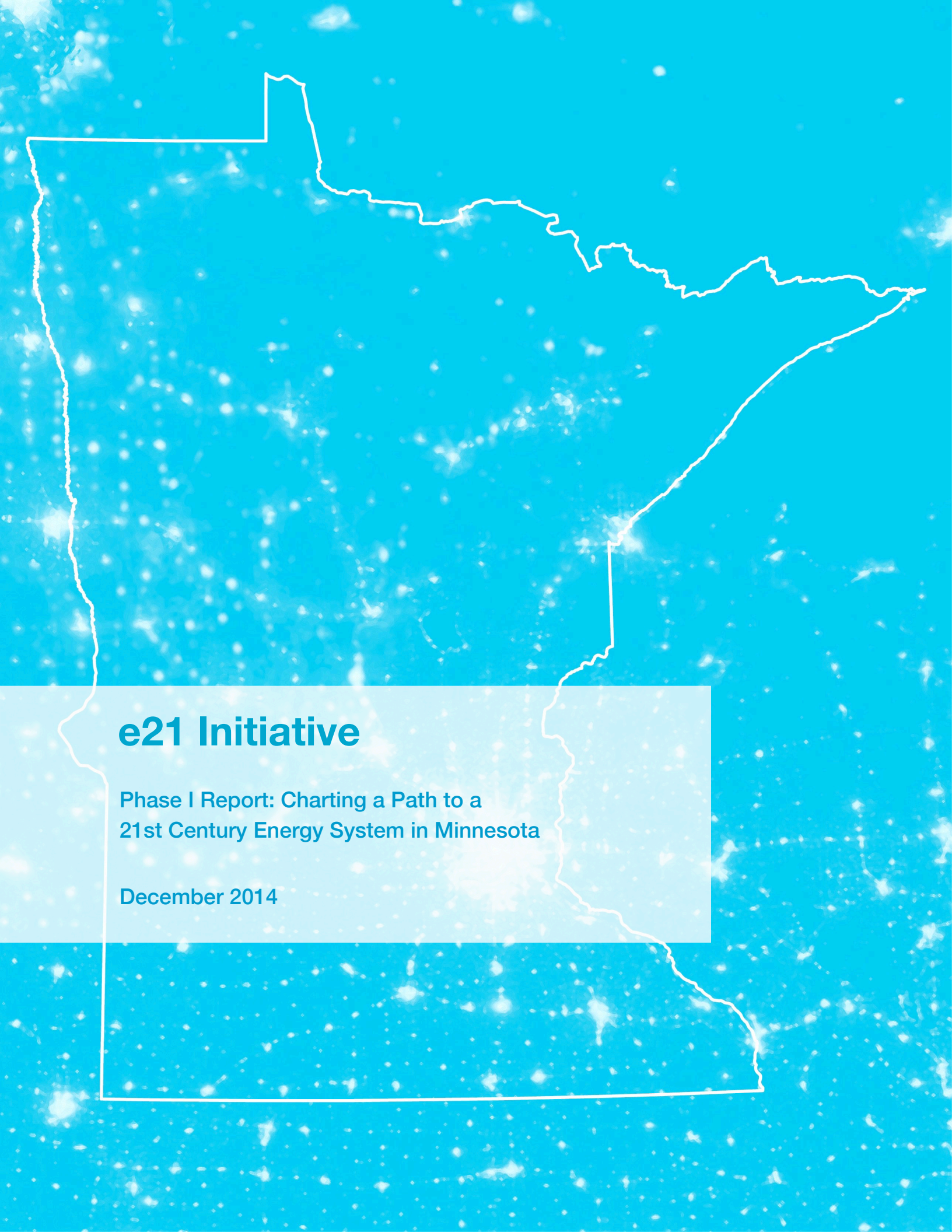

e21 Initiative

Phase I Report: Charting a Path to a 21st Century Energy System in Minnesota

December 2014

About the e21 Initiative

The e21 Initiative aims to develop a more customer-centric and sustainable framework for utility regulation in Minnesota that better aligns how utilities earn revenue with public policy goals, new customer expectations, and the changing technology landscape. The Initiative brings together key interests including utility, consumer advocate, energy technology, business, environmental, academic, and government to accomplish this goal and enable Minnesota to continue to lead in shaping an energy system for the 21st century.

The Great Plains Institute (GPI), Center for Energy and Environment (CEE), Energy Systems Consulting Services (ESCS), George Washington University Law School (GWU), Xcel Energy, and Minnesota Power convene the e21 Initiative.

The Energy Foundation, the Joyce Foundation, Xcel Energy and Minnesota Power have funded the e21 Initiative, with in-kind contributions from CEE, ESCS, and GWU.

Learn more at: www.betterenergy.org/projects/e21.

Cover page adapted from a NASA Earth Observatory image by Robert Simmon (2012), using Suomi NPP VIIRS data provided courtesy of Chris Elvidge (NOAA National Geophysical Data Center). The image is available here: http://earthobservatory.nasa.gov/Features/NightLights/.

About the Phase I Report

This report is written primarily for Minnesota's electric utility regulators, policymakers, organizations representing ratepayers, and others who have a stake in the direction of Minnesota's future energy system, and includes specific recommendations for statutory changes and regulatory action.

It is also e21's hope that this report is useful to others outside of Minnesota who are grappling with similar issues, albeit in their own context. Please refer to Appendix C to view a map of other efforts working on the 'utility of the future' in the United States.

To learn more about the e21 Initiative and how the recommendations were developed, please refer to the e21 Process section in Appendix A of this report.

When reading the e21 consensus recommendations, please note that these are intended as a cohesive *package* of ideas rather than as disparate options from which to pick and choose. In other words, the recommendations relate to and support one another, and only as a package do they reflect the consensus recommendation of e21 Participants. The Recommendations Background section provides detailed context and examples to describe the rationale and purpose of each recommendation.

Finally, since each utility in Minnesota is unique, the state's implementation of e21's recommendations should recognize the attributes and context within which each utility in Minnesota operates.

The report can be downloaded here: www.betterenergy.org/projects/e21

About the Authors

The preparation of this report was every bit as collaborative as the e21 process itself. It was primarily written and edited by Jennifer Christensen and Rolf Nordstrom at the Great Plains Institute, but based entirely on content developed by the e21 group.

Various portions of the report were written by e21 participants and synthesized by GPI. The report also benefitted from significant edits and refinements from many e21 participants and observers. The final product was co-created in the best possible sense and we are grateful to all who lent their time, experience, expertise, and resources to charting this new course.

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Table of Contents

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Executive Summary

A growing and fundamental misalignment exists between the traditional utility business model (and the regulatory framework that supports it), and the realities of today's marketplace and Minnesota's public policy goals. This is unsurprising since we have regulated utilities more or less the same way since roughly 1900, when the first state regulation of electric utilities emerged, just 20 years after Thomas Edison established the first centralized electric utility in New York.[1]

The e21 Initiative ("e21" stands for 21st Century Energy System) is a highly diverse and collaborative group of Minnesota leaders assembled by the Great Plains Institute to recommend ways to fix this misalignment and update the way we regulate utilities in two fundamental ways:

> *1) Shifting away from a utility business model that provides customers few options (everyone gets the same grid electricity produced largely with coal, natural gas, or nuclear power at large central stations) toward one that offers customers more options in how and where their energy is produced and how and when they use it; and*
>
> *2) Shifting away from a regulatory system that rewards the sale of electricity and building large, capital-intensive power plants and other facilities toward one that rewards utilities for achieving an agreed-upon set of performance outcomes that the public and customers want (e.g., energy efficiency, reliability, affordability, emissions reductions, predictable rates, etc.).*

In short, new customer expectations, public policy goals, and the changing utility marketplace are driving the need for a modern electric system that can support new ways for electricity to be generated, delivered, and used. These and other drivers will require the electric system to continue to be reliable, as well as become cleaner, more flexible, secure and resilient against attack and natural disaster, and able to empower customers to manage and reduce their energy costs. It will also become more distributed, flexible, intelligent, efficient, real-time controlled, and open to more participants. These technology, market, and policy forces are inexorable and will continue to transform the energy economy and technology landscape, impacting utilities and their customers in profound ways, both in Minnesota and elsewhere.

> ***In the face of this rapid change, e21 presents Minnesota with an opportunity to act in advance of any particular crisis and lead the nation in demonstrating how a new customer-centric, performance-based regulatory approach and utility business model can enable both economically viable utilities and achievement of public policy goals.***

Readers should view the consensus recommendations in this Phase I report as a cohesive *package* of ideas rather than as disparate options from which to pick and choose. In other words, the recommendations relate to and support one another, and only as a package do they reflect the consensus recommendations of e21 Participants.

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[1] Jim Lazar (March 2011), "Electricity Regulation in the U.S.: A Guide," Regulatory Assistance Project, available from: www.raponline.com.

