

# AGENDA

## COMMITTEE OF THE WHOLE MEETING

August 19, 2014

5:30 P.M. – 1201 S. Washington Ave.

REO Town Depot

Call to Order

Roll Call

Public Comments on Agenda Items

1. Committee of the Whole Meeting Minutes of 7/8/14
2. Regional Customer Input (**INFORMATION ONLY**)
3. CRT/MPSC Update
4. Renewable Energy Update
5. BWL Outage Map (**INFORMATION ONLY**)

Adjourn

## COMMITTEE OF THE WHOLE

July 8 2014

The Committee of the Whole of the Lansing Board of Water and Light met at the BWL Headquarters-REO Town Depot located at 1201 S. Washington Ave., Lansing, MI, at 5:30 p.m. on Tuesday, July 8, 2014.

Committee of the Whole (COW) Chair Dennis M. Louney called the meeting to order and asked the Corporate Secretary to call the roll.

Present: Commissioners Dennis M. Louney, Margaret Bossenbery, Anthony McCloud, Tony Mullen, David Price, Tracy Thomas, Cynthia Ward and Sandra Zerkle.

Absent: None

### **Public Comments**

None

### **Approval of Minutes**

**Motion** by Commissioner Price, Seconded by Commissioner McCloud to approve the Committee of the Whole meeting minutes of June 10, 2014.

**Action:** Motion Carried

### **CRT/MPSC Reports Recommendations update**

General Manager Lark stated that at the last meeting we talked about the Community Review Team's (CRT) recommendations and how we hope that those recommendations, together with the Public Service Commission's (PSC) thoughts, as well as our own 54 points would operate to make the BWL a much stronger utility; in fact, ensuring that during outages that customers get their power back more quickly, and have access to better information than they had. As you know, we have begun the process of putting together a new BWL that incorporates a lot of those activities.

We have been working the 54-point outage report for some months longer than we have the CRT, and for those of you who had access to your email know I did send to you that 54 point update, and you can see that many of the items are completed; those that are not will be completed shortly and some will never be completed because they are ongoing items.

General Manager Peter Lark provided an update of the BWL's response to the CRT, PSC, and its own 54 recommendations. (See attached)

II. Planning and Preparation			
Item #	Division	CRT Recommendation	BWL Division Response
<b>System Resilience</b>			
1	Lead: Emergency Operations Director Support: Dave Bolan	Working jointly with local emergency planners and municipal governments, update the inventory of critical facilities, as part of a Regional Emergency Operations Plan.	Agreed. The BWL will work jointly with local emergency planners and municipal governments to update the Critical Facilities Inventory for both electric and water services. The updated inventory will be completed by August 31, 2014. By September 30, 2014, the BWL will secure critical infrastructure agreements with local EOC's for sharing its Critical Facilities inventory. The BWL will then work with the Lansing EOC, and through them with other local emergency planners and municipal governments on integrating the Critical Facilities Inventory into the Regional Emergency Operations Plan. After August 31, 2014, the Critical Facilities Inventory update and integration process will take place on an as-needed basis but no less frequently than annually by the end of each calendar year.
2	Lead: Emergency Operations Director Support: Dave Bolan and Calvin Jones	Assist all units of government representing its customer base with identifying Special Needs Facilities for power restoration efforts, including assisted care facilities, elder care facilities, water and sewer plants, food warehouses, Capital City airport and key industry.	Agreed. As part of the process and timing described in CRT#1 above, the BWL will assist all units of government representing its customer base with identifying the Special Needs facilities identified in this Recommendation.
3	Lead: George Stojic	Undertake a program of technical assistance to critical facilities in its service area to determine the feasibility and net benefits of implementing a micro-grid at each such facility, using combined heat and power or renewable generation and storage.	Agreed. By March 31, 2015, the BWL will complete a survey of critical facilities for possible combined heat and power (CHP) opportunities. The survey will include existing distributed generators in the BWL service territory as demand response resources. The BWL will then work with the identified facilities to provide technical assistance in determining the feasibility of implementation of projects, including purchase power agreements. This work will be completed by May 31, 2015. The BWL will also expand its distributed solar energy program by August 1, 2014. The BWL will continue its program of grid sectionalizing to help preserve service to critical facilities with onsite generation.
4	Lead: George Stojic	Explore various options to participate financially in implementing micro grids at critical facilities where they are feasible and beneficial, including power purchase agreements, joint ventures, and Board ownership.	Agreed. As indicated in CRT#3 above, by May 31, 2015, the BWL will explore participation options with those candidates identified in its survey of CHP and distributed generation facilities.
<b>National Incident Management System Implementation &amp; Training</b>			
5		Recognize its role to assist Regional, City and Township Emergency Management in disaster response by implementing all of the following:	
a	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	During any event where the City EOC is activated, including during major widespread outages, a trained and experienced BWL Liaison Officer must be deployed to the City EOC.	Agreed. On April 4, 2014, the BWL assigned three electric liaisons to the Lansing EOC and on April 8, 2014, the BWL assigned three water liaisons to the Lansing EOC. Each liaison is familiar with and either experienced in design or operations of the BWL electric or water distribution systems. Status: Completed.

b	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Participate in all EM exercises sponsored by any units of government representing its customer base	Agreed. Within 60 days of being hired, the Emergency Operations Director will survey local EOC's for scheduled EM exercises and request participation. The BWL's Emergency Operations Director will be tasked with ensuring BWL communicates with local units of government including coordinating BWL participation in local emergency exercises.
c	Lead: Emergency Operations Director Support: All LBWL Managers	Assure that all operations employees receive basic NIMS training, at a minimum the two introductory courses: 1. FEMA IS-700, NIMS An Introduction; 2. IS-100.PW-B, Introduction to the Incident Command System (ICS 100) for Public Works;  that all first-line supervisors take those courses, plus ICS-200, Basic ICS;  that all senior management officials take those 3 courses, plus ICS-400, Advanced ICS.	Agreed. The BWL currently has the following ICS trained employees: 100 Introduction to Incident Command: 17 ICS 200 ICS for Single Resources and Initial Action Incidents: 13 ICS 300 Intermediate ICS for Expanding Incidents: 14 ICS 400 Advanced ICS: 13 IS G402 ICS for Executives/Senior Officials: 35 IS 700 National Incident Management System (NIMS) An Introduction: 12 IS: 800 National Response Framework, An Introduction: 2 Training is continuing for the remaining employees and must be completed no later than the following dates: 1. All BWL operations employees will complete the FEMA IS-700 IS-100 PW-B and the ICS 100 courses by March 31, 2015 2. All Managers and First-line Supervisors will also take ICS 200 course by November 30, 2014. 3. All BWL Directors will take courses in (1) and (2) and ICS-400 by December 31, 2014.
d	Lead: Emergency Operations Director Support: Appropriate BWL Managers	2) Participate in After-Action Reviews with all units of government representing its customer base, not just post-exercise, but after every major outage, disaster and emergency	Agreed. The BWL 's Emergency Operations Director will be tasked with participating and coordinating BWL participation with units of government representing its customer base in all after action reviews, including exercises, major outages, disasters and emergencies. The BWL will share information, data, and its experiences with other participants to improve regional emergency response. This will be an ongoing responsibility of the Emergency Operations Director with support from BWL Management and Staff.
e	Lead: Emergency Operations Director Support: Dave Bolan, Dick Peffley, and Calvin Jones	Develop and maintain good working relationships with the first-responder community for all units of government representing its customer base	Agreed. To develop and maintain a good working relationship with the first-responder community for all units of government representing its customer base, by the end of the third quarter FY15 the BWL's Emergency Operations Director and GRCS staff will have met with first responders from throughout its service territory to discuss emergency plans and responder roles. This recommendation will be an ongoing responsibility of the Emergency Operations Director. The BWL recognizes this on-going relationship as an important component of the Unified NIMS structure and guidelines.
<b>Contingency Planning, Training and Exercises</b>			
		Statements Provided (pg. 27)	
<b>Continuity of Operations</b>			
6	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Consolidate its multiple emergency response plans within the City and Regional plan, (see below) and then test that plan by scheduling a full staff coordinated "table top" exercise at a minimum of every 12 months.	Agree. The BWL's Emergency Operations Director will oversee and complete the consolidation of BWL Emergency Plans by October 31, 2014. The BWL Emergency Operations Director will be tasked with coordinating BWL plan with local or regional plans by December 31, 2014 and on an ongoing basis as updates are adopted. The Emergency Operations Director will also be tasked with coordinating the BWL's participation in City or regional exercises.

7	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	BWL Staff and upper management should participate in the exercises and receive training on these plans and regular refresher training. BWL staff with emergency responsibilities should be required to have training on these plans and their role and responsibilities and the role and responsibilities of others that will be involved with any emergency response.	Agreed. The BWL's Emergency Operations Director will develop and coordinate an Emergency Management training program for all Managers and staff with emergency responsibilities. The program will include annual training. The initial training will be completed within 120 days of the Emergency Operations Director's hire. The Emergency Operations Director will also conduct and coordinate emergency training with other local or regional emergency exercises.
8	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Together with the communities in the greater Lansing area (not just the BWL service area), undertake a regional planning effort to be better prepared and coordinated and assure that emergency communication protocols are agreed to and followed. The mayors and township supervisors of our communities must lead and encourage this effort and provide the necessary resources. This planning effort should be done in coordination with the State Police EMHSD District 1 Coordinator.	Agreed. The BWL will work with local officials and others on a regional planning effort, coordinating as appropriate with the State Police EMHSD District 1 Coordinator. When complete, the BWL will coordinate its Emergency plans with local EOC's and will participate with local EOC's in regional planning and training.
9	Lead: Emergency Operations Director Support: Dave Bolan, Gennie Eva, Dick Peffley, Bruce Cook, and Nick Burwell	Include Business Continuity Planning in its development of a comprehensive Emergency Operations Plan.	Agreed. The BWL's Emergency Operations Director will coordinate development of a business continuity plan as part of the BWL's EOP, with completion by March 30, 2015.
<b>Inter-agency Communications and Emergency Operations Center</b>			
10	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Develop a comprehensive EOP, in coordination with the City EM officials, that is an Annex to the City EOP, consistent with MCL 30.410 (1) (a)	Agreed. The BWL's Emergency Operations Director will consolidate BWL's emergency plans into a single BWL EOP by October 31, 2014 per CRT#6 above. The BWL Emergency Operations Director will be tasked with coordinating the BWL plan with local or regional plans by December 31, 2014 and on an ongoing basis as updates are adopted. The BWL is committed to a sustained partnership with local EOC's and a Regional EOC and will support development of a regional EOC, should one be adopted.
11	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Working jointly with the City of Lansing and other regional governments, develop a regional EOP which includes a process for siting, supporting and sustaining a regional EOC.	Please see response to CRT # 10
12	Lead: Emergency Operations Director Support: Dave Bolan, Gennie Eva, and Dick Peffley	Develop, in coordination with the governments representing its customer base, an Energy Annex to a Regional Emergency Operations Plan.	Agreed. The BWL Emergency Operations Director will coordinate the BWL Emergency Plan with local governments and a Regional Emergency Operations plan. The BWL Emergency Operations Director will coordinate the BWL plan with local units of government by December 31, 2014.

13	Lead: Calvin Jones Support: Emergency Operations Director and Dan Barnes	Collaborate with Lansing Emergency Management, Lansing Police Department's Neighborhood Watch, Lansing Neighborhood Council, East Lansing neighborhood associations and similar groups in all townships in the development of a program supporting block level emergency response plans. This effort would build upon the well-developed social infrastructure of Lansing's 186 organized neighborhood groups and prepare them to play an important role in planning for, responding to, and recovering from extreme weather events.	Agreed. On January 23, 2014, the BWL's Governmental Relations and Community Services Department (GRCS) began a program of outreach to neighborhood associations. To date, the GRCS has been in direct communications; in person, by phone, or by email; with all 124 known neighborhood associations who's members, in part, or entirely, fall within the BWL Service territory. The GRCS goal has been to promote communications and education regarding preparations for future emergencies. The GRCS is also collaborating with Do1Thing, the Red Cross, and The Power of We to make the BWL an emergency preparedness resource for the BWL's customer base. As an ongoing responsibility, the GRCS will continue outreach to neighborhood associations and other local organizations in order to provide information, coordination, and assistance with emergency preparedness plans. Status: Completed except for Emergency Management portion.
<b>BWL Crisis Communications</b>			
14	Lead: Stephen Serkaian Support: Calvin Jones, Bruce Cook, and Nick Burwell	Create a robust social media presence for its customers – this work is already underway internally, but must become a priority for its communications operations, as consumers are primarily using digital communication tools to learn about outages and other service issues.	Agreed. The BWL has hired a social media specialist and has tasked the position with undertaking and coordinating social media communications with BWL customers including, among other media, updating the BWL's Facebook, twitter, Nixle, and website. The BWL has recently created a near real time outage map with restoration times on its website. Status: Completed.
15	Lead: Emergency Manger Support: Calvin Jones and Stephen Serkaian	Require all communications staff and senior leadership to undergo certified NIMS communications training in order to understand best communications practices during crisis situations, with associated training events and tabletop exercises to ensure coordination of communications functions with regional governments.	Agreed. The BWL communication, GRCS staff, and leadership have already begun NIMS training. The BWL's Emergency Operations Director will be tasked with assuring communications staff annually update their training and that BWL's communications staff and leadership team participate in local and regional emergency exercises.
16	Lead: Stephen Serkaian Support: Emergency Operations Director	Further refine the March 2014 plan. The plan must contain greater detail on how to address the need for timely and accurate information; customer information must be consistently explained in a way that effectively meets customer expectations; and the plan must assure the provision of information sufficient to allow the public to make informed decisions on how they may best respond. There is a considerable body of studies on this subject that should be drawn upon in the development of such a plan. Once this plan is completed the BWL management and employees must be trained on, periodically exercise, and follow the plan.	Agreed. The Crisis Communications plan was developed by consultants based on industry best practices. The BWL agrees that customer communications must be timely, accurate, consistent, meet customer expectations, and provide sufficient information for customers to make informed decisions. To ensure that the BWL's crisis communications plan meets those objectives, the BWL will continue to review crisis communications studies and reports and make any necessary modifications to its plan by August 31, 2014. Following this, the Crisis Communications plan will be updated on an as-needed basis, with complete review and update performed annually at a minimum.
17	Lead: Emergency Operations Director Support: Stephen Serkaian	The crisis communications plan must be an annex to the Emergency Operations Plan and should be guided by a qualified communications professional certified through the NIMS protocols.	Agreed. The BWL Emergency Operations Director will be tasked with consolidating BWL emergency plans and will include the crisis communications plan in the consolidated plan as an annex. Emergency communications staff will undergo NIMS training, which will be completed by November 1, 2014, and at least one staff member will complete training for qualification through NIMS protocols.
<b>City Emergency Planning &amp; the Collaborative Planning Process</b>			

18		Consider amendment of the City Charter to clarify the powers of the Mayor and to provide the Mayor executive authority over the BWL during disasters or emergencies	City of Lansing
19	Lead: Emergency Operations Director	Emergency Management Director, working with all other member communities, including Ingham, Clinton and Eaton Counties, create a regional emergency operations plan (EOP).	Agreed. The BWL will participate in encouraging and developing a regional emergency operations plan.
20	Lead: Emergency Operations Director	Work with BWL Operations and Senior Leadership to integrate their BESOC and Crisis Command Center, using the NIMS framework, with the City EOC.	Agreed. The BWL stands ready to cooperate with the City Emergency Director to fulfill this recommendation.
21		Consider fully integrating BWL employees into the City EM structure.	City of Lansing
22	Lead: Emergency Operations Director	Recommend appropriate emergency management training for BWL leadership, including Commissioners, on how best to build in resilience and ensure full response capability to storms that are increasing in severity and frequency.	Agreed. Training will be scheduled for BWL leadership and Commissioners by end of fiscal year 2015. NIMS and ICS training will be offered to Commissioners as well as training on resiliency.
23	Lead: Emergency Operations Director	Sponsor or encourage a full scale training exercise, involving emergency management staff of all units of government and BWL in the tri-county region, to take place annually.	Agreed. The BWL will participate in full scale regional training exercises.
<b>Emergency Declarations</b>			
24		That all units of government within or partially within the BWL customer service area review their emergency operations plans to include a process for assessing the need for an anticipatory emergency declaration.	City of Lansing and local units of government

**ACTIONS**

**FOLLOW-UP**

1.	The BWL will include its distribution plan in its annual table top tests designed to stress its emergency response and will use the results to continually improve its emergency plans	Expected completion date 10/16/14
2.	The BWL will consider implementing a set of triggers into its distribution plan.	Completed 4/14
3.	The BWL will consolidate its Transmission and its Distribution emergency response plans into one document.	Completed 6/30/14, both plans updated and maintained simultaneously, however plans will not be fully consolidated into one document due to need to demonstrate NERC transmission compliance.
4.	The BWL will investigate the benefit of collaborating with other Michigan utilities to track and estimate the impact of inclement weather.	Expected completion date 8/29/14

5.	Based on the BWL's experience with the impact of the ice storm, the BWL will make use of additional secondary role employees and these roles will be discussed in subsequent sections.	Initial phase to expand and formalize secondary role program which includes identification of position and roles required for the restoration plan completed.  Identification of employees for secondary roles completed 6/30/14. Training employees to fill secondary roles rescheduled for completion November 30, 2014.
6.	Most utilities have not found placing overhead lines underground to be cost effective. Instead reviewing maintenance practices and construction standards seems to be a more reasonable method for improving the resiliency of the BWL's distribution system. However, for those customers who want and are willing to pay for undergrounding existing services, the BWL will provide the service.	Completed 5/8/14
7.	The BWL will strictly adhere to a 5 year trimming cycle and is in the process of modifying its tree trimming standards and procedures to remove all branches located above distribution lines and better protect its lines during a major storm.	Completed 3/24/14
8.	The BWL will begin to use multiple tree trimming contractors and assign work to contractors based on past performance. The contractor with the best record of performance will get a larger portion of the work. Recently, the BWL temporarily increased the number of tree trimming crews under contract to eighteen.	Original expected completion date 5/16/14 rescheduled to 8/29/14 due to contractors need to develop deployment plan including staffing levels.
9.	The BWL will publish the contact information for its supervisor responsible for trimming scheduling so customers can contact the Manager directly with questions or complaints regarding tree trimming procedures and workmanship.	Completed 2/18/14
10.	The BWL is in the process of carefully reviewing spotter duty during the ice storm and determining how many additional trained spotters would be needed to efficiently secure down lines and provide timely damage assessment during an event with the destructive impact of the ice storm. Based on this analysis, the BWL will survey its staff for additional personnel who would be suitable for spotter duty and train personnel for both spotter and damage assessment duty.	Completed 5/29/14
11.	The BWL will also utilize retired line workers to perform damage assessments and serve as spotters.	Completed 5/9/14
12.	The BWL will consider contracting with electric service firms for damage assessment services to supplement its own staff.	Completed 5/30/14
13.	The BWL is developing common reporting forms and methods to be used by all spotters and damage assessors and will stress the importance of adhering to these during the annual training sessions.	Original expected completion date 5/30/14 rescheduled to 8/29/14; working with Osmose, contract firm for spotter and line crew supply, on forms that are used with other clients.
14.	The BWL will evaluate the use of damage predictive tools to determine if these tools could help in assessing possible damage earlier in a storm's approach.	Completed



