Chaussis 05/02/16 12:50 pm
and 12:54 pm
and 12:55 pm
and 12:44 pm

Rockland Energy Committee

Report To Planning Board

Date: **January 25, 2016 Meeting**

Members: Larry Pritchett, Bill Pearce, Tony Coyne, Brooks Winner
Nathan Davis (Mayor Has Nominated/Pending Council Confirmation)

To: Eric Laustsen & Members Of Planning Board

Regarding: **Ordinance Amendment #48**
Development Of Standards For Grid Scale Power Generation Facilities

1. Summary/Overview

On January 11, 2016 the City Council enacted a moratorium on site plan applications for new power generation facilities over 10 megawatts in capacity. The moratorium as enacted does not apply to businesses constructing heating or power generation systems to meet on-site heating and/or power needs. The first step under the moratorium is for the City's Energy Committee to provide a summary of issues and questions that the Committee recommends be considered by the Planning Board based on the questions raised and information presented at the community forums facilitated by the Committee in 2015. This document constitutes that summary.

The Energy Committee held three meetings (1/14, 1/21 and 1/25) to review materials and develop this summary for the Planning Board. At the initial meet on January 14th, the Committee discussed at some length the types of power generation facilities that would likely be covered by this moratorium. While wind power projects are being built at sizes over 10 Megawatts, the City's long standing height ordinance precludes the construction of grid scale wind projects in the City. Likewise, solar is being developed at some locations on a scale over 10 megawatts. But a 10 MW solar farm would require 50 acres of land, which makes development on that scale in Rockland unlikely.

After some discussion the Committee concluded that in practice this moratorium would apply to a couple of related power generation technologies. First the moratorium would apply to facilities that use a liquid or gaseous fuel (biogas, natural gas, diesel, etc.) to power a turbine that drives a generator. Second, the moratorium would apply to facilities that burn some form of feedstock or fuel (biomass, natural gas, oil, biogas, etc.) to make steam that in turn drives a generator. Many modern power generation facilities utilize both processes (i.e., biogas or natural gas powers a turbine; the exhaust heat from the turbine is utilized to make steam that in turn powers a steam turbine).

The points detailed below are drafted around these types of technologies. The Committee also discussed that regulations should be crafted with careful thought not to inadvertently preclude renewable energy sources or preclude a business from installing power or heat generation equipment that would lower a business' emissions and energy consumption.

2. Water Utilization, Recycling & Disposal

A. Background Information:

Historically, many types of electrical power generation facilities utilized large volumes of water. Some of this water was used for equipment cooling. In many cases the largest water utilization was to make steam to drive generators. If this water was used on a "once through basis" (i.e., run through the power plant and then discharged to a water body or released into the air as low

pressure steam), daily water consumption by an electrical power plant could be on the scale of hundreds of thousands, if not millions, of gallons per day.

However technologies like "Combined Heat and Power" were developed to utilize the heat from the power generation process for manufacturing purposes or building heating and cooling. The U.S. Environmental Protection Agency supported research on these types of technologies in part because CHP type plants can, in a cost effective manner, dramatically reduce if not eliminate daily source water consumption and daily wastewater discharges from power generation facilities.

B. Key Question(s):

1. Should the City add standards requiring a minimum percentage (50%? 85% or ???) of source water utilized in a combined cycle power generation facility, a combined heat and power facility or in a steam powered electrical generation facility for cooling, steam generation, or hot water distribution be recycled?

2. If the City requires a minimum level of water recycling, should that minimum requirement be reduced, or eliminated, if processed wastewater is the source water for the facility?

3. For a power generation facility, should the City add standards that would set an absolute maximum peak or average water consumption or set standards for drought conditons?

4. Should the city regulate or prohibit (if it does not already) thermal discharges to the municipal stormwater system or new direct thermal discharges to the harbor?

3. Noise Standards & Site Plan Evaluation Mechanism

A. Background Information:

Electrical power generators may be driven by direct fuel powered turbines (i.e., natural gas, biogas, etc.) or by steam turbines (i.e., powered by heat recovered from the fuel driven turbines or from biomass or similar stream boilers). Both sides of this process (i.e., the turbine and the steam) may generate substantial noise that can have unique sound attributes.