Together they provide a broad framework, describing the overall arc of change needed, while acknowledging that there are many implementation details to be worked out in 2015 and beyond through stakeholder collaboration, outreach to policymakers, regulators and the public, and legislative and regulatory action.

e21 Guiding Principles

The e21 Initiative established the following consensus principles and e21 participants recommend that these principles guide any regulatory or statutory changes:

- *Align an economically viable utility model with state and federal public policy goals.*
- *Provide universal access to electricity services, including affordable services to low-income customers.*
- *Provide for just, reasonable, and competitive rates.*
- *Enable delivery of services and options that customers value.*
- *Recognize and fairly value grid services and "distributed energy resource" services.*
- *Assure system reliability, and enhance resilience and security, while addressing customer privacy concerns.*
- *Foster investment that optimizes economic and operational efficiency of the system as a whole.*
- *Reduce regulatory administrative costs where possible (e.g., results in fewer rate cases or otherwise reduce the burden of the regulatory process).*
- *Facilitate innovation and implementation of new technologies.*

e21 Consensus Recommendations

e21's recommendations for a new regulatory framework fall into four main categories:

- Performance-based Ratemaking;
- Customer Option and Rate Design Reforms;
- Planning Reforms; and
- Regulatory Process Reforms.

A new performance-based, more forward-looking approach to ratemaking and incentives. In place of today's frequent, costly—and by design adversarial—rate cases, e21 proposes that Minnesota provide an alternative option in which utilities that "opt in" are allowed to submit a forward-looking, performance-based business plan covering up to five years. This length of time will provide more predictable rates for customers and give utilities sufficient time to achieve the public outcomes they commit to in the plan.

This approach will also enable Minnesota utilities and stakeholders to work together to envision, plan for, and pay for the electric system they want versus the current framework that assesses, in an audit-like fashion, whether customers are paying the right amount for what utilities delivered (see Text Box 1 below).

As its name suggests, a performance-based approach would tie a portion of a utility's revenue to achieving an agreed-upon set of performance metrics (e.g., measuring such things as energy efficiency, customer service, environmental sustainability, affordability, and competitiveness) so that utilities have a natural financial incentive to produce the outcomes customers want.

Both are explained in more detail in the full report, but in brief the ***Business Plan*** would describe the investments the utility needs to make in order to operate effectively, how it will accomplish the agreed-upon performance metrics, and how costs will be allocated and recovered over the plan's term. It would also outline how the utility will modernize the grid, plan for and manage the addition of Distributed Energy Resources (e.g., solar PV, demand response, electric vehicles), optimize the system's overall efficiency, and the expenditures required to do so.

The proposed ***Integrated Resource Analysis (IRA)*** would replace the current Integrated Resource Plan (IRP). Still looking out 15 years or more (as with the current IRP), the IRA would capture all the informational benefits of the traditional IRP, but improve the process by fundamentally changing the way all parties to the regulatory process use the information the IRA contains. Instead of adjudicating every detail of the IRP (as is done now), the IRA would guide the five-year Business Plan and focus everyone's time and resources on getting that right, rather than arduously perfecting a 15-year IRP that is often out-of-date by the time state regulators finally approve it. The shift from preparing an Integrated Resource "Plan" to producing an "Analysis" may seem subtle, but the overall idea behind the IRA is to make resource planning more useful to regulators, utilities and intervenors, reduce overall regulatory burden and cost, and tie resource decisions more closely to the actual costs of maintaining the electric system and achieving the agreed upon performance outcomes.

Box 1. The e21 recommendations represent a new approach to ratemaking:

- **Current approach:** A cost-by-cost accounting to determine **whether we are paying the right amount for what utilities delivered.**
- **Proposed approach:** A performance-based, more forward-looking regulatory framework that determines **what we should pay to achieve the outcomes society wants.**

Customer Option and Rate Design Reforms

e21's recommendations support a shift to a more customer-centric framework that meets growing expectations of customers regarding service, product, and technology options by enabling:

- Delivery of services and options that customers value, while providing universal access to affordable service.
- Rate design reform, such as a review and adjustment of time-varying rates.
- Flexibility for utilities to offer tailored rate and service options that respond to unique customer needs and interests.
- Pilot programs or other methods to test, evaluate, and bring to market more quickly new service options, products, and technologies for customers.

Reforms to Regulatory Processes

In order to transition toward a performance-based regulatory framework, Minnesota regulators will need sufficient authority, resources, and tools. This includes, but is not limited to, exercising more fully their existing quasi-legislative authority where appropriate, engaging stakeholders in more collaborative and forward-looking processes, and initiating generic dockets on issues of statewide concern. e21's recommendations for reforming the regulatory process are intended to support more nimble and flexible decision-making that allows regulators to:

- Put forth policy solutions that are not entirely one party's position or another;
- Encourage proactive exploration of critical and emerging issues; and
- Support the development of forward-looking solutions through more collaborative stakeholder processes in advance of the quasi-judicial hearings that most often characterize regulatory proceedings and that will remain necessary for making official decisions and ensuring due process rights.

Planning for a Modern & Efficient Grid

e21's first phase raised many questions yet to be answered. One is how best to modernize Minnesota's electric grid, particularly the distribution system (as opposed to the bulk transmission system), since that is where many new technologies, such as solar, energy storage, and electric vehicles, will plug in.

The current electric grid—with its large centralized power plants and miles of transmission and distribution lines—relies on many technologies that originated more than a century ago with Edison and Westinghouse. The rapidly emerging modern grid looks much more distributed and decentralized, with many actors on the system sending electricity and data back and forth.

Proactively planning for an intelligent, flexible, nimble, efficient, open, and secure distribution system over the next several decades that can handle new distributed energy technologies and the complexity of many more actors on the system will require a coherent strategy. To develop this strategy, e21 recommends that Minnesota establish a distribution planning and grid modernization stakeholder process much like e21 itself. Such a process will help us understand where on the electric system new distributed energy technologies can provide the most value, how best to coordinate which technologies get put on the distribution system and when, and which distribution management systems and advanced control and

communications technologies we will need to enable seamless integration and interoperability of a wide variety of energy technologies and systems.

Desired Outcomes of the e21 Recommendations

The e21 recommendations presented in this report should position Minnesota to fix the misalignments described above and address key challenges, enabling our state to better achieve a wide range of desired outcomes (see table below).

ISSUE AREA	CHALLENGES TO THE CURRENT SYSTEM	DESIRED OUTCOMES
Utility Business Model	• The current model is leading to more frequent rate cases, higher rates for customers, and arguably insufficient revenue for utilities. The current model is not sustainable. • The current framework requires the utility and the regulators to engage in long, protracted, time and resource intensive quasi-litigation about how much a utility should spend or has spent to provide service. This framework is inefficient, opaque and expensive, not just for those two primary participants, but for everyone (e.g., intervenors, policymakers, customers). • Increasing energy efficiency and the falling costs of new technologies (e.g., solar) are eroding utilities' traditional sources of revenue. • The electric system requires significant reinvestment at a time when electric demand is flat or declining. • The current framework inhibits innovation by requiring long regulatory processes to bring new service options to customers.	• An economically viable utility business model that focuses on performance outcomes we want utilities to achieve on behalf of customers and the public. • A utility business model that supports energy efficiency, renewable energy, distributed energy resources, and advanced energy technologies. • A regulatory framework that enables a fair return for energy producers, an equitable allocation of costs for all customer classes, with as few stranded assets as possible during the transition. • Timely and predictable recovery of utilities' fixed costs that are not necessarily dependent on commodity sales, and more predictable rates for customers. • A regulatory framework that allows for collaborative, flexible approaches that puts the interests and expectations of customers at the heart of the business model.

ISSUE AREA	CHALLENGES TO THE CURRENT SYSTEM	DESIRED OUTCOMES
Customer Access, Options & Engagement	• A growing number of customers want to make decisions about their energy use, management, and in some cases, source of energy (wind, solar, coal). The current system offers customers few options or control. At the same time, other customers do not have the capacity or the desire to take a more active role in making energy decisions. • As electric customers become more efficient and some choose other sources of electricity (such as producing their own via solar), under the current utility business model, eroding sales could lead to higher charges for customers as utilities have fewer resources to cover fixed costs. • Rates for commercial and industrial customers are becoming increasingly uncompetitive.	• Delivery of services and options that customers value. • Universal access to electricity services that provide affordable service to low-income customers, while providing, where desired, more options. • Electricity users are encouraged and enabled to take advantage of all cost-effective energy efficiency and other opportunities to reduce demand for electricity. • Commercial and industrial customers are encouraged to partner with utilities on competitive rate options while leaving the Commission with discretion to ensure just and reasonable rates for all customers.
Customer Rates	• Flat or declining sales of electricity, the falling costs of alternatives to traditional grid power, and the need for significant reinvestment in the electric system create a “perfect storm” for frequent and unpredictable changes to rates.	• Customer rates are competitive, equitable, predictable, affordable, and transparent. • Cost-recovery mechanisms are stable and transparent, attracting capital at competitive rates.
System reliability, resilience, and security	• The electric system needs reinvestment in order to maintain and improve reliability; it will require additional investment to ensure that it can bounce back from increasingly frequent harsh weather and remain secure from cyber and physical attacks.	• A cleaner, more flexible grid that is reliable, resilient, and secure and enables customers to manage and reduce their energy costs.