15.	The BWL will remind customers that lines marked with red and white tape are power lines and the tape indicates that the BWL is aware that the line is down. The BWL will publish this information on its website and Customer Connections newsletter.	Completed 5/1/14
16.	The BWL has expanded the number of utilities and non-utility electric service contractors with which it has mutual aid agreements or service contracts. The list is shown below. Existing Agreements• Michigan Municipal Electric Association (35 Municipal Utilities)• Consumers Energy New Agreements• American Public Power Association• Asplundh• Kent Power• Hydaker-Wheatlake• FEMA Mutual Aid (Upon a Declaration of a State of Emergency) Pending Agreements• DTE Energy (Under Negotiations)These agreements both increase the number of potential crew sources and provide geographical diversity as well. For example the APPA agreement would enable the BWL to bring crews in from a number of different states. In the event of a declaration of emergency, the FEMA agreement would allow the BWL to bring in crews from nearly anywhere in the United States.	Completed 3/28/14
17.	The BWL is in the process of hiring 3 additional line workers and an additional dispatcher to supplement its workforce and to help manage crews during the restoration process.	2 of 3 additional line workers hired along with dispatcher.
18.	With the addition of 3 line workers, an additional dispatcher, more trained spotters, and the new mutual aid agreements the BWL has tripled the number of line crews that are available for immediate deployment and can be used safely and efficiently during a major outage event.	Completed 6/30/14, triple number of crews available.
19.	The BWL does update its critical and public safety lists periodically to ensure that it is up to date and complete. The BWL will share its overall restoration plans with local public officials so that they can be kept up to date on the BWL's restoration plans. If another catastrophic storm does occur, local officials will be better able to respond to citizen inquiries regarding the restoration progress.	Original expected completion date 11/14/14. Electric Transmission and Distribution plans updated 6/30/14. Update of critical list expected 8/29/14. Consolidation of BWL emergency plans scheduled for 10/31/14, and coordination of BWL consolidated plan with local officials expected to be completed by 12/31/14. Consolidation of BWL emergency plans along with table top exercises have increased the scope of this recommendation resulting multiple steps and a new final completion schedule.
20.	The BWL will review it's storm inventory based on the recent ice storm.	Completed 3/21/14
21.	The BWL will investigate connecting its line truck laptops to its OMS system as a tool to assist crews with storm responses.	Completed 3/18/14
22.	The BWL has resolved the matters related to the OMS functionality. The conductor cuts are now operational and the OMS performs to design standards.	Completed and tested 3/11/14
23.	To avoid this situation with other outage tools that may be employed in the future, the BWL will conduct annual stress tests of all its restoration tools including, but not limited to the OMS, outage call in number, Customer Service Center, and Communications plans.	Completed 3/11/14

24.	The BWL is moving forward with a project to implement smart grid and smart meter technology, which will allow it to identify individual customer outages. It will also develop a policy that will allow customers to "opt out" of smart meter use. c. customer communications:	Scheduled and budgeted for FY15 this will be a multi-year project
25.	The BWL is hiring additional call center staff.	Completed 2/24/14
26.	The BWL has implemented a process to assure call forward to the 877 number occurs during large outages. This will allow CSR and supporting staff to concentrate on line down, voice mail and other communications mediums.	Completed 2/13/14
27.	The BWL will trigger the IVR in the 877 system to direct non-matched callers to voicemail during major outage events.	Completed 2/13/14
28.	The BWL has reconfigured the Call Center to send messages in the voice mailbox to CSR's automatically.	Completed 3/1/14
29.	The BWL is aggressively advertised the 877 number for outages including all available communications mediums, like magnets, social media, BWL Website, and other customer communications.	Completed 1/24/14
30.	During a major outage, the BWL Call Center staff will focus their efforts on responding to email, texts, Facebook, Twitter, and voicemails left on the outage reporting system with the goal of responding to storm related inquiries in a timely fashion. The BWL has expanded the number of employees in secondary storm roles to assist with these customer service functions.	Completed 1/24/14
31.	The BWL will ensure that the distribution plan weather forecasting and storm preparation function include employees who are directly or indirectly, through secondary roles, responsible for customer service. This, along with other changes, will assure that the BWL can respond to customer inquiries promptly.	Completed 3/6/14
32.	The BWL is working with the 877 vendor to provide additional methods for customers to be identified or matched when calling in to report an outage. This will include using the last digits of an account number or social security number.	Original expected completion date 6/20/14 rescheduled to 7/31/14. Date moved due to technical issues: vendor has changed the way the call back files must be sent and BWL is making the necessary technical adjustments.
33.	The interface between the 877 number and the OMS has been fixed and alarms will be added on each system to alert staff of any problems in the future.	Completed 4/25/14
34.	The BWL has added text outage reporting to the 877 system to offer customers another method for reporting outages.	Expected completion date 7/25/14
35.	The BWL is working on a method to provide quicker updating of customer data from BWL system to 877 system. This is intended to provide better matches of customers to service addresses.	Completed 6/28/14

36.	The BWL is working to improve its ability to automatically call back customers and provide them with updated outage information.	Completed 6/27/14
37.	The BWL will continue its enhancements to its phone system. The enhancements will use newer technology to increase Internet bandwidth, increase available phone lines, and make the system fully redundant across the BWL private city-wide network. This upgrade will allow the system to dynamically increase the number of available lines to the call center during a large outage, using many of them to forward calls to the 877 vendor site which is designed for large volumes.	Expected completion date 7/25/14
38.	The BWL has increased the TFCC voice mailbox size to 8,000 messages and is in the process of contracting with another vendor to assist in responding to voice mailbox messages during a large outage.	Completed
39.	The BWL is investigating a separate site created just for outage information (including outage maps). This will help ensure that the BWL's outage website will be available to customers in the event that a catastrophic outage disables the BWL's main website.	Completed 3/11/14
40.	Although the external email to Customer Service functioned normally during the storm, the BWL is investigating establishing a redundant external email system.	Expected completion date 8/15/14
41.	The BWL has developed a temporary web-based outage map for its website. The BWL is also working with a local vendor for a permanent outage map linked directly to the BWL's OMS system. Phase I of the project covering functionality has been completed and development is underway. Phase I is Scheduled for completion soon.	Completed 3/11/14
42.	In Phase II of the project, the BWL plans to continue enhancements to all of its Information Systems that interact with customers. The next phase of the outage map product for BWL will include further interaction with our customers, allowing them to identify themselves to learn if our system shows them specifically out as well as possibly reporting an outage through the map system to our OMS system. Other enhancements and features are being evaluated.	Completed 6/28/14
43.	In addition to using Twitter and Facebook, the BWL is investigating the use of Nixle to communicate outage and other information to its customers.	Completed 5/9/14
44.	The BWL will work with customers and local officials to determine how to make local officials aware of seniors, customers with medical alerts, and other vulnerable populations during extended outages.	The process of identification and notification has been completed. The process will be operational in the first quarter FY15 after permission to share information has been secured from customers.

45.	The BWL will be more proactive informing customers of where their responsibility for service ends, the service mast, and the BWL's begins.	Completed
46.	The BWL will maintain a list of qualified electricians who can repair service masts and the BWL will help customers finance the cost of mast repair by allowing customers to pay it off on their bill over a one year period without interest. A list of qualified electricians will appear on the BWL's website.	Completed June 4, 2014
47.	During events like the ice storm, the BWL will work with local organizations to maintain warming centers in the winter and cooling centers in the summer for Lansing area residents.	Completed
48.	As an integral part of the Lansing community, the BWL will work with other organizations to respond to crisis that may affect mid-Michigan in the future. The BWL is supporting work by The Power of We and others to help empower neighborhoods to react to any type of emergency. The BWL pledges to be a part of that coalition and play its part in protecting the Lansing community and to meet with neighborhood associations to explain the BWL storm response plans and listen to their concerns and questions.	Completed and ongoing
49.	Since ice storm outage restoration, the BWL's service territory has experienced a number of severe winter weather events, and four separate outage events ranging from 100 outages to 7,400 outages. In all of the severe weather events, the BWL has posted, on all communications channels, at least two days prior to the forecasted weather, warning customers about the impending storm and directing them to call the BWL "877" outage number if they lost power. The BWL has also continuously posted updates, cold weather safety tips, and City of Lansing updates.	Completed
50.	During outages, the BWL has acknowledged the time the outage began, the number of outages, the cause of the outage, the geographic area of the outage that can be found on the outage map, the projected time of restoration, and full restoration all clear.	Completed
51.	Communication improvements have been noted on Facebook and Twitter with positive comments by our customers.	Completed
52.	The BWL has retained the communications firm of Martin Waymire to help develop a crisis communications plan based on an examination of best practices across the utility industry to make sure it has a strong crisis communications protocol in place in the very near future. Martin Waymire will also assist during emergencies if needed. In the meantime, the BWL has a working interim crisis communications plan.	Completed

53.	The BWL has also hired a social media specialist, a newly created position. The social media specialist will help develop strategies on how to best communicate with our customers over all social media channels.	Completed 2/17/14
54.	The BWL will provide information to state and local officials on a regular basis. During an event like the ice storm, it will assign a liaison to state and local officials to answer questions that they may have from their constituents.	Completed

The Committee of the Whole reviewed the following:

**CRT and Governance Recommendations**

**The CRT recommends that the Board of the BWL and the City:**

- 1) Hire an "operational auditor" to conduct annual performance audits of the BWL operations and planning.

**Outcome:** Instruct Auditor Perkins to come back with a proposal outlining what he sees as being an operational audit scope and the estimated level of work needed from an outside contractor. That information will be brought back to committee for consideration.

- 2) Establish a standing committee for review of, and contract with outside expertise for, an annual operational audit.

**Outcome:** Deferred until further conversation with the Internal Auditor

- 3) Institute a training process for all board members in Carver or other Policy Governance Model. Implement and use the model and continue the training on an ongoing basis.

**Outcome:** Agreed On/In Process

- 4) Request the City to consider provision to the BWL Board of expense reimbursement and/or some minor stipend for attendance.

**Outcome:** Deferred

- 5) Create a Local Government Liaison Committee of Board members and local government representatives from remaining governments, which will meet quarterly to review service-related issues and to recommend changes, improvements, and innovations AND the Board must institute a clear process for plenary and due consideration and action on the Committee's recommendations

**Outcome:** An Ad Hoc Committee has been established headed by Chair Zerkle. The Committee will examine this recommendation with the goal in mind to look at involving all those other local units and then determining the procedures that that would occur. The Ad Hoc committee is charged with finding the best way to implement the recommendation.

- 6) Request an opinion from the Lansing City attorney to clarify whether an ordinance or City Charter amendment could establish an expanded Board to include non-Lansing residents, to represent the municipalities within the BWL customer area.

**Outcome:** In Process/Based on the Mayor's recommendations

### **Board of: Commissioner Crisis Communication Plan**

The Committee had dialogue regarding the Board of Water & Light Board of Commissioners establishing own Crisis Report. After a lengthy conversation, it was determined the Committee would like to consider a draft of the Lansing City Council recommendations, and use their plan as a template to create our own. Committee of the Whole Louney stated that he would work with the Corporate Secretary to revise the template and bring it back to the Committee of the Whole for review.

### **Board of Water & Light Crisis Communication Plan**

General Manager Lark stated that the Board of Water & Light's Communication Plan was created by the firm of Martin Waymire, who surveyed a number of utilities throughout the country, a number of relevant utilities and came up with what they believe, was the best practices of crisis communications plan.

General Manager Lark introduced, Board of Water & Light Communications Director Steve Serkaian to provide details of the plan.

Mr. Serkaian stated the following:

We asked Martin Waymire to look at best practices of utilities all across the country and without exception, found that our customers wanted to know three important things during an outage: 1) are you aware that my power is out; 2) what caused the outage, and 3) when will my service be restored. During the ice storm, quite frankly, we could only answer one of those questions - what caused the outage. Moving forward, these three questions, and answers to these questions have become our guiding mantra. Any customer outage, large or small since the ice storm, whether it's 12 outages like we had over the 4th of July, or larger outages, I think our biggest one was perhaps 3,500; we have communicated answers to all three questions, both through traditional media and through social media.

Before we get to the actual crisis document and your questions, it is important to look at what the research found and how we address the research; because, those elements and those changes are every part of this plan, and something that we operate under every day; both with regular communications to our customers through social media, and traditional media about our day to day activities. Outages and everything in between, the research came back and suggested a number of things; the changes I am going to describe and the improvements I'm going to describe, have been the direct result of work by dozens of people at the BWL. I only had a small part of it; dozens of folks continue to work on improvements lead by our general manager, Mr. Lark, and it's important to tell this Board and the public that, in my experience in working for public entities there has been a sea change of ways we have done things differently. These are important changes that we're communicating through our newsletters and to the media, but at some point there's going to be an end point to the focus on us, so that we do our day-to-day business and do it well, as we have for more than 100 years.

Mr. Lark mentioned a lot of things in his review of the CRT recommendations. Let me get back to the findings of the research of Martin Waymire made, they found the best practices across the country that additional communications channels are necessary to allow customers to

communicate easily and conveniently with us. During the ice storm, we only had one 877 line, and because of the problems with the OMS, we were unable to communicate with customers. They were only able to effectively communicate with us, and we couldn't tell them when their power was going to be restored. Those problems have been fixed, addressed, and tested. We now have additional sources of how we can communicate with our customers, and our customers with us; our interactive outage map, which is in our outage center, now has the ability for customers to report an outage. They can check whether the power is on or off, and will be able to get right-now restoration time, as they were able to get that through the 877 number. Targeted for early August, we are going to launch a mobile app for all of our customers to download on their mobile platforms whether it is a smart phone, tablet, and so on; the mobile app would be able to allow customers to report outages and get updates on outages, and this coming December, we are going to launch a new feature that will allow our customers to report outages via texting from their phones. Therefore, from December and January, the communication vehicle will have multiple communication vehicles that our customers can communicate with us.

During the ice storm, we had outage information scattered throughout our website, and not easily found. Since then, we have created an icon on our front page; if you click on it, it goes directly to the outage center and on that outage center is an outage map, and you can click that to see an outline of our service territory and inside our service. If there is anything inside the map relative to outages, you can just hover over it with your mouse. The site refreshes every 15 minutes. It has changed the way that I have done business with reporting outages because, once I get the alert, I go directly to the outage center to see the outage map and what the boundaries are; that has streamlined and made my job more efficient in communicating with Amy Akers' support, and reporting to the social media what the boundaries are, what the restoration time is, and through our other Internal information, what the cause of the outage is. Therefore, the outage center has been, and is interesting to see because our customers are giving each other updates; I call that the market correcting itself, and it's wonderful to observe. Now with our ability to push people to our outage map and the outage center, it is a really convenient thing, for which our customers screamed for during the ice storm, and that we now have, six months after the fact.

We've got the outage center prominently displayed on our home page; the outage map has been updated to allow folks to post their outages and to get updates on restoration, that's going to be in the August "Connections," so it will go customer-to-customer directly through the billing insert. We also have a number of tabs that talk about what to do when the lights go out, how to prepare for outages, how the BWL handles outages, vegetation management information. We've got a sign up on the site along with social media streams, both on Facebook and Twitter. The research also told us that we have to do a better job communicating with all of our key audiences before the crisis happens, and before the storm hits; now at least two days before a forecasted storm, we are communicating with our customers and media both, though traditional media and social media. Advising that a big storm is on its way and we think it's going to hit, if it does we're ready, we've got crews on stand-by and that these are things that you need to do if your power goes out; in particular, we push them to two places one the 877 number.

We've also expanded our constituent groups through which we send social media and traditional media updates; to those constituent groups beside the board, our internal list, all master media lists, including an expanded governmental list of all local, county, and state

officials throughout our service territory. We have created our neighborhood association list throughout our service territory, we have a faith-based list and, in all press release communications, we sent emails to them not only during outages and crises, but also in our day-to-day stuff because, it is important that these constituent groups know the kind of things that we are doing. Now in every outage, even minor outages of 10, 100, 500 or more than 1000, we always post, that we know about the outage, we know where it is, and we try to give a restoration time. Information is always posted on social media, as that's where all our customers are going for information. We post a Twitter message about an outage, and we find many times that the media, the Lansing State Journal and Channels 6 and 10 are re-tweeting our posts. A number of commissioners are also re-tweeting our posts. So there is no longer, a silver bullet of how we are communicating with our customers, it is multiple mediums and it is multiple ways that people are getting the information. We have also created an email group list that we send to our constituent groups, we have also created a number of templates, that give us direction on how to address a small outage, a medium sized outage and a large sized outage, and the same is on the back of the crisis plan that was included in your packets today. I believe there were about 9 templates that we included in March, when we released the plan and has now grown to about 17.

The crisis plan itself is sort of a living breathing document that is always being adjusted. For instance, when the emergency manager comes on board, we will have to fold this new position into it to reflect this person's leadership with a crisis. Therefore, we are constantly making tweaks to the templates. We are also developing a power point presentation that senior leadership including Mr. Lark will be taking to the community. These are all things that we're doing to communicate the changes we have made since the ice storm. The BWL was also told that the tone of communications needs to be improved, and that that traditional media communications and social media posts regarding outages should reflect our humility; that we should apologize to customers for the outage; that we should thank them for their patience in enduring an outage and we try to do that in every instance of an outage. Lastly, the research said to put standard operating policies and protocols in place to guide communications during routine practices, outages, whether large or small, and crises that the ice storm reflected; we have done that. The kinds of changes that I have characterized, the elements that have gone into the crisis plan is something that we operate under every day, and if a major outage hits our community tomorrow, we are going to be in much better shape in terms of communicating with our customers and being able to respond in appropriate way both in terms of communications and operationally so that we can get our customers power back on, as quickly as possible.

Mr. Sarkaian spoke about marketing efforts that have taken place, or have been put into place since the ice storm. For Example "The Power of We" and "Do 1 Thing" have been implemented as a tool to help with outreach.

There was a lengthy question and answer session regarding the responsibilities of the Emergency Manager, the Board of Commissioner communicating with media, and the inclusions of a Board member on the crisis communication team.

Committee of the Whole Chair Louney thanked Mr. Sarkain for his efforts on the presented crisis communication plan.



## **Dialogue re: Board of Commissioners Governance Training.**

The Committee of the Whole had dialogue regarding the desire for governance training. Board Chair Zerkle presented a proposed agenda as well as a bio on a recommended presenter for the training. After some dialogue and reviewing the presented proposed agenda, it was determined that this may be a good place to begin, however, there was uncertainty regarding this proposed agenda, and the proposed presenter regarding obtaining the desired educated outcome. Upon conclusion of the discussion, it was determined that the Board Chair would have the Corporate Secretary send an email asking the Board of Commissioner to submit to their expected learning outcome and/or specific agenda subjects that you would like addressed in the governance training.

## **Other**

Board Chair Zerkle conveyed that she and Human Resource Chair Thomas are prepared to start the process for negotiating the contract for the 3 appointed employees. There was a lengthy conversation regarding the evaluation and negation process. Human Resource Chair Thomas stated that there was a process established last year and the same process would be used this year. Committee of the Whole Chair Louney stated during this dialogue what he heard was that we had a process in place and some board members are saying that they think the process needs to be reviewed and I feel that that is an issue for the HR committee to look at, if the chair deems it necessary.