B. Key Question(s):

1. Does the City need to modify its noise standards, or add specific site review noise modeling provisions that would be paid for by the applicant, to insure adequate analysis of potential sounds/noise attributable to processes in these types of electrical power generation facilities?

2. Should the City add local ordinances provisions governing either noise easements or sound mitigation measures on nearby properties?

4. Local Air Emissions And Meeting Emissions Reduction Targets

A. Background Information:

Burning virtually any fuel (natural gas, oil, biogas, diesel, solid waste, biomass, wood pellets, coal, etc.) generates some level of the air pollutants nitrogen oxides (NOx), sulfur oxides (SOx), particulate matter (PM10) and carbon dioxide (CO_2). NOx, SOx and PM10 all can contribute to respiratory problems like asthma. In Maine, especially along the coast, these pollutants are the primary source of acid rain which degrades lake water quality and weakens softwood trees.

Carbon dioxide (CO_2) emissions from burning fossil fuels are generally accepted as a major contributor to climate change. The best available data indicates CO_2 emissions and global warming present significant challenges to the Gulf of Maine due to related warming of the Gulf's historically cold waters and due to CO_2 emission making the Gulf more acidic. The northeast states have a goal of reducing CO_2 emissions by 80% from historic peaks by 2050.

High efficiency systems combined with emissions controls can limit emissions of SOx, NOx, and PM10 to low levels Utilizing technology like "Combined Heat and Power" allows electrical power to be generated and the heat from the power generation process utilized for other purposes. Thus electricity could be produced locally with no increase in emissions (or a reduction in emissions) if the recovered heat from new power generation displaces heat being generated by existing boilers.

B. Key Question(s):

1. For power generation facilities developed to sell power, as opposed to facilities developed to directly supply a local business' energy needs,, should the City make site plan approval contingent on MeDEP approval of any required air emissions license for the proposed facility combined with an additional submittal by the applicant showing that the MeDEP approved emissions limits will lower air pollutants released locally (by a specific target percentage??) because of other existing local air emissions sources replaced by the facility or by efficiency measures implemented as a part of the project?

5. Standards Specific To Open Cooling Towers

A. Background Information:

In some cooling tower designs, the water being cooled cascades down an open tower directly exposed to the air as opposed to flowing through coiling coils. Steam/mist will be visibly under some (many) atmospheric conditions around open cooling towers. Utilized on a large scale, an open cooling tower may produce enough steam/fog/mist/precipitants in the immediate area to potentially be a nuisance or to potentially raise traffic safety questions.

B. Key Question(s):

1. Should the City either prohibit open cooling towers over a specific size or develop standards by which to evaluate larger open towers and to base conditions that avoid potential localized impacts?

6. Traffic Impacts and Transportation Routes For Trucked Fuel/Feed Stock

A. Background Information:

Power generation facilities utilizing compressed natural gas (CNG), biomass (i.e., wood chips, wood pellets, straw, etc.) or solid waste could require more than a dozen 80,000 lb. GVW truck deliveries daily depending on the size of the facility (municipally owned 70 megawatt McNeil Biomass plant in Burlington Vermont as one example).

B. Key Question(s):

1. Should the City's site plan standards be revised to allow the City to specify which routes would be used, or the timing of deliveries, to supply the fuel to the facility?
2. Should the City's site plan standards be revised to allow the City to require the developer to pay for road or intersection improvements needed to safely accommodate added truck traffic providing fuel/feedstock to the facility?

7. Onsite Fuel/Feedstock Storage, Fugitive Emissions & Emergency Response Plan

A. Background Information:

A natural gas fueled facility supplied by a pipeline would likely have some onsite fuel storage (either CNG or diesel). A biomass facility could have several days of feedstock stored onsite. A CNG supplied facility would have several trailers parked on site. Also, power generation facilities of these types would require an emergency response plan for both onsite fuel and the generation facility.

B. Key Question(s):

1. Are any revisions needed to the City's site plan standards to insure appropriate screening and safety measures are required for onsite fuel storage or any other hazardous materials utilized?

2. Are any specific revisions needed to the City's site plan standards to address any potential fugitive emissions of fuels or other chemicals from a power generation facility?