ISSUE AREA	CHALLENGES TO THE CURRENT SYSTEM	DESIRED OUTCOMES
Public Policy	• The current utility business model is misaligned with achieving many local, state, and federal public policy goals. • State public policy calls for increasing energy efficiency, ramping up renewable energy, reducing greenhouse gasses (GHG's) by at least 80% by 2050, and encouraging a more "distributed" system that gives customers more options, but the current regulatory framework and grid itself are not yet designed to deliver those things. • The existing regulatory framework may make the U.S. EPA's proposed rule to reduce GHGs from power plants and other federal environmental regulation more difficult for utilities to meet.	• Minnesota is better positioned to meet state and federal public policy goals. • Utility and customer interests are aligned with the pursuit of Minnesota's goal of at least an 80% reduction in GHGs by 2050 and the transition to a sustainable, carbon-neutral energy system. • Reduced regulatory administration costs and resources, resulting in fewer rate cases or otherwise reducing any regulatory burden. • A "systems approach" to coordinating planning, operations, and energy markets across transmission, generation, distribution, and end use. • Maintain competitiveness of energy-intensive, trade-exposed industries.
Cost allocation & Recognition of value	• The current system is not set up to compensate actors on the system for the full range of benefits they offer (energy, capacity, voltage support, etc.) or charge them for the legitimate cost of the grid services they use. Without this "two-way street" being established, utilities will find it difficult to maintain the system and remain financially healthy. Moreover, the current system presents barriers to development and deployment of new technologies.	• Utilities, customers and service providers are compensated for the full range of services they provide. • Payments to and by participants on the system are aligned with the costs and benefits they impose and provide.
Innovation	• The existing utility business model and regulatory framework make it difficult to keep pace with technological change.	• Innovation is facilitated and new technologies are implemented to provide customer and system value.

e21 Recommendations

The e21 Initiative proposes shifting to a more customer-centric and sustainable framework for utility regulation in Minnesota that better enables innovation, new customer options, modernization of the grid, and achievement of policy goals.

The following recommendations, taken as a package, provide the blueprint for this new regulatory approach, and suggest a new utility business model that places less emphasis on selling an increasing amount of electricity and more on providing the energy services and options that meet customer expectations. The recommendations cover four broad areas of reform: performance-based ratemaking, customer options and rate design, planning, and regulatory processes.

(A) Allow a multi-year, performance-based regulatory framework for utilities that wish to opt-in. The e21 Initiative recommends that Minnesota should provide utilities the option of a multi-year, performance-based regulatory framework that bases a portion of a utility's revenue on the achievement of identified performance metrics that are quantifiable, verifiable, and align with e21's Guiding Principles and Outcomes. Performance metrics would measure such things as: total system efficiency, reliability, customer service, environmental sustainability, affordability, and competitiveness. In 2015, the e21 Initiative plans to flesh out the details of what these metrics are, how they can be measured, and what portion of a utility's revenue will depend on achieving them. Some of these metrics may be tied to utility revenue, and others not.

The main components of the multi-year, performance-based regulatory framework would be a utility Business Plan covering up to five years, guided by a 15-year (or longer) Integrated Resource Analysis (IRA) as outlined below:

(B) ***Require utilities that opt into a multi-year, performance-based framework to file a comprehensive Business Plan (covering up to 5 years) consistent with a 15-year (or longer) Integrated Resource Analysis (described in (C) below).*** This comprehensive Business Plan, filed with the Minnesota Public Utilities Commission, would replace the traditional rate case. Components of this business plan would include, but not be limited to:

1. *Resource adequacy and customer needs*. How the utility expects to meet resource adequacy requirements and customer needs.

2. *Investments and expenditures*. A description of the investments and expenditures a utility proposes to make in order to operate effectively and reliably, satisfy established policy goals, and accomplish the agreed-upon performance metrics over the years covered by the business plan.

3. *Performance metrics*. Proposed performance metrics and award and penalty mechanisms to be in effect during the plan's term, and the associated measurement and verification process.

4. *Cost recovery*. A description of how the utility will recover identified costs, including the process for annual rate adjustments and any additional adjustment mechanisms. Utilities should have the option of proposing fixed or formula-based annual rate adjustments or a combination of the two.

5. *Cost allocation*. How the utility proposes to allocate costs across classes and segments.

6. *Earnings-sharing*. Description of potential "earnings-sharing" opportunities in which both the utility and ratepayers could benefit.

7. *Grid modernization and system efficiency.* How the utility will enhance the distribution grid, plan for and manage the addition of distributed energy resources (DERs) to the system, and other investments needed to optimize the energy system's efficiency as a whole.

8. *Other information.* Other information the Commission deems necessary to approve the business plan.

Within the business plan, a utility should have flexibility to manage its spending and investments as it deems necessary to meet the established policy goals and performance metrics of the plan. This includes allowing utilities to add, cancel, and/or replace projects within a business plan.

(C) ***Revise Minnesota statutes to allow utilities that opt into a multi-year, performance-based framework to replace the current Integrated Resource Plan (IRP) with a 15-year (or longer) Integrated Resource Analysis (IRA) that guides the utility business plan; and allow utilities to coordinate the filings of the Business Plan and IRA.*** The IRA would consider all system resources and strategies for achieving state and federal regulatory and policy goals, setting the stage for and informing the business plan to be submitted simultaneously by the utility. Although the IRA would not be subject to the full regulatory process required of resource plans currently, the five-year action plan that is currently part of the Integrated Resource Plan would be included in the business plan and subject to full regulatory review. Utilities would update the IRA as the Commission deems necessary. Utilities would integrate an advisory committee of key stakeholders representing the broad public interest in the development of the IRA prior to filing, and/or develop other mechanisms for these stakeholders to have access to the same planning tools and information as the utility, while respecting confidentiality and trade secret issues, so that they can help shape the analysis and propose alternatives.

(D) ***The Commission should encourage the use of pilot programs or other methods for testing and evaluating components of a multi-year, performance-based framework,*** *including service options, products, and technologies. This approach would allow, for example, utilities to test what new service options customers want before going through lengthy, expensive regulatory proceedings.*

(E) ***The Commission should establish clear methods for determining the value of grid services and DER services, and set rates to:***

1. Fairly compensate customers;
2. Cover utilities' fixed costs of maintaining the system;
3. Provide clear price signals to encourage economically efficient choices; and
4. Send appropriate price signals to achieve the e21 Principles and Outcomes.

(F) ***The Commission should review and adjust time-varying rates for energy services so that they send more accurate and effective price signals.*** Customers currently have "on peak" and "off peak" options, but moving toward additional time-varying and location-based rates for some customers would improve the accuracy of price signals they receive and better reflect true costs. In keeping with e21 Principles and Outcomes, providing more options that signal actual time-of-day prices should not disadvantage low-income ratepayers.

(G) ***Enable innovative product and service options and technologies by revising Minnesota statutes and regulations.*** Utilities should be allowed, through streamlined statutory and/or regulatory means, the flexibility to offer tailored rate and service options that respond to unique customer needs and interests, where doing so brings economic and/or system efficiencies. Examples include, but are not limited to:

1. *Maintain competitiveness of energy-intensive, trade-exposed industries.* Keep energy-intensive, trade-exposed industries competitive, while ensuring just and reasonable rates. This could be accomplished through changes in statute that:
    a. Allow greater flexibility to establish special tariffs between these industries and utilities. Examples include fixed rates or market-based rates, which could include, for example, time, location, or other circumstance-based pricing.
    b. Facilitate partnerships among utilities and customers that foster initiatives beneficial to the system, such as on-site generation via elimination of certificate of need requirements where appropriate.
2. *Expand services and develop markets.* Empower utilities to expand services and develop additional markets that can be demonstrated to be in the public interest, such as electrification of transportation.

(H) ***The Commission and Department of Commerce should use their existing authorities to achieve e21 Principles and Outcomes; and review and recommend revisions to their authorities where needed.*** For example, in order to enable more proactive, nimble, and flexible decision-making, the Commission should make greater use of its existing authority to fashion policy solutions from the procedural record that are consistent with legislative direction but are not entirely one party's position or another's. The Commission and the Department should also identify areas where they may need more explicit legislative authority to accomplish e21 Principles and Outcomes, and should flag those issues for consideration by the Legislature and the Governor.

