Working Group 4: Customer and Community Participation

1. Introduction

1.1 Customers and Communities

Customers are the end users of the energy system and communities are the human networks tying them together. A household, a building, or a business may be a member of multiple communities – each based on different characteristics such as categories of geography (urban, suburban, rural), residence in a specific town, city or neighborhood, household income level, business category, ethnicity, religion, vocation, age, other demographic characteristics, as well as interests, activities, views and orientations. All communities depend on electricity to enable the functionalities of modern life: lighting, heating, cooling, communications, appliances, production of goods and services, and now vehicular travel, connectivity, and mobile information. The electricity grid exists for the benefit of customers of all sizes and its costs are recovered in the regulated rates of public utilities.

The key word in "Customer and Community Participation" is the last one. Illinois energy policy should empower all those participating in emerging energy opportunities and leverage new technologies and new markets for system benefits, while ensuring accessible, sustainable, reliable, resilient, secure and affordable high-quality electric service to all customers.

1.2 Scope of work

Utility customers In Illinois are empowered to make individual choices about technology, energy sources, uses, and pricing plans. Customers and communities are affected not only by their own choices and behaviors but by the countless decisions and actions of all consumers and producers connected to the integrated grid. The affordability and reliability of electric service as well as the physical and social environments of communities, are also impacted by decisions made by utilities and regulators regarding investments, expenditures, rate options, collection practices, and other policies. This WG4 report examines a range of relevant issues and reflects the perspective of participating stakeholders as to how outcomes might be optimized for individual, community, and system benefit. Within the limited available time to take up a broad set of complex topics, there was no attempt to forge consensus about the many issues about which stakeholders have divergent views, opinions and expectations. Instead, the group interaction and this report were intended to provide substantive information about the issues covered, elucidate stakeholder perspectives, and lay out options recommended by individual working group participants to address issues they identified. Not all issues could be identified and covered in depth, not all ideas were the subject of group discussion, and the group did not perform cost analyses of policy and technology options, nor did it address how to evaluate costs and benefits of potential strategies. These are important subjects for further analysis by policy makers and stakeholders.

1.3 Topics

Building on the WG1 examination of the capabilities of new technologies, this WG4 report considers the different ways that groups of customers and communities may participate in the evolving energy marketplace and explores what customer-friendly and community-friendly policies and options might look like in an interconnected world featuring Distributed Energy Resources (DER), the availability of more granular data, and emerging transportation electrification opportunities. The topics covered by WG4 include consumer engagement, education and empowerment, retail market opportunities and challenges, market transformation, the changing roles of public utilities, Alternative Retail Electric Suppliers (ARES) and other entities, options for electricity pricing, opportunities and challenges of DER and transportation

electrification, the needs of low and moderate income (LMI) customers, and the perspective of very large commercial and industrial customers (VLC&I). The diverse opinions of participating stakeholders about identified issues and their proposals to address them are described for each topic. Due to the overlapping subject matter there may be different ideas and perspectives presented by other working groups on these topics.

1.4 Working Group 4 Process

Approximately 32 participants representing a wide range of Illinois energy stakeholder perspectives participated in Working Group 4. The group met five times in sessions averaging three hours each to consider issues related to Customer and Community Participation in the context of overall framing questions posed for the NextGrid study. [Note: meeting summaries are available at the NextGrid website] At the first meeting, each participant was asked to identify a key issue raised by emerging changes in the way electricity is produced, delivered, and used in Illinois, what from their perspective would be a long-term positive outcome for customers and communities, what would be a negative outcome, and how the issue might be addressed through public policy. At subsequent meetings, presentations were made by the following stakeholder groups: Office of Illinois Attorney General, Elevate Energy, Citizens Utility Board, Ameren Illinois, ComEd, IGS Energy (a retail energy supplier), Charter Dura-Bar (a large industrial customer), Delta Institute, Advocate Health Care, and Northwestern Memorial Healthcare. The final meeting was devoted to discussion of the initial draft working group report that was subsequently the subject of comments and suggested edits by participants prior to its finalization for submission to the NextGrid senior facilitators.

During the Working Group 4 process, participants were invited by the working group leader to submit ideas for "3Ps" – Programs, Policies and Pilots that the stakeholder group or individual would propose to address emerging electricity issues affecting customers and communities. Specific proposals and options included in this draft report are derived from discussions that occurred over the two-month course of the working group process and in responsive comments as well as the 3P exercise. Documents and links provided by participants and the working group leader on a shared drive were additional source materials for this report.

Some stakeholders, including the Office of the Attorney General, assert that the report would be more edifying if the views described were attributed to individuals and groups expressing them; however, in the view of some others, the goals of giving all perspectives equal consideration regardless of source and encouraging open discussion are best served by not attributing views to individuals or groups. Therefore, as laid out at the beginning of the NextGrid process, all working groups operate under the "Chatham House Rules," under which points raised are not attributed to particular individuals or groups with which they are affiliated. That attribution-free format was followed in writing this report, which was initially drafted by the working group leader and revised following extensive comments and suggested edits by working group members.

2. Overview of Stakeholder Perspectives

2.1 Evolving Electricity Service and Objectives

In the 125 years since the 1893 Chicago World's Fair astonished people with its electric lighting, the consumer uses of electricity evolved from lighting to motors and appliances, to heating, air-conditioning, television, and finally computers and smartphones – and all the other devices that have become essential to a modern lifestyle. Transportation is emerging as the potential next step in lifestyle electrification, perhaps soon followed by "self-driving" electric vehicles. On the supply side, large central station power plants face growing competition from a variety of new energy resources including wind turbines and smaller scale distributed technologies like rooftop solar photovoltaic generators. Variable output

renewable generation increasingly may be paired with energy storage as that technology improves in performance and declines in cost.

The traditional goals of delivering safe and reliable utility service at rates that "are affordable and therefore preserve the availability of such services to all citizens," have evolved to include environmental sustainability (i.e., reduced pollution and carbon emissions). In addition, the General Assembly has directed that the ICC "should act to promote the development of an effectively competitive electricity market that operates efficiently and is equitable to all consumers," and that the State should "encourage the adoption and deployment of cost-effective distributed energy resource technologies and devices".[1]

Energy efficiency is part of the new set of social goals and regulatory requirements. Using less energy results in lower and more stable bills for consumers, environmental and health-related improvement, and less need for system capacity expansion over the long term. However, lower or flattened usage does not mean correspondingly lower costs to run the grid, which must be continually operated, maintained and upgraded to meet customer needs. Smart grid and advanced technology deployment have coincided with improvement in the key reliability metrics of frequency and duration of outages for ComEd and Ameren Illinois in each of the years since enactment of the Energy Infrastructure Modernization Act (EIMA).[2]

2.2 Threshold Questions about New Policies and Technologies

The velocity of technology innovation, the expansion of data capture and analysis, and the growth in connected devices may drive consumer demand for more choice, more control, and more convenience in energy transactions. These preferences may result in provision of energy products and services in ways that customer and social value would no longer flow from a simple two-way exchange between the utility and the electricity user. Tomorrow's solutions are evolving toward a multi-sided mesh of interactions between the utility, other producers of value-added products and services, and their consumers/prosumers.

Policy development is growing more complex and requires examination of costs, benefits, and other ramifications of proposed regulatory innovation and technology deployment. Stakeholders have proposed a range of initial questions to consider when evaluating effects of policies, programs, and investments on customers and communities, including:

- What is the nature of the challenge being addressed?
- What are its scope, scale and timeframe?
- What are the customer and community benefits of proposed solutions? How can they be quantified? Do they differ between customers or classes?
- What are the additional benefits and beneficiaries (e.g., society, utilities, vendors, markets)?
- How can barriers that may prevent certain customers or classes from realizing benefits be reduced or eliminated?
- What role for the public utility will best serve the public interest?
- Would the challenge be solved adequately by unregulated market forces? Is there a combination of market and regulatory policy that would best address it?
- What are the projected costs and how will they be allocated?
- What will be the effects on customer rates of different solutions?
- What incentives would lead to optimal outcomes for customers and communities?

[1] 220 ILCS 6/16-101A(d); P.A. 99-0906, Section 1

[2] See ICC annual reliability reports at https://www.icc.illinois.gov/Electricity/utilityreporting/ElectricReliability.aspx

- What is the level, if any, of necessary regulatory oversight of implementation and operation?

Illinois has a robust regulatory process, open to participation by all stakeholders, to consider the equity issues inherent in the delivery of electricity services. A critical task is to ensure that benefits of any grid innovation extend to all Illinois communities, regardless of socioeconomic or other status.