3. Do the City's site plan standards (or other ordinances) require the developer to pay for any municipal costs related to the development of emergency response plans for the facility?

8. Development Of Properties on Zone Boundaries

A. Background Information:

In some locations in the City properties in Commercial or Industrial zones on which a grid scale electrical power generation facility could be located are adjacent to, or across the street from, residential zones or existing residential uses.

B. Key Question(s):

1. Should any supplemental revisions to setback, screening, or sound standards be added for grid scale power generation projects where the property on which the facility is proposed abuts a residential zone (or an existing residential use)?

9. Development Of Properties Abutting High Value Wetlands

A. Background Information:

In some locations properties in Commercial or Industrial zones on which a grid scale electrical power generation facility could be located are adjacent to high value wetlands.

B. Key Question(s):

1. Should any supplemental revisions to setback, screening, sound or other standards be added for grid scale power generation projects where the property on which the facility is proposed abuts high value wetlands?

10. Fiscal Capacity Standard For Developer

A. Background Information:

Grid scale electrical power generation facilities require multi-million dollar level of investment to bring to full operational status.

B. Key Question(s):

1. Is the City's financial capacity requirement adequate to insure that once permits are granted the facility will likely be completed and the City is not at any significant risk of acquiring a partially completed project due to unpaid taxes in the future?

11. Decommissioning Costs

A. Background Information

Smaller power generation facilities likely raise no unique questions once closed than a range of other commercial and industrial uses the City permits. However larger power generation facilities (30 MW, 75 MW, 250 MW) may be of a scale that the facility would present substantial financial challenges to repurpose or demolish when closed down.

B. Key Question

Should the City create a mechanism by which facilities over a specified size would be required to set aside some percentage of annual revenue from the sale of electricity generated into a City verifiable escrow account that can be used solely for decommissioning?

12. Questions Raised That Appear Not To Be Site Plan Or Zoning Questions

When the community forums were held, City Council had approved an option on both the current Public Services Garage site and the adjacent City Hall property with a developer who was considering constructing a combined heat and power generation facility up to 74 Megawatts in capacity. Many of the questions raised and concerns expressed can be translated into regulatory standards.

A few of the questions raised at the forums appear straightforward to consider as conditions to insure community benefits from the sale of public land. But the Energy Committee could not clearly identify any site plan aspect to these questions (or in one case noted below there is a local regulatory questions, but the issue appears to be mostly a street opening question and possibly not a site plan question). The Energy Committee decided to note these here in case there might be a Site Plan/Zoning facet to these which the Committee missed. And, all of these questions would appear valid if a developer requested a Credit Enhancement Agreement, or any similar form of City support.

A. Not Displacing Cleaner Local Distributed Generation

Conservation Law Foundation's presentation, "Getting Natural Gas Right," at the August forum included the point that a natural gas powered facility should not displace cleaner local distributed sources of power generation

B. Local Community Benefit

Some new construction of power generation is targeted to meet local electrical needs (or even consumption of just one business, home or institution). Larger projects are often developed to sell power to the New England grid. In this later scenario the benefits are regional. One key question is what benefits associated with grid scale power generation projects benefit the local community? A second question is whether the city should consider negotiating monetary and/or non-monetary community benefits with the developer?

C. Standards For High Pressure Steam Lines/Safety Response to Steam Leaks

The Moratorium clearly envisions possible revisions to City's street opening ordinance to address natural gas lines and related questions. The moratorium does not mention steam lines. But thermal and pressure and joint standards may also warrant review.

13. Documents From Local Forums

The following documents are available on the City web site (and can be easily emailed to members of the Planning Board by the Energy Committee).