(I) ***The Minnesota Legislature should appropriate the resources necessary for the Commission and the Department to implement e21's recommendations*** and enable both agencies to carry out their respective duties in a timely and cost-effective manner.

(J) ***The Commission and the Department should institutionalize the practice of using a collaborative regulatory process*** where appropriate, while preserving due process protections, including the right to appeal to a regulatory or judicial decision maker. A more collaborative, multi-interest process may be lower cost, faster, and lead to better outcomes. This recommendation is linked to the need for adequate resources. The Commission and Department should:

1. Encourage the use of, and give additional weight to, settlement agreements among parties, as long as the Commission determines that the agreements are in the public interest.

2. Establish guidelines for what the Commission wants to see in any kind of negotiated settlement among interested parties.

3. Routinely use transparent dispute resolution processes facilitated by staff or others. An example includes technical conferences designed to reach consensus on some or all potentially disputed facts or policy issues in a given situation in order to narrow the issues in contention before entering the more formal docket process.

(K) ***The Commission and the Department should look for opportunities to initiate generic dockets*** in cases where doing so would enable more consistent policies statewide on issues of common concern to many. Using generic dockets could reduce the transaction costs of participating in the regulatory process for both intervenors and government agencies (which are required by statute to participate in dockets).

(L) ***Initiate forward-looking stakeholder processes.*** The Commission and the Department should use existing authorities to encourage and/or initiate forward-looking stakeholder processes, such as technical conferences and workshops, to address issues that merit deeper exploration and stakeholder dialogue, understanding that resources to do this are a constraint.

(M) ***Develop a transparent, forward-looking, integrated process for modernizing the grid.*** This should include identifying how to achieve a more flexible distribution system that can efficiently and reliably integrate cost-effective distributed energy resources (e.g., efficiency, demand response, distributed generation, distributed intelligence, etc.).

(N) ***Identify and develop opportunities to reduce customer costs by improving overall grid efficiency.*** In Minnesota, the total electric system utilization is approximately 55 percent (average demand divided by peak demand), thus providing an opportunity to reduce system costs by better utilizing existing system assets (e.g., generation, wires, etc.).

Recommendations Background

This section provides detailed context and examples to describe the rationale and purpose of each e21 recommendation.

(A) A multi-year, performance-based regulatory framework. This core recommendation addresses the need to shift from a regulatory system that rewards utilities for selling more electricity and building capital-intensive facilities and infrastructure (e.g., large, central station power plants) toward one that rewards utilities for achieving an agreed-upon set of performance outcomes.

After serving Minnesota well for more than 100 years, it has become clear that the way we regulate utilities—and the two main ways they earn revenue—have become increasingly misaligned with both customer demands (e.g., for more choice in how and where their energy is produced) and with public policy goals calling for more energy efficiency (i.e., lower sales of electricity) and a cleaner, more distributed energy system. The way we regulate utilities made sense when growing electricity use was seen as an indicator of a healthy economy and the focus was on serving vast geographic areas with large centralized plants.

But today, one can have robust economic growth without necessarily using more electricity. This is driven partly by public policy and partly by technological innovation such as LED lights and increasingly efficient appliances and by the dramatic reduction in the costs of new more decentralized technologies, such as solar. As a result, a growing number of customers are interested in managing – and even producing – their own electricity.

These increases in energy efficiency and distributed energy technologies are translating into even lower sales of electricity and less need for capital-intensive, central station power plants—again, the two principal ways utilities currently earn revenue.

At the same time that utilities are faced with this inexorable erosion of their traditional sources of revenue, they are obligated to continue to invest in the electric system, much of which is in need of replacement and upgrades. Utilities will also need to make significant investments to enable new capabilities and technologies, particularly in the distribution system. It has been estimated that by 2030, the U.S. electric utility industry will need to make a total infrastructure investment of $1.5 trillion to $2.0 trillion.[2]

Left unchanged, the current regulatory framework and utility business model will become increasingly unsustainable, yielding more frequent rate cases, unpredictable rates for customers, and likely insufficient revenue for utilities.

Frequent rate cases are not only time-consuming and expensive for everyone involved—utilities, intervenors, and regulators (and ultimately ratepayers) — but also reduce the amount of time and resources utilities can devote to developing the products and services that customers are increasingly demanding. In this way, rate cases impose an opportunity cost.

Instead of rewarding performance, the current framework assesses in an audit-like

[2] Marc W. Chupka, Robert Earle, Peter Fox-Penner, Ryan Hledik, the Brattle Group (November 2008), "Transforming America's Power Industry," prepared for Edison Electric Institute, available at: www.edisonfoundation.net.

fashion whether customers are paying the right amount for what utilities delivered.

This recommendation recognizes that what is needed is a new regulatory framework that rewards utilities for achieving agreed-upon performance outcomes.

The two main requirements for a utility that decides to opt in to the proposed performance-based framework will include filing with the Minnesota Public Utilities Commission (Commission) the following:

- *A Business Plan.*
- *An Integrated Resource Analysis.*

(B) Business Plan. The business plan would provide a comprehensive picture of a utility's expected investments and expenditures, how it will meet resource adequacy requirements, customer needs, agreed-upon performance metrics, and how costs would be allocated and recovered over a term of up to five years. The plan will also detail how a utility intends to invest in the distribution system and otherwise support and optimize an increasingly modernized grid. In other words, the business plan describes what specific outcomes a utility would deliver over a five-year term, and how it proposes to achieve and pay for those outcomes.

The business plan would serve as a replacement for the conventional rate case, but would contain all the information necessary to appropriately set rates.

The benefits of a longer, multi-year term are several and include, but are not limited to:

- Increased "marketing flexibility"[3] for utilities that can result in tailored rates, new services, and innovative products that meet customer needs, provide more customer options, and support achievement of agreed-upon performance metrics.
- Reduced regulatory burden – and associated costs – by replacing the need for frequent rate cases with a more predictable, longer-term plan for rates.

Given its benefits, using a multi-year term for rates is the most common approach to alternative regulation used across the world.[4]

To account for changes within the multi-year term of the business plan, the Commission will need to establish a process for rate adjustments (e.g., annual rate adjustments to account for changes in costs). The Commission should allow utilities to propose fixed or formula-based annual rate adjustments or a combination of the two. If a formula is used, it should incent operational efficiency and allow for appropriate Commission review.

Furthermore, the regulatory approach should allow rate adjustments for capital investment and/or expenses that cannot be otherwise accommodated within the framework, including significant costs incurred as a result of exogenous events (e.g., natural disasters, changes in law, etc.). For example, adjustments are commonly used to address material cost impacts from exogenous events that cannot be accommodated within an approved plan.[5]

Under the multi-year, performance-based ratemaking approach envisioned, utilities would participate voluntarily. The approach would provide clear incentives to Minnesota utilities that opt in to deliver on desired outcomes, including those related to customer needs, public policy goals, and innovation.

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[3] Dr. Mark Newton Lowry, Pacific Economics Group Research LLC (September 2014), "PBR for the Electric 'Utility of the Future'," presented to the e21 Initiative, available here: http://www.betterenergy.org/publications/lowry-e21-pbr

[4] Ibid.

[5] This is often referred to as a 'Z-factor' adjustment.

This approach can be designed to encourage utilities to maximize cost efficiency, enhance customer products and service, and deliver on a range of other performance outcomes by tying a portion of utility revenue to achieving them, in areas such as: reliability, total system efficiency, customer service, environmental sustainability, affordability, and competitiveness.

In 2015, the e21 Initiative plans to specify the important details of what these metrics are, how they can be measured, and what portion of a utility's revenue will depend on achieving them (see details in 'Next Steps'). Some of these metrics may be tied to utility revenue, while others would not.

To protect ratepayers against the potential for utilities over-earning within this framework, regulators can put in place an earnings-sharing mechanism in which both utilities and ratepayers benefit.[6] A useful historical example of this is the Metropolitan Emissions Reduction Plan (MERP) proposed by Xcel Energy, supported by an e21-like group of stakeholders, and approved by the Commission in 2002. The final MERP plan included a specific incentive for the utility to complete the project under its proposed capital budget for converting two coal plants to natural gas. When the utility in fact achieved that outcome, ratepayers paid less and the utility received a higher return.

Taken as a whole, the business plan will enable utilities to anticipate and deliver on the performance outcomes Minnesota wants utilities to achieve that are in the public interest.

(C) Integrated Resource Analysis (IRA). Under the existing system, utilities file Integrated Resource Plans (IRPs) that provide a 15-year (or longer) look at the utility's expected load forecast (future demand for electricity) and resources planned to meet that demand, plus a five-year action plan that details the investments and actions the utility plans to undertake to ensure that it can meet electricity demand in the nearer-term.