2.3 NextGrid Questions for Policy Makers

The NextGrid process is an effort to identify and elucidate issues in an evolving energy environment. With regard to the core elements of regulatory policy affecting customers and communities in an era of changing technology and priorities, key questions posed by stakeholders for consideration by policy makers (listed here in no particular order) include:

- What new polices, if any, are needed to promote greater choice and price-constraining competition for energy products and services?
- What new policies, if any, are needed to assure easy and timely interconnection for behind-the-meter DER?
- What new policies, if any, are needed to inform and educate customers about programs, rates, and options that can improve their energy experience and reduce their costs?
- What new policies, if any, are needed to provide accurate price signals to customers?
- What new policies, if any, are needed to accurately allocate new costs to cost-causers?
- What new policies, if any, are needed to ensure that customers are compensated for the value they provide to the grid?
- What new policies, if any, are needed to fairly allocate costs among customer classes and address the possibility of uneconomic bypass?
- What new policies, if any, are needed to provide access to customer information and data to support competition in energy products and service markets?
- What new policies, if any, are needed to provide access to customer interval meter data on an equal basis to ARES, consistent with customer privacy and authorization rules?
- What new polices, if any, are needed to protect consumers from deceptive and fraudulent behavior by energy product and service marketers?
- What new polices, if any, are needed to protect limited State and Federal Low-Income Home Energy Assistance Program dollars from being spent on high-priced energy supply provided through unregulated providers?
- What new policies, if any, are needed to improve reliability and customer satisfaction?
- What new policies, if any, are needed to ensure the benefits of utility investment in new technologies flow to all customers and communities?
- What new policies, if any, are needed to provide all customers with access to the full range of product, service and pricing options enabled by new technology?
- What new policies and methods, if any, are needed to estimate costs associated with new policies or infrastructure proposals?
- What new policies, if any, are needed to equitably share risks of investment in new system beneficial technology?

- What new policies, if any, are needed to ensure energy affordability for LMI customers?
- What new policies, if any, are needed to provide low and moderate income (LMI) customers with new technology options?
- What new policies, if any, are needed to evaluate and respond to the value different groups of customers place on different forms and levels of reliability and their associated costs?
- What new policies, if any, are needed for utilities to flexibly respond to changes in customer requirements and expectations?
- What new policies, if any, are needed to allow utilities to respond to potential grid defection?
- What new policies, if any, are needed to recover investments made to serve customers who leave the distribution system?
- What new policies, if any, are needed to effectively and securely improve data sharing capabilities with third parties as utility usage data becomes increasing granular?
- What new polices, if any, are needed to address the risks to cybersecurity of additional interconnection and digitization of the grid? [note: Cybersecurity is a subject of WG3]
- What new policies, if any are needed to ensure community and government access to information and input into utility infrastructure decision making and siting?

3. Empowering Consumers to Make Energy-Smart Choices

For the first century of society's electrification, after an initial "shake-out" period of competition and self-generation, the regulated public utility was created as a response to the natural monopoly scale and scope characteristics of electricity provision, given the technology at the time. Electrification meant extending the grid to places it had never been and displacing inferior technologies like gas lighting. From the point of view of most "ratepayers," the only data that mattered was the amount of the monthly bill and the only thing a residential customer had to know was how to turn the switch on and off and never to touch live wires. Choices were few and nobody spent much time on energy management. Even large industrial customers, with the technical ability to self-generate, saw value in being grid-connected and benefit from regulated pricing and policies.

Demand was seen as inelastic and the main question was how fast to expand the system to meet ever growing loads and reduce unit costs. People noticed when their bills went up to pay for new capacity and growing usage but otherwise most small volume customers didn't think much about electricity. This was the paradigm for the first 100 years of electricity consumption. However, by the 1970s, unit costs began rising after the construction of large new power plants without corresponding increases in demand. At the federal level, policy to allow non-utility generators access to the transmission system allowed new generation technology to compete and created wholesale electricity markets. This eventually led Illinois to restructure the electric industry in 1997 to capture the benefits of competition. This effort has largely been seen as successful, as it has given all customers access to lower wholesale electricity market supply costs and an increasing array of consumer options for energy products and services.[3]

3.1 Evolving Customer Priorities and Expectations

Stakeholder hold a variety of views about what today's consumers want from their utilities and other energy providers. Some suggest that, spurred by concerns about pollution, climate change, resource

[3] See report prepared by former ICC Chairman Philip R. O'connor: Restructuring Recharged: The Superior Performance of Competitive Electricity Markets, a report prepared by Philip R. O'Connor, Ph.D, for the Retail Energy Supply Association at https://www.resausa.org/sites/default/files/RESA_Restructuring_Recharged_White%20Paper_0.pdf

depletion, and the opportunity to reduce energy costs, many consumers are becoming more energy conscious, changing their behaviors, and are ready to adopt new technologies. In this view, customers would be responsive and make choices benefiting themselves and the broader community, provided they had easy access to trustworthy, easily understood and actionable information.

However, customers are not uniform in their desires for or ability to adapt to new technologies, rate designs and policy innovations. Some stakeholders believe that customers generally want the utility to focus on its core function of providing low-cost reliable electricity and to provide information about how to use less energy and save money. Though they acknowledge that technological innovation is providing new options, they question whether customers' energy concerns and needs are changing. Others point to a familiar example of the way innovative products have historically shaped demand: People didn't know they needed a smart phone until they had one.

3.2 Customer Engagement and Education

For consumers to derive full value from their energy options first requires that they understand them sufficiently to make well-informed choices. Informed customers will be able to better engage in the grid of the future and derive value from it. Customer adoption of new technologies will facilitate other commercial and societal (e.g., decarbonization) value. That's why some stakeholders underscore that a crucial ongoing task for utilities, suppliers in energy markets, regulators, and advocates will be to successfully engage customers, educate them about rate, product, and service options, design tools to help consumers make choices, provide fact-based energy cost and savings information, and protect consumers from deceptive practices. Customers may increasingly appreciate the ability for robust connections to the energy products and services they use. Future customer satisfaction may depend not just on provision of reliable and affordable service, but on utilities and marketers delivering a customer experience that meets the expectations of consumers in the Amazon era.

3.3 Evolving Illinois Utilities

Utilities are changing in the face of new technologies, evolving regulatory goals, and increasing customer expectations. In addition to its role as network provider and system operator, the utility's responsibility for improving the reliability, efficiency, affordability and accessibility of its services now means greater efforts to engage and educate customers, provide information and usage data to help them manage consumption and reduce bills, and enable new options to achieve broader regulatory and social goals. Customer education is a core utility function and it will continue to play a key role in driving customer awareness, interest, and adoption of new and/or enhanced offerings that create customer value.

The utility is a key repository of information customers need to help make smart energy choices. Because the utility generally is subject to regulatory oversight, it is seen by some customers as an unbiased and trustworthy information source. There are also many other sources of energy information, including trusted individuals, community groups, institutions, agents, brokers and suppliers of energy products and services. Under a provision of EIMA, ComEd and Ameren Illinois fund the Illinois Science and Energy Innovation Foundation (ISEIF) (for a ten-year period through 2022). ISEIF was created by the General Assembly to help inform and engage Illinois consumers in the transformation to a digital grid.

Full deployment of AMI means that more detailed usage data will be available for each customer, opening up some options for analysis and optimized energy management to benefit many individuals and the system. In the future, even more precise and granular data, with additional options for analysis and actions, could be made available. Utility customer engagement strategies may become more proactive and individualized, using channels preferred by the customer. Access to such individualized customer usage data should not be tied to how a customer pays for their utility service. Facilitating active and meaningful consumer participation within an evolving energy marketplace will require support from utilities as well as other market participants.

The articulated customer service objectives of Illinois utilities reflect this evolution. ComEd has a stated goal of delivering what it calls the "Premier Customer Experience" – personalized service for each customer that is simple and automated, transparent and understandable, flexible to suit the customer's preferences, proactive in anticipating issues before they arise, and responsive to customer needs. The company is deploying new online smart-meter-enabled tools to organize and present data that customers can use to manage their electricity consumption and their relationship with the utility. Bills have been redesigned and customer messaging has been upgraded to include information such as high bill alerts, power outage information, and peak time savings alerts. These can be accessed via text, email, phone calls and pushed app notifications. All customer information including bill payment and personal profile is available through the ComEd mobile app.

ComEd has become one of the nation's first utilities to provide access to "Internet of Things" (IoT) applets that enable automatic response of smart appliances to real time conditions, such as changing the temperature on a smart thermostat when time-variant prices fluctuate or precooling in advance of an expected curtailment event. Also available from the utility is Smart Meter Connected Device (SMCD) service which provides near-real-time usage data and estimated electricity cost information to in-home displays and energy management equipment. However, IoT is in an early stage and most customers do not yet take advantage of – or even know about – these opportunities to use new technology to optimize energy usage and reduce energy bills and their carbon footprints.

Ameren Illinois also is redesigning its customer engagement programs to meet what it believes are the expectations of customers that the utility will provide an increasingly personalized experience, with timely response to customer preferences and easy access to information used for making choices and managing costs. Using internal and third-party studies, surveys, focus groups, data analytics, and tracking results, the company regularly analyzes its residential customer base to follow the drivers of customer satisfaction and to test the effects of marketing and communication strategies. Ameren Illinois commissioned a study which found that its customer households can generally be grouped into five identified energy demand segments, each with certain characteristics, profiles and priorities, allowing outreach messages to be tailored to meet their concerns and eventually to potentially identify service options that might be best for the customer's needs and aspirations. Some stakeholders have inquired as to whether a similar segmentation study might be valuable for understanding larger commercial and industrial customers as well.

Like ComEd, Ameren Illinois continues to expand its online portal to provide customized data to each customer (which, as Ameren Illinois is a combined utility, also includes natural gas information). Ameren Illinois has also enabled the ability for customers to connect a Home Area Network (HAN) device to their AMI meter. The HAN functionality allows customers to receive energy data in near real time and use it to make energy choices, including automatic response by appliances and HVAC systems.