A. May 26th Forum: EMI Slides & Energy Committee Record of Public Comments

B. August 19th Forum: Greg Cunningham/Conservation Law Foundation Slides

C. August 19th Forum: Tim Schneider/Public Advocate Slides

D. August 19th Forum: Kathleen Everett/SMRT Slides

E. August 19th Forum: Energy Committee Compilation of Community Questions

Chonko 05/02/16 12:54pm
and MacLellan-Ruf 04/23/16

City Of Rockland

To: **Michael J. Chonko PE, CEM**
Director of Mechanical Engineering
SMRT Architects and Engineers
PO Box 618
Portland, Maine 04104

Re: **Scope of Services**
Technical Support For Development Of Power Generation Ordinance Standards
Rockland City Council Ordinance Amendment 2015-48

Project Background
On January 11th, 2016 the Rockland City Council adopted Ordinance Amendment #2015-48. This ordinance amendment established a moratorium on new Site Plan applications for power generation facilities over 10 Megawatts in size that are being developed to sell power to the grid. Ordinance Amendment #2015-48 provides the City with a time window to develop Site Plan and Performance Standards governing power generation facilities.

This Ordinance Amendment charged the City's Planning Board, working with support from the City's Energy Committee, with reviewing the City's current standards and proposing revised standards as may be appropriate to address potential project siting and operations impacts related to power generation facilities.

Services To Be Rendered By SMRT
This document constitutes the agreement between the City of Rockland and SMRT Architects and Engineers to provide technical support to the City, principally the Planning Board, in the ordinance development and ordinance review process. The services to be rendered by SMRT under this agreement include:

(A) Attending Planning Board meetings and other City meetings on this project as requested; (B) Providing technical analysis to support specific standards in any proposed ordinance; (C) Providing information on the technologies utilized in power generation and any operational attributes that may warrant performance standards to ensure compatibility with surrounding uses; (D) Providing examples from other municipalities and existing facilities; (E) Reviewing any draft ordinance standards developed; (F) Answering community questions at any public forums or public hearings that may be held as a part of ordinance development and ordinance review.

This scope of services may extend to screening level analysis or projections of air emissions, water utilization, feed stock transportation and input, sound levels, power production, or other similar parameters. This scope of services is not intended to cover detailed modeling of parameters beyond exporting data from models already developed by SMRT unless a modification of this scope of service with specific costs provisions is agreed upon by the City and SMRT in advance. Opinions offered by SMRT will be based on relevant prior project experience and further research of questions asked, as required. Technical guidance will be

offered for Ordinance language additions and modifications. The legal authority of this language shall be solely the responsibility of the City of Rockland.

Technical Areas Include In Scope Of Services To Be Rendered By SMRT
In 2015 three community forums on power generation were held in Rockland. Ordinance Amendment #2015-48 directed the City's Energy Committee "to convey to the Planning Board a summary of any issues that the Committee recommends be considered by the Planning Board" as the Board reviews existing ordinance standards and considers the development of new ordinance provisions. The Energy Committee's report summarizing the identified questions and issues the Committee recommends the Planning Board consider was completed on 1/25/2016.

The Energy Committee's summary identified 10 areas on which the Committee would recommend focusing: (1) Water Utilization, Recycling and Disposal; (2) Noise Standards and Site Planned Evaluation Mechanism; (3) Local Air Emissions and Meeting Emissions Reductions Targets; (4) Standards Specific to Open Cooling Towers; (5) Traffic Impacts and Transportation Routes For Trucked Feed Stock; (6) Onsite Feedstock Storage, Fugitive Emissions and Emergency Response Plan; (7) Development of Properties on Zone Boundaries; (8) Development of Properties Abutting High Value Wetlands; (9) Fiscal Capacity Standard for Developer; And (10) Decommissioning Costs.

The Energy Committee's 1/25/2016 report to the Planning Board is included in this Scope of Services by reference and is attached. The topics just listed, and explained in more detail in the 1/25/2016 report are the areas on which SMRT may be requested by the Planning Board to provide technical data and information.

Costs Allocation For Services Rendered By SMRT And Project Phasing
This project will involve two phases. All billing for each phase denoted below shall be actual costs (i.e., professional time spent on the project and any allowed expenses such as travel).

Phase 1: Ordinance Development By Planning Board
To comply with State statutes governing moratoriums and to provide adequate time for the two reading and public hearing process before City Council, any ordinance revisions proposed need to be included in Council's meeting materials packet on Friday April 1st. Thus the Planning Board ordinance development and review process must conclude no later than Tuesday March 29th. SMRT costs to the City of Rockland for this phase shall be actual costs of professional time and expenses up to $7,500.