While the traditional IRP contains valuable information, it often takes so long to adjudicate all the details that it is either obsolete or has changed multiple times by the time the Commission considers and approves the Plan. Through no fault on the part of any one actor in the system, utilities, regulators, ratepayer advocates, and other intervenors spend large amounts of time on the IRP, only to re-litigate the same details in subsequent dockets (e.g., rate cases, certificate of need proceedings, rate rider requests).

The proposed Integrated Resource Analysis (IRA) is meant to capture all the informational benefits of the traditional IRP, but improve the process by fundamentally changing the way all parties to the regulatory process *use* the information the IRA contains, so that relevant facts are hammered out, and then used to guide a utility's business plan and the Commission's rate-setting.

To ensure appropriate stakeholder and regulatory evaluation of the IRA, a utility that opts in to this framework would be required to engage a broad group of stakeholders up front, prior to filing the IRA, so that all interested parties have the opportunity to inform and shape the analysis.

The shift from preparing an Integrated Resource "Plan" to producing an "Analysis" may seem subtle, but the overall idea behind the IRA is to make resource planning more useful to regulators, utilities, and intervenors, reduce overall regulatory burden, and tie resource decisions more closely to the actual costs of maintaining the reliability of the electric system.

Utilities that opt in to a performance-based, multi-year regulatory framework would still prepare the five-year action plan component of current IRPs and it would be part of and

[6] Regulatory Assistance Project at 17 (Dec. 2000), "Performance-Based Regulation for Distribution Utilities," available at: www.raponline.org.

inform its multi-year business plan. Sales forecasts, load and capability projections, and RES/EE compliance over that time would be included in the business plan filing, and would still follow the regulatory process and be subject to Commission approval.

The IRA would still be scrutinized by regulators for completeness, but would not be subject to the full discovery and approval process that traditional IRPs currently undergo.[7]

(D) Pilot programs. The rationale behind this recommendation is that both customers and utilities would benefit from a new regulatory framework in which regulators give their support up-front for utilities to pilot, test, and modify new customer options more quickly, and see what new service offerings are successful with a test group of customers before expanding to all customers. This does not mean giving utilities a blank check to develop whatever products they choose, but rather it means establishing a framework within which utilities can innovate. This approach would allow utilities to be more responsive to customers and more nimble in response to changing market demands.

The existing Conservation Improvement Program (CIP) offers a useful example of the type of regulatory flexibility the e21 Initiative contemplates and what the regulatory system could do more of. The regulatory requirements that govern CIP make it relatively quick and easy to add new programs and features or change existing ones. Offering a new product under CIP takes just 2-3 months, as opposed to a year or more for a typical regulatory proceeding.

e21 participants understand that for some new products (e.g., the creation of solar gardens), extra time may be warranted; but for things such as new tailored rates for particular customer segments or renewable energy-only options, everyone would benefit from allowing utilities to bring those to products to market more quickly—within certain pre-established guidelines.

Examples of the kind of pilot programs, demonstration projects, or accelerated deployments that a more CIP-like approach could enable include:

- Renewable energy rate options that provide renewable energy at prices close to existing General Service and Time-of-Day rates.
- Providing interested customers more detailed data on their energy use and the ability to better control how and when they use energy.
- Accelerated LED street lighting, in which there is growing community interest.

In this more nimble approach, if utilities offer a new option that customers like and demand is significant, the Commission could add additional oversight if deemed necessary. If customers don't respond to a new service offering, the utility should be allowed to withdraw it from the marketplace. Without this space for testing ideas that other innovative businesses have, utilities and customers will both lose out.

(E) Value of grid and DER services. A fundamental shift in the way the electric grid works is already underway. The conventional electric grid we have all come to know moves electricity in one direction—from centralized power stations through transmission lines, substations and distribution lines to Minnesota's homes and businesses. The modern grid that is quickly emerging looks much more distributed and decentralized, with many actors on the system sending electricity and data back and forth. This new electric grid is being driven largely by changes in consumer preferences, improvements in energy technology, and sharp declines in their cost —for example modular solar technologies that enable households and institutions to produce their own power.

[7] Available at: https://www.revisor.mn.gov/rules/?id=7843.0400

Distributed energy resources (DERs) are supply and demand side resources that can be used throughout an electric distribution system (i.e., on either the customer side or on the utility side of the customer meter) to meet energy and reliability needs of customers. They include end-use efficiency, distributed generation (solar PV, combined heat and power, small wind), distributed flexibility and storage (demand response, electric vehicles, thermal storage, battery storage), and distributed intelligence (communications and control technologies).

An integrated system of distributed resources can provide new and not yet recognized values as well as new and not yet resolved challenges to distribution systems and regulatory approaches that were designed for conventional resources.

To encourage the installation of distributed generation, "net metering" programs credit customers for the electricity they export, often at retail rates. The certainty and simplicity of retail net metering has led to its adoption in forty-three states. Some supporters of DER technologies are strongly in favor of net metering, believing that it makes the financial proposition of distributed electricity generation more attractive since customers are guaranteed to sell any excess electricity at the going retail rate. However, others have argued that net metering raises a fairness question about whether (and how much) producers of their own electricity should continue to pay for maintaining the existing electric grid that benefits everyone.

In Minnesota, investor-owned utilities may apply to the Public Utilities Commission for a Value of Solar (VOS) tariff as an alternative to net metering for distributed solar PV. The VOS tariff compensates the customer through a bill credit for the value of electricity produced (to the utility, its customers, and society) using the established Minnesota VOS methodology, and the customer is charged for all electricity usage under the existing applicable tariff. As technologies continue to evolve, the challenge of valuing grid and DER services will expand beyond distributed solar.

Energy storage provides an example of the need to appropriately compensate services provided by both the grid and forms of DER. Energy storage technologies have potential to provide the grid with a wide range of services for which there is a value but often no current way to compensate those who might deliver these services, including so-called spinning or non-spinning reserves, fast ramping when electricity demand goes up or down, peak load shaving and demand shifting, frequency regulation and voltage support, black start capability, the ability to store renewable energy and deliver it later, when needed, and more. On the flip side, providers of energy storage or any other distributed energy resource (e.g., rooftop solar) benefit from the existence and function of the electricity grid itself.

The grid not only provides reliable back-up power should the customer's own system fail, but it provides the means for the customer to sell excess electricity. The grid can also act as a kind of shock absorber, smoothing out the voltage and frequency disturbances that might otherwise be caused by hundreds or thousands of actors taking and delivering electricity at any given time.

The e21 stakeholder group recognizes—as stated in the guiding principles—that society still needs the services that the electric grid provides and should help pay for them; and that providers of various kinds of DERs also provide quantifiable benefits that should be compensated.

A key step in e21's Phase II will be to develop greater clarity on who should pay for what, and be compensated for what on both ends of the economic transactions that will inevitably take place as part of a more decentralized electric system with many more actors and complexity.

As part of this, e21 recognizes and will learn from the significant work done on the value of solar in Minnesota.[8]

(F) Time varying rates. Economics 101 dictates that the price of any good or service should reflect the true costs of providing it—if the price is artificially low then people will over-consume and if the price is artificially high they will under-consume. Thus, by providing more accurate price signals to customers, time-varying rates are an important tool for managing an increasingly complex electric grid with many more participating actors on it.

Of particular benefit are peak-pricing rates that apply for only a short period of time when electricity demand is highest. If applied fairly and with some advance notice to customers, such rates can significantly reduce the system's peak demand, leading to more efficient use of the system's existing capacity and avoiding the need for new power plants just to meet peak demand.[9] Similar to sizing parking lots to accommodate a small number of high-volume shopping days per year, the existing regulatory framework and rate structure leads to a system design that results in some units only being used during the few peak demand hours of the year. Not having to build additional gas-fired, traditional "peaking plants" will simultaneously save customers money and reduce emissions.

Influencing the amount and timing of electricity use (often called load management) through such means as time-varying rates provides a wide range of benefits, from saving money for the system as a whole to enable increasing amounts of renewable resources onto the grid to reduce greenhouse gases. This is because load management, when it can be relied upon to deliver, can be used as an alternative (at least in part) to peaking plants as a means to keep both demand for electricity and generation of electricity in balance when the output of intermittent renewable resources changes.[10]

Time-varying rates may also expand customer options and facilitate desirable customer participation in energy markets. For example, time-varying rates can alert customers to opportunities for lowering their current cost of power or signal when is the best time to plug an electric vehicle or sell electricity or other ancillary services back to the grid in order to fetch the best price. Technological advances can assist customers in responding appropriately to time-varying rates. For example, thermostats and appliances that can accept price signals from the grid are increasingly available to residential customers. Time-varying rates may not be suitable for all customers, such as those with low usage or limited ability to adapt and shift load. But advanced metering makes it feasible within different classes of customers to identify sub-groups that have similar characteristics and design rates applicable to those sub-groups.