Committee of the Whole Chair Louney stated that he was notified last week about a legal case that was not on their legal update, and asked that the General Manager contact the Commissioners' by email and provide some details. General Manager Lark in response stated that he was not aware of such a case but would look into it.

## **Excused Absence**

None

## **Public Comments**

None

## **Adjourn**

**On Motion** by Commissioner Price, Seconded by Commissioner Bossenhery, the meeting adjourned at 8:12 p.m.

Respectfully Submitted  
Dennis M. Louney, Chair  
Committee of the Whole

### CRT Remaining Recommendations

Item #	Division	CRT Recommendation	BWL Division Response
1	Lead: Emergency Operations Director Support: Dave Bolan	Working jointly with local emergency planners and municipal governments, update the inventory of critical facilities, as part of a Regional Emergency Operations Plan.	Update the Critical Facilities Inventory for both electric and water services by August 31, 2014 Secure critical infrastructure agreements with local EOC's by September 30, 2014 within <b>90 days of Emergency Director hire</b> update inventory and share with local EOC's no less frequently than annually by end of each calendar year
2	Lead: Emergency Operations Director Support: Dave Bolan and Calvin Jones	Assist all units of government representing its customer base with identifying Special Needs Facilities for power restoration efforts, including assisted care facilities, elder care facilities, water and sewer plants, food warehouses, Capital City airport and key industry.	See CRT #1 for completion dates to assist local governments in identifying Special Needs facilities
3	Lead: George Stojic	Undertake a program of technical assistance to critical facilities in its service area to determine the feasibility and net benefits of implementing a micro-grid at each such facility, using combined heat and power or renewable generation and storage.	Complete survey of critical facilities for combined heat and power opportunities and distributed generation by March 31, 2015 Provide technical assistance in determining the feasibility of implementation of projects, including purchase power agreements with likely candidates May 31, 2015 <b>Expand distributed solar energy program by August 1, 2014, Completed</b> <b>Continue grid sectionalizing investments. Completed</b>
4	Lead: George Stojic	Explore various options to participate financially in implementing micro grids at critical facilities where they are feasible and beneficial, including power purchase agreements, joint ventures, and Board ownership.	See CRT #3 for estimated completion dates
5		Recognize its role to assist Regional, City and Township Emergency Management in disaster response by implementing all of the following:	
b	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Participate in all EM exercises sponsored by any units of government representing its customer base	Emergency Operations Director will survey local EOC's for scheduled EM exercises within 60 days of hire. Emergency Operations Director will schedule BWL participation in local EM exercises as an ongoing basis.
c	Lead: Emergency Operations Director Support: All LBWL Managers	Assure that all operations employees receive basic NIMS training,  at a minimum the two introductory courses: 1. FEMA IS-700, NIMS An Introduction; 2. IS-100.PW-B, Introduction to the Incident Command System (ICS 100) for Public Works;  that all first-line supervisors take those courses, plus ICS-200, Basic ICS;  that all senior management officials take those 3 courses, plus ICS-400, Advanced ICS.	The BWL currently has the following ICS trained employees:  Introduction to Incident Command: <b>48</b> ICS 200 ICS for Single Resources and Initial Action Incidents: <b>29</b> ICS 300 Intermediate ICS for Expanding Incidents: 14 ICS 400 Advanced ICS: 13 IS G402 ICS for Executives/Senior Officials: 35 IS 700 National Incident Management System (NIMS) An Introduction: <b>26</b> IS: 800 National Response Framework, An Introduction: <b>1 2</b> Training is continuing for the remaining employees and must be completed no later than the following dates: 1. All BWL operations employees will complete the FEMA IS-700 IS-100 PW-B and the ICS 100 courses by March 31, 2015 2. All Managers and First-line Supervisors will also take ICS 200 course by November 30, 2014. 3. All BWL Directors will take courses in (1) and (2) and ICS-400 by December 31, 2014.
d	Lead: Emergency Operations Director Support: Appropriate BWL Managers	2) Participate in After-Action Reviews with all units of government representing its customer base, not just post-exercise, but after every major outage, disaster and emergency	BWL 's Emergency Operations Director will be tasked with participating and coordinating BWL participation with units of government in all after action reviews, including exercises, major outages, disasters and emergencies.

## CRT Remaining Recommendations

Item #	Division	CRT Recommendation	BWL Division Response
e	Lead: Emergency Operations Director Support: Dave Bolan, Dick Peffley, and Calvin Jones	Develop and maintain good working relationships with the first-responder community for all units of government representing its customer base	BWL's Emergency Operations Director and GRCSO staff will meet with first responders from throughout its service territory by the end of the third quarter FY15 to discuss emergency plans and responder roles. This recommendation will be an ongoing responsibility of the Emergency Operations Director.
6	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Consolidate its multiple emergency response plans within the City and Regional plan, (see below) and then test that plan by scheduling a full staff coordinated "table top" exercise at a minimum of every 12 months.	Consolidation of BWL Emergency Plans <b>within 120 days of Emergency Director hire.</b> Coordination BWL plan with local or regional plans <b>within 180 days of Emergency Director hire</b> and on an ongoing basis as updates are adopted. Coordination of BWL's participation in City or regional exercises ongoing.
7	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	BWL Staff and upper management should participate in the exercises and receive training on these plans and regular refresher training. BWL staff with emergency responsibilities should be required to have training on these plans and their role and responsibilities and the role and responsibilities of others that will be involved with any emergency response.	Conduct emergency management training for all Managers and staff with emergency responsibilities, with initial training completed <b>within 120 days of Emergency Director hire.</b> Conduct and coordinate emergency training with other local or regional emergency exercises on an ongoing basis.
8	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Together with the communities in the greater Lansing area (not just the BWL service area), undertake a regional planning effort to be better prepared and coordinated and assure that emergency communication protocols are agreed to and followed. The mayors and township supervisors of our communities must lead and encourage this effort and provide the necessary resources. This planning effort should be done in coordination with the State Police EMHSD District 1 Coordinator.	Assist and participate with local officials and others on a regional planning effort, coordinating as appropriate with the State Police EMHSD District 1 Coordinator. Coordinate BWL's emergency plans with local EOC's and participate with local EOC's in regional planning and training on ongoing basis.
9	Lead: Emergency Operations Director Support: Dave Bolan, Gennie Eva, Dick Peffley, Bruce Cook, and Nick Burwell	Include Business Continuity Planning in its development of a comprehensive Emergency Operations Plan.	Coordinate development of a business continuity plan as part of the BWL's EOP <b>within 270 days of Emergency Director hire.</b>
10	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	CRT: Develop a comprehensive EOP, in coordination with the City EM officials, that is an Annex to the City EOP, consistent with MCL 30.410 (1) (a)	Consolidate BWL's emergency plans into a single BWL EOP <b>within 120 days of Emergency Director hire</b> per CRT#6 above. Coordinating the BWL plan with local or regional plans <b>within 180 days of Emergency Director hire</b> and on an ongoing basis as updates are adopted.
11	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Working jointly with the City of Lansing and other regional governments, develop a regional EOP which includes a process for siting, supporting and sustaining a regional EOC.	Please see response to CRT # 10
12	Lead: Emergency Operations Director Support: Dave Bolan, Gennie Eva, and Dick Peffley	Develop, in coordination with the governments representing its customer base, an Energy Annex to a Regional Emergency Operations Plan.	Coordinate the BWL Emergency Plan with local governments and a Regional Emergency Operations plan; coordinate the BWL plan with local units of government by <b>within 180 days of Emergency Director hire.</b>

### CRT Remaining Recommendations

Item #	Division	CRT Recommendation	BWL Division Response
13	Lead: Bob Perialas Support: Emergency Operations Director and Dan Barnes	Collaborate with Lansing Emergency Management, Lansing Police Department's Neighborhood Watch, Lansing Neighborhood Council, East Lansing neighborhood associations and similar groups in all townships in the development of a program supporting block level emergency response plans. This effort would build upon the well-developed social infrastructure of Lansing's 186 organized neighborhood groups and prepare them to play an important role in planning for, responding to, and recovering from extreme weather events.	Identify and establish contact with community groups and organizations, June 1 Completed Consolidate BWL resources and services to provide organizations, November 30, 2014 Provide resources, adopt as practices and procedures Encourage and participate community coalition, adopt as practices and procedures
15	Lead: Emergency Manger Support: Calvin Jones and Stephen Serkaian	Require all communications staff and senior leadership to undergo certified NIMS communications training in order to understand best communications practices during crisis situations, with associated training events and tabletop exercises to ensure coordination of communications functions with regional governments.	Provide BWL communication, GRCS staff, and leadership with NIMS training. Annual update training fo rcommunications staff on ongoing basis. Annual BWL's communications staff and leadership team will participate in local and regional emergency exercises on an ongoing basis.
16	Lead: Stephen Serkaian Support: Emergency Operations Director	Further refine the March 2014 plan. The plan must contain greater detail on how to address the need for timely and accurate information; customer information must be consistently explained in a way that effectively meets customer expectations; and the plan must assure the provision of information sufficient to allow the public to make informed decisions on how they may best respond. There is a considerable body of studies on this subject that should be drawn upon in the development of such a plan. Once this plan is completed the BWL management and employees must be trained on, periodically exercise, and follow the plan. PSC: #8, develop communications plan	Review and determine if updates to crisis communications plans are needed by August 31, 2014. The Crisis Communications plan will be updated on an as-needed basis, with complete review and update performed annually at a minimum.
17	Lead: Emergency Operations Director Support: Stephen Serkaian	The crisis communications plan must be an annex to the Emergency Operations Plan and should be guided by a qualified communications professional certified through the NIMS protocols.	Consolidating BWL emergency plans including crisis communications plan as an annex. Provide emergency communications staff with NIMS training by November 1, 2014, and at least one staff member will complete training for qualification through NIMS protocols.
18		Consider amendment of the City Charter to clarify the powers of the Mayor and to provide the Mayor executive authority over the BWL during disasters or emergencies	City of Lansing
19	Lead: Emergency Operations Director	Emergency Management Director, working with all other member communities, including Ingham, Clinton and Eaton Counties, create a regional emergency operations plan (EOP).	The BWL will participate in encouraging and developing a regional emergency operations plan.
20	Lead: Emergency Operations Director	Work with BWL Operations and Senior Leadership to integrate their BESOC and Crisis Command Center, using the NIMS framework, with the City EOC.	The BWL stands ready to cooperate with the City Emergency Director to fulfill this recommendation.
21		Consider fully integrating BWL employees into the City EM structure.	City of Lansing
22	Lead: Emergency Operations Director	Recommend appropriate emergency management training for BWL leadership, including Commissioners, on how best to build in resilience and ensure full response capability to storms that are increasing in severity and frequency. PSC: #13, expand training and exercise programs to Board members	Training will be scheduled for BWL leadership and Commissioners by end of fiscal year 2015. NIMS and ICS training will be offered to Commissioners as well as training on resiliency.

### CRT Remaining Recommendations

Item #	Division	CRT Recommendation	BWL Division Response
23	Lead: Emergency Operations Director	Sponsor or encourage a full scale training exercise, involving emergency management staff of all units of government and BWL in the tri-county region, to take place annually.	Plan and coordinate BWL participation in full scale regional training exercises.
24		That all units of government within or partially within the BWL customer service area review their emergency operations plans to include a process for assessing the need for an anticipatory emergency declaration.	City of Lansing and local units of government

### CRT Remaining Recommendations

Item #	Division	CRT Recommendation	BWL Division Response
30	Lead: Nick Burwell	Remedy the lack of redundancy in their OMS System by (1) devising an alternative system and (2) including the potential loss of OMS as a contingency in EOP. The OMS failed during the December outage and had no backup system. PSC #23, contingency plan for OMS	Test BWL's disaster recovery process by August 1, 2014. Documentation of backup system by December 31, 2014.
33	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Maintain and retain all information developed during restoration operations, including all forms of communications. Retaining this information will assist post restoration analysis, enhance institutional retention and uses of valid lessons learned, and improve the technical competencies of field engineers and technicians, as well as assuring operations or restoration manager's decision making processes are more clearly understood by future key personnel. PSC #24, collect and retain data during and after storm events	Develop and implement records retention requirements in emergency plans within 120 days of Emergency Director hire.
34		Information to be retained should include:	
a	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	A full log of the operations/restoration center input (phone calls, emails, radio messages, etc.), including identification of individuals sending and receiving, during the event.	Please see response to CRT #33.
b	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	A full log of output, as in #1 above.	Please see response to CRT #33.
c	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Set of maps, optimally GIS, depicting the stages of the event, including at least, the initial outage area and affected components and customer zones, and stages of restoration sufficient to recreate the series of restoration actions leading to full restoration.	Please see response to CRT #33.
d	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Full log of personnel engaged in restoration activities.	Please see response to CRT #33.
e	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Full log of components and equipment used. This, optimally, would differentiate between components initially/originally identified for the restoration and those identified during the event based on discovery of event damage.	Please see response to CRT #33.
f	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Log of field engineer actions; optimally with enough specificity to distinguish technical actions vs. administrative actions.	Please see response to CRT #33.

**CRT Remaining Recommendations**

Item #	Division	CRT Recommendation	BWL Division Response
36	Lead: Dave Bolan	Contract with, or otherwise fund, the City of Lansing Operations and Maintenance Division to do all tree trimming for BWL in those areas (tree lawns and adjacent to city parks and golf courses) where the City is already engaged in vegetation management.	Proposal reviews and contracts completed by August 31, 2014
42	Lead: Calvin Jones	Establish a process of long-term scheduling and annual work coordination in conjunction with each of its host communities.	As practices and procedures, meet annually with local governments to inform and coordinate scheduling of major infrastructure projects. Meetings will be completed by end of 3rd quarter FY15.
44	Lead: Dave Bolan	Adopt the practice of installing breakaway service drops whenever it installs or repairs a service drop or performs major maintenance on the distribution line to which a service drop is connected.	Determine if breakaway service drops meet BWL safety, performance, and cost requirements by May 31, 2015. If they meet these requirements, the BWL will begin deployment of the breakaway service drops on a replacement basis.
45	Lead: Dave Bolan	Perform a benefit cost analysis to determine whether a proactive effort to install breakaway service drops is warranted.	Please see response to CRT #44.
49c	Lead: Dave Bolan	Once the value engineering analysis of the primary distribution system is completed, the BWL could begin using internal staff to undertake a substation-by-substation analysis of the secondary distribution lines fed from each substation and optimize the configuration of that portion of the secondary distribution grid. The order in which this analysis is done should begin with those portions of the secondary distribution grid suffering the greatest outage experience in recent storms and proceed toward those with apparently less risk. As these lines run through neighborhoods, and options to improve the secondary distribution system will require collective decisions about vegetation management, line relocation, undergrounding, and the like, that the BWL is not necessarily institutionally empowered to make on its own, we recommend that this planning be done jointly with the local government and engage the affected neighborhood. PSC #30, Study worst performing circuits and cost benefit of undergrounding service	Upgrades to BWL's high voltage transmission and primary systems underway and ongoing. Comprehensive long-term T& D plan, including secondary system, to be completed by 2017. Collaborate with local units of government on secondary system upgrades, see CRT #42.
50	Lead: Calvin Jones	Direct its staff to work with local units of government to determine optimal strategies to harden the secondary distribution system, proceeding substation-by-substation in the order of susceptibility to storm damage as determined by experience in recent storms.	As part of practices and procedures this will be included in annual meetings with local governments. First meetings will be completed by end of 3rd quarter FY15.
55	Lead: Dave Bolan	Consider plans to install breakaway service drops first to those customers on lateral circuits or to special needs customers.	Please see response to CRT #44.
56	Lead: Bruce Cook Support: Emergency Manager and Calvin Jones	Develop through voluntary customer participation, and maintain, a list of all elderly customers and those with medical needs. PSC # 11, data base of vulnerable populations and service response facilities	Distribute consent forms to share medical alert customers and seniors residences with emergency response personnel for the purpose of wellness checks by August 1, 2014. <b>Completed.</b> Implement protocols for sharing information with local governments by end of second quarter FY15
57	Lead: Emergency Manager Support: Bruce Cook	Communicate daily with all EOCs to coordinate with emergency response personnel in all municipalities to ensure the safety of vulnerable citizens during an outage or other emergency event. Communication should be for the duration of a storm event. PSC # 11, data base of vulnerable populations and service response facilities	Please see CRT # 56
58	Lead: Emergency Manager Support: Bruce Cook	As part of the integrated Regional EOP, provide the regional EOC (or all EOCs or EMs for all governments within its customer service area, if no regional EOC is created) with up-to-date information of the location of its at-risk customers.	Please see responses to CRT #'s 56 and 57.