Phase 2: Ordinance Review By City Council And Comprehensive Planning Commission
Revisions to the City's Land Use Ordinances are a three step process. If the Council approves ordinances in First Reading the ordinance goes before the City's Comprehensive Planning Commission for review and then comes back before Council for a "Second Reading" and Public Hearing. On substantive ordinance revisions, the Council frequently holds a work session on the topic. SMRT costs to the City of Rockland for this phase shall be actual costs of professional time and expenses up to $2,500.

Project Schedule & Early Termination
The time for providing services under this agreement begins with the initial meeting with the Rockland Planning Board and ends on June 15, 2016 unless the City and SMRT agree to extend

the agreement. This agreement may be ended early by a majority vote of the Planning Board in Phase 1 or a majority vote of the City Council in Phase 2 if either body concludes additional services are not needed or if SMRT fails to provide the services specified herein in a timely manner. If the agreement is ended prior to June 15 the City's sole obligation to SMRT is payment for services rendered and costs incurred up to the date the agreement is ended.

Project Lead
Michael J. Chonko, PE shall be project lead from SMRT and all contacts with the City shall be through Michael. Michael will be the representative attending meetings in Rockland unless the City and SMRT agree that another SMRT staff member is better suited to address the topics to be covered at a specific meeting.

Public Documents
All materials provided to the City by SMRT under this agreement for services shall be considered public documents which may be posted to the City's web site or shared with the public in whatever manner is determined to be appropriate by the City.

This scope of services is agreed to by:

For The City Of Rockland

_____
James D. Chaousis
City Manager
City of Rockland Maine

For SMRT Architects and Engineers

_____
Michael J. Chonko, PE
Principal
SMRT Architects and Engineers

Attachment:
January 25, 2016 Energy Committee Report To Planning Board

Chaousis 05/02/16 12:54 pm
and Machellan-Ruf 04/23/16
and Machellan-Ruf 04/19/16

Rockland Energy Committee

Recommendation To Planning Board

Date: **February 24, 2016 Meeting**

Members: Larry Pritchett, Bill Pearce, Tony Coyne, Brooks Winner, Nathan Davis

To: Erik Laustsen & Members of Rockland's Planning Board
Jim Chaousis, Rockland City Manager

Regarding: **Ordinance Amendment #2015-48**
Technical Support For Drafting Standards Governing Power Generation Facilities

1. Background

On January 11, 2016 the City Council approved a moratorium on site plan applications for new power generation facilities over 10 Megawatts in capacity. The ordinance amendment enacting the moratorium directed the Energy Committee to do three things:

> (A) Based on the community forums held in 2015, provide the Planning Board a summary of any issues that the Energy Committee recommends be considered when developing a new ordinance. This information is contained in a report from the Energy Committee to the Planning Board dated 1/25/2016 and was subsequently presented by members of the Energy Committee to the Planning Board on 2/16/2016.
>
> (B) Based on questions and issues identified in the Energy Committee's report to the Planning Board, provide the Board with a list of technical experts from which the Planning Board could choose to advise the Board as needed. On 2/10/2016 the Energy Committee voted to recommend six firms and organizations for the Planning Board to choose among as possible resources to utilize in the power generation ordinance development process.
>
> (C) Provide the Planning Board with advice or assistance during the ordinance development process as may be requested by the Board's Chairman.

At the Planning Board's 2/16/2016 meeting, members of the Energy Committee presented to and discussed with the Planning Board the report and recommendations referenced in (A) and (B) above. The Planning Board then discussed how to proceed with ordinance development and made several decisions in regard to moving forward on this project including the following two.

First, the Planning Board requested through the City Manager that the City Attorney be tasked with developing the outline of a concept power generation ordinance and with providing the Planning Board with ongoing ordinance drafting support through the ordinance development process.

Second, rather than the Planning Board choosing among the firms from the list provided by the Energy Committee, Planning Board members asked the Energy Committee to select the technical resources to utilize. Board members felt that the Energy Committee's familiarity with energy and technology put the Committee in a better position to select technical resources than the Board.

2. Recommended Technical Resources

This memorandum contains the Energy Committee's recommendation on technical resources to utilize in the ordinance development process as well as a summary of the selection process. Based on the