



## **SmartGrid Outline Guide**

This outline guide is intended to describe the organization and general content of the narrative which will support the SmartGrid outline. The following discussion should provide assistance to those providing input to the SmartGrid draft narrative.

The premise for the SmartGrid draft narrative is that it should provide a layman’s description of the SmartGrid concept. Next the narrative should address what value SmartGrid brings to the utilities and their customers. The bulk of the narrative should describe the modern grid technologies available to advance the concept. Next the narrative should present current progress of modernization projects in Michigan which support the SmartGrid concept. This should be followed by a discussion of the barriers and challenges for Michigan in advancing the SmartGrid concept. Lastly, the narrative should, if possible, conclude with a recommendation for a collaborative or pilot project which advances the SmartGrid concept and provides a practical and cost-effective outcome for the benefit of Michigan customers.

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The following discussion of the proposed SmartGrid Outline content is organized by major sections of the proposed outline and briefly describes the anticipated content of each section’s narrative.

### **1. SmartGrid Concept**

This portion of the narrative should begin with some background information on why we should be thinking about the application of SmartGrid concepts to the existing grid. Next, the narrative should present an explanation of what the SmartGrid concept is about in layman’s terms. Current SmartGrid initiatives should be described in sufficient detail to understand the general mission of each initiative as well as the current scope and progress toward identifying appropriate technologies, their potential benefits and barriers to implementation. The collective descriptions of the national and international initiatives should identify technologies not covered as well as areas of duplication in these efforts. Finally, this portion of the narrative should conclude with a description of the basic characteristics of SmartGrid technologies.

### **2. SmartGrid Benefits**

This portion of the narrative should describe how implementation of technologies which support the characteristics of a SmartGrid will drive development of the modern grid and provide benefits for Michigan customers. Some of the concepts identified in the national and international initiatives discussed in the previous section may be more or less suitable for implementation in Michigan. The discussion should present the value-added services and benefits for Michigan consumers. Such potential benefits include increased service reliability; improved



outage recovery; improved power quality for sensitive electronic loads; options for customers to manage electric use and costs; plug-and-play integration of control systems, power electronics, and distributed resources; improved grid resilience to disturbances from terrorists and from nature; and more efficient grid operations.

3. **Grid Modernization Technologies (see Technologies Matrix)**  
Technology and innovation will be required to develop the functional specifications necessary to implement the modernization projects. Implementation of the SmartGrid concept is very comprehensive in scope, requiring the enabling technologies to be grouped into fundamental technology categories. While there are many ways SmartGrid technologies may be grouped, the SmartGrid Technologies Matrix presents four comprehensive technology categories. Technology categories shown in the Technologies Matrix are as follows: Advanced Grid Operations, Monitoring & Load Management, Architecture & Communication Standards, Modeling and Simulation. The narrative should then describe technology options available for implementing the subject technology categories, the option benefits, barriers to adoption and commercial readiness. The technology options will likely include references to many technologies which are mentioned and discussed in greater detail by other report groups. The non-layman technical details associated with some of the technology option can be relegated to the report appendix for purposes of a smoother and more understandable 21<sup>st</sup> Century Energy Plan narrative.
  
4. **Michigan Modernization Projects**  
This narrative could describe current projects completed or currently underway which advance the concept of SmartGrid. Detroit Edison and Consumers Energy have completed some activities which have advanced the SmartGrid concept and are studying others. Hawk Asgeirsson's paper presented in Phoenix, Arizona last November describes some of DTE's activities. Consumers Energy has upgraded its EMS/SCADA and is currently managing a BPL pilot project. Various smaller Michigan utilities have installed AMR equipment. The narrative should also tap the experience of representatives of METC and ITC to describe the current state of the transmission infrastructure as it relates to the smart grid concept and recent advances in transmission infrastructure modernization projects. MISO was criticized post the 2003 blackout regarding its inadequate protocols for communications and monitoring the operational state of the grid. The narrative should include a discussion of progress in improving the MISO communications infrastructure to support its security coordination function. Michigan is one of the few states which has promulgated interconnection standards. The interconnection standards are an important step in encouraging developments in distributed generation. Also, Michigan has embarked on a 5-year voluntary net metering program which should benefit the development of distributed generation



technologies. This section of the narrative should briefly describe these various Michigan grid modernization projects and how they contribute to advancing the SmartGrid concept. The Energy Plan report appendix/reference materials could include Hawk Asgeirsson's paper

([https://www.gridapp.org/eidb/meetingminutes/Asgeirsson\\_DTE.pdf](https://www.gridapp.org/eidb/meetingminutes/Asgeirsson_DTE.pdf)) as well as Tim Sparks' white papers on interconnection and SCADA

5. Grid Modernization Challenges

Achieving the SmartGrid vision will be difficult. Many challenges exist today and others are likely to appear before the vision is realized. Some of today's challenges are stakeholder involvement; regulatory impacts; human resources and training; siting for grid expansion; and encouraging investments in the modernized grid infrastructure. This portion of the narrative should present a discussion of these issues.

6. Collaborative/Pilot Projects

The narrative should be able to conclude with at least one potential collaborative/pilot project which would be possible based on a review of current progress with the national initiatives and grid modernization projects within Michigan. The proposed projects could be Michigan only funded or perhaps qualify for partial funding from one of the national initiatives.