**CRT Remaining Recommendations**

<b>Item #</b>	<b>Division</b>	<b>CRT Recommendation</b>	<b>BWL Division Response</b>
59	Lead: Emergency Manager Support: Bruce Cook	Revise items 44, 47, 48, 54 of the outage report. There must be a coordinated effort between BWL and local government emergency personnel and community groups to assure clear communication and coordination of efforts to protect at-risk customers when an emergency arises.	Please see responses to #'s 56 and 57.
60	Lead: Calvin Jones Support: Emergency Manager	Create a Community Resilience Planning Coalition which would take a broad approach to building community level resilience to extreme events by: PSC #'s 9 consumer education regarding outages and outreach to community organizations to build resiliency	Identify and establish contact with community groups and organizations, June 1 <b>Completed</b> Consolidate BWL resources and services to provide, November 30, 2014 Provide resources, adopt as practices and procedures Encourage and participate community coalition, adopt as practices and procedures
a	Lead: Emergency Manager Support: Calvin Jones	Participating in the drafting of a regional emergency response plan, that would include community organizations' input on issues including a coordinated crisis communications plan and procedures to ensure a coordinated, efficient response to hazards across jurisdictions;	The BWL's Emergency Operations Director will coordinate the BWL's emergency plan with the City <b>within 180 days of hire</b> and will be the primary liaison with the City and local communities regarding the BWL's emergency plan.
b	Lead: George Stojic Support: Dave Bolan and Dick Peffley	Providing a forum for consideration of new risk reducing technologies and design in the built environment;	Conduct risk reduction technology forum by end of third quarter of FY15.
c	Lead: Calvin Jones	Promoting strategies for engaging and organizing the community at multiple levels (household, block, neighborhood, shelters and non-profits, businesses, jurisdiction) to identify vulnerabilities, mitigate risk and better prepare for response and recovery from extreme events, and	Please see response to CRT # 60
d	Lead: Calvin Jones	Providing a platform for regional sharing of lessons learned; connecting people, ideas, and resources; and engaging policymakers and community members in an ongoing conversation about resilience.	Please see response to CRT #60.
61	Lead: George Stojic	Include regional resiliency, including energy self-reliance, as a strategic goal	Part of ongoing planning and investment program. See also CRT #3.
62	Lead: George Stojic	Explore the potential for "islanding" to protect the local electrical grid, with BWL taking the lead in creating an innovative, strategic solution	Please see response to #61.
63	LBWL Board of Commissioners	Hire an "operational auditor" to conduct annual performance audits of the BWL operations and planning;	
64	LBWL Board of Commissioners	Establish a standing committee for review of, and contract with outside expertise for, an annual operational audit.	
65	LBWL Board of Commissioners	Institute a training process for all board members in Carver or other Policy Governance Model. Implement and use the model and continue the training on an ongoing basis.	
66	LBWL Board of Commissioners	Request the City to consider provision to the BWL Board of expense reimbursement and/or some minor stipend for attendance.	
67	LBWL Board of Commissioners	Create a Local Government Liaison Committee of Board members and local government representatives from remaining governments, which will meet quarterly to review service-related issues and to recommend changes, improvements, and innovations AND the Board must institute a clear process for plenary and due consideration and action on the Committee's recommendations;	



**CRT Remaining Recommendations**

Item #	Division	CRT Recommendation	BWL Division Response
68	LBWL Board of Commissioners	Request an opinion from the Lansing City attorney to clarify whether an ordinance or City Charter amendment could establish an expanded Board to include non-Lansing residents, to represent the municipalities within the BWL customer area.	
69	LBWL Board of Commissioners	Urge the involved governments, the City of Lansing and the City of East Lansing and all townships with residents within the BWL customer area to meet and discuss the concept of representation on the BWL Board. These discussions must focus on the need for regionally developed and implemented plans for emergency response and for resiliency.	
70	LBWL Board of Commissioners	Create and drive the system for implementation of the Internal Report and the CRT Report.	
71	LBWL Board of Commissioners	Recommend to the City a "Best Practice" for recruiting new board members. Not only those that may represent certain areas that they serve, but recruit to needs of expertise, including, as examples only, an engineering background, business background or security background.	
73	Lead: Bruce Cook	Customer call answer time – rule 460.724 (pg. 29 of MSPC staff report) PSC #7, customer standards	Estimated time to comply with this standard is June 1, 2015.
74	Lead: Calvin Jones	Community outreach activities (no rule – but see comparison pg. 32 of MPSC staff report)	Please see response to CRT # 60. GRCS D department will also survey utilities to identify outreach programs adopted for major outages by end of second quarter FY15
75	Lead: Bruce Cook	Blockage time of customer ability to report outage – (reference to rule at pgs. 32-33 of MPSC staff report) PSC #7, customer standards	Estimated time to comply with this standard is June 1, 2015. Agreed
81	Lead: J. Peter Lark	Hold an Annual Meeting of Stakeholders, with explicit invitations and opportunities for public debate on innovation and strategy.	Conduct an annual stakeholder meeting on innovation and strategy fby end of third quarter FY15.

Item #	Division	MPSC Remaining Recommendation	BWL Division Response
I.	Executive Management	The BWL's internal report and 54 actions contain numerous aspiring phrases such as: plan to update, are in the process of implementing, will consider, will work to develop, will expand testing, is investigating, will solicit, will work with, will make part of, will aggressively pursue, etc. The MPSC recommends the BWL create a standing committee that would track the implementation of all recommendations and create a transparent process for reporting progress to the Board and the City of Lansing.	Board of Commissioners
IV.	Executive Management		
V.	City Government	The MPSC recommends that the Mayor of the City of Lansing, as the appointing authority to the Board, should appoint new member(s) with expertise related to the duties of the BWL.	City of Lansing
VI.		In addition to adopting the recommendations of the CRT, the MPSC makes the following recommendations:	
MPSC 1	BRUCE COOK	Require specific customer service metrics as part of the BWL's Quality of Service best practices. The MPSC also recommends the BWL institute a billing credit.	Estimated completion date August 31, 2014
MPSC 3	Lead: Dave Bolan	Analyze the reliability measurements of System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI) and Customer Average Interruption Duration Index (CAIDI) on a circuit basis and expand the reporting of these indices to include each of the individual municipalities served by the BWL.	Estimated completion date September 1, 2014
MPSC 4	Lead: Dave Bolan	Develop metrics that allow the BWL to analyze the performance of all reliability investments.	MPSC #5
MPSC 5	Lead: Dave Bolan	Develop an annual reliability report that can be publicly available.	Estimated completion date end of FY15
MPSC 6	Lead: Dave Bolan	Develop an annual reliability spending report that focuses on current and future reliability project spending and analyzes customer benefits and the overall effectiveness of reliability projects.	MPSC #5
MPSC 12	Executive Management	Provide training to the Board and identify resources and opportunities for Board members to gain experience and knowledge that will allow for greater control of current and emerging issues.	Training to be conducted FY15
MPSC 14	Lead: Dave Bolan	Train and educate BWL staff so that experienced and knowledgeable staff can fill back-up roles in the event of an outage or energy emergency.	The BWL currently has staff with secondary roles to support operations staff and customer service staff. However, the BWL will review its secondary staff needs, identify staff to fill additional roles that may be needed, and schedule training for secondary role staff by November 30, 2014.
MPSC 17		Voluntarily report to MPSC Staff when outages affect more than 10 percent of its customers, when a significant event affects the operation of its system, or when there is loss of power to a critical facility or critical customer.	MPSC #5
MPSC 18	Calvin Jones	Keep the BWL Board and Lansing City Council continually informed on mutual assistance agreements should any contracts expire or have cause to be amended.	MPSC #5
MPSC 30	Lead: Dave Bolan	Study its poorest performing distribution power lines to determine the costs and benefits of undergrounding such lines as compared to other options aimed at increasing reliability.	This will be completed by the end of FY15

Item #	Division	BWL 54 Remaining Action Item	BWL Division Response
BWL 1	Emergency Manager	The BWL will include its distribution plan in its annual table top tests designed to stress its emergency response and will use the results to continually improve its emergency plans	Expected completion date 10/16/14
BWL 8	Dave Bolan	The BWL will begin to use multiple tree trimming contractors and assign work to contractors based on past performance. The contractor with the best record of performance will get a larger portion of the work. Recently, the BWL temporarily increased the number of tree trimming crews under contract to eighteen.	Original expected completion date 5/16/14 rescheduled to 8/29/14 due to contractors need to develop deployment.
BWL 10	Dave Bolan	The BWL is in the process of carefully reviewing spotter duty during the ice storm and determining how many additional trained spotters would be needed to efficiently secure down lines and provide timely damage assessment during an event with the destructive impact of the ice storm. Based on this analysis, the BWL will survey its staff for additional personnel who would be suitable for spotter duty and train personnel for both spotter and damage assessment duty.	Training scheduled for November 30, 2014
BWL 17	Dave Bolan	The BWL is in the process of hiring 3 additional line workers and an additional dispatcher to supplement its workforce and to help manage crews during the restoration process.	2 of 3 additional line workers hired along with dispatcher. Third line worker to transfer from production by end of second quarter FY15.
BWL 19	Dave Bolan and Emergency Manager	The BWL does update its critical and public safety lists periodically to ensure that it is up to date and complete. The BWL will share its overall restoration plans with local public officials so that they can be kept up to date on the BWL's restoration plans. If another catastrophic storm does occur, local officials will be better able to respond to citizen inquiries regarding the restoration progress.	T&D plans updated 6/30/14 Critical facilities list updated 8/29/14. Consolidation of BWL emergency plans within 120 days of Emergency Director hire. Coordination of BWL consolidated plan with local officials expected to be completed within 180 days of Emergency Director hire.
BWL 24	Dave Bolan	The BWL is moving forward with a project to implement smart grid and smart meter technology, which will allow it to identify individual customer outages. It will also develop a policy that will allow customers to "opt out" of smart meter use. c. customer communications:	Scheduled and budgeted for FY15 this will be a multi-year project
BWL 32	Nick Burwell	The BWL is working with the 877 vendor to provide additional methods for customers to be identified or matched when calling in to report an outage. This will include using the last digits of an account number or social security number.	Scheduled to be completed November 1, 2014
BWL 34	Nick Burwell	The BWL has added text outage reporting to the 877 system to offer customers another method for reporting outages.	Expected completion date rescheduled to 12/1/14. Need to register and comply with cell providers for standards and SMS code.
BWL 44	Bruce Cook	The BWL will work with customers and local officials to determine how to make local officials aware of seniors, customers with medical alerts, and other vulnerable populations during extended outages.	Expected completion date September 30, 2014.

### CRT Recommendations Completed or Ongoing

Item #	Division	Recommendation	Status
5a	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	During any event where the City EOC is activated, including during major widespread outages, a trained and experienced BWL Liaison Officer must be deployed to the City EOC.	Completed
14	Lead: Stephen Serekaian Support: Calvin Jones, Bruce Cook, and Nick Burwell	Create a robust social media presence for its customers – this work is already underway internally, but must become a priority for its communications operations, as consumers are primarily using digital communication tools to learn about outages and other service issues.	Completed
20	Lead: Emergency Operations Director	Work with BWL Operations and Senior Leadership to integrate their BESOC and Crisis Command Center, using the NIMS framework, with the City EOC.	Completed
25	Lead: Dave Bolan	Given that insufficient spotters for damage assessment was a serious problem in the December outage, identify the types of spotters necessary and currently lacking. PSC: #19, additional spotters	Completed
26	Lead: Dave Bolan	Include the acquisition of qualified primary distribution system spotters in its mutual aid agreements and extraordinary assistance contracts. Since repair crews are fundamentally more expensive than spotters, we believe that repair crews should be the restoration bottleneck rather than spotters.	Completed
27	Lead: Dave Bolan	Identify specific personnel for spotter duty and training for deployment in emergencies. This function should be mandatory, not voluntary on the part of the employee, as it appears to be now. Training should also be mandatory and held, minimally, once per year. PSC; #'s 19 and 20, additional spotters and training	Completed
28	Lead: Dave Bolan	That the two person line crew requirement and the requirement that a BWL employee accompany the outside contracted line crew are reasonable to ensure safety of BWL employees.	Completed
29	Lead: Nick Burwell Support: Emergency Operations Director	Integrate the OMS into an Emergency Operations Plan (EOP) which is tested to its maximum capacity68., both to assure system functionality and to assure integration with restoration operations, on a semi- annual (6 months) basis. Staff noted that because they had not experienced an outage of more than 20,000 customers, they assumed that was the maximum ever likely. As noted above, recent reports indicate that storm frequency and intensity are on the rise. Since the outage, the now apparently functional OMS has been tested for loss of power to 35,000 households—still fewer than lost power in the December outage. Therefore, the system must be tested to its maximum capability PSC # 22, Integrate OMS into emergency plan and test system	Completed
31	Lead: Nick Burwell and Dave Bolan	The IT Department shall report OMS implementation and maintenance and redundant system development to the Board of Commissioners at least monthly. Further, the Commissioners should carefully review the history of the selection, installation, and performance of the GE OMS system to determine if further action is required.	Completed and Ongoing
32	Lead: Bruce Cook Support: Nick Burwell	A contingency retainer agreement with a third-party answering service must be executed. This is consistent with the BWL changing its corporate philosophy to one that plans for, recognizes, and addresses all potential contingencies.	Completed
34g	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Log of physical access entries, either IAW or similar to NERC CIP standards for Physical Access to BES sites.	Completed
34h	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Log of all connections to the local control systems during the restoration, including full hardware/software descriptions and each connecting devices security certificate.	Completed

Item #	Division	Recommendation	Status
34i	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Log of interactions with partner utilities, Independent/Regional Systems Operators (ISO/RSO), private, state and federal regulatory organizations, state utility commissions, state governing personnel, federal entity personnel supporting restoration activities, as well as other personnel or organization interactions relevant to the restoration or an understanding of their role or influence on the restoration activities.	Completed
35	Lead: Emergency Operations Director Support: Dave Bolan and Dick Peffley	Retain this documentation in a form that enables efficient use, recall, and reuse, and in a format that is compatible with performing the same series of retention actions for future events; i.e., not a 'one time' storage, but with future use and comparison in mind.	Completed
37	Lead: Dave Bolan	Evaluate its 5-year schedule to determine whether vegetation management needs to be even more aggressive. Based on the Board's representation that it has been close to a five-year cycle for vegetation management, however, it is doubtful that shortening that cycle will provide much benefit. Rather, based on both public comments and comments from the BWL, focus should be placed on a strong and effective quality assurance program. Adjustments to the vegetation management standards must be made, especially with respect to the removal of dead trees or trees in poor condition. PSC #s 2 and 25 Analyze vegetation management budget and practices	Completed
38	Lead: Dave Bolan	Perform an 100% audit of all lines annually to ensure both that the BWL can stay on track in its vegetation cycle and that sections that may require immediate attention are not neglected.	Completed
39	Lead: Dave Bolan	Explore collaboration with other entities doing tree-trimming (City of East Lansing, Townships, Consumers Energy, DTE) in order to increase efficiencies.	Completed
40	Lead: Dave Bolan	Budget for distribution system maintenance based on regular replacement of each and every component at its engineering-based life-length and continue to recalculate its grid maintenance budget on that basis in all future budgets. PSC #s 27 and 29	Completed and ongoing
41	Lead: Dave Bolan	Implement a procedure that actual replacement of most grid assets will be condition-based, or because distinctly better technology is available and warrants replacement of equipment that is not yet at end of life. PSC #27, Develop inspection and maintenance program for critical equipment	Completed and ongoing
43	Lead: Dave Bolan	Undertake a value engineering analysis of the potential deployment of automatic circuit interrupters in its distribution grid and implement them accordingly. PSC # 28, study grid modernization and two-way communications technologies	Completed and ongoing
46	Lead: Dave Bolan	Undertake a value engineering analysis of its entire primary distribution system, with the intent to calculate the optimum extent and topology of the primary distribution grid, and the optimum design of each segment of its primary distribution grid. This analysis should consider all aspects of distribution grid performance, but particularly should include strong consideration of its effects on outage extent and time to service restoration in major storm events. PSC #s 28 & 29, grid modernization and investments to build grid resiliency	Completed and ongoing
47	Lead: Dave Bolan	When performing value engineering of the primary distribution grid and in implementing any hardening of the primary distribution grid, the BWL should examine opportunities to reduce costs (or improve results) through collaboration with host communities.	Completed and ongoing
48	Lead: Dave Bolan	Examine options to add additional sensors to the primary distribution system so as to localize faults much more quickly. Sensors are not particularly expensive and use of increased numbers of them may well be warranted.	Completed and ongoing
49		Harden the Secondary Distribution System	
a	Lead: Dave Bolan	Breaks and other faults in the secondary distribution system affect fewer customers per fault and are easier to repair than are faults in the primary distribution system. Thus, while we encourage the Board to undertake some hardening of the secondary distribution system, the CRT believes the Board should focus its grid maintenance and upgrade investments on the primary distribution system for the next few years.	Completed and ongoing
b	Lead: Dave Bolan	Vegetation management is a key to reducing storm-induced outages in the secondary distribution system as it currently exists. Accepting BWL's representation that it will "strictly adhere" to a five-year cycle for vegetation management, the CRT believes that shortening that cycle further will not provide much further benefit. Rather, based on both public and BWL staff comments we believe that the Board should focus on a strong and effective quality assurance program for its vegetation management and consider making some adjustments in its vegetation management standards, especially with respect to the removal of dead trees or trees in poor condition. See the vegetation management section for further analysis of these issues.	Completed

Item #	Division	Recommendation	Status
50	Lead: Calvin Jones	Direct its staff to work with local units of government to determine optimal strategies to harden the secondary distribution system, proceeding substation-by-substation in the order of susceptibility to storm damage as determined by experience in recent storms.	
51	Lead: Dave Bolan	Proceed as quickly as is consistent with good practice to deploy smart meters and integrate them to its outage management system to accelerate the identification and repair of the secondary distribution system after storm damage.	Completed and ongoing
52	Lead: Dave Bolan	In the interim, ensure that it has an adequate core of spotters for restoration of the secondary distribution system following a storm.	Completed
53	Lead: Dave Bolan	Deploy smart meters first to those residences located on lateral circuits.	Completed and ongoing
54	Lead: Gennie Eva	Consider plans to own the system, including the mast, through to their meter box, as part of its benefit cost analysis to determine whether a proactive effort to install breakaway service drops is warranted.	Completed
72	Lead: Dave Bolan	Setting a vegetation management schedule and budget & complying with it (pgs. 23-26 of MPSC staff report)	Completed
76	Lead: Gennie Eva	Service quality credits (rule 461.744-746, pg. 34 of MPSC staff report) PSC #7, customer standards	Completed
77	Lead: Dave Bolan	Time limits for relief of non-utility personnel guarding downed power lines	Completed
78	Lead: Dave Bolan	(Rule 460.723, pg. 37 of MPSC staff report) sets time limits for non-utility employees (i.e. police /fire personnel) guarding a downed wire. & adequate number of persons certified to perform wire down duty during high volume event (pg. 38 of MPSC staff report).	Completed
79	Lead: J. Peter Lark	Establish a Customer Ombudsman, Chief Customer Officer or expand the duties of the Director of Governmental Affairs and Customer Relations, directly reportable to the General Manager.	Completed
80	Lead: J. Peter Lark	Restructure its organizational chart so that the positions of Strategic Planning, Information Technology, and Operations direct reporting to the General Manager.	Completed
82	Lead: Susan Devon	Implement a utility-wide quality assurance plan. The testimony on vegetation management (that they looked at bills submitted by contractor monthly, and only now are adding a competitor and checking performance after trimming) suggests the lack of a comprehensive quality assurance plan.	Completed
83	Lead: George Stojic	Consider revision of the 54 Recommendations, using the SMART analysis to include specific metrics, including the tasks to be performed, the directorate or section within BWL charged with performance and the time need for accomplishment.	Completed
84	Lead: J. Peter Lark	Require staff reports monthly to the Board of Commissioners on specific actions that have been taken on all of the 54 recommendations made in the Ice Storm Outage Report and that the BWL post those reports on its website for the next 18-24 months.	Completed and ongoing

## MPSC Recommendations Completed or Ongoing

Item #	Division	Recommendation	Status
8	Lead: Stephen Serkaian Support: Calvin Jones	Develop a Communication Plan, as part of an overall emergency operations plan, aligning with industry best practices for customer service obligations for major service outage responses and during restoration periods.	Completed
10	Bruce Cook	Maintain single phone number for customer inquiries	Completed
15	Calvin Jones	Consider use of the Local Energy Assistance Program (LEAP) process to serve as the conduit for establishing private-public partnerships focused on improving community resiliency to a prolonged energy disruption. The CRT was explicit in recommending that the BWL develop an emergency operations plan in the context of a regional plan. This would satisfy that suggestion.	Completed
16	Dave Bolan Support: Emergency Manager	Work in conjunction with the Michigan Municipal Electric Association (MMEA) to share the lessons learned and best practices with other municipal utilities within the state in an effort to improve the resiliency and outage response of all municipal utilities in Michigan.	Completed
19	Executive Management	Perform its own action items 10 through 15 from the BWL December 2013 Ice Storm Outage Report regarding spotters and provide frequent update reports to the BWL Board and Lansing City Council.	Completed
20	Dave Bolan	Provide spotter training at least two times per year at a very minimum, once in the spring and once in the fall for respective storm events.	Completed
21	Dave Bolan	Survey several Michigan utilities to determine the industry best practice regarding the BWL "bird dogs" assisting mutual assistance crews.	Completed
22	Nick Burwell Support: Emergency Manager	Integrate the BWL's Outage Management System (OMS) into an Emergency Operation Plan and test the system to its maximum capacity as recommended by the CRT.	Completed
23	Nick Burwell Support: Emergency Manager	Create a contingency process that will provide guidance to BWL staff in the event the OMS is not operational during an outage or catastrophic event.	Completed
25	Dave Bolan	Continue a rigorous tree trimming program and develop tree trimming practices that include overhead branch removal and hazardous tree removal.	Completed
26	Dave Bolan	Develop inspection procedures to ensure that companies who lease space on poles are clearing around communication lines.	Completed
27	Dave Bolan	Develop a comprehensive and transparent inspection and preventive maintenance plan that includes all equipment critical for maintaining system reliability.	Completed and ongoing
28	Dave Bolan	Study all grid modernization and two-way communication technologies to develop a capital investment plan that maximizes reliability and customer benefit.	Completed and ongoing
29	Dave Bolan	Continue to invest in assets that increase the overall strength and resiliency of the electric system when replacing assets that are at the end of their useful life.	Completed and ongoing