This recommendation could enable the utility to make time-varying rates available to suitable customers, particularly those open to innovative, technology-driven adaptation of their usage patterns, while preserving simpler rate options for customers who use little power or have limited options for adaptation.

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[8] Minnesota Value of Solar tariff methodology, available at: http://mn.gov/commerce/energy/topics/resources/energy-legislation-initiatives/value-of-solar-tariff-methodology%20.jsp

[9] Carl Linvill, John Shenot, Jim Lazar (November 2013), "Designing Distributed Generation Tariffs Well," Regulatory Assistance Project at 39, available at: www.raponline.com.

[10] Jim Lazar, "Teaching the Duck to Fly," Regulatory Assistance Project (January 2014), available at: www.raponline.com.

(G) Innovative product and service options and technologies. Energy technologies and customer demands are evolving quickly. To keep pace, utilities need to be better equipped to offer tailored products and service options and technologies to meet the unique needs and interests of their customers. e21's recommendations highlight some examples, described below, that illustrate how tailored rate and service options would provide significant benefits to Minnesota customers.

Competitiveness of energy-intensive, trade-exposed industries. Since 2007, industrial rates in Minnesota have gone from below the national average to above it. According to the U.S. Energy Information Administration, Minnesota ranks 31st out of 50 states for industrial electric utility rates as of 2012. In 1990, Minnesota was ranked 15th out of 50 states.

This precipitous drop in competitiveness, which will likely continue absent attention by policymakers, is not sustainable for energy-intensive, trade-exposed industry. For these businesses, the cost of energy is a factor that influences investment and operation – the cost of energy for some Minnesota businesses is roughly 25% of their overall cost of production. This is not a cost that businesses operating in a global marketplace can pass on to customers.

Fair, predictable, and competitive utility rates are therefore critical to job retention, business development, and job growth in Minnesota. This is especially true as we grapple with aging electric plants and other infrastructure and new and existing federal and state regulations – all of which is fueling a utility investment cycle at a time of low to no sales growth.

Two statutes – the Competitive Rate Statute and the Area Development Statute – were designed to keep rates competitive and incentivize economic development. However, neither has been an effective tool, especially in controlling the sharp increase in electric rates - some customers have experienced a 60% increase in rates since 2007.

Minnesota Statutes § 216B.162 (the Competitive Rate Statute) provides for competitive rate schedules for customers with connected loads of at least 2MW, but they are rarely if ever used. The idea is that if a large-load customer had an alternative to meet its energy requirements from a non-rate regulated energy supplier at a more affordable rate, the utility could offer the competitive rate, but only under certain conditions after the Commission makes required findings. Among them, the Commission, after considering the environmental and socioeconomic impacts, must determine that offering the competitive rate is in the best interests of all other classes of customers. Given utilities' exclusive service territories and the lack of customer options when it comes to who provides their electricity, meeting the burden required for implementation of the Competitive Rate Statute is arduous.

Minnesota Statute § 216B.161 (the Area Development Statute) allows utilities to incorporate area development rates into their tariffs. But such a tariff can only apply to new or expanding customers. In effect, neither the Competitive Rate Statute nor the Area Development Statute provides the intended relief to existing and captive customers that do not have plans for expansion.

Generally speaking, energy-intensive, trade-exposed customers are significant employers, providing tax base and ancillary employment to their respective communities and regions. But this value can be lost if these customers are forced to shift production to other locations around the country and world due to the ever-increasing cost of production.

To help ensure this value remains in Minnesota, e21 proposes modification of existing law to provide energy-intensive, trade-exposed industries the flexibility to negotiate tailored rates with the utility providing service to those customers. These

rates would be subject to approval by the Commission, thereby ensuring the rates remain just and reasonable.

Examples of such a statutory change would be to specifically allow energy-intensive, trade-exposed industry to negotiate fixed rates or market-based rates (e.g., time, location, or other circumstance-based pricing). While such an option may appear to provide for a discount to existing or future generally applicable tariff rates, any discount would reflect the risk the energy-intensive trade-exposed customer is willing to accept via a fixed or market-based rate.

Another example of an innovative service option, e21 recommends that Minnesota law and regulation should encourage utilities and customers to explore on-site generation partnerships that are beneficial to the electric system as a whole. To make this possible, e21 recommends modifying existing law to eliminate the Certificate of Need requirements and streamline other regulatory requirements for such installations. Such a statutory change could provide a platform for utilities and customers to construct new generation facilities that take advantage of economies of scale and manage load on a utility's system to better accommodate new and increasingly variable forms of generation.

Expand services and develop markets. The Commission and Department of Commerce should look for opportunities to allow utilities to expend some ratepayer funds, along with shareholder funds, to develop new socially beneficial markets for electricity.

While e21's recommendation is technology agnostic, one of the biggest opportunities for Minnesota may be the electrification of transportation, including EV passenger cars, light rail, and fully electric buses (now being researched by Metro Transit). e21 recommends that regulators allow utilities to identify and propose ways to encourage adoption and use of technologies and new markets that offer the greatest net social benefits.

Enabling utilities to be partners in developing new markets for electricity-using products may not only provide greater financial stability for utilities but also deliver societal benefits including jobs, economic multipliers, healthier air, quieter transit (in the case of electric buses and light rail) and perhaps retention of some of the $18 billion sent out of state for energy each year.

(H) Regulatory authorities. The Commission has both quasi-judicial and quasi-legislative powers. It uses its judicial powers to make decisions in proceedings that have complex factual disputes, such as rate proceedings and certificates of need. The Commission has in the past used its quasi-legislative powers to develop rules that guide its processes and decisions.

In recent years, however, the Commission has been faced with many unique issues and requests from regulated utilities and stakeholders that may not fit neatly into existing Commission rules and processes. Many of these instances call for policy decisions (made within the legal framework the Commission is given by the Legislature) rather than strict determinations of fact.

Issues that don't fit neatly into existing Commission rules and processes crop up regularly in utility resource planning and resource cost recovery proceedings. An example of this is the miscellaneous tariff filings required to implement new programs driven by legislation.

What is typically, by design, an adversarial hearing process often doesn't lend itself to dealing effectively with such policy-oriented issues. For example, deciding how best to handle the implementation of renewable energy or low-income programs is usually not well served by simply choosing one position or another. As issues become more complex, a better role for the Commission may be in fashioning compromise solutions that balance the interests of all parties, a practice which the Commission has encouraged on occasion, but sporadically.

Developing these "highest common denominator" solutions more frequently will require a more active role on the part of Commissioners and staff. The Commission could, for example, hold informal hearings where all stakeholders present their positions and the Commission provides guidance and direction for the parties to take away and either revise their proposals or attempt to find common ground. Staff could facilitate settlement discussions or propose creative solutions for Commission consideration, keeping in mind that a record to support a Commission decision must always be created and maintained.

In some cases, this could be done with more generic policy proceedings where the Commission provides general direction on how it would like utilities to handle a new issue. Other times, it could apply to more specific proposals that need additional shaping to meet public interest standards.

Through this recommendation, e21 intends to promote a more interactive process of Commission decision-making that facilitates "win-win" solutions, as opposed to the current more linear, one-side-wins approach.

(I) Appropriation of Resources. Evolving the 100-year-old-plus regulatory framework from one in which customers have few options toward a more customer-centric paradigm will place new demands on Minnesota's regulatory agencies, particularly during the transition.

Both the Commission and Department will need additional resources if they are to guide this transition to a new framework and carry out their duties in a timely and cost-effective manner.

To that end, the Minnesota Legislature should appropriate additional resources to the Commission and Department beyond amounts appropriated in the previous biennium.

(J) Collaborative regulatory process. This recommendation seeks to strengthen the regulatory structure while saving resources, time, and money, minimizing the potential for litigation, and maximizing the potential for universal support of policies that are in the public interest and mutually beneficial to utilities, ratepayers, intervenors, and other stakeholders.

The current regulatory system is predominantly adversarial, and not designed to be a collective, problem-solving process. Although in some instances, a few parties in a proceeding might enter into a settlement, these are typically not inclusive, and global settlements among all parties reached through a collaborative process have not been encouraged and therefore rarely, if ever, occur.

The current regulatory framework has layers upon layers of process, regulatory oversight, and interventions, with the vast majority of information sharing being conducted via written arguments. Disgruntled parties may appeal for reconsideration and, subsequently, judicial review, and issues solved via the current process are often reargued in subsequent cases.

This framework was deemed necessary both for the protection of ratepayers against being taken advantage of by monopoly utilities and to ensure development of an appropriate record for Commission decisions.

However, in today's quickly changing environment, over-reliance on a regulatory process that, by its current design, is adversarial, may not always produce the best outcomes or support utilities in delivering new, innovative service offerings to customers in a timely way.

