,404**
31	1,035,348			$0.1863	$192,835	$192,835	$0	**$192,835**	-$4,604	$0	$0		**-$4,604**	$188,232	**$1,370,636**
32	1,030,171			$0.1912	$197,013	$197,013	$0	**$197,013**	-$4,604	$0	$0		**-$4,604**	$192,410	**$1,563,046**
33	1,025,020			$0.1964	$201,282	$201,282	$0	**$201,282**	-$4,604	$0	$0		**-$4,604**	$196,678	**$1,759,724**
34	1,019,895			$0.2016	$205,643	$205,643	$0	**$205,643**	-$4,604	$0	$0		**-$4,604**	$201,039	**$1,960,764**
35	1,014,795			$0.2070	$210,098	$210,098	$0	**$210,098**	-$4,604	$0	$0		**-$4,604**	$205,495	**$2,166,258**
36	1,009,721			$0.2126	$214,650	$214,650	$0	**$214,650**	-$4,604	$0	$0		**-$4,604**	$210,047	**$2,376,305**
37	1,004,673			$0.2183	$219,301	$219,301	$0	**$219,301**	-$4,604	$0	$0		**-$4,604**	$214,697	**$2,591,002**
38	999,649			$0.2241	$224,052	$224,052	$0	**$224,052**	-$4,604	$0	$0		**-$4,604**	$219,449	**$2,810,451**
39	994,651			$0.2301	$228,907	$228,907	$0	**$228,907**	-$4,604	$0	$0		**-$4,604**	$224,303	**$3,034,754**
40	989,678			$0.2363	$233,866	$233,866	$0	**$233,866**	-$4,604	$0	$0		**-$4,604**	$229,262	**$3,264,017**

FINANCE DEPARTMENT

GREGORY N. L'HEUREUX
Finance Director
(207) 767-7613

Kristie Bradbury
Deputy Finance Director
(207)767-7657

City of South Portland

Memorandum

TO: City Council; Don Gerrish, Interim City Manager
FROM: Gregory L'Heureux, Finance Director
DATE: August 17, 2016
RE: Landfill Solar

****

I have been asked to look at how the City might finance the landfill solar project? To receive the benefits of the Federal Solar Tax Credits, initially, it would make sense for the City to utilize a Power Purchase Agreement (PPA). As Julie has noted, the City receives no benefit from federal solar tax credits. Using a PPA for the first 6 years allows the benefits of a portion of the tax credits to reduce the purchase price at the end of the PPA. As is presently identified in the ReVision Energy Proposal, the buyout amount is presently estimated at around $1.6 million at the end of 6 years as compared to the initial cost of about $2.6 million. I'm going to focus my comments on the buyout option at this time and try to provide some thoughts for discussion on this phase of the long term financing of the project. In summary, the City would have the following options:

A. Bond – With the City's strong bond rating, this would probably be the most cost effective way to finance the project. The City's Charter requires that bonding be approved by the voters so that would be the first hurdle. Beyond that would be the issue of the PPA and the six-year lag of the borrowing. The Charter has a requirement that the first principal payment of the bonds needs to be within 5 years of the approval of the bond ordinance. This might be a viable option if the PPA were not being utilized. The logistics of moving forward with the PPA and then getting voter approval at a later date could be done but I would think be challenging.

B. Municipal Energy Savings Lease – Lease financing would allow greater flexibility in the approval and timing of the financing of the project. The interest rate would most likely be slightly higher but would also allow a more fixed payment stream. Under this financing, the cost savings from the electrical would be greater than the lease payments.

C. Reserve Funding - The City has for several capital items set funds aside for the future purchase of high cost capital items. This could be used to fund a portion of the buyout amount. This past year, I discussed with the Council several items that the Council might consider funding with fund balance in excess of the City's fund balance policy. This item could be added to that list. I would call this the down payment approach. We have been very successful in avoiding or reducing the amount we borrow for many of our capital needs. In good years, the City could set aside an amount from surplus in a reserve for this project. As an example, if the City set aside $100,000 a year for this project, the down payment after 6 years would be $600,000 and the City could do the energy lease for only $1,000,000. The interest savings (based on interest rate of 3% over 20 years) would be about $200,000 with annual cash flow savings of about $41,000.