## BWL 54 Items Completed or Ongoing











Item #	Recommendations	Status
2.	The BWL will consider implementing a set of triggers into its distribution plan.	Completed
3.	The BWL will consolidate its Transmission and its Distribution emergency response plans into one document.	Completed
4.	The BWL will investigate the benefit of collaborating with other Michigan utilities to track and estimate the impact of inclement weather.	Completed
5.	Based on the BWL's experience with the impact of the ice storm, the BWL will make use of additional secondary role employees and these roles will be discussed in subsequent sections.	Completed
6.	Most utilities have not found placing overhead lines underground to be cost effective. Instead reviewing maintenance practices and construction standards seems to be a more reasonable method for improving the resiliency of the BWL's distribution system. However, for those customers who want and are willing to pay for undergrounding existing services, the BWL will provide the service.	Completed
7.	The BWL will strictly adhere to a 5 year trimming cycle and is in the process of modifying its tree trimming standards and procedures to remove all branches located above distribution lines and better protect its lines during a major storm.	Completed
9.	The BWL will publish the contact information for its supervisor responsible for trimming scheduling so customers can contact the Manager directly with questions or complaints regarding tree trimming procedures and workmanship.	Completed
11.	The BWL will also utilize retired line workers to perform damage assessments and serve as spotters.	Completed
12.	The BWL will consider contracting with electric service firms for damage assessment services to supplement its own staff.	Completed
13.	The BWL is developing common reporting forms and methods to be used by all spotters and damage assessors and will stress the importance of adhering to these during the annual training sessions.	Completed
14.	The BWL will evaluate the use of damage predictive tools to determine if these tools could help in assessing possible damage earlier in a storm's approach.	Completed
15.	The BWL will remind customers that lines marked with red and white tape are power lines and the tape indicates that the BWL is aware that the line is down. The BWL will publish this information on its website and Customer Connections newsletter.	Completed
16.	The BWL has expanded the number of utilities and non-utility electric service contractors with which it has mutual aid agreements or service contracts. The list is shown below. Existing Agreements• Michigan Municipal Electric Association (35 Municipal Utilities)• Consumers Energy New Agreements• American Public Power Association• Asplundh• Kent Power• Hydaker-Wheatlake• FEMA Mutual Aid (Upon a Declaration of a State of Emergency) Pending Agreements• DTE Energy (Under Negotiations)These agreements both increase the number of potential crew sources and provide geographical diversity as well. For example the APPA agreement would enable the BWL to bring crews in from a number of different states. In the event of a declaration of emergency, the FEMA agreement would allow the BWL to bring in crews from nearly anywhere in the United States.	Completed
18.	With the addition of 3 line workers, an additional dispatcher, more trained spotters, and the new mutual aid agreements the BWL has tripled the number of line crews that are available for immediate deployment and can be used safely and efficiently during a major outage event.	Completed
20.	The BWL will review it's storm inventory based on the recent ice storm.	Completed
21.	The BWL will investigate connecting its line truck laptops to its OMS system as a tool to assist crews with storm responses.	Completed
22.	The BWL has resolved the matters related to the OMS functionality. The conductor cuts are now operational and the OMS performs to design standards.	Completed
23.	To avoid this situation with other outage tools that may be employed in the future, the BWL will conduct annual stress tests of all its restoration tools including, but not limited to the OMS, outage call in number, Customer Service Center, and Communications plans.	Completed and ongoing
25.	The BWL is hiring additional call center staff.	Completed
26.	The BWL has implemented a process to assure call forward to the 877 number occurs during large outages. This will allow CSR and supporting staff to concentrate on line down, voice mail and other communications mediums.	Completed
27.	The BWL will trigger the IVR in the 877 system to direct non-matched callers to voicemail during major outage events.	Completed
28.	The BWL has reconfigured the Call Center to send messages in the voice mailbox to CSR's automatically.	Completed



Item #	Recommendations	Status
29.	The BWL is aggressively advertised the 877 number for outages including all available communications mediums, like magnets, social media, BWL Website, and other customer communications.	Completed
30.	During a major outage, the BWL Call Center staff will focus their efforts on responding to email, texts, Facebook, Twitter, and voicemails left on the outage reporting system with the goal of responding to storm related inquiries in a timely fashion. The BWL has expanded the number of employees in secondary storm roles to assist with these customer service functions.	Completed
31.	The BWL will ensure that the distribution plan weather forecasting and storm preparation function include employees who are directly or indirectly, through secondary roles, responsible for customer service. This, along with other changes, will assure that the BWL can respond to customer inquiries promptly.	Completed and ongoing
33.	The interface between the 877 number and the OMS has been fixed and alarms will be added on each system to alert staff of any problems in the future.	Completed
35.	The BWL is working on a method to provide quicker updating of customer data from BWL system to 877 system. This is intended to provide better matches of customers to service addresses.	Completed
36.	The BWL is working to improve its ability to automatically call back customers and provide them with updated outage information.	Completed
37.	The BWL will continue its enhancements to its phone system. The enhancements will use newer technology to increase Internet bandwidth, increase available phone lines, and make the system fully redundant across the BWL private city-wide network. This upgrade will allow the system to dynamically increase the number of available lines to the call center during a large outage, using many of them to forward calls to the 877 vendor site which is designed for large volumes.	Completed
38.	The BWL has increased the TFCC voice mailbox size to 8,000 messages and is in the process of contracting with another vendor to assist in responding to voice mailbox messages during a large outage.	Completed
39.	The BWL is investigating a separate site created just for outage information (including outage maps). This will help ensure that the BWL's outage website will be available to customers in the event that a catastrophic outage disables the BWL's main website.	Completed
40.	BWL has tested and established a redundant external email system	Completed
41.	The BWL has developed a temporary web-based outage map for its website. The BWL is also working with a local vendor for a permanent outage map linked directly to the BWL's OMS system. Phase I of the project covering functionality has been completed and development is underway. Phase I is Scheduled for completion soon.	Completed
42.	In Phase II of the project, the BWL plans to continue enhancements to all of its Information Systems that interact with customers. The next phase of the outage map product for BWL will include further interaction with our customers, allowing them to identify themselves to learn if our system shows them specifically out as well as possibly reporting an outage through the map system to our OMS system. Other enhancements and features are being evaluated.	Completed
43.	In addition to using Twitter and Facebook, the BWL is investigating the use of Nixle to communicate outage and other information to its customers.	Completed
45.	The BWL will be more proactive informing customers of where their responsibility for service ends, the service mast, and the BWL's begins.	Completed
46.	The BWL will maintain a list of qualified electricians who can repair service masts and the BWL will help customers finance the cost of mast repair by allowing customers to pay it off on their bill over a one year period without interest. A list of qualified electricians will appear on the BWL's website.	Completed
47.	During events like the ice storm, the BWL will work with local organizations to maintain warming centers in the winter and cooling centers in the summer for Lansing area residents.	Completed and ongoing
48.	As an integral part of the Lansing community, the BWL will work with other organizations to respond to crisis that may affect mid-Michigan in the future. The BWL is supporting work by The Power of We and others to help empower neighborhoods to react to any type of emergency. The BWL pledges to be a part of that coalition and play its part in protecting the Lansing community and to meet with neighborhood associations to explain the BWL storm response plans and listen to their concerns and questions.	Completed and ongoing
49.	Since ice storm outage restoration, the BWL's service territory has experienced a number of severe winter weather events, and four separate outage events ranging from 100 outages to 7,400 outages. In all of the severe weather events, the BWL has posted, on all communications channels, at least two days prior to the forecasted weather, warning customers about the impending storm and directing them to call the BWL "877" outage number if they lost power. The BWL has also continuously posted updates, cold weather safety tips, and City of Lansing updates.	Completed

Item #	Recommendations	Status
50.	During outages, the BWL has acknowledged the time the outage began, the number of outages, the cause of the outage, the geographic area of the outage that can be found on the outage map, the projected time of restoration, and full restoration all clear.	Completed
51.	Communication improvements have been noted on Facebook and Twitter with positive comments by our customers.	Completed
52.	The BWL has retained the communications firm of Martin Waymire to help develop a crisis communications plan based on an examination of best practices across the utility industry to make sure it has a strong crisis communications protocol in place in the very near future. Martin Waymire will also assist during emergencies if needed. In the meantime, the BWL has a working interim crisis communications plan.	Completed
53.	The BWL has also hired a social media specialist, a newly created position. The social media specialist will help develop strategies on how to best communicate with our customers over all social media channels.	Completed
54.	The BWL will provide information to state and local officials on a regular basis. During an event like the ice storm, it will assign a liaison to state and local officials to answer questions that they may have from their constituents.	Completed and ongoing

# CRT Recommendations

Item #	Task Name	Start	Finish	% Complete	September	January	May	September	January	May	September
1	Work Jointly with local emergency planners to update Critical Facilities Inventory	Tue 2/18/14		50%		C					
2	Assist all units of government representing its customer base with identifying special needs facilities for power restoration	Tue 2/18/14		50%		C					
3	Assistance of micro-grid evaluation of critical facilities in service area	Tue 2/18/14		5%		C					
4	Explore options to participate financially in implementing micro-grid at critical facilities	Tue 2/18/14		5%		C					
5	Recognize its role to assist Regional, City and Township Emergency Management in disaster response by implementing all of the following	Tue 2/18/14		0%		C					
5a	During any event where the City EOC is activated, including during major widespread outages, a trained and experienced BWL Liaison Officer must be deployed to the City EOC.	Tue 2/18/14	Tue 4/8/14	100%							
5b	Participate in all EM exercises sponsored by any units of government representing its customer base	Tue 2/18/14		0%		C					
5c	Assure that all operations employees receive basic NIMS training,	Tue 2/18/14		4%		C					
5d	Participate in After-Action Reviews with all units of government representing its customer base, not just post-exercise, but after every major outage, disaster and emergency	Tue 2/18/14		0%		C					
5e	Develop and maintain good working relationships with the first-responder community for all units of government representing its customer base	Tue 2/18/14	Tue 3/31/15	0%							
6	Consolidate its multiple emergency response plans within the City and Regional plan, (see below) and then test that plan by scheduling a full staff coordinated "table top" exercise at a minimum of every 12 months.	Tue 2/18/14		0%		C					
7	BWL Staff and upper management should participate in the exercises and receive training on these plans and regular refresher training. BWL staff with emergency responsibilities should be required to have training on these plans and their role and responsi	Tue 2/18/14		0%		C					
8	Together with the communities in the greater Lansing area (not just the BWL service area), undertake a regional planning effort to be better prepared and coordinated and assure that emergency communication protocols are agreed to and followed. The mayors	Tue 2/18/14		0%		C					
9	Include Business Continuity Planning in its development of a comprehensive Emergency Operations Plan.	Tue 2/18/14	Mon 3/30/15	0%							
10	Develop a comprehensive EOP, in coordination with the City EM officials, that is an Annex to the City EOP, consistent with MCL 30.410 (1) (a)	Tue 2/18/14		0%		C					
11	Working jointly with the City of Lansing and other regional governments, develop a regional EOP which includes a process for siting, supporting and sustaining a regional EOC.	Tue 2/18/14		0%		C					
12	Develop, in coordination with the governments representing its customer base, an Energy Annex to a Regional Emergency Operations Plan.	Tue 2/18/14	Wed 12/31/14	0%							
13	Collaborate with Lansing Emergency Management, Lansing Police Department's Neighborhood Watch, Lansing Neighborhood Council, East Lansing neighborhood associations and similar groups in all townships in the development of a program supporting block level	Tue 2/18/14		50%		C					
14	Create a robust social media presence for its customers – this work is already underway internally, but must become a priority for its communications operations, as consumers are primarily using digital communication tools to learn about outages and other	Tue 1/7/14	Thu 2/20/14	100%							
15	Require all communications staff and senior leadership to undergo certified NIMS communications training in order to understand best communications practices during crisis situations, with associated training events and tabletop exercises to ensure coordi	Tue 2/18/14	Fri 8/1/14	0%							
16	Further refine the March 2014 plan. The plan must contain greater detail on how to address the need for timely and accurate information; customer information must be consistently explained in a way that effectively meets customer expectations; and the pla	Tue 2/18/14	Sun 8/31/14	50%							
17	The crisis communications plan must be an annex to the Emergency Operations Plan and should be guided by a qualified communications professional certified through the NIMS protocols.	Tue 2/18/14	Sat 11/1/14	30%							
18	Consider amendment of the City Charter to clarify the powers of the Mayor and to provide the Mayor executive authority over the BWL during disasters or emergencies	Tue 2/18/14	Thu 7/24/14	0%							
19	Emergency Management Director, working with all other member communities, including Ingham, Clinton and Eaton Counties, create a regional emergency operations plan (EOP).	Tue 2/18/14	Wed 12/31/14	0%							

# CRT Recommendations

Item #	Task Name	Start	Finish	% Complete	September	January	May	September	January	May	September
20	Work with BWL Operations and Senior Leadership to integrate their BESOC and Crisis Command Center, using the NIMS framework, with the City EOC.	Tue 2/18/14	Mon 6/30/14	100%							
21	Consider fully integrating BWL employees into the City EM structure.	Tue 2/18/14	Fri 6/27/14	0%							
22	Recommend appropriate emergency management training for BWL leadership, including Commissioners, on how best to build in resilience and ensure full response capability to storms that are increasing in severity and frequency.	Tue 2/18/14	Tue 6/30/15	0%							
23	Sponsor or encourage a full scale training exercise, involving emergency management staff of all units of government and BWL in the tri-county region, to take place annually.	Tue 2/18/14	Tue 7/1/14	0%							
24	That all units of government within or partially within the BWL customer service area review their emergency operations plans to include a process for assessing the need for an anticipatory emergency declaration.	Tue 2/18/14	Wed 10/29/14	0%							
25	Given that insufficient spotters for damage assessment was a serious problem in the December outage, identify the types of spotters necessary and currently lacking.	Tue 2/18/14	Tue 4/1/14	100%							
26	include the acquisition of qualified primary distribution system spotters in its mutual aid agreements and extraordinary assistance contracts. Since repair crews are fundamentally more expensive than spotters, we believe that repair crews should be the re	Tue 2/18/14	Wed 4/30/14	100%							
27	Identify specific personnel for spotter duty and training for deployment in emergencies. This function should be mandatory, not voluntary on the part of the employee, as it appears to be now. Training should also be mandatory and held, minimally, once per	Tue 2/18/14	Mon 6/30/14	100%							
28	That the two person line crew requirement and the requirement that a BWL employee accompany the outside contracted line crew are reasonable to ensure safety of BWL employees.	Tue 2/18/14	Tue 8/26/14	100%							
29	Integrate the OMS into an Emergency Operations Plan (EOP) which is tested to its maximum capacity, both to assure system functionality and to assure integration with restoration operations, on a semi- annual (6 months) basis. Staff noted that because t	Tue 2/18/14	Tue 3/11/14	100%							
30	Remedy the lack of redundancy in their OMS System by (1) devising an alternative system and (2) including the potential loss of OMS as a contingency in EOP. The OMS failed during the December outage and had no backup system.	Tue 2/18/14	Wed 12/31/14	50%							
31	The IT Department shall report OMS implementation and maintenance and redundant system development to the Board of Commissioners at least monthly. Further, the Commissioners should carefully review the history of the selection, installation, and performa	Tue 2/18/14	Thu 7/31/14	100%							
32	A contingency retainer agreement with a third-party answering service must be executed. This is consistent with the BWL changing its corporate philosophy to one that plans for, recognizes, and addresses all potential contingencies.	Tue 2/18/14	Fri 11/7/14	100%							
33	Maintain and retain all information developed during restoration operations, including all forms of communications. Retaining this information will assist post restoration analysis, enhance institutional retention and uses of valid lessons learned, and I	Tue 2/18/14	Tue 6/17/14	0%							
34	Information to be retained should include:	Tue 2/18/14	Tue 7/8/14	0%							
a	A full log of the operations/restoration center input (phone calls, emails, radio messages, etc.), including identification of individuals sending and receiving, during the event.	Tue 2/18/14	Fri 11/21/14	20%							
b	A full log of output, as in #1 above.	Tue 2/18/14	Mon 7/21/14	20%							
c	Set of maps, optimally GIS, depicting the stages of the event, including at least, the initial outage area and affected components and customer zones, and stages of restoration sufficient to recreate the series of restoration actions leading to full resto	Tue 2/18/14	Wed 8/20/14	20%							
d	Full log of personnel engaged in restoration activities.	Tue 2/18/14	Tue 9/23/14	20%							
e	Full log of components and equipment used. This, optimally, would differentiate between components initially/originally identified for the restoration and those identified during the event based on discovery of event damage.	Tue 2/18/14	Tue 6/10/14	20%							
f	Log of field engineer actions; optimally with enough specificity to distinguish technical actions vs. administrative actions.	Tue 2/18/14	Fri 6/13/14	20%							
g	Log of physical access entries, either IAW or similar to NERC CIP standards for Physical Access to BES sites.	Tue 2/18/14	Tue 10/7/14	100%							