Providing an alternative regulatory path that is more collaborative and consultative up front may make the transition that e21 is proposing smoother. The thrust of e21 is to shift to a more customer-centric, outcome-based regulatory approach, which lends itself to a collaborative process wherein all

parties agree on outcomes, measurements, and methodologies.

(K) Generic dockets. The Commission and Department should look for opportunities to initiate generic dockets in cases where the practices of one utility affect other interests in the state. Doing so would enable more consistent policies statewide on issues of common concern to many, and reduce the transaction costs of participating in the regulatory process for intervenors.

Under the current regulatory system, issues that affect all utilities and all ratepayers statewide infrequently result in the opening of a docket that addresses the generic matter and involves all utilities and stakeholders.

This recommendation seeks to institute a more regular process to involve all affected parties in broad issues that may be raised formally by a single party. It rests on the presumption that issues affecting utilities, ratepayers, and stakeholders statewide might be best solved through an inclusive, collaborative, problem-solving process that reaches a resolution which all parties can support.

(L) Forward-looking stakeholder processes. Implementing this report's recommendations will require proactive exploration of emerging issues and developing forward-looking solutions with stakeholders.

Developing this new regulatory approach will require just such stakeholder processes that enable regulators, customers, utilities, and others to spend more time learning from one another in collaborative forums and allowing creative solutions to specific issues to arise and be implemented. This will increase customer satisfaction with both utilities and their regulators.

(M) Grid Modernization Process. The current electric grid relies on many technologies that originated centuries ago with Edison and Westinghouse.

This recommendation seeks to initiate the development of forward-looking distribution planning and timely grid modernization through a robust, well-informed stakeholder process, which could include workshops and technical conferences.

Customer demands and public policy requirements are driving the need for a modern grid that will support new ways in which electric energy will be generated, delivered, and used. The modern grid will be cleaner and reliable, more flexible, and will enable customers to manage and reduce their energy costs. This will also require the electric system to become more distributed, intelligent, efficient, real-time controlled, open *and* secure, and resilient against attack and natural disaster.

Proactive, forward-looking planning of the distribution system over the next several decades will include evaluating the extent to which the system can reliably and cost-effectively:

- Integrate a high level of distributed energy resources (both supply- and demand-side);
- Accommodate and support active participation by customers;
- Manage two-way flows of electricity and data; and,
- Ultimately provide seamless integration and interoperability of varied systems and components.

All of the above will require implementing modern distribution management systems including advanced control and communications.

(N) Grid Efficiency. The basic design of the electric grid has remained largely the same throughout its history. Electricity is generated remotely at large central stations, transmitted large distances with high voltage lines, and then reduced in voltage for local distribution system delivery to the customers.

The system is planned and operated to meet the instantaneous demand of customers plus an additional reserve for unexpected power plant and/or transmission line outages.

This historical approach has developed due to a combination of limited generation technologies, inelastic customer demand and, in the pre-digital era, very minimal information, communications, and control technology.

Thus the grid is designed to meet retail peak demand, which is nearly twice the average load. This results in significant underutilization of much of the grid most of the time.

In Minnesota, the total electric system utilization is approximately 55 percent (average demand divided by peak demand), providing opportunity to reduce system costs by better utilizing existing system assets (e.g., generation, wires, etc.).

There are a number of potential opportunities to improve the overall grid efficiency. For example, more responsive demand would improve grid efficiency and reduce overall costs. One approach could be, in areas with advanced metering technology, to transition to time-varying rates.

e21's Next Steps - The Plan for Phase II

e21 participants understood from the beginning of the project in February 2014 that evolving Minnesota's 100-year-old-plus regulatory framework would be neither simple nor fast. The initial recommendations outlined in this Phase I Report propose a new blueprint for regulating utilities in Minnesota. But as with any blueprint, the building still needs to be built. That is what e21's second phase will be about. Phase II begins the hard work of "sweating the details" to place Minnesota on a predictable, step-wise path toward implementing e21's recommendations.

The precise timeline of the e21 Initiative's second phase depends on several factors, including:

1. Endorsement of the process by the Minnesota Public Utilities Commission;
2. The willingness of participants to continue devoting time and energy to the effort;
3. Funding to support the process; and
4. The speed with which e21 participants—and others to be engaged during Phase II—are able to work out the details of implementing a multi-year, performance-based regulatory approach.

Expected Activities & Outcomes

In its second phase, the e21 Initiative expects to work with the Commission, Department, e21 stakeholders, and others to further develop the implementation strategies and details for Phase I recommendations and tackle issues raised in Phase I but not yet fully addressed by e21. Multi-interest stakeholder processes, such as e21, should be used in the near-term to work out the details of implementing the multi-year, performance-based regulatory framework recommended in this report, including but not limited to:

1. Identification of performance metrics that are quantifiable, verifiable, and align with e21 Principles and Outcomes;
2. The percentage of a utility's revenue that should be tied to achieving these performance metrics, and any penalties for failing to achieve them, or additional incentives for exceeding them;
3. Additional questions raised by the proposed Integrated Resource Analysis;[11] and
4. The planning needed to identify grid modernization investments or new services that would facilitate achieving e21 Principles and Outcomes.

e21 expects to leverage the diversity of the e21 stakeholder group to build an even broader and more diverse coalition of interests to support and advocate for e21's recommended changes to the policy and regulatory framework in a stepwise fashion over time. This would include engaging participants in the Citizens League's electricity project.

As part of this broadening of the process, e21 may also:

1. Organize and host a "roll-out event" in Minnesota that shares more broadly with key interests what the e21 process produced.

[11] See Appendix B for the list of questions.

2. Conduct smaller, targeted meetings with key constituents who were not directly represented in the e21 stakeholder process, but who are affected by the recommendations and important to effective and timely implementation of the results.
3. Organize other outreach activities in Minnesota and nationally.

We look forward to discussion with the Commission, Department and other stakeholders to determine the most appropriate forum, timeline, and audience for continued dialogue.

Conclusion: Toward a Modern Energy System

Minnesota has an opportunity to lead the nation in preparing for a more modern, customer-centric, cleaner energy system. e21's performance-based regulatory framework will enable new technology and deliver more options and value, while protecting those who simply need and want electricity at an affordable price.

Instead of rewarding utilities for selling more electricity and building capital-intensive facilities, the proposed regulatory framework would allow utilities to earn revenue by delivering the outcomes Minnesotans want.

Minnesota is not alone in this quest.[12] Establishing a regulatory framework and utility business model that can keep up with technological change in the energy sector and maintain secure, reliable, sustainable, and affordable energy is a truly national and global challenge.

[12] See Appendix B: Map of US Projects Working on the Future of Electric Utilities.

Appendix A: The e21 Process

Launched in February 2014, a diverse set of stakeholders have met monthly to develop recommendations for evolving the regulatory system in Minnesota so that it better aligns how utilities earn revenue with new customer expectations and public policy goals. The e21 Initiative project team, participants, and observers represent key Minnesota interests including utility, consumer advocate, energy technology, business, environmental, academic, government and others.

A shared understanding of the current state and plausible futures

To identify what changes might be necessary to Minnesota's legal and regulatory framework, the e21 Initiative went through a process called 'transformative scenario planning.'[13] This helped e21 participants think through the threats, opportunities, and choices presented by energy scenarios that could plausibly occur in the future (not necessarily what any one interest would want to happen). This process enabled participants to understand how others viewed the current state of affairs and what potential futures they envisioned, and the associated challenges and opportunities of different futures.

Grounding the process in a common base of knowledge

As part of developing a shared understanding of "the current state," the e21 Initiative developed a series of working papers to provide detailed background information and cultivate a common base of knowledge on which to build. These foundational documents include the following:

- *Overview of the Current Utility Business Model in Minnesota.* Provides an overview of Minnesota utilities' business models, which operate in a regulated market under a cost-of-service regulatory framework.
- *Challenges and Misalignments with the Current Regulatory Model.* Lays out the challenges that are driving the need for change in the current regulatory model.
- *Summary of Complementary Utility Regulatory Reform & Business Model Initiatives.* This surveys and summarizes significant efforts underway in other parts of the US and abroad, from both research-focused projects to business model initiatives, on developing the utility of the future.
- *Legal and Regulatory Framework for Energy Utilities in Minnesota.* Provides an overview of Minnesota's legal and regulatory framework for energy utilities.[14]

e21 participants also learned about a range of issues through presentations from e21 stakeholders and in-state and national experts including Minnesota Power, Xcel Energy, the Minnesota Department of Commerce's Division of Energy Resources, the Minnesota Public Utilities Commission, George Washington University School of Law, Rocky Mountain Institute, the Regulatory Assistance Project and Pacific Economics Group.

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[13] This is a derivative of traditional scenario planning made famous by Royal Dutch Shell and now used regularly by many institutions to adapt to an uncertain future. Transformative scenario planning helps to understand and change complex systems where one cannot simply derive the answers by looking at history or at "best practices" because often none exist. It was popularized by Adam Kahane and used effectively in South Africa after apartheid (and elsewhere) as a way to actively shape and transform the future, not just adapt to it.

[14] All of these working papers are available at: www.betterenergy.org/projects/e21.

Using a Consensus-Based Approach to Develop Recommendations

The e21 Initiative developed its recommendations on a consensus basis, which means that the participants support the recommendations, taken as a package, as a framework for moving Minnesota on a path toward achieving the e21 principles and desired outcomes. Consensus does not mean that each party is equally enthusiastic about every idea, bu*t rather that all participants support the package as a whole.* Importantly, consensus does not require participants to give up their right to object to future implementation details that they feel do not reflect the original agreement. While reaching consensus is neither fast nor easy, it can lead to solutions that—if implemented together—are more effective and durable than a "majority rule" or single-issue result.

Phase II of the e21 Initiative will focus on implementing the recommendations identified in Phase I, including a more detailed examination of questions raised during this first Phase. See the 'Next Steps' section of this report for more details.

Engaging Others

The e21 project team and participants have engaged other stakeholders and the public through several venues and media outlets, including presentations to the Minnesota Legislative Energy Commission, Minnesota Public Utilities Commission, Minnesota Chamber of Commerce, Solar Energy Industries Association Conference, the Citizen's League, and members of the Minneapolis City Council. An e21 team also participated in the Rocky Mountain Institute's eLab Accelerator, a national 'innovation boot camp' for those exploring how a 21st century electricity system might work, where they had the opportunity to interact with, and learn from, eleven other related efforts from around the country.[15]

[15] To learn about e21's experience at the eLab Accelerator, see Rolf Nordstrom (July 2014), "e21 Initiative Eyes a Sustainable, Carbon-Neutral Energy System for the Land of 10,000 Lakes," available at: http://www.betterenergy.org/e21-RMI-blog.

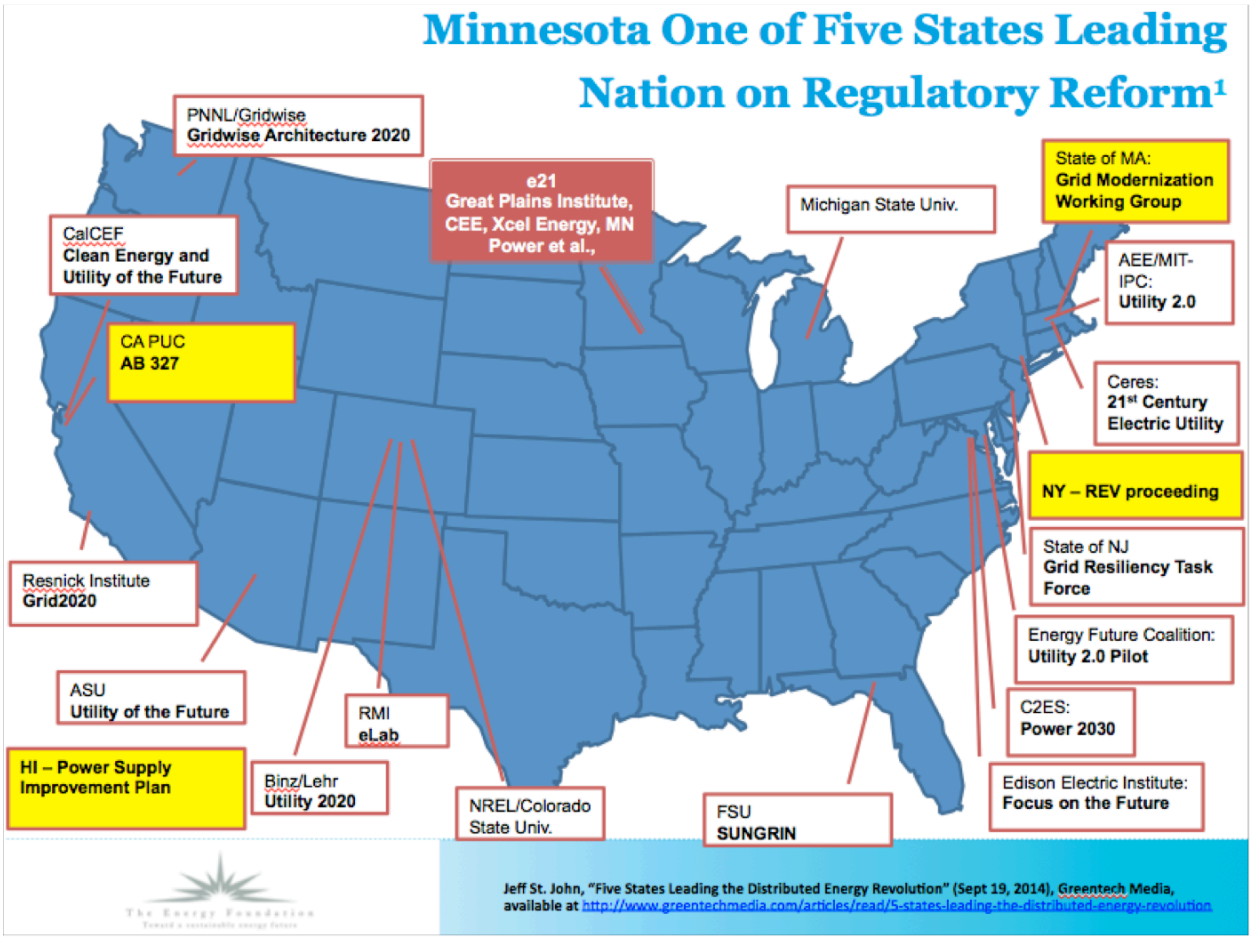
Appendix B: Issues & Questions for Phase II

In its second phase, the e21 Initiative expects to work with the Commission, Department, and e21 stakeholders to further develop the implementation strategies and details for Phase I recommendations and tackle issues raised in Phase I but not yet fully addressed by e21. Multi-interest stakeholder processes, such as e21, should be used in the near-term to work out the details of implementing the multi-year, performance-based regulatory framework recommended in this report, including but not limited to:

1. Identification of performance metrics that are quantifiable, verifiable, and align with e21 Principles and Outcomes;
2. The percentage of a utility's revenue that should be tied to achieving these performance metrics, and any penalties for failing to achieve them, or additional incentives for exceeding them;
3. Precisely what a Business Plan must contain for utilities that opt in to a performance-based approach; and
4. Additional questions raised by the proposed Integrated Resource Analysis:
    A. How to integrate and address the impacts of federal policies such as the U.S. Environmental Protection Agency's proposed rule to reduce greenhouse gases (GHGs) under Section 111d of the Clean Air Act?
    B. The potential value of developing a statewide resource analysis rather than a utility-by-utility evaluation? This may lead to better coordination across utilities, facilitate development of more economically sized projects and shared resources, and reduce the time commitment and workload of the Commission in developing and reviewing analyses. Uniformity across the state could also make execution of the analysis more efficient.
    C. Whether or not the tools (e.g., methodologies, software packages) used to identify and compare options in an IRA are taking into equal consideration all supply and demand-side resources? This includes:
        i. Distributed energy resources (DERs) such as efficiency, storage, distributed generation, demand response, and demand-side management;
        ii. Bulk electric system/centralized generation and storage;
        iii. Integration of electric vehicles, and other technologies,
        iv. Distribution and transmission alternatives; and,
        v. Non-traditional solutions, such as customer-sited solutions that provide net benefits to the system.
    D. How should utilities that prepare IRAs coordinate them with planning done by the Midcontinent Independent System Operator (MISO) and neighboring states? Do there need to be protocols that facilitate regular communication and, to the extent possible, coordination of state and regional plans to achieve optimal investments end-to-end across the entire regional electric system?

5. Other questions e21 plans to explore in Phase II include:
    A. How to better incorporate the growth of DERs and other distribution-level technologies on the system, enabling better evaluation of their costs/benefits, and their ideal locations on the system?
    B. What planning is needed to identify grid modernization investments or new utility services that would facilitate achieving e21 Principles and Outcomes? That might include allowing utilities to invest in efficiency improvements or other solutions at their customers' sites if and when doing so is a more cost-effective way of meeting demand consistent with other policy objectives.
    C. What energy products and service options need to be regulated, even if provided by a non-utility?
    D. What mechanisms (e.g., aggregation of load) could be allowed and encouraged to better reflect customer's load and improve billing efficiency for customers with multiple meters?
    E. What customer-side utility investments might go in the rate base?

Appendix C: Map of US Projects Working on the Utility of the Future



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e21 Initiative Phase I Report

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To learn more about the e21 Initiative,

please visit: www.betterenergy.org/projects/e21