4. Data Access

Upon the completion of AMI deployment, smart meter interval data will be available to all customers and their suppliers. Analysis and utilization of granular data have potential to open up energy opportunities for customers of all sizes, provided that data is accessible to providers. Combined with supply, demand, and control technologies, data allows customers to become grid-interactive participants, rather than passive loads, with more complex but also more manageable energy behaviors. Data also provides the utility with the opportunity to establish a customer's capacity and energy cost responsibility on a per-hour or other interval basis. Doing so enables the utility to remove the disconnect between the wholesale cost components of serving a customer and the retail customer's behavior. It is possible that in a not too distant future, a typical household may be producing, storing, managing, buying and selling electricity -- as well as consuming it. A customer-friendly experience would make all these interactions easy and affordable.

4.1 Data Opportunities and Challenges

AMI data must be accessible to customers and authorized third parties who can analyze it and use it to provide services. In addition to their ARES portals, Ameren Illinois and ComEd have adopted the "Green Button" protocols developed by an industry non-profit group to enable consumers to access their detailed energy usage data in a standardized downloadable format, so they can securely manage their consumption and make better-informed energy decisions.[4]

Innovative applications, including those using the Green Button data format have the potential to transform the way people use energy. ComEd makes interval usage data available to customers, retail suppliers, and third-party vendors (using ES Portal access to HIU data, Green Button Connect, and Anonymous Data Usage access). ComEd leverages data to enable customers to lower their bills through energy efficiency programs and reaches out to affordable-housing residents through its Community Energy Management initiative. Analysis of energy data by third parties including retail electric suppliers, demand response aggregators, utilities and other service providers could result in customized products and services. Availability of even more granular usage data over sufficient periods of time for study by academic and non-profit groups could reveal new ways to achieve system benefits and inform consumers of their best options.

Household energy usage data is private and protected under Illinois law. It cannot be released by the utility without authorization by the customer (except as anonymized research data under certain conditions) but implementation policies are the responsibility of the ICC. Several cases have been or are in litigation before the ICC as to what is the required form of authorization and how data is made available.[5] The issues addressed by the Commission include, but are not limited to:

- whether or not a third party, such as an ARES, can access usage data directly from the utility after being authorized to do so by the customer;
- the required form of a customer authorization (written, verbal, electronic, wet signature);
- the required authorization language and disclosure to the customer of how the data will be used;
- the length of time for authorization to be effective;
- the rules for non-ARES to access data for other purposes;
- the restrictions on access to anonymous usage data for research and non-sales purposes;
- the rules and practices to prevent inadvertent release of customer information, or theft of customer information by malefactors due to failure of third-party vendors to protect the data to the same level as the utility;
- the measurement and allocation of any costs for making data available.

The details of how customer data is accessed are important because customers are accustomed to a seamless online experience and may be frustrated by a multistep process requiring them to separately visit the sites of utility and a third party in order to investigate service options. At the same time, customers must be assured that their personal usage and identification data will not fall into unauthorized hands. Utilities play a key role in protecting the privacy of customer data and protecting the grid against security threats, while utilizing data to empower customers and enable third-party vendors. While there are significant privacy, security, safety, and intellectual property considerations associated with granular data sharing, the sharing of information with competitive market participants must be maintained to ensure a

[4] See: http://www.greenbuttondata.org/

[5] These include ICC dockets 13-0506, 14-0507, 14-0701, 15-0073 and 17-0123

competitive market environment. The utility already serves as the repository of grid and customer data and can oversee the data-sharing necessary to animate the competitive market.

4.2 Further data analytic options

With increased data granularity, software could be made available to disaggregate electricity usage to the appliance level by applying artificial intelligence to whole-home meter data. This information can be used to help customers understand their electricity consumption and take measures to lower their costs, providing utilities and service providers another potential level of personalized customer engagement. The net benefits of such software would have to be evaluated prior to a deployment decision and its costs allocated appropriately.

4.3 Stakeholder Recommendations re: Data Policy

[Note that policy options and recommendations are proposals and ideas of individual stakeholders and do not reflect agreement by working group participants.]

a. Promote data authorization protocols: Green Button Connect provides the customer with the ability to transfer data more seamlessly to third party developers to help accelerate technology applications and analytics leveraging AMI data. Green Button Connect has enabled ComEd residential and C&I customers to authorize third-party service providers to receive direct access to their energy usage analytics through an electronic, web-based interface. As of February 2018, there have been approximately 2,000 green button downloads with 17 participating Green Button Connect third parties.

b. OpenID Connect: In the view of some stakeholders, Green Button Connect, as it is currently implemented, does not provide a simple and user-friendly customer experience. To authorize data access to a third party, a user needs to separately authenticate on a utility website and then be sent back to the third-party site. Many large services with similar sensitive data, such as banking, provide similar functionality through OpenID software instead of a user interaction. Some stakeholders suggest that employing other data authorization protocols such as OpenID could make the experience more user friendly while maintaining protection of customer privacy. [6] New methods of authorization may require ICC action.

c. OpenID connect through existing channels: Other stakeholders suggest that authentication also could be enabled through other data authorization protocol users such as Facebook, Google, and Twitter, which can be used to log on to other sites. They suggest this would make the path to data access familiar to customers who use these social media platforms and However, some stakeholders caution that lack of transparency in data handing practices and potential for security breaches are causes for concern with certain platforms.

d. Pilot DSS and SSO: To achieve a high quality digital engagement experience from their utilities, an option identified by a stakeholder is Digital Self-Service (DSS), combined with Single Sign-On (SSO), software that enables a range of customer interaction with their utility. SSO would allow a customer to use one username and password to securely access personalized data within the utility platform – rates, usage, disaggregation, and other types of information.

e. Expand data sharing capability: Usage data currently is provided to customer-authorized third parties by the utility once per day. This allows the utility to review data for integrity and is in line with the current limitations of utility backend services, which were built for monthly billing. Some stakeholders suggest that delivering data to both customers and suppliers in near real-time should be studied and piloted to assess its costs and benefits. Allowing a utility to acquire the infrastructure

[6] see: https://openid.net/

needed to offer streams of granular data to third parties in a sandbox (an isolated software testing environment) for a small number of customers would allow developers to experiment with real data and would obviate the need for in-home devices to access it.

f. Different customer value propositions may be unlocked with more granular data. However, these opportunities are currently only available through Smart Meter Connected Devices (SMCD), which have a cost to the user and require in-home internet service. Opportunities and challenges associated with other methods to access this data including direct access to the meter via a Home Area Network should also be evaluated.

g. Employ disaggregation software in utility energy efficiency programs: As discussed above, some stakeholders suggest that new data analytic tools can inform customers about how energy is being consumed and recommend ways to reduce usage and save money.

5. Roles of Utilities, ARES and Others in Serving Customers and Communities

5.1 Regulated vs. Market Options

The primary function of utilities will always be the provision of safe and reliable electric power; however, the grid, as a platform in an increasingly connected economy, has potential to deliver added customer value in dynamic and personalized ways without compromising the security, reliability, and resiliency of electricity delivery. A central question for policy makers becomes: How will new value streams be brought to customers?

Illinois regulatory policy since restructuring of the electric industry in 1997 has promoted the growth of competitive markets to spur innovation and reduce costs. However, stakeholder opinions diverge on to what extent unregulated markets should be relied on to provide the products and services upon which the benefits of AMI and other utility investments were premised. While WG4 participants generally share the opinion that tomorrow's energy landscape should include an array of customer choices, they have distinct conceptions of what that means for public policy.

Some stakeholders assert that part of the job of public utilities is to maximize the value of new technology for customers, communities, economies, and the environment by providing new service, product, and pricing options in a regulated environment, consistent with cost-recovery principles. Others view utility offerings of any products and services that could be provided by competitive vendors as detrimental to market development. From this perspective, the role of regulation should be to maintain a level playing field on which unregulated competitive providers can and should be relied on to deliver innovative energy products and services at the least cost. Some other stakeholders take the position that utilities should provide a limited set of options when technology with costs recovered through customer rates is underutilized for its intended benefits to customers and communities.

5.2 Regulatory Framework Implications

Stakeholder positions on the role of utilities in providing a broader array of services often coincide with differing perspectives on the optimal regulatory framework. From one perspective, all utility expenditures should be proven reasonable and prudent in regulatory proceedings that determine which costs incurred will be recoverable in rates. This point of view is driven by a precept of traditional regulation, which is that least cost principles and cost/benefit analysis must always be applied to utility investment decisions and rate recovery requests. Other stakeholders take the position that the public interest is served when utilities are financially motivated to invest in new technology intended to achieve public policy objectives (such as improved reliability and asset utilization, greater use of renewable energy, higher energy efficiency, beneficial electrification, energy storage, and long-run cost savings). While some stakeholders

see traditional regulatory incentives as sufficient to achieve these objectives, others believe alternative regulatory constructs can better align utility and customer interests. Mechanisms employed have included performance-based incentives and pre-approval of investment determined by policy makers to be in the public interest that would not be undertaken by the utility if it were exposed to significant recovery risk. These issues are further discussed by Working Group 7.