# CRT Recommendations

Item #	Task Name	Start	Finish	% Complete	September	January	May	September	January	May	September
	h Log of all connections to the local control systems during the restoration, including full hardware/software descriptions and each connecting devices security certificate.	Tue 2/18/14	Tue 6/10/14	100%							
	i Log of interactions with partner utilities, Independent/Regional Systems Operators (ISO/RSO), private, state and federal regulatory organizations, state utility commissions, state governing personnel, federal entity personnel supporting restoration activi	Tue 2/18/14	Tue 6/10/14	100%							
35	Retain this documentation in a form that enables efficient use, recall, and reuse, and in a format that is compatible with performing the same series of retention actions for future events; i.e., not a 'one time' storage, but with future use and compariso	Tue 2/18/14	Tue 6/10/14	100%							
36	Contract with, or otherwise fund, the City of Lansing Operations and Maintenance Division to do all tree trimming for BWL in those areas (tree lawns and adjacent to city parks and golf courses) where the City is already engaged in vegetation management.	Tue 2/18/14	Tue 6/10/14	50%							
37	Evaluate its 5-year schedule to determine whether vegetation management needs to be even more aggressive. Based on the Board's representation that it has been close to a five-year cycle for vegetation management, however, it is doubtful that shortening th	Tue 2/18/14	Mon 6/30/14	100%							
38	Perform an 100% audit of all lines annually to ensure both that the BWL can stay on track in its vegetation cycle and that sections that may require immediate attention are not neglected.	Tue 2/18/14	Tue 6/10/14	100%							
39	Explore collaboration with other entities doing tree-trimming (City of East Lansing, Townships, Consumers Energy, DTE) in order to increase efficiencies.	Tue 2/18/14	Mon 6/30/14	100%							
40	Budget for distribution system maintenance based on regular replacement of each and every component at its engineering-based life-length and continue to recalculate its grid maintenance budget on that basis in all future budgets.	Tue 2/18/14	Fri 7/25/14	100%							
41	Implement a procedure that actual replacement of most grid assets will be condition-based, or because distinctly better technology is available and warrants replacement of equipment that is not yet at end of life.	Tue 2/18/14	Tue 2/18/14	100%							
42	Establish a process of long-term scheduling and annual work coordination in conjunction with each of its host communities.	Tue 2/18/14		30%							
43	Undertake a value engineering analysis of the potential deployment of automatic circuit interrupters in its distribution grid and implement them accordingly.	Tue 2/18/14	Tue 2/18/14	100%							
44	Adopt the practice of installing breakaway service drops whenever it installs or repairs a service drop or performs major maintenance on the distribution line to which a service drop is connected.	Tue 2/18/14	Sun 5/31/15	10%							
45	Perform a benefit cost analysis to determine whether a proactive effort to install breakaway service drops is warranted.	Tue 2/18/14	Sun 5/31/15	10%							
46	Undertake a value engineering analysis of its entire primary distribution system, with the intent to calculate the optimum extent and topology of the primary distribution grid, and the optimum design of each segment of its primary distribution grid. This	Tue 2/18/14	Tue 2/18/14	100%							
47	When performing value engineering of the primary distribution grid and in implementing any hardening of the primary distribution grid, the BWL should examine opportunities to reduce costs (or improve results) through collaboration with host communities.	Tue 2/18/14	Fri 6/30/17	100%							
48	Examine options to add additional sensors to the primary distribution system so as to localize faults much more quickly. Sensors are not particularly expensive and use of increased numbers of them may well be warranted.	Tue 2/18/14	Tue 2/18/14	100%							
49	Harden the Secondary Distribution System	Tue 2/18/14	Tue 2/18/14	100%							
	a Breaks and other faults in the secondary distribution system affect fewer customers per fault and are easier to repair than are faults in the primary distribution system. Thus, while we encourage the Board to undertake some hardening of the secondary dist	Tue 2/18/14	Fri 6/30/17	100%							

# CRT Recommendations

Item #	Task Name	Start	Finish	% Complete	September	January	May	September	January	May	September
b	Vegetation management is a key to reducing storm-induced outages in the secondary distribution system as it currently exists. Accepting BWL's representation that it will "strictly adhere" to a five-year cycle for vegetation management, the CRT believes th	Tue 2/18/14	Tue 2/18/14	100%		I					
c	Once the value engineering analysis of the primary distribution system is completed, the BWL could begin using internal staff to undertake a substation-by-substation analysis of the secondary distribution lines fed from each substation and optimize the co	Tue 2/18/14	Fri 6/30/17	0%							
50	Direct its staff to work with local units of government to determine optimal strategies to harden the secondary distribution system, proceeding substation-by-substation in the order of susceptibility to storm damage as determined by experience in recent s	Tue 2/18/14		30%		C					
51	Proceed as quickly as is consistent with good practice to deploy smart meters and integrate them to its outage management system to accelerate the identification and repair of the secondary distribution system after storm damage.	Tue 2/18/14	Tue 2/18/14	100%		I					
52	In the interim, ensure that it has an adequate core of spotters for restoration of the secondary distribution system following a storm.	Tue 2/18/14	Tue 2/18/14	100%		I					
53	Deploy smart meters first to those residences located on lateral circuits.	Tue 2/18/14	Tue 6/30/20	100%							
54	Consider plans to own the system, including the mast, through to their meter box, as part of its benefit cost analysis to determine whether a proactive effort to install breakaway service drop: is warranted.	Tue 2/18/14	Tue 2/18/14	100%		I					
55	Consider plans to install breakaway service drops first to those customers on lateral circuits or to special needs customers.	Tue 2/18/14	Sun 5/31/15	10%							
56	Develop through voluntary customer participation, and maintain, a list of all elderly customers and those with medical needs.	Tue 2/18/14	Fri 8/1/14	20%							
57	Communicate daily with all EOCs to coordinate with emergency response personnel in all municipalities to ensure the safety of vulnerable citizens during an outage or other emergency event. Communication should be for the duration of a storm event.	Tue 2/18/14	Fri 8/1/14	5%							
58	As part of the integrated Regional EOP, provide the regional EOC (or all EOCs or EMs for all governments within its customer service area, if no regional EOC is created) with up-to-date information of the location of its at-risk customers.	Tue 2/18/14	Fri 8/1/14	5%							
59	Revise items 44, 47, 48, 54 of the outage report. There must be a coordinated effort between BWL and local government emergency personnel and community groups to assure clear communication and coordination of efforts to protect at- risk customers when an	Tue 2/18/14	Fri 8/1/14	15%							
60	Create a Community Resilience Planning Coalition which would take a broad approach to building community level resilience to extreme events by:	Tue 2/18/14		10%		C					
a	Participating in the drafting of a regional emergency response plan, that would include community organizations' input on issues including a coordinated crisis communications plan and procedures to ensure a coordinated, efficient response to hazards across	Tue 2/18/14	Wed 12/31/14	0%							
b	Providing a forum for consideration of new risk reducing technologies and design in the built environment;	Tue 2/18/14	Wed 12/31/14	0%							
c	Promoting strategies for engaging and organizing the community at multiple levels (household, block, neighborhood, shelters and non-profits, businesses, jurisdiction) to identify vulnerabilities, mitigate risk and better prepare for response and recovery	Tue 2/18/14		20%		C					
d	Providing a platform for regional sharing of lessons learned; connecting people, ideas, and resources; and engaging policymakers and community members in an ongoing conversation about resilience.	Tue 2/18/14		0%		C					
61	Include regional resiliency, including energy self-reliance, as a strategic goal	Tue 2/18/14		0%		C					



# CRT Recommendations

Item #	Task Name	Start	Finish	% Complete	September	January	May	September	January	May	September
83	Consider revision of the 54 Recommendations, using the SMART analysis to include specific metrics, including the tasks to be performed, the directorate or section within BWL charged with performance and the time need for accomplishment.	Tue 2/18/14	Tue 2/18/14	100%		I					
84	Require staff reports monthly to the Board of Commissioners on specific actions that have been taken on all of the 54 recommendations made in the Ice Storm Outage Report and that the BWL post those reports on its website for the next 18-24 months.	Tue 2/18/14	Tue 2/18/14	100%		I					



# MPSC Recommendations

ID	Item #	Task Name	Start	Finish	% Complete						
						December	January	February	March	April	May
1	I.	The BWL's internal report and 54 actions contain numerous aspiring phrases such as: plan to update, are in the process of implementing, will consider, will work to develop, will expand testing, is investigating, will solicit, will work with, will make par	Tue 2/18/14	Fri 6/27/14	75%						
2	II.	N/A			0%						
3	III.	N/A			0%						
4	IV.	N/A			0%						
5	V.	The MPSC recommends that the Mayor of the City of Lansing, as the appointing authority to the Board, should appoint new member(s) with expertise related to the duties of the BWL.	Tue 2/18/14	Mon 7/7/14	57%						
6	VI.	In addition to adopting the recommendations of the CRT, the MPSC makes the following recommendations:	Tue 2/18/14	Thu 5/8/14	100%						
7	1	Require specific customer service metrics as part of the BWL's Quality of Service best practices. The MPSC also recommends the BWL institute a billing credit.	Tue 2/18/14	Sun 8/31/14	18%						
8	2	Analyze and determine if the BWL's current budget and expenditures on vegetation management and maintenance of the distribution and transmission system are adequate to continue to provide safe and reliable service.	Tue 2/18/14	Fri 5/16/14	100%						
9	3	Analyze the reliability measurements of System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI) and Customer Average Interruption Duration Index (CAIDI) on a circuit basis and expand the reporting of these i	Tue 2/18/14	Mon 9/1/14	70%						
10	4	Develop metrics that allow the BWL to analyze the performance of all reliability investments.	Tue 2/18/14	Tue 6/30/15	14%						
11	5	Develop an annual reliability report that can be publicly available.	Tue 2/18/14	Tue 6/30/15	15%						
12	6	Develop an annual reliability spending report that focuses on current and future reliability project spending and analyzes customer benefits and the overall effectiveness of reliability projects.	Tue 2/18/14	Tue 6/30/15	19%						
13	7	Adopt Service and Reliability Standards similar to those ordered by the Commission in Case No. U-12270 (R 460.732), and include a customer catastrophic outage credit (R 460-744 - R 460.746), as well as comparable rules to the Unacceptable Levels of Perfor	Tue 2/18/14	Thu 4/17/14	17%						
14	8	Develop a Communication Plan, as part of an overall emergency operations plan, aligning with industry best practices for customer service obligations for major service outage responses and during restoration periods.	Tue 2/18/14	Mon 6/30/14	100%						
15	9	Provide consumer education material through multiple media so that customers may be prepared to handle outages including free outreach to educate the public on electric line safety, preparation for storm events, and who to contact in the event of an outag	Tue 2/18/14	Tue 6/24/14	100%						
16	10	Maintain a single customer phone number for all customer inquiries.	Tue 2/18/14	Wed 5/21/14	100%						
17	11	Identify the account holders who are seniors and maintain a database of facilities servicing vulnerable populations.	Tue 2/18/14	Mon 6/30/14	66%						
18	12	Provide training to the Board and identify resources and opportunities for Board members to gain experience and knowledge that will allow for greater control of current and emerging issues.	Tue 2/18/14	Mon 6/30/14	10%						
19	13	Expand emergency training and exercise programs to include the Board so they are educated on the BWL's electric system infrastructure and emergency operations plan.	Tue 2/18/14	Fri 3/14/14	0%						
20	14	Train and educate BWL staff so that experienced and knowledgeable staff can fill back-up roles in the event of an outage or energy emergency.	Tue 2/18/14	Sun 11/30/14	40%						
21	15	Consider use of the Local Energy Assistance Program (LEAP) process to serve as the conduit for establishing private-public partnerships focused on improving community resiliency to a prolonged energy disruption. The CRT was explicit in recommending that t	Tue 2/18/14	Tue 3/18/14	100%						
22	16	Work in conjunction with the Michigan Municipal Electric Association (MMEA) to share the lessons learned and best practices with other municipal utilities within the state in an effort to improve the resiliency and outage response of all municipal utiliti	Tue 2/18/14	Fri 5/30/14	100%						
23	17	Voluntarily report to MPSC Staff when outages affect more than 10 percent of its customers, when a significant event affects the operation of its system, or when there is loss of power to a critical facility or critical customer.	Tue 2/18/14	Tue 6/30/15	9%						
24	18	Keep the BWL Board and Lansing City Council continually informed on mutual assistance agreements should any contracts expire or have cause to be amended.	Tue 2/18/14	Wed 9/10/14	10%						

# MPSC Recommendations

ID	Item #	Task Name	Start	Finish	% Complete						
						December	January	February	March	April	May
25	19	Perform its own action items 10 through 15 from the BWL December 2013 Ice Storm Outage Report regarding spotters and provide frequent update reports to the BWL Board and Lansing City Council.	Tue 2/18/14	Sun 8/31/14	100%						
26	20	Provide spotter training at least two times per year at a very minimum, once in the spring and once in the fall for respective storm events.	Tue 2/18/14	Fri 3/7/14	100%						
27	21	Survey several Michigan utilities to determine the industry best practice regarding the BWL "bird dogs" assisting mutual assistance crews.	Tue 2/18/14	Fri 3/7/14	100%						
28	22	Integrate the BWL's Outage Management System (OMS) into an Emergency Operation Plan and test the system to its maximum capacity as recommended by the CRT.	Tue 2/18/14	Tue 3/11/14	100%						
29	23	Create a contingency process that will provide guidance to BWL staff in the event the OMS is not operational during an outage or catastrophic event.	Tue 2/18/14	Wed 7/9/14	100%						
30	24	Develop a procedure to collect system outage data during and post storm events for future reliability analysis.	Tue 2/18/14	Thu 3/13/14	100%						
31	25	Continue a rigorous tree trimming program and develop tree trimming practices that include overhead branch removal and hazardous tree removal.	Tue 2/18/14	Thu 3/6/14	100%						
32	26	Develop inspection procedures to ensure that companies who lease space on poles are clearing around communication lines.	Tue 2/18/14	Fri 5/16/14	100%						
33	27	Develop a comprehensive and transparent inspection and preventive maintenance plan that includes all equipment critical for maintaining system reliability.	Tue 2/18/14	Tue 5/6/14	100%						
34	28	Study all grid modernization and two-way communication technologies to develop a capital investment plan that maximizes reliability and customer benefit.	Tue 2/18/14	Tue 2/18/14	100%						
35	29	Continue to invest in assets that increase the overall strength and resiliency of the electric system when replacing assets that are at the end of their useful life.	Tue 2/18/14	Thu 5/29/14	100%						
36	30	Study its poorest performing distribution power lines to determine the costs and benefits of undergrounding such lines as compared to other options aimed at increasing reliability.	Tue 2/18/14	Thu 6/19/14	50%						

# BWL Outage Review 54 Item Project Plan

ID	Task Name	Start	Finish	% Compl	Timeline													
					November	January	March	May	July	September	November	January						
1	The BWL will include its distribution plan in its annual table top tests designed to stress its emergency response and will use the results to continually improve its emergency plans	Tue 2/18/14	Thu 10/16/14	50%														
2	The BWL will consider implementing a set of triggers into its distribution plan.	Tue 2/25/14	Thu 4/3/14	100%														
3	The BWL will consolidate its Transmission and its Distribution emergency response plans into one document.	Thu 4/3/14	Mon 6/30/14	100%														
4	The BWL will investigate the benefit of collaborating with other Michigan utilities to track and estimate the impact of inclement weather.	Tue 2/18/14	Mon 6/30/14	100%														
5	Based on the BWL's experience with the impact of the ice storm, the BWL will make use of additional secondary role employees and these roles will be discussed in subsequent sections.	Tue 2/18/14	Sun 11/30/14	100%														
6	Most utilities have not found placing overhead lines underground to be cost effective. Instead reviewing maintenance practices and construction standards seems to be a more reasonable method for improving the resiliency of the BWL's distribution system.	Tue 2/18/14	Thu 5/8/14	100%														
7	The BWL will strictly adhere to a 5 year trimming cycle and is in the process of modifying its tree trimming standards and procedures to remove all branches located above distribution lines and better protect its lines during a major storm.	Tue 2/18/14	Mon 3/24/14	100%														
8	The BWL will begin to use multiple tree trimming contractors and assign work to contractors based on past performance. The contractor with the best record of performance will get a larger portion of the work. Recently, the BWL temporarily increased the	Tue 2/18/14	Fri 8/29/14	50%														
9	The BWL will publish the contact information for its supervisor responsible for trimming scheduling so customers can contact the Manager directly with questions or complaints regarding tree trimming procedures and workmanship.	Wed 1/1/14	Tue 2/18/14	100%														
10	The BWL is in the process of carefully reviewing spotter duty during the ice storm and determining how many additional trained spotters would be needed to efficiently secure down lines and provide timely damage assessment during an event with the destruct	Tue 2/18/14	Sun 11/30/14	75%														
11	The BWL will also utilize retired line workers to perform damage assessments and serve as spotters.	Thu 2/27/14	Fri 5/9/14	100%														
12	The BWL will consider contracting with electric service firms for damage assessment services to supplement its own staff.	Thu 2/27/14	Fri 5/30/14	100%														
13	The BWL is developing common reporting forms and methods to be used by all spotters and damage assessors and will stress the importance of adhering to these during the annual training sessions.	Wed 4/2/14	Fri 8/29/14	100%														
14	The BWL will evaluate the use of damage predictive tools to determine if these tools could help in assessing possible damage earlier in a storm's approach.	Tue 2/18/14	Mon 6/30/14	100%														
15	The BWL will remind customers that lines marked with red and white tape are power lines and the tape indicates that the BWL is aware that the line is down. The BWL will publish this information on its website and Customer Connections newsletter.	Tue 2/18/14	Thu 5/1/14	100%														
16	The BWL has expanded the number of utilities and non-utility electric service contractors with which it has mutual aid agreements or service contracts. The list is shown below. Existing Agreements• Michigan Municipal Electric Association (35 Municipal Uti	Tue 2/18/14	Fri 3/28/14	100%														







# BWL Outage Review 54 Item Project Plan

ID	Task Name	Start	Finish	% Compl	Timeline																	
					November	January	March	May	July	September	November	January										
17	The BWL is in the process of hiring 3 additional line workers and an additional dispatcher to supplement its workforce and to help manage crews during the restoration process.	Tue 2/18/14	Fri 10/31/14	66%																		
18	With the addition of 3 line workers, an additional dispatcher, more trained spotters, and the new mutual aid agreements the BWL has tripled the number of line crews that are available for immediate deployment and can be used safely and efficiently during	Tue 2/18/14	Mon 6/30/14	100%																		
19	The BWL does update its critical and public safety lists periodically to ensure that it is up to date and complete. The BWL will share its overall restoration plans with local public officials so that they can be kept up to date on the BWL's restoration	Tue 2/18/14	Wed 12/31/14	0%																		
20	The BWL will review it's storm inventory based on the recent ice storm.	Tue 1/28/14	Fri 3/21/14	100%																		
21	The BWL will investigate connecting its line truck laptops to its OMS system as a tool to assist crews with storm responses.	Tue 2/18/14	Tue 3/18/14	100%																		
22	The BWL has resolved the matters related to the OMS functionality. The conductor cuts are now operational and the OMS performs to design standards.	Tue 1/28/14	Tue 3/11/14	100%																		
23	To avoid this situation with other outage tools that may be employed in the future, the BWL will conduct annual stress tests of all its restoration tools including, but not limited to the OMS, outage call in number, Customer Service Center, and Communicat	Wed 2/5/14	Tue 3/11/14	100%																		
24	The BWL is moving forward with a project to implement smart grid and smart meter technology, which will allow it to identify individual customer outages. It will also develop a policy that will allow customers to "opt out" of smart meter use. c. customer	Tue 7/1/14	Wed 1/21/15	10%																		
25	The BWL is hiring additional call center staff.	Tue 2/4/14	Mon 2/24/14	100%																		
26	The BWL has implemented a process to assure call forward to the 877 number occurs during large outages. This will allow CSR and supporting staff to concentrate on line down, voice mail and other communications mediums.	Mon 1/27/14	Thu 2/13/14	100%																		
27	The BWL will trigger the IVR in the 877 system to direct non-matched callers to voicemail during major outage events.	Mon 1/27/14	Thu 2/13/14	100%																		
28	The BWL has reconfigured the Call Center to send messages in the voice mailbox to CSR's automatically.	Mon 2/10/14	Sat 3/1/14	100%																		
29	The BWL is aggressively advertised the 877 number for outages including all available communications mediums, like magnets, social media, BWL Website, and other customer communications.	Fri 1/10/14	Fri 1/24/14	100%																		
30	During a major outage, the BWL Call Center staff will focus their efforts on responding to email, texts, Facebook, Twitter, and voicemails left on the outage reporting system with the goal of responding to storm related inquiries in a timely fashion. The	Wed 1/1/14	Fri 1/24/14	100%																		
31	The BWL will ensure that the distribution plan weather forecasting and storm preparation function include employees who are directly or indirectly, through secondary roles, responsible for customer service. This, along with other changes, will assure tha	Tue 2/18/14	Thu 3/6/14	100%																		
32	The BWL is working with the 877 vendor to provide additional methods for customers to be identified or matched when calling in to report an outage. This will include using the last digits of an account number or social security number.	Tue 3/25/14	Sat 11/1/14	75%																		
33	The interface between the 877 number and the OMS has been fixed and alarms will be added on each system to alert staff of any problems in the future.	Fri 1/17/14	Fri 4/25/14	100%																		

# BWL Outage Review 54 Item Project Plan

ID	Task Name	Start	Finish	% Compl	Timeline													
					November	January	March	May	July	September	November	January						
34	The BWL has added text outage reporting to the 877 system to offer customers another method for reporting outages.	Thu 1/30/14	Mon 12/1/14	50%														
35	The BWL is working on a method to provide quicker updating of customer data from BWL system to 877 system. This is intended to provide better matches of customers to service addresses.	Wed 3/26/14	Sat 6/28/14	100%														
36	The BWL is working to improve its ability to automatically call back customers and provide them with updated outage information.	Wed 2/19/14	Thu 7/31/14	100%														
37	The BWL will continue its enhancements to its phone system. The enhancements will use newer technology to increase Internet bandwidth, increase available phone lines, and make the system fully redundant across the BWL private city-wide network. This up	Tue 2/25/14	Fri 7/25/14	100%														
38	The BWL has increased the TFCC voice mailbox size to 8,000 messages and is in the process of contracting with another vendor to assist in responding to voice mailbox messages during a large outage.	Thu 2/6/14	Tue 6/17/14	100%														
39	The BWL is investigating a separate site created just for outage information (including outage maps). This will help ensure that the BWL's outage website will be available to customers in the event that a catastrophic outage disables the BWL's main webs	Tue 2/11/14	Tue 3/11/14	100%														
40	Although the external email to Customer Service functioned normally during the storm, the BWL is investigating establishing a redundant external email system.	Tue 3/4/14	Fri 7/25/14	100%														
41	The BWL has developed a temporary web-based outage map for its website. The BWL is also working with a local vendor for a permanent outage map linked directly to the BWL's OMS system. Phase I of the project covering functionality has been completed and	Wed 1/29/14	Tue 3/11/14	100%														
42	In Phase II of the project, the BWL plans to continue enhancements to all of its Information Systems that interact with customers. The next phase of the outage map product for BWL will include further interaction with our customers, allowing them to ident	Fri 4/11/14	Sat 6/28/14	100%														
43	In addition to using Twitter and Facebook, the BWL is investigating the use of Nixle to communicate outage and other information to its customers.	Fri 1/24/14	Fri 5/9/14	100%														
44	The BWL will work with customers and local officials to determine how to make local officials aware of seniors, customers with medical alerts, and other vulnerable populations during extended outages.	Wed 2/19/14	Tue 9/30/14	50%														
45	The BWL will be more proactive informing customers of where their responsibility for service ends, the service mast, and the BWL's begins.	Fri 1/24/14	Wed 1/29/14	100%														
46	The BWL will maintain a list of qualified electricians who can repair service masts and the BWL will help customers finance the cost of mast repair by allowing customers to pay it off on their bill over a one year period without interest. A list of quali	Mon 2/3/14	Wed 6/4/14	100%														
47	During events like the ice storm, the BWL will work with local organizations to maintain warming centers in the winter and cooling centers in the summer for Lansing area residents.	Wed 1/1/14	Sun 1/26/14	100%														
48	As an integral part of the Lansing community, the BWL will work with other organizations to respond to crisis that may affect mid-Michigan in the future. The BWL is supporting work by The Power of We and others to help empower neighborhoods to react to a	Thu 1/23/14	Mon 6/30/14	100%														

# BWL Outage Review 54 Item Project Plan

ID	Task Name	Start	Finish	% Compl	November	January	March	May	July	September	November	January
					49	Since ice storm outage restoration, the BWL's service territory has experienced a number of severe winter weather events, and four separate outage events ranging from 100 outages to 7,400 outages. In all of the severe weather events, the BWL has posted, o	Wed 1/1/14	Mon 2/17/14	100%			
50	During outages, the BWL has acknowledged the time the outage began, the number of outages, the cause of the outage, the geographic area of the outage that can be found on the outage map, the projected time of restoration, and full restoration all clear.	Wed 1/1/14	Mon 2/17/14	100%								
51	Communication improvements have been noted on Facebook and Twitter with positive comments by our customers.	Wed 1/1/14	Mon 2/17/14	100%								
52	The BWL has retained the communications firm of Martin Waymire to help develop a crisis communications plan based on an examination of best practices across the utility industry to make sure it has a strong crisis communications protocol in place in the v	Wed 1/1/14	Thu 4/3/14	100%								
53	The BWL has also hired a social media specialist, a newly created position. The social media specialist will help develop strategies on how to best communicate with our customers over all social media channels.	Fri 1/24/14	Mon 2/17/14	100%								
54	The BWL will provide information to state and local officials on a regular basis. During an event like the ice storm, it will assign a liaison to state and local officials to answer questions that they may have from their constituents.	Tue 2/18/14	Tue 4/8/14	100%								



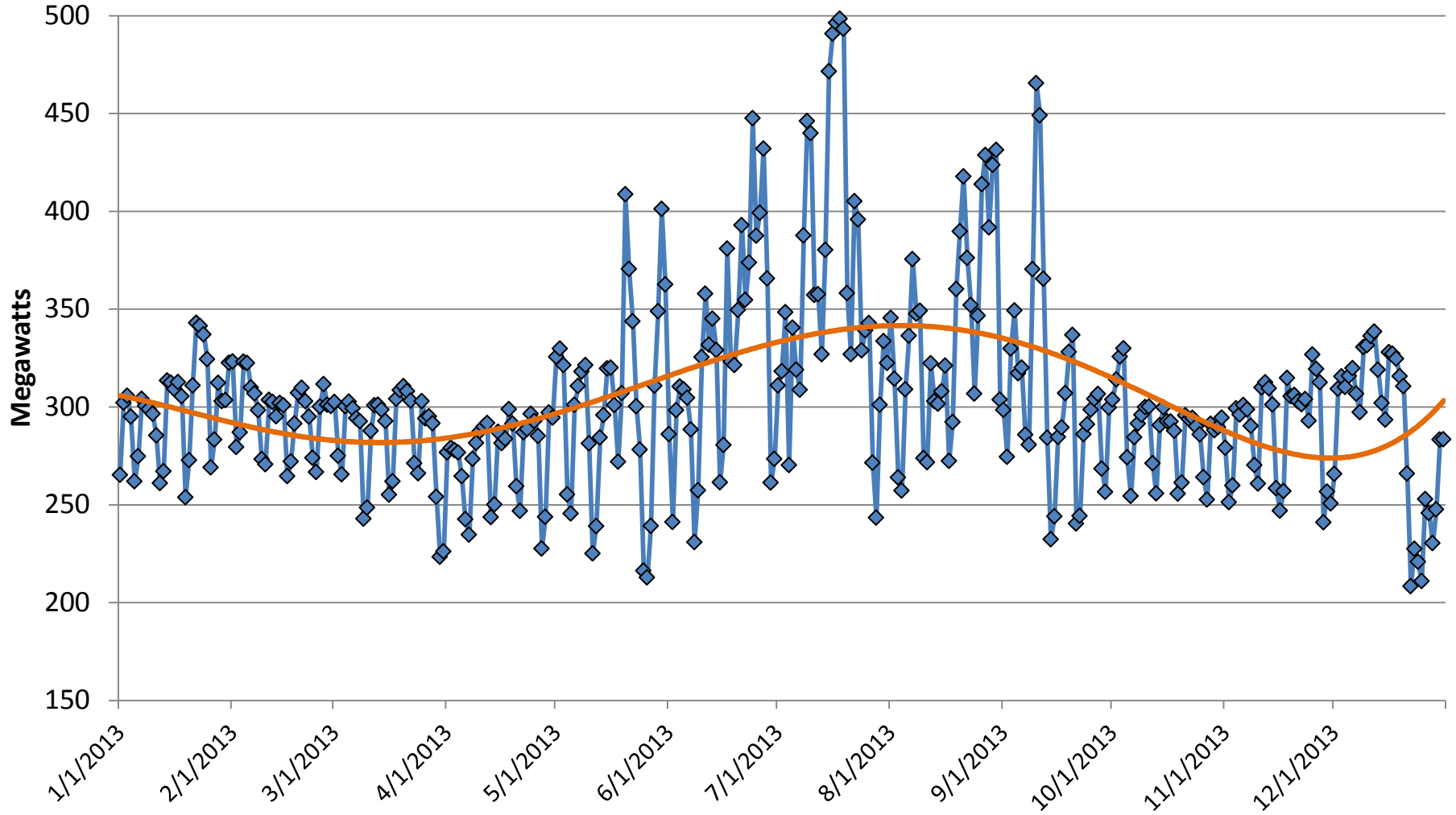
**Renewable Energy  
Committee of the Whole  
August 19, 2014**

# Electric Generation Operational Requirement

- Continuous and instantaneous balance of generation and demand
- Generation requirements
  - Generation capacity
  - Energy production
  - Load following (dispatchable)

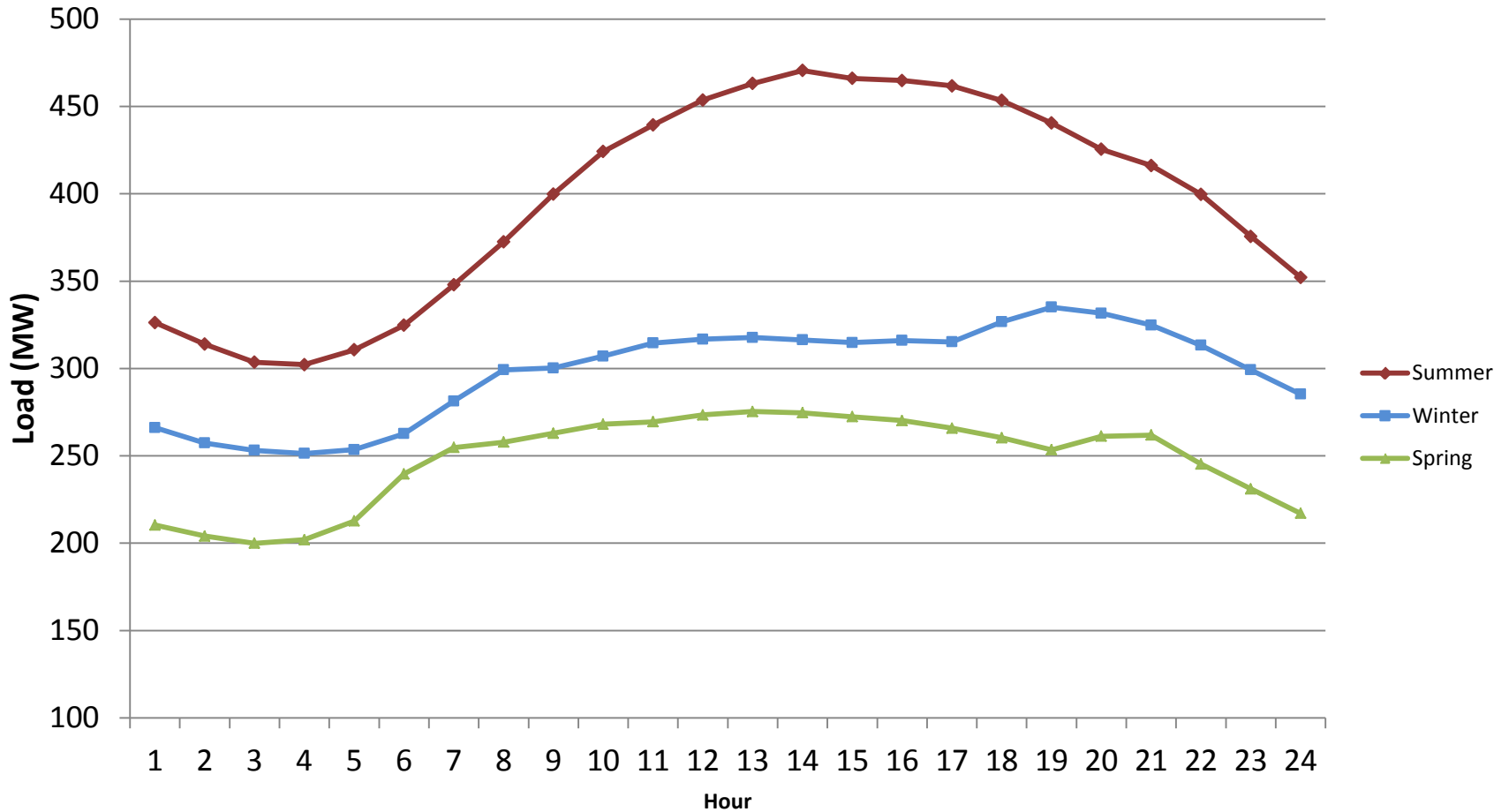


# BWL Daily Demand 2013



# Daily Load Curves

## Hourly Loads



# Future Renewable Energy Portfolio

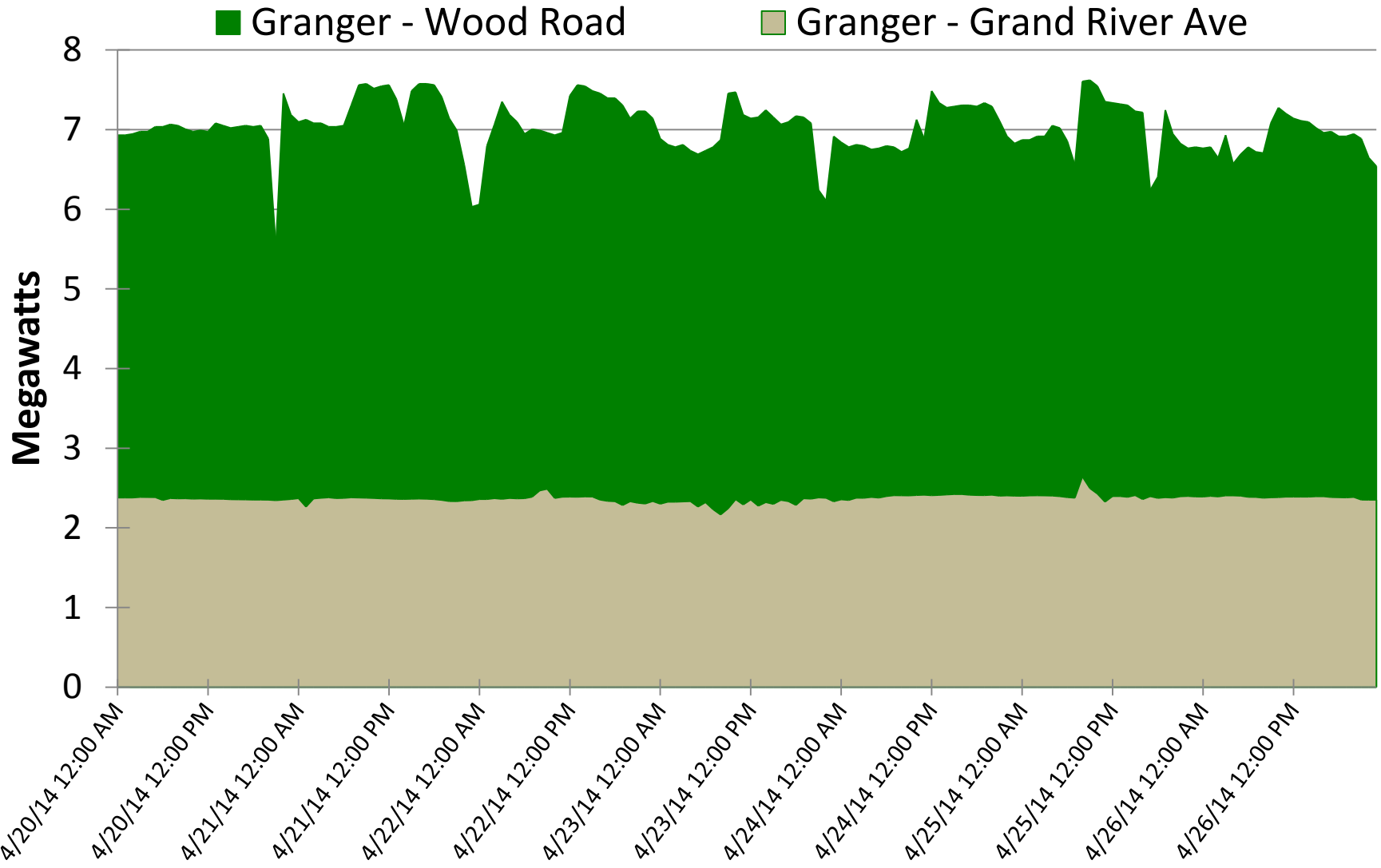
- Granger Landfill Gas 11.2 MW
- Tower Kleber Hydro 1.7 MW
- BWL Hydro 0.5 MW
- **Gratiot County Wind 19.2 MW**
- **BWL Solar 5.2 MW**

# Landfill Gas

- Engine driven generator firing landfill gas
  - Methane and Carbon Monoxide
- Two sites totaling 11.2 MW
  - Grand River Ave and Wood Road
- >90% capacity factor



# Landfill Gas

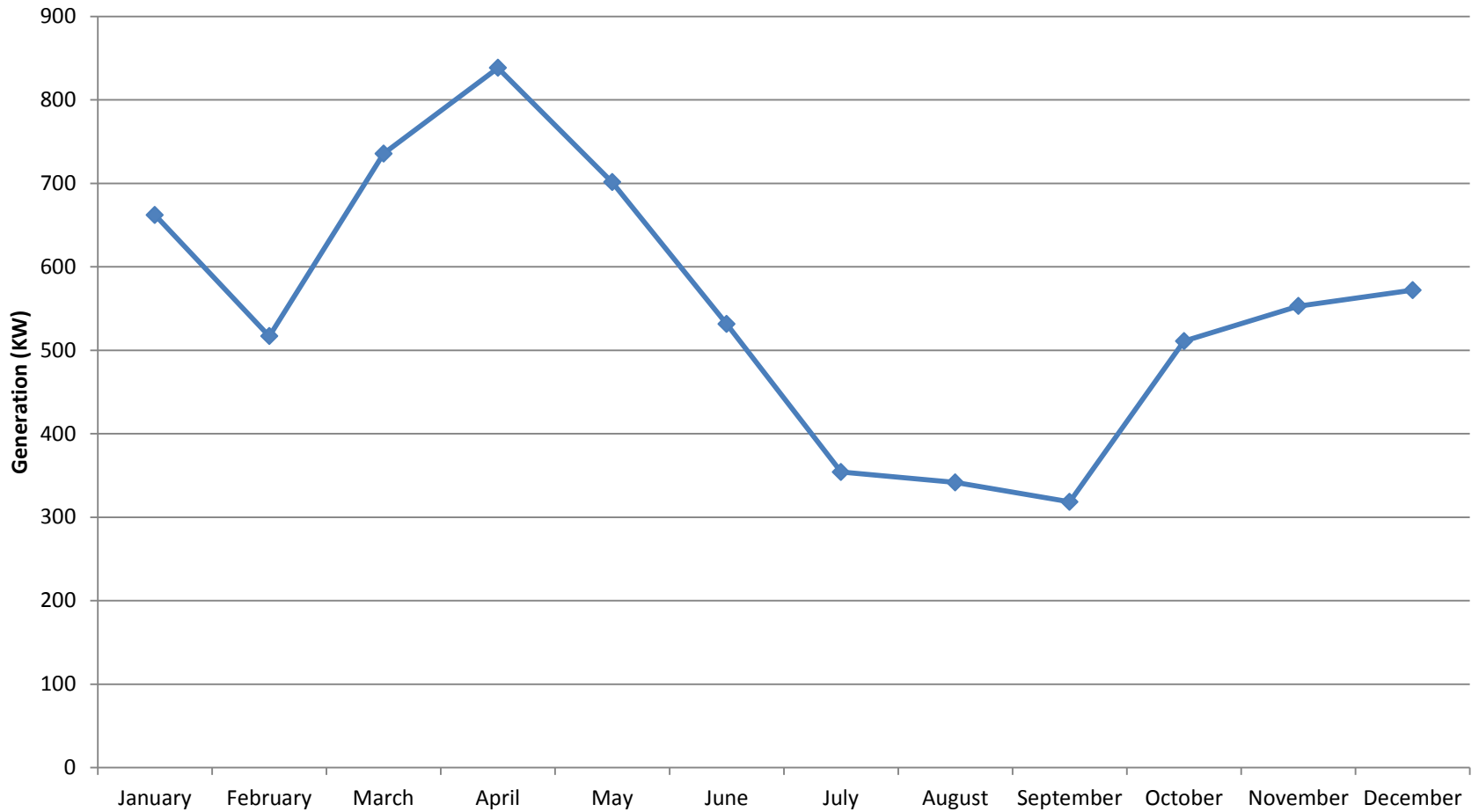


# Hydroelectric Power

- Refurbished Moores Park Dam – 600 kW
- Tower/Kleber – 1.7 MW on the Black River
- 42% Capacity Factor



# Annual Hydro Generation



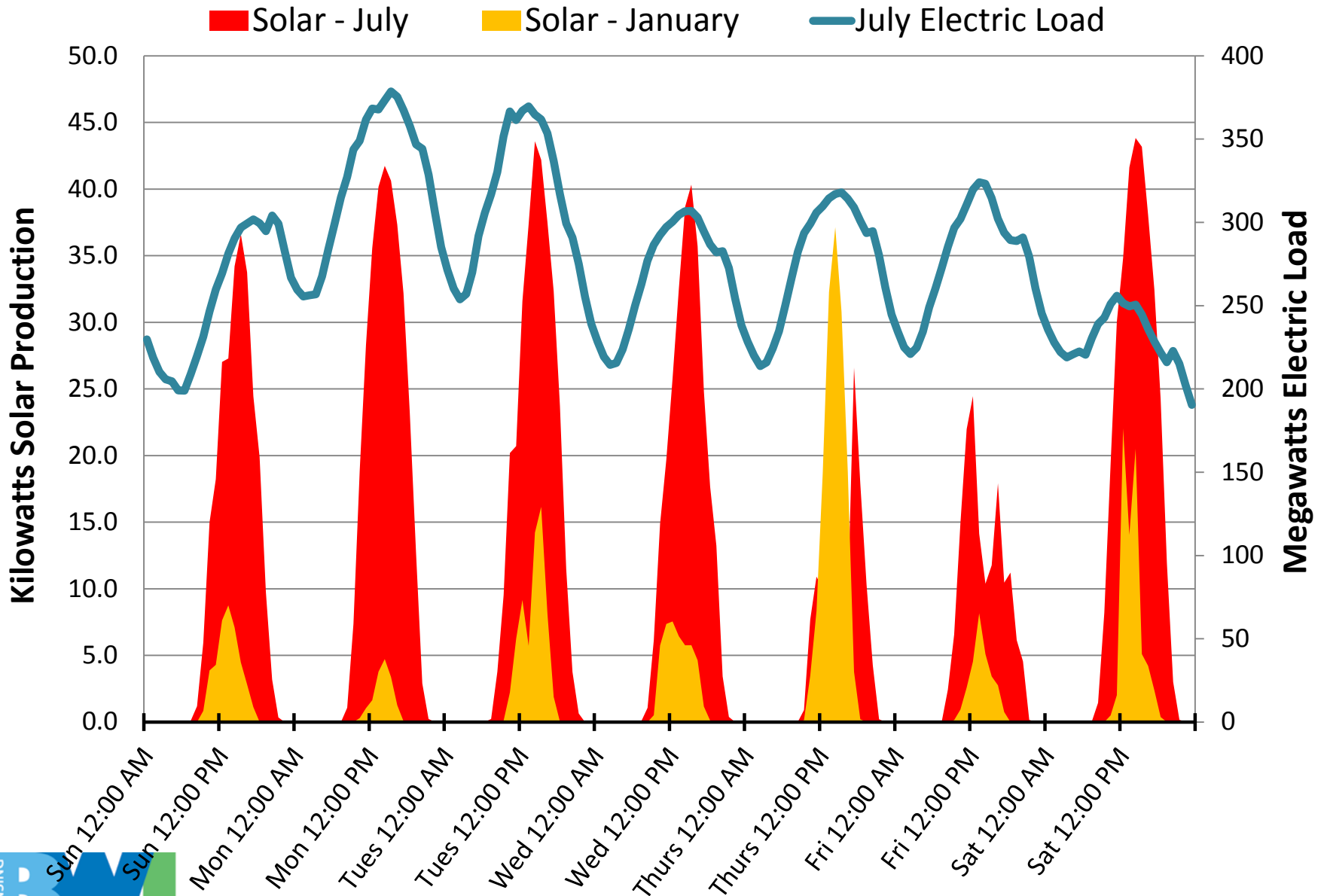
# Solar Array Expansion

- 158 kW Cedar/Dye facility
  - 14% capacity factor
- 13.5 kW on the REO Town Headquarters





# Seasonal Solar Production



# Solar RFP

The BWL issued an RFP seeking to purchase up to 5 megawatts of solar energy from one or more solar energy installations through a Power Purchase Agreement.

- Due September 8, 2014
  - Pre-bid Meeting June 19
  - Questions answered through July 28
- Projects up to **5 MW**
  - Community Solar
  - Large Array
  - Distributed Generation
- Possible locations around Lansing



# Net Metering

- 5 Customers – all Solar PV
- Systems sized from 1.5 to 3 kW
- \$5.00 monthly charge



# Wind

- Eight Nordex N117 2.4 MW wind turbines in Gratiot County = **19.2 MW**
  - Designed for moderate wind sites
  - 300 foot towers
  - Expected 38% capacity factor
- Commercial Operation Date : Fall 2014
- Power Purchase Agreement



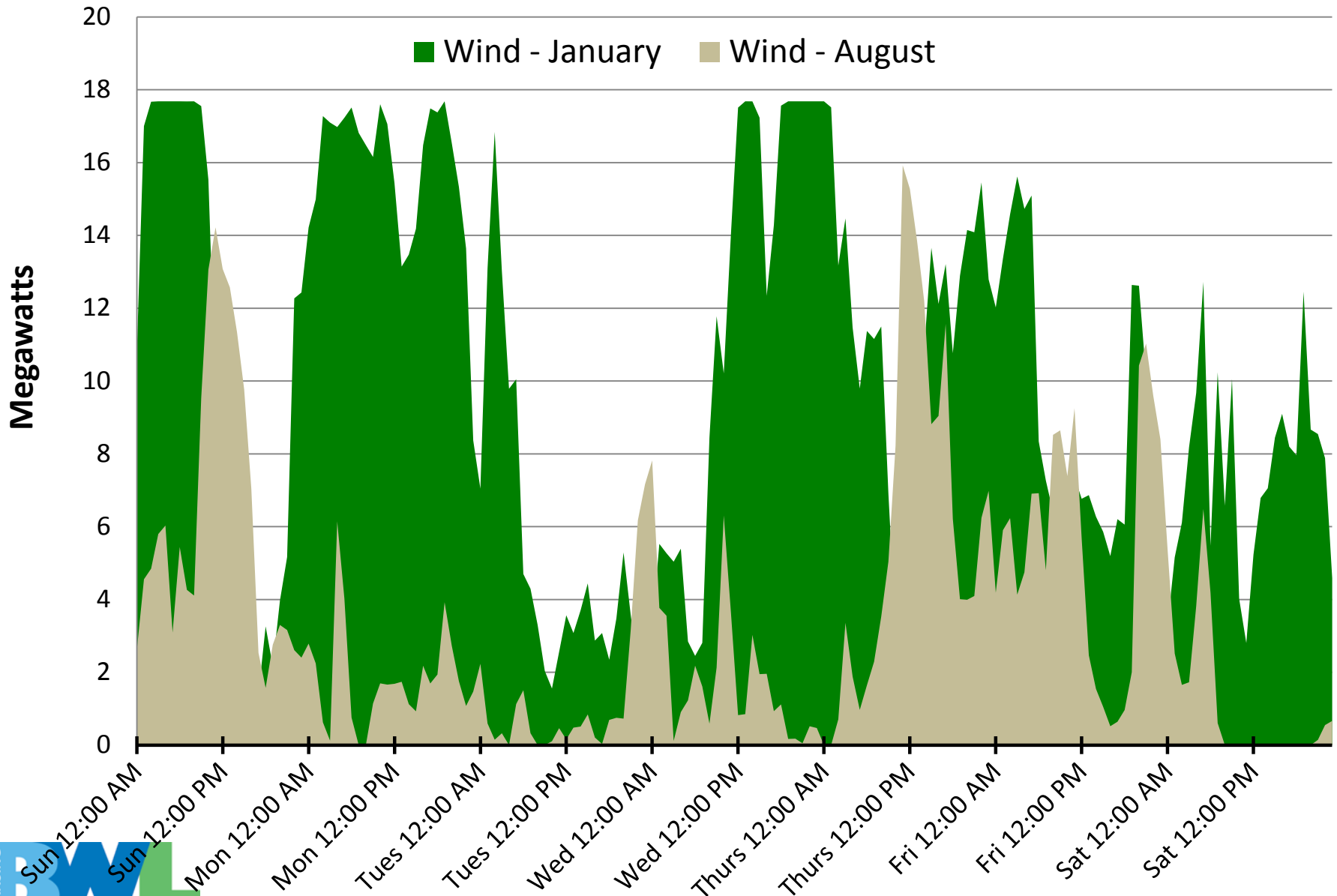
# Foundation Construction



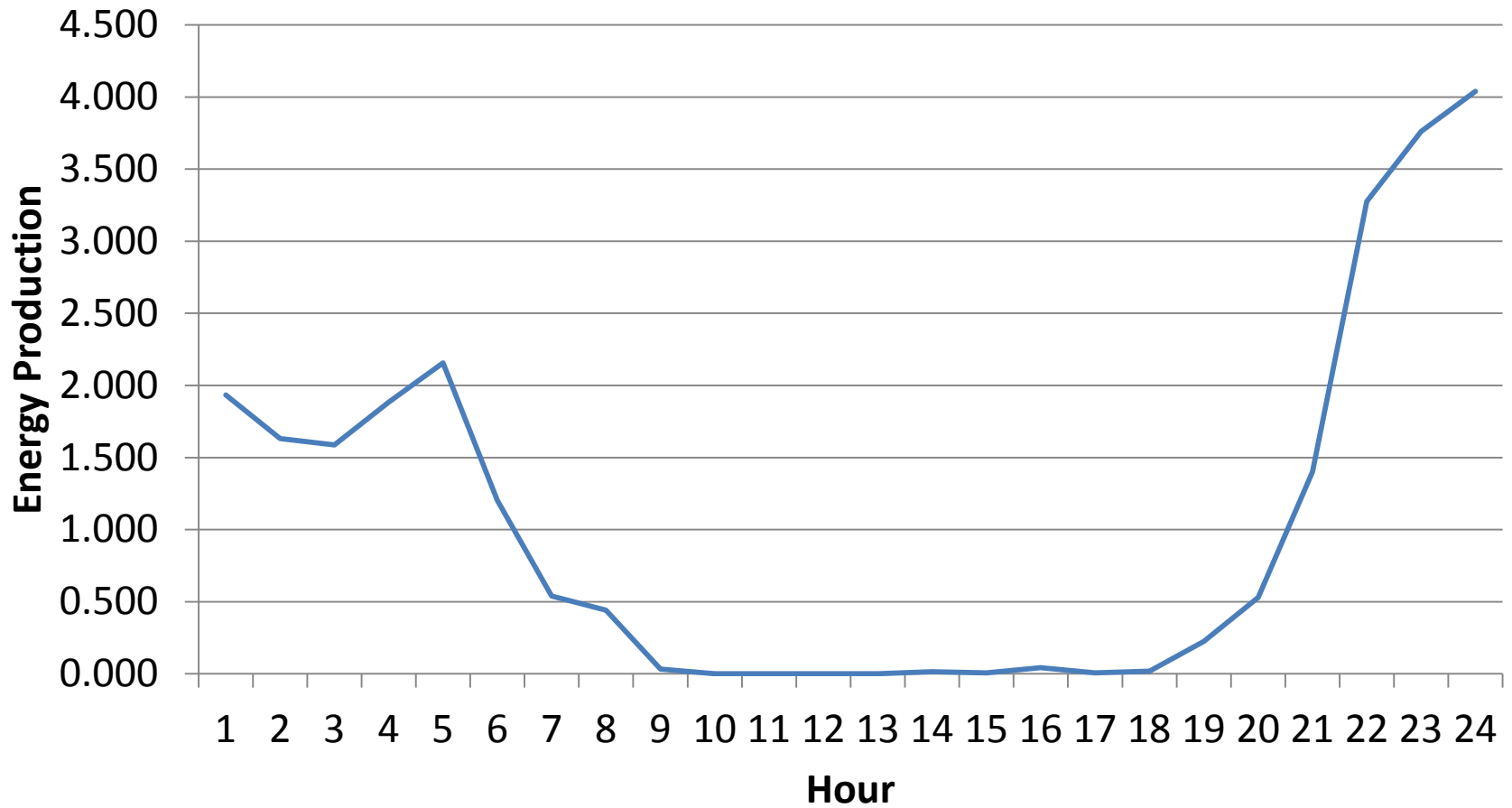
# Tower Component Arriving at Site



# Seasonal Wind Production



# Wind Energy Production July 12



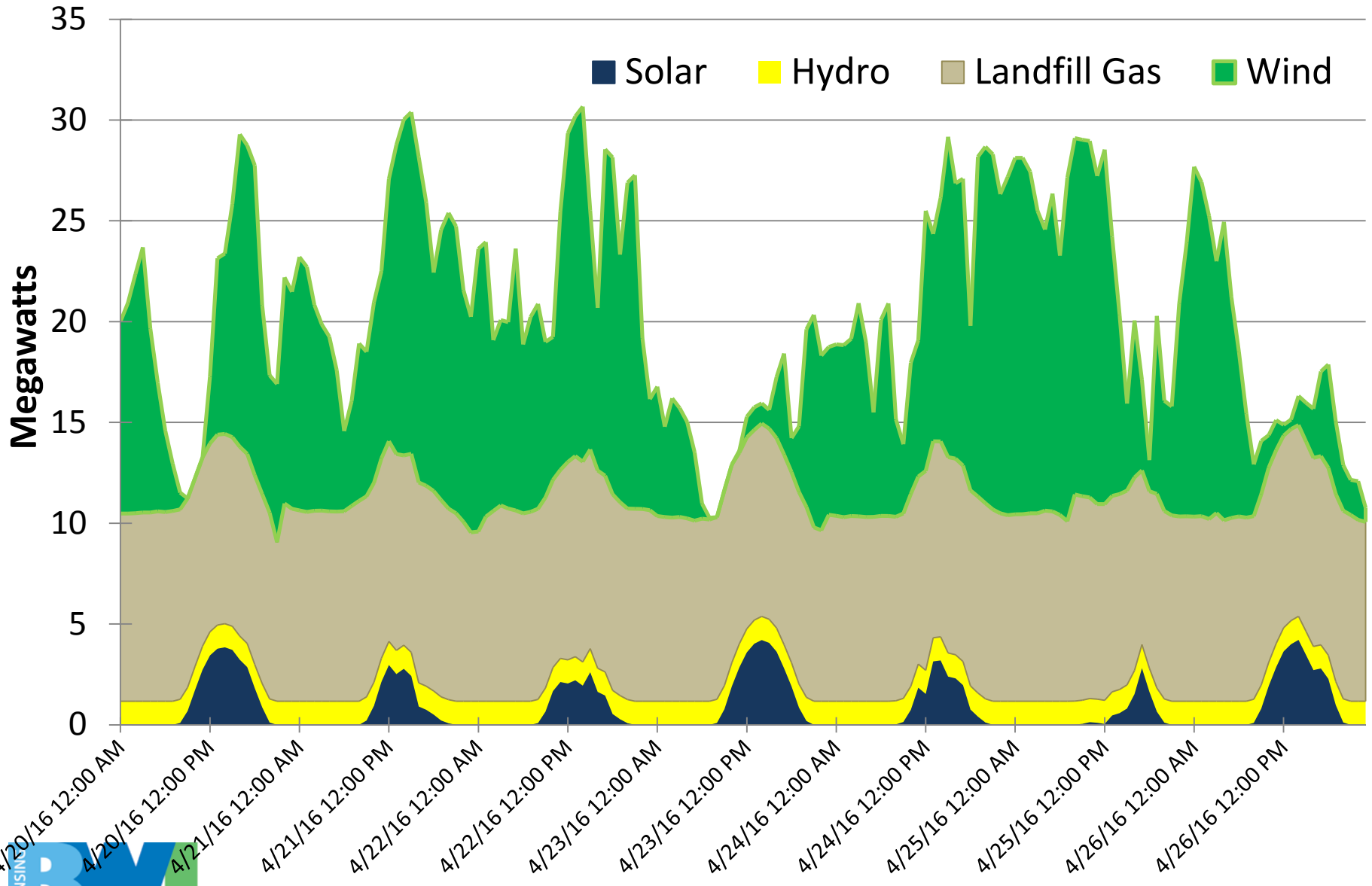


# Biomass Co-Firing

- In 2010, biomass fuel test, blended at 10% with coal, in existing utility-sized pulverized coal electric generating plant
  - Needs similar properties to coal
  - Tested 100 tons of E-Coal
  - Worked well, could be blended with coal, flowed through existing delivery system
  - Main Problem – Fuel Availability



# Renewables in 2016



# Questions?