5.3 Consumer Protection

Many stakeholders see consumer protection as a critical issue in retail energy markets. They assert that deceptive practices cannot be allowed for an essential service like electricity, particularly when options are not well understood by consumers and the consequences of mistakes can be severe. Stakeholders have different views on the question of whether new consumer protections will be needed going forward. Some draw conclusions from issues that have arisen in retail energy supply markets, as discussed below.

5.4 Retail Supply Competition

Retail choice of supplier by individual residential customers began in 2002 but did not result in significant movement to alternative suppliers until after the 2009 introduction of Utility Consolidated Billing and Purchase of Receivables.[7] Under these statutory mandates, ComEd and Ameren Illinois became the billers and collectors for registered ARES, mitigating both the alternative providers' cost of billing their customers and their risk of uncollectibles, which became socialized among all utility customers. These provisions were essential for ARES to enter the retail supply market but it was not until implementation of "municipal aggregation" legislation in 2009 for Ameren Illinois and 2010 for ComEd that ARES gained a substantial foothold in the residential market. That state law allowed towns, cities and counties to pass ordinances and referenda to authorize the governmental unit to choose the default provider of electricity supply for their residents and small businesses. Individual customers could opt out of municipal aggregation and choose their own supplier or remain with the utility. Few residential and small commercial customers opted out because the municipal aggregation contracts generally provided a lower supply price. This cost savings was largely due to the fact that the 2007 law establishing the Illinois Power Agency included long-term power contracts intended to stabilize retail energy rates as parts of the initial supply portfolios. When a conflux of events, including the economic downturn of 2008, the emergence of low-cost new sources of natural gas, and the growth of wind power, caused wholesale market energy prices to fall, the higher-priced long-term contracts for a large portion of utility-supplied power meant there was "headroom" for alternative suppliers to bid against the utility price. Other factors influencing participation in municipal aggregation may have included lack of awareness of available choices by many consumers. At its peak in 2013, three out of four customers were served through municipal aggregations, but when the above-market utility supply contracts expired in 2012 and 2013, that particular ARES cost advantage evaporated. Since then, 31% of communities did not renew their municipal supply contracts (including Chicago) and the percentage of customers taking service from an ARES through municipal aggregation fell to 20% in 2017.[8]

ARES now largely focus their attention on marketing to individual customers, and the 73 ARES operating in the ComEd service territory and 37 in Ameren Illinois territory have a combined market share of approximately 18% individually switched customers. However, it has proven difficult for some retailers to beat the flat rate price of utility supply derived from competitive wholesale bidding conducted under IPA procurement plans, particularly since retailers must cover their marketing and administrative costs,

[7] See ICC Office of Retail Market Development annual reports: https://www.icc.illinois.gov/reports/report.aspx?rt=22

[8] Data from ICC Office of Retail Market Development annual reports: file:///C:/Users/Marti/Dropbox/Minnesota%20EV%20Comments/2018%20ORMD%20Section%2020-110%20Report.pdf

plus earn a profit, whereas utility supply is offered with no markup. ARES have argued that some costs of administering utility supply are included in the rates of all delivery service customers; however some others point to the allocation of customer care costs to utility supply as leveling the playing field with respect to administrative costs.

ARES differentiate some of their products from utility supply by offering longer fixed price commitments or lowering introductory rates, and/or providing premiums, or renewable energy beyond statutory Renewable Portfolio Standards applicable to all suppliers. ARES assert that because they operate in a competitive market, they must be responsive to consumer needs and preferences. For that reason, some ARES say they eventually will offer products and services beyond commodity energy, such as energy management tools, and they intend to offer innovative time-variant products after deployment of AMI is complete.

Some stakeholders assert that utilities and retail suppliers should have complementary roles in serving customers, with utilities providing delivery and billing services, real-time access to smart meter data, RTO settlement on capacity and energy charges, and third-party access to rebate incentives and utility programs, while ARES sell customers competitive product and service bundles. However, other stakeholders assert that in the 16 years since being invited to enter the Illinois market, with few exceptions ARES have offered largely undifferentiated commodity energy instead of innovative packages of energy products and services.

The ICC's Office of Retail Market Development (ORMD) calculated in its 2018 Annual Report that in 2017 ARES customers paid a cumulative total of $227.6M more than they would have paid had they received their energy supply from ComEd or Ameren Illinois (and a total of $551M more over three years). ARES representatives respond that this is not a complete comparison with utility supply prices and does not reflect the ORMD report's disclaimers regarding the difference between the products compared.[9]

5.5 Retail Energy Marketing Issues

The residential retail electricity market in Illinois has been hindered not only by its difficulties to date in delivering savings or innovative products, but by the false and misleading marketing by some ARES, which have tarnished the industry and harmed customers in the view of some stakeholders. These marketing tactics are difficult to police, in part because solicitations are sometimes conducted by ARES agents using telemarketing and door-to-door sales techniques. Solicitations have included false claims of bill savings, false description of the billing elements, false association of the supplier with the utility, selling at higher than published rates, falsely stating or implying that a customer is required to make a choice, short-term "teaser" rates that jump after a few months, inflating the price of green energy offers far beyond the incremental cost of purchasing RECs, and targeting vulnerable populations such as elderly, non-English speaking, and low-income households. The utilities, the Attorney General, the Citizens Utility Board and the ICC have received and acted upon numerous consumer complaints; however, ARES assert that the complaint number is relatively low compared to the aggregate number of customers served by them and that some of these issues have been addressed by revisions in part 412 of the administrative rules under which ARES operate.

Some stakeholders assert that analysis of the problems in the retail energy supply market, along with vigorous enforcement of the Consumer Fraud Act and revocation of ARES certification for suppliers found to have engaged in or allowed fraudulent marketing, should be the first steps to protect consumers and promote effective competition. Creating a healthy and consumer-friendly competitive market for DER products and services will be important as the opportunities for DER grow. For example, the IPA has included a detailed set of contract and disclosure requirements for community solar programs, which

[9] See ORMD report at {cite}

some stakeholders see as a useful example for developing workable and effective consumer protections in other retail energy markets.[10]

6. Pricing Options to Benefit Customers and Communities

All electricity supply is competitively sourced in Illinois, either by individual customers, or through ARES, municipalities, hourly wholesale market pricing or the competitive auctions conducted by the IPA for utility default supply. Under current law and regulatory policy, large commercial and industrial customers can purchase electricity from retail providers or they can access hourly wholesale market procurement through the utility. Small commercial and residential customers have additional tariffed (fixed-price) utility supply service options, with the utility supply purchased through competitive bidding conducted by the Illinois Power Agency (IPA) and shaped through the RTO wholesale markets. Some stakeholders advocate that utilities could and/or should provide a broader array of pricing plans under regulatory oversight, while others are concerned that utilities offering additional options would stifle the competitive retail market.

6.1 Time-Variant Pricing

Some stakeholders assert that flat rate prices mask true system costs of making, moving and using electricity, which vary by time and location according to a variety of factors including electricity demand. Time-variant pricing reflects the fact that electricity is more expensive in wholesale markets at high-demand times and less expensive off-peak. Most stakeholders support the availability of optional time-variant rates for customers who want to choose them (and Illinois law requires that hourly rates for energy supply be available to all customers, as will be discussed below).

Some stakeholders assert that when customers pay the time-variant cost of electricity, they better understand the financial and environmental impact of their usage and can choose to modify their consumption accordingly. From this perspective, in addition to potentially lowering many customers' electric bills, time-variant rates may reduce pollution and carbon emissions (depending on the generation mix), improve grid resiliency, and potentially enhance renewable energy usage. However, other stakeholders argue that many customers may prefer the familiarity, certainty, and simplicity of basic flat rates. Because some residential customers may be unable to shift any usage to off-peak period due to a limited supply of appliances in the home, medical conditions requiring use of medical devices, work and school schedules and other factors, they might be at risk of higher bills if they were charged time-variant prices.

The two basic types of time-variant rates are hourly pricing, under which supply rates are tied to fluctuating wholesale market prices, and time of use (TOU) rates, which are fixed for defined periods such as peak, off-peak, shoulder peak, and weekend.

Factors precipitating potential change in the dominance of flat volumetric pricing, include but are not limited to: new technology increasing potential customer response and benefits from variant rates, changing customer load profiles, smart meter deployment that enables new rate designs, and growing customer understanding of potential benefits. Not all cost components (e.g. energy, capacity, transmission, delivery service, and other costs) nor all customer classes are necessarily suitable for TOU treatment. Rate design options of Illinois customers are not limited to those offered by regulated utilities, so any discussion about achieving specific objectives (e.g. peak load reduction) through rate design must consider the diversity of options available in Illinois' competitive retail market.

[10] See IPA Long-Term Renewable Resource Plan filed 12-2017, p.140 at https://www2.illinois.gov/sites/ipa/Pages/Renewable_Resources.aspx

6.2 Hourly Pricing:

Illinois is unique in having a state law requiring utilities to offer customers the option of market-based hourly pricing through utility procurement from wholesale energy markets operated by MISO (for Ameren Illinois customers) and PJM (for ComEd). The enabling statute requires residential hourly pricing programs to be administered by a non-utility third party, and both utilities have selected Elevate Energy, an independent Illinois non-profit organization, as the current program manager. The Ameren Illinois Power Smart Pricing program uses day-ahead hourly prices, whereas the ComEd Hourly Pricing program uses hourly real-time prices, but in other respects the programs are very similar and provide supply service that follows the wholesale market price and varies by hour. Hourly pricing applies to supply only, as participants pay standard tariffed rates for delivery service. Charges to recover the hourly energy costs are assessed on variable per kWh basis. Customers who choose this type of supply service are assigned a Peak Load Contribution (PLC) on a kW basis, which is determined during the June through September months, averaging the customer's peak demands at the time of five PJM system peaks. The PLC is assigned to the customer as a uniform monthly amount during the following June through May billing periods.

A website and mobile app provides hourly pricing participants with detailed information about their energy usage and costs, including comparisons to standard utility supply rates for each month and cumulative savings. Ongoing communication with participants includes high price alerts, energy-saving tips, annual individual performance reports, and a personalized savings portal showing historical and current data.

Since inception of residential hourly pricing programs in 2007, ComEd participants have seen average energy cost savings of 22% compared to what they would have paid for the same usage on flat rates, and Ameren Illinois participants have seen 16% savings (not including any amounts saved by reduced usage in response to price signals). [*ADD CITATION FR ELEVATE]* An analysis conducted by CUB and the Environmental Defense Fund (EDF) found that 97% of residential customers would have saved money in 2016 on hourly pricing, even without modifying their usage in response to fluctuating prices. {CITE} This result is consistent with expectations for years in which average wholesale market prices are low, since hourly pricing can sometimes mitigate both the risk premium included in longer-term locked-in flat rates and the costs and profit margin for intermediaries (other than the costs of the program administrator).[11] Elevate Energy has calculated the average annual projected customer savings to be $86. However, hourly pricing, by design, can be volatile, especially during extreme temperature periods, and historical market prices are not necessarily predictive of future prices.

Hourly pricing is a voluntary opt-in program that has so far attracted participation of approximately one percent of residential customers. [CITE NUMBER FROM ELEVATE] This relatively low participation rate, despite the cost savings that would result for the vast majority of customers, appears to be the result of several factors identified by some stakeholders:

- Hourly pricing is not well-understood by customers and it takes time and attention to appreciate its potential value.
- Opt-in programs generally have far lower participation rates than opt-out default programs.

[11] Zethmayr, J. and Kolata, D., *The Costs and Benefits of Real Time Pricing: An empirical Investigation into customer bills using hourly energy data and prices*, November 14, 2017, available at https://citizensutilityboard.org/wp-content/uploads/2017/11/FinalRealTimePricingWhitepaper.pdf. The authors suggest further research is necessary: "While the 2016 data set is large and includes a higher percentage of low-income customers than the overall service territory, it is not necessarily representative of the rural areas in the ComEd service territory. Running the analysis over multiple years – and with a larger number of utilities – is also necessary to further inform policy development." *Id.*, at 3

- The effects of hourly pricing on overall electricity costs depend on the customer's load shape. To project the effect on monthly on bills requires analysis that customers may find very difficult to do by themselves.
- Hourly pricing customers are exposed to the risk of price spikes. High wholesale prices tend to occur in peak summer periods and for brief periods of time, but occasionally can be prolonged, such as during the "polar vortex" winter of 2014, and sometimes occur at unexpected times.
- Unless they also enroll in a budget-billing plan, hourly customers are also exposed to greater seasonal bill variations that may be difficult for some customers to manage, as both usage and prices are generally higher in summer months.
- Marketing of hourly pricing has been limited to areas with AMI, which will not be fully deployed in the ComEd service territory until the end of 2018 and in the Ameren Illinois territory until the end of 2019.
- Utilities themselves were prohibited by the "Integrated Distribution Company (IDC)" rules from promoting a supply service, because that was deemed interference with the competitive retail supply market. A provision of FEJA (16-119(e)) removed the marketing limitation by expressly permitting the utility to market and promote its hourly supply pricing program[12].

6.3Stakeholder Recommendations re: Hourly Pricing

[Note that policy options and recommendations are proposals and ideas of individual stakeholders and do not reflect agreement by working group participants.]

Working Group 4 participants have proposed a variety of program designs, marketing and customer engagement/education efforts about hourly pricing, including the following:

a. Shadow billing: Some stakeholders suggest that the utilities could show the effect of hourly pricing on monthly bills of a customer by comparing their current bill and retrospective annual costs with what they would be under hourly pricing or other optional rate plans. ARES might object to this proposal unless they were to have access to the data necessary to offer a similar functionality, which would raise data privacy and access issues.

b. Reduction in Monthly Bill Variations: Some customers are deterred by the monthly bill variability associated with hourly pricing. While hourly pricing customers are eligible for budget billing programs, some stakeholders suggest that utilities should provide information about potential savings from the program when marketing budget billing.

c. Savings Guarantee Pilot: To introduce customers to hourly pricing and study their response and performance, some stakeholders suggest a limited program with guaranteed savings (over flat rates) should be piloted.

d. Hourly Rates Stability Collar: Occasional spikes in hourly rates could be ameliorated through an "insurance" program intended to prevent rates from fluctuating beyond an upper and lower threshold. Costs for the collar would be paid for by participants.

e. Data sharing with ARES: Some suppliers have suggested that customer AMI data should be shared with competitive suppliers, so that ARES can offer enhanced hourly rate programs for customers. (Presumably, this examination would include how to share data while complying with data privacy laws and rules).

[12] See 16-119A(e).

6.4 Time of Use rates

Rather than prices that fluctuate hourly, periodic time of use (TOU) prices may be preferable for some customers who want to save money, can safely do so by shifting usage to off-peak periods, and want to have known rates in each period. In considering TOU rate plans, regulators will need to consider the costs and benefits of offering additional utility rate options and their effect on retail markets. Any impediments to TOU pricing by ARES should also be examined. The first question in designing a utility TOU pan is whether to include only electricity supply on a time-variant basis (as is the case with hourly pricing) or also to recover a portion of delivery service rates on a time-variant basis. Other variables to consider in TOU rate design include:

- pricing period options (such as peak, off-peak, shoulder-peak, super-peak, weekend);
- rate structure (such as prices fixed vs. set at a fixed ratios between periods);
- magnitude of price variance between periods; (larger variance will induce greater load shifting, but may not reflect wholesale market variance);
- cost recovery of supply elements with different cost bases, such as energy and capacity;
- included elements of service (and cost basis for each);
- seasonal adjustment;
- method and frequency of energy procurement to serve TOU customers.

6.5 Stakeholder Recommendations re: TOU Pricing

[Note that these policy options and recommendations are proposals and ideas of stakeholders and do not reflect agreement by working group participants.]

a. Offer utility-provided optional TOU rates, designed through an ICC proceeding that would consider the variables referenced above. This proposal may require a change or waiver of the IDC rules or legislative approval.

b. Data on load shapes, demographic and other characteristics of those who choose (and do not choose) TOU rates should be analyzed by the utility and independent third parties to project effects of TOU at larger scale.

c. The utility TOU rates, if offered, could also include price-differentiated delivery service rates to match the power supply TOU periods and be available to all customers regardless of supplier.

d. One rate structure proposal is an expansion of the hourly pricing program to include a fixed-period TOU option, which could have fixed price ratios between periods. This suggestion raises the question of whether time-variant rates should be derived directly from wholesale market prices or could be structured to make them more understandable and more effective at improving load shapes.

e. Pilot programs that combine time-variant rates with different behind-the-meter devices could be piloted. For example, the effect on energy usage and costs of devices such as a simple price display, a disaggregated usage display, and a price-responsive thermostat, could each be tested against a control group under time-variant rates without an in-home device.

f. Study the load shapes and demographic characteristics of those who would be "structural" winners and losers under different TOU rate structures. For structural losers (i.e. they will face higher rates if they cannot or do not adjust their usage behavior), regulators could consider what policies could reduce the risks, while retaining the load-shifting value of the TOU rates.

g. Provide shadow-billing for those on TOU and hourly pricing, so they can compare the effects of different time-variant plans on monthly bills.

h. Educate consumers about the effects of changes in behavior on load shape and bills. Some stakeholders advocate that utilities employ tools such as home energy reports and analyses to provide ongoing information to customers on their performance after they choose a new rate plan. This would be intended to optimize consumption patterns to deliver maximum benefits of load shifting and load reduction.

i. Provide pricing guarantees for the first year of a TOU rate, to make it initially a risk-free option.

Note: Ratemaking is the subject of Working Group 7, which further considers issues associated with time-variant rates.

7. Market transformation

Market Transformation (MT) efforts employ targeted strategies to speed the adoption of new technologies by customers, to reduce the cost of acquisition, and to overcome initial market barriers. The goal of MT is ultimately to change consumer transactional behavior so that a market becomes self-sustaining. Example of MT strategies in the electricity sector include programs and incentives in some states (not including Illinois at this time) to promote electric vehicle early adoption. In Illinois, peak-time rebate programs that educate customers about the money-saving benefits of reducing peak usage energy are an initial part of an energy market transformation effort, as are efficiency programs introducing consumers to new products and methods of saving energy. A transformed energy market will eventually have market barriers removed and will no longer need incentives for participants. The ComEd Marketplace, an online store in which customers can purchase discounted energy efficiency and AMI-enabled devices, was approved for cost recovery by the ICC in a contested proceeding, in part as a component of the company's consumer education and market transformation efforts.[13] This issue is also under litigation in the 2018 rate proceeding. In its first year of operation, the Marketplace had 700,000 visitors and issued $2M in rebates.

7.1 Stakeholder Recommendations re: Market Transformation

Several stakeholders have made recommendations related to MT efforts. *[Note that following policy options and recommendations are proposals and ideas of individual stakeholders and do not reflect agreement by working group participants.]*

a. Examine which customer segments are accessing the ComEd marketplace and how it could expand its educational function and program offerings and be oriented towards underserved communities that may lag behind in adoption of smart and energy efficient products.

b. Support market transformation in energy efficiency through an EE scoring system. Because consumer products have multi-year useful lifetimes – as high as 10 to 20 years for most of the major end-uses, like domestic appliances, HVAC equipment and LEDs – purchasing inefficient products is costly to customers in the long run, even if they may cost less at the outset (and often they do not). Data and analytics are available to make efficiency visible and actionable by consumers. In the view of some stakeholders, market transparency reduces and potentially eliminates the need for mass market efficiency incentives and could be accomplished through a utility information site using a zero to 100 energy efficiency score applied to every marketed electric device (from appliances to vehicles). Some stakeholders respond that any marketplace enhancements should be compatible with the utilities' Commission-approved consumer education

[13] The record of this case, in which the Attorney General's office unsuccessfully opposed cost recovery on several grounds, can be found at: CITE

and market transformation programs. A further stakeholder response is that some information of the sort proposed is available through federal appliance efficiency disclosure standards and in competitive product markets.

c. Efficiency scoring information could also be used as part of a PAYS® cost-benefit analysis to identify projects and products that have a robust payback for consumers.

8. Participation by Customers and Communities in Distributed Energy Resource (DER) Opportunities

As described and discussed by WG1, DER has potential to deliver individual, social, environmental, and grid system benefits. These opportunities can be optimized through cooperation among customers, utilities, and third-party providers, facilitated by supportive law and appropriate regulatory policy..

Some stakeholders assert that DER developers need policy certainty to ensure economic value of long-term investments, while utilities need assurance that they will fully and fairly recover fixed grid costs. This section reviews several categories of technology becoming available in Illinois and subject to new law and policy; however, other DER technologies exist or may be brought to market that may entail different challenges and opportunities. *[Note: The ICC has initiated a separate workshop process outside of NextGrid, in which stakeholders are examining DER valuation and related policy.*[14]*]*

8.1 Customer and Community Opportunities and Challenges re: DER

Photovoltaic (PV) installations and production of solar energy in Illinois are poised to increase significantly under FEJA, which contains three new approaches to transforming the Illinois solar market:

- Community solar programs to allow residential and commercial customers to participate in solar energy even if they cannot install solar panels at their home or business; scale economies of these larger projects can make them more economic than home rooftop arrays.
- Adjustable Block Program to provide upfront payments to solar owners for long-term REC contracts, adding certainty to the amount of benefit and reducing initial capital investment; and
- "Solar for All" to bring distributed generation to low-income communities (with initial funding of approximately $150M from existing Renewable Energy Resource Funds) and to ensure that at least 50% of the solar energy produced is credited to participants as monthly bill reductions.

These programs are detailed in the IPA Long-Term Renewable Resources Procurement Plan as approved by the ICC.[15] When fully implemented, solar power capacity in Illinois is projected to grow as much as 50-fold, perhaps to 3,000 MW by 2030. Some stakeholders not that solar continues to decline in cost, market forces could push the total even higher, particularly if small scale distributed storage becomes a cost-effective opportunity.

8.2 Solar Challenges

Many customers are interested in solar energy but do not understand its ramifications for their energy experience or electricity costs. Because shopping for rooftop solar or participating in community solar is an unfamiliar experience, customers need both trustworthy sources of information and reasonable consumer protections.

In preparation for the impending growth of solar in Illinois, ComEd, Ameren Illinois, solar suppliers and other entities are developing materials and tools for customers to become sufficiently informed and aware

[14] see: https://www.icc.illinois.gov/Electricity/workshops/DistributedGenerationValuation.aspx
[15] See IPA Plan and ICC Order: https://www2.illinois.gov/sites/ipa/Pages/Renewable_Resources.aspx

to make confident solar choices. ComEd's "Digital Solar Toolkit" will include a calculator for customers to project the financial implications of home solar arrays, educational information about what to expect from the solar developer and the utility during installation and operation, and an online energy dashboard to provide individualized information about output, credits and other variables. Solar developers will be provided tools for interaction with the utility and management of interconnection requests for their customers. Similarly, Ameren Illinois is adding detailed solar information to its website and will be developing customer tools intended to create seamless solar connectivity.

Some stakeholders caution that savings from rooftop solar are not guaranteed by providers and can be lower than projected, while costs may be higher. Installation agreements and contracts may be opaque to customers, and the included cost of financing the installation may not be explicitly disclosed. The Illinois solar market is in its infancy and consumers will need to become equipped with the tools to understand their options and make choices that meet their needs and aspirations.

Many customers cannot have their own solar installation due to a range of barriers, including lack of ownership or access to a rooftop, inability to take on new debt, shade of other buildings or trees, or a structure without a rooftop angled in the right direction for cost-effective solar power generation. These issues are why community solar is being introduced to provide greater access (as described above).

8.3 Stakeholder Recommendations re: Solar Policies

[Note that policy options and recommendations are proposals and ideas of individual stakeholders and do not reflect agreement by working group participants.]

a. Some stakeholders advocate changes in state solar policies to enhance participation of public buildings and not-for-profit institutions. Suggested examples of ways to achieve this include, but are not limited to, technical assistance programs to navigate project planning and budgeting, publicizing annual budgets for SREC categories, and publicizing timelines for funding announcements and project submission deadlines as applicable.

b. Many large governmental agencies have significant rooftop space, open areas, and electric loads that would make them good candidates for solar installations. However, they may lack administrative capacity, budget, and capital planning flexibility required to navigate the development of a successful project. Timely availability of published SREC incentive levels and mechanism to reduce uncertainty of SREC incentives for non-profit and public facilities might enable more solar arrays to be installed on public and institutional buildings.

c. Some stakeholders assert that utility-scale solar should be a focus of solar expansion efforts, as it has better return on investment than distributed solar and does not create the behind-the-meter operational issues associated with individual customer solar systems.

d. Some stakeholders suggest that utility customer education efforts should be expanded to include tools to help customers calculate their costs and benefits of solar installations and what to consider when shopping for solar, as well as ongoing information to help solar customers understand how to maximize their solar generation benefits and change their consumption patterns in ways that minimize net energy costs.

8.4 Net Metering

Small-scale solar installations are presently eligible for net metering, under which the full retail rate is credited to the customer for each solar kwh produced. Under FEJA, when net-metered enrollment reaches 5% of peak demand, net-metering will be phased out for delivery service. Solar producers will then receive market-based payment for solar energy and will be credited for the value of solar to the distribution system as determined by the ICC. While the current value of solar is prescribed by FEJA, the

future methodology for calculating the value will be the subject of an ICC proceeding. FEJA provides that the ICC's investigation "shall include diverse sets of stakeholders, calculations for valuing distributed energy resource benefits to the grid based on best practices, and assessments of present and future technological capabilities of distributed energy resources." (220 ILCS 5/16-107.6(e)) Issues relating to the value of solar and other distributed energy resources is a subject of Working Group 7 and have been discussed by Working Groups 1 and 6. They are also the subject of the aforementioned ICC workshop process.

8.5 Solar Consumer Protections

Consumer protections applicable to solar programs are contained in the Part 412 administrative rules and in the ICC-approved IPA Long Term Renewable Resource Plan. Some stakeholders assert that these could be a starting point for rules applicable to other DER marketed to residential customers. The Resource Plan includes the following:

- Approval of vendors (and vendor requirements such as annual reports)
- Information about the relationship between the end customer, the installer/developer and the approved vendor
- Contract requirements and standard disclosure forms
- Marketing standards (based on existing Part 412 ARES rules)
- Right to cancel
- Prohibition on any loans being secured by a participant's home
- Prohibition on prepayment penalties
- Consumer complaint hotline, monitoring and reporting

While some vendors may find these sorts of requirements to be onerous, many stakeholders believe that experience has demonstrated the necessity of strong consumer protections in retail markets for energy products and services.

9. Energy Efficiency

Energy efficiency – driven by improved technology, appliance standards, market demand, regulatory mandates and utility programs – has played a role in keeping overall usage flat or declining in recent years. Illinois has had customer-funded EE programs run by the state of Illinois since 2008 and they have operated with input from the Stakeholder Advisory Group, which was created under statutory authority to provide input into EE program development and operation. Under FEJA, EE spending increases to $XXXX and program design is consolidated with utilities' capital investment and earns a rate of return. Utility EE programs are subject to performance metrics which can increase or decrease the return on equity for these investments.[16] Large industrial customers with peak demand in excess of 10MW were exempted from paying for EE after they successfully argued that they were not adequately served under the statutory EE programs and they have economic incentives and opportunities to make their own cost-effective EE investments.

[16]See: 220 ILCS 5/8-103B for details of new EE policies in FEJA

9.1 Stakeholder Recommendations re: Energy Efficiency Policies

Stakeholder proposals for modifying EE efforts to support customer and community participation in Illinois include:

[Note that policy options and recommendations are proposals and ideas of individual stakeholders and do not reflect agreement by working group participants.]

a. EE/DER Individual and Community Donations: Allow individual customers to share their kilowatt hour savings from energy efficiency programs, credits from peak time rebate programs or generated energy from investments in DER. For example, an individual saving 10 kWh from an energy efficiency investment could choose to pass those savings along to another individual or community organization or donate to a pool to benefit LMI customers. Members of a community solar program could choose to donate their generation credits to the host site, such as a church, or share those credits with others.

b. Peer to Peer Exchange: Pilot programs allowing customers to capture additional financial value from their assets by selling the carbon attributes (RECs) or kWh to interested third parties such as corporations, local governments, individuals, and/or non-profits. An initial pilot program could begin with assets tradeable between peers, such as the carbon credits associated with Energy Efficiency measures.

c. EE Opt-in for Large Customers: FEJA exempted very large customers, those with greater than 10 megawatts of demand, from specific provisions of the Public Utilities Act related to EE (220 ILCS 5/8-103B(l)). However, some large hospitals, and perhaps other public institutions, were covered by the blanket exemption but may want to participate in EE programs. Some stakeholders suggested that one remedy may be to allow large users to opt in to the utility efficiency programs. Changing this policy may require revising 220 ILCS 5/8-103(B) and perhaps other provisions of the PUA, and notice for modification of the utilities' EE program portfolios.

d. Program Coordination: Explore opportunities for further collaboration among utility and government hardship and assistance programs, and coordinate or integrate them with EE programming to bring efficiency opportunities to those who need them most

e. IEE Integration with Basic Utility Service: FEJA makes energy efficiency programs and customer operations more integrated concerns to a utility, however utilities are generally still structured to deliver them separately. One stakeholder proposal is to align the customer experience expectation with the value proposition to the utility customer, the utility, and any third-party service provider. (For example, if a customer were to receive an efficiency benefit through a program, the program provider would be compensated to the degree that it reduces ratepayer costs and doesn't increase the burden on the customer or utility).

f. Providing a Uniform Benefit Structure: This might enable a third-party to provide more efficient program delivery, as the provider might be able to offer expanded features if they could increase revenue without duplicating efforts or providing a separate experience. The value of this approach is being examined by the Illinois Stakeholder Advisory Group.[17]

g. Innovative financing: Programs such as PAYS® (Pay As You Save), under which financing is provided to customers and paid on their monthly utility bills for energy improvements that

[17] See: http://ilsagfiles.org/SAG_files/Evaluation_Documents/Draft%20Reports%20for%20Comment/ComEd_EPY9_Draft_Reports/ComEd_Income_Eligible_Programs_NEBs_Secondary_Research_Report_Draft_2018-03-06.pdf

produce net bill savings, could enable customers without capital or who face other barriers to install efficiency measures. Such a program may require legislative authorization.

10. Electric Energy Storage (thermal, battery)

Cost-effective electricity storage can help balance system loads and save energy generated off-peak for future use. Storage allows clean power sources with zero fuel costs but variable output -- like wind and solar – to generate energy without limitation and for customers to use it whenever needed.

Batteries are a form of distributed energy storage that can be used to support the grid and can defer or avoid infrastructure investment to address congestion. In some locations, grid-scale battery storage is already competing with natural gas plants to serve peak loads under certain conditions.[18] Energy storage can also serve as a backup power source to prevent or recover from outages. Well-integrated energy storage can make the grid more stable, flexible and efficient. Whether it can be deployed cost-effectively as a component of utility operational strategy is the subject of ICC scrutiny in pilot proposals by ComEd.

Storage is a unique DER, because it alternates between being an energy source and a system load, sometimes very quickly, which can entail operational challenges. Because it can support the delivery system in various ways, storage combines characteristics of supply, demand, and system operating technologies, and is not considered simply a form of distributed generation.

Storage, when appropriately paired with renewable generation sources can be deployed at scale and sited with flexibility. Eventually that may be in a consumer's basement or closet (and car) if present declining cost trends continue. Forecasters agree that the cost of storage will continue to decline as production volume increases and technology improves. Bloomberg New Energy Finance projects battery prices at less than one-third of today's cost within a decade.[19] As costs come down, storage combined with utility-scale solar will also become increasingly attractive as complementary DER.

10.1 Storage Issues

Stakeholders have differing views as to the optimal role for utilities, if any, in owning and operating storage facilities, a key subject for public policy discussion as cost-effective energy storage opportunities grow. Some stakeholders assert that utility-owned storage can be a customer-beneficial addition to the tools available for grid management. Some argue that it should be a third-party function, with the utility making available location-based grid costs to non-utility storage developers so they can deploy storage systems based on grid need and thus maximize revenue and reduce customer costs.

Cost-effective energy storage has many potential benefits but will raise new issues for tomorrow's grid. A customer with on-site self-generation and storage capacity may use far less grid-provided electricity. In theory, with enough on-site storage and generating capacity, a customer could disconnect from the grid entirely. This occurs rarely today, because such electricity isolation is not only expensive but risky. However, some stakeholders project that if the savings over grid-provided electricity were sufficient, "grid defection" could become an economic choice for some customers.

There are many reasons why such an outcome is unlikely, including the significant value of a customer to be connected to the grid – not just for reliability of service, backup power, and economic efficiency, but for the critical ability to transact over the network. A healthy, reliable, accessible and affordable grid will remain essential, and many customers will remain grid-connected, either by choice or necessity. However, the potential for grid defection highlights the need for careful future ratemaking (as examined in WG7) and raises questions about whether regulation should address the potential for customers to go

[18] See,e.g.: https://enerknol.com/wp-content/uploads/2018/07/EKR-PU-Visual-Primer-Battery-Storage-Peaker-Plants-7-17-2018.pdf

[19] See Invenergy presentation to ICC Policy Session 6-27-18

"off-grid," how utilities may respond to customer bypass of their delivery systems, and whether non-bypassable stranded system cost assessments should be considered. Some stakeholders believe that a crucial future public goal will be to create an environment in which all customers, whether or not they are grid-connected, will thrive in tomorrow's energy system.

Jurisdictional and regulatory issues regarding energy storage are evolving. Some stakeholders assert that all DER is subject to either ICC or FERC oversight, and that batteries should be treated as generation for purposes of interconnection. They recommend that that the ICC create a definition ensuring that lower voltage facilities that qualify under the FERC "seven factors test" are deemed to be transmission. Some stakeholders also recommend that the ICC examine issues of tax treatment of revenue from DER interconnection. Some stakeholders further recommend that the Commission consider whether there are circumstances under which customers should be allowed to self-build distribution system upgrades and interconnection facilities, consistent with the utility's system requirements.

11. Demand Response

As discussed in WG1, Demand Response (DR) refers to changes in usage in response to variables such as pricing, load conditions, and other variables. Modification of consumption can be:

- centralized through direct load control (DLC) by a third party such as the utility; or
- automatic through a behind-the-meter device such as a smart thermostat or a software applet responding to signals or prices; or
- manual behavior, through customer management in response to an alert or other message.

Because DR can benefit the individual customer (through cost savings), the environment (through reduced emissions) and the system (through greater efficiency and lower peaks), several utility DR programs are in place in Illinois to allow customers to monetize usage reductions during peak events. These include DLC programs under which the utility turns air-conditioning down or off during peak events and the customer receives a flat seasonal fee, and Peak Time Rebates under which customers who voluntarily reduce usage during peak events are paid a per/kWh fee. DR can obviate the need to fire up gas peaker plants, and is offered competitively in wholesale markets. This opportunity is motivating competitive energy providers to offer DR programs, including aggregation of participating customer loads

DR can give system operators a flexible tool to reduce peak loads and smooth imbalances between supply and demand. When combined with other DER through system management software, aggregated DR has the potential to be a component of a "virtual power plant," that can be dispatched like a large central station generator, only much quicker and without the physical plant or fuel consumption, providing economic returns to participants and system benefits. However, DR is a voluntary service offered by end-users, and to have capacity value it must always be available when called upon by system operators

11.1 Stakeholder Recommendations re: Demand Response Policies

Several proposals were made by stakeholders to enhance and actualize the customer and community value of DR. *[Note that policy options and recommendations were provided by individuals, do not reflect agreement by working group participants, and were not necessarily discussed in WG session.]*

a. Change the utility market model to accommodate peer-to-peer transactions: Customers could maximize the value of their DER, energy storage, and flexible demand through trading across the distribution network. (The idea of changing the utility business model into one that facilitates transactions is discussed by WG1, WG5 and WG7). Some stakeholders assert that, at minimum, large customers should be allowed to directly access DR markets rather than being required to use intermediaries.

b. Study Peer to Peer Carbon Trading Market: Some stakeholders suggest that the ICC and utilities explore how a market allowing individuals to trade credits or attributes associated with carbon-free generation could be designed and potentially piloted in Illinois.

c. Study blockchain technology: Blockchain is a system for maintaining distributed ledgers of facts and a history of updates and transactions. It can provide near real-time records of transactions among all participants and reduces or eliminates the need for trading intermediaries, which makes feasible very large volumes of very small transactions. While the potential use of blockchain and associated operating technologies in energy transactions has not been established, some stakeholders think it may have the capability to identify participating distributed energy resources on the network, determine what those resources can contribute to future energy management events, and assess the value of the contribution after the event. Other stakeholders assert that while blockchain enables data-blocks and information to be stored and used, which has potential application to energy transactions, the determination of DERs and their contribution to energy management needs many other complex applications to function. Blockchain may be an appropriate issue for workshops to explore, examine use cases for this technology, and if found promising, to possibly develop ideas for pilots.

d. Expand utility DR programs: Some stakeholders suggest that utility DLC air-conditioning programs could be augmented by piloting other appliances such as water heaters. Also recommended by some stakeholders is piloting of "prices-to-devices" technology for automatic response by appliances to real-time market conditions.

e. Some stakeholders suggest that new market structures such as PAYS® (a form of On-Bill Financing, as described above for EE) could also lower barriers to participation in DER.

f. Pilot DR for EVs: Some stakeholders project that there will soon be sufficient market penetration of EVs to begin piloting managed charging, as described below in the transportation electrification section.

12. DER Participation

DER has significant value, but there are many challenges in bringing it to all customers. Some stakeholders assert that a key barrier for many customers to acquire DER is not just lack of information about technology that can benefit them, but lack of access to capital for these investments. Another challenge is that the payback period for customer-installed DER may be longer than the anticipated residency in the home. An additional barrier for renters is the fact that they do not own the premises and landlords may have little incentive to install DER. Also, customers may not have sufficient disposable income to pay even modest up-front costs, they may not trust vendors' promises of net savings, and they may not be willing or able to take on debt.

12.1 Stakeholder Recommendations re: DER Participation Policies

Options to address these challenges have been identified by stakeholders. *[Note that policy options and recommendations were provided by individuals, do not reflect agreement by working group participants, and were not necessarily discussed in WG session.]*

a. On-Bill Finance Expansion: Utility long-term on-bill financing (OBF) programs have been an effective tool to help customers manage up-front costs of energy efficiency upgrades. But they have been limited to a budget that can serve only a small number of customers *[ADD OBF DATA]*. Some stakeholders want to see OBF expanded to multiunit buildings. Other stakeholders support expansion of OBF scale and scope to include DER, with financing terms tied to the lifetimes of different types of cost-effective DER, allowing for immediate bill savings. However,

some stakeholders oppose using utility bills for DER financing because of potentially higher bills leading to increased risk of disconnection.

b. In addition to including DER, some stakeholders suggest that OBF could be applied to other services such as water conservation. In this view, allowing OBF to assist with water conservation measures would bring awareness of the energy finance opportunity to some customers that may not otherwise engage with energy utilities and may be more cost-effective than offering separate programs. OBF expansion (and employment of new financing methods such as PAYS®) would require changes to 220 ILCS 5-16/111.7 (electric) and 220 ILCS 5-19/140 (gas).

c. Long-term financing methods such as PACE, where the costs of investment in energy upgrades stay with the building when ownership changes can help address the limited residency challenge.[20] PACE financing on residential buildings, however, is controversial because a lien could be placed on the property if the customer falls behind on payments. (New DER financing methods may require legislative authorization)

d. Competitive providers are beginning to address DER financing. For example, there are solar business models based on financing installations and paying for them with revenue from the energy and solar RECs produced plus any tax credits or other public support.

e. Program integration: Some stakeholders assert that current energy efficiency programs and renewable energy programs operate in silos – incentivizing specific technology or programs limited in scope, with no overlap in marketing, incentives, or economic impact. They believe integration of these programs by utilities would result in efficiencies and larger impacts.

f. Community energy planning: One proposal is to develop a new Community Energy Plan (CEP) model that would attempt to integrate EE, DER, and other energy programs at the local level. The intent would be to enable communities to organize energy initiatives on a local scale, layering energy efficiency, distributed generation, resiliency, workforce development programs and associated program incentives. CEP could allow communities to chart energy paths that best meet their local needs, enabling greater participation by residents and small businesses. For example, communities could target shared infrastructure to support transportation electrification and serve other community needs by directing DER into targeted geographic areas, thus producing complementary benefits, such as a community solar project combined with housing retrofit and workforce development initiatives. However, the costs of CEP and how they would be paid are unknown.

g. Utility planning expansion: Some stakeholders propose that utility system planning be expanded to include coordination with non-utility DER, through Integrated Distribution Planning (IDC). IDC would broaden system planning to include more stakeholders in an effort to target DER growth to where it can provide the most value for customers and reduce system costs.

h. However, reliance on unregulated and uncommitted assets for distribution system planning could raise new operational and reliability challenges. Because utilities have statutory responsibility to ensure safety, reliability and system security, they must have situational awareness to understand the interrelation of DER and their system impacts. Utilities assert that they are best-positioned to coordinate planning and dispatch of customer and third-party DER assets at scale and that they already accommodate emerging technologies and enhance transparency through hosting capacity analysis and mapping, interconnection processes and other efforts. From their point of view, understanding DER and enhancing its system value would be a positive addition to system planning, but does not require wholesale changes to the planning process (IDC is further discussed in the WG1 report).

[20] See https://www.energy.gov/eere/slsc/property-assessed-clean-energy-programs

i. System Mapping: Some stakeholders recommend that utilities create maps showing where solar and other DER at different scales would most benefit the system, based on its projected dynamics and congestion. This could help target optimal locations for community solar and could be combined with location incentives.

13. Transportation Electrification (TE)

Many stakeholders assert that TE (also discussed by WG1), has enormous potential benefits for customers and communities and therefore should be supported through public policies and initiatives. Electrification of transportation and other sectors would likely be a component of any federal, state or local plan to reduce carbon emissions. Those who favor public policy support of TE argue that in addition to the high performance, low operating costs, environmental benefits and other characteristics that are gaining electric vehicles (EV) a foothold in the automobile market, EV charging could improve the system load shape, use utility assets more efficiently, support reliability, and make better use of renewable energy. Other stakeholders emphasize that EV expansion has not yet been subject to rigorous analysis of its effects on utility systems, customers and communities. They observe that at this early stage of EV market development, it is not known whether consumers will embrace EVs in large numbers, and whether they will prefer battery-only vehicles or plug-in hybrid vehicles, which have auxiliary gasoline engines for extended trips.

Charging of personal EVs occurs primarily at home, where a combination of hourly pricing, time-of-use rates (TOU) and managed charging programs have the potential to move EV home charging to overnight and off-peak periods when the new demand can be accommodated without significant investment in new infrastructure. However, because "range anxiety" is an issue for consumers contemplating acquiring an EV, policies and programs with regard to public charging infrastructure haver become a focus of attention, and are subjects of diverse stakeholder views that will be discussed below.

13.1 Public charging infrastructure

Much of the discussion around policy to promote electric vehicle growth has centered on issues related to public charging infrastructure, which would be needed to support high penetration of electric-only vehicles: Should the expansion of public charging be left to the market? To what degree (if any) should it be subsidized by utility customers? If so, what are the criteria for determining when, where, and in what amounts? What role should utilities have in planning, building and operating Electric Vehicle Supply Equipment (EVSE)? What kind of rates and regulatory oversight, if any, should apply? These and related issues should be the subject of in-depth review by policy makers. Stakeholders express these viewpoints on EV charging issues:

a. Public charging facilities, particularly direct current fast chargers (DCFC) may be needed to support EV market growth but, in the view of some stakeholders, will not be installed through private investment because they are too costly to be paid for by user fees alone. Others point to Tesla's expanding charge network as contrary evidence.

b. Proponents of charge station investment by utilities assert that as a matter of arithmetic, if revenues from EV charging loads exceed the incremental costs to serve them (including energy consumed and any additional infrastructure costs), the added contribution to utility fixed cost recovery would make electricity rates lower than they otherwise would be. These stakeholders support pilot programs to test different public charging business and operational models.

c. Some stakeholders assert that significant involvement by utilities would be an essential element of EV public policy. However, they see public charging infrastructure as but one way in which utilities might be involved in promoting beneficial EV growth. In the view of these stakeholders, proposals for public funding of charge stations should be compared with alternative investments

and examined as part of a broader electrification policy consideration. Other EV-supportive policies might include providing information, rate options, smart charging programs, assistance for EV car sharing (particularly in LMI communities), and support for charging opportunities in multi-unit dwellings and on streets. Some see opportunities for communities to collaborate with utilities on TE, for example, to optimize e-bus en-route charging locations, address peak charging and demand charge issues, ensure resilience, and pilot wayside rail storage.

d. Some stakeholders emphasize that consumer protections are needed when public or customer funds are expended. They advocate that any utility subsidies for independent charge stations be contingent on acceptance by operators of model rate structures, price constraints, interoperability and service quality requirements.

e. Some stakeholders advocate an approach centered on ensuring that consumers who do not have EVs will also benefit from TE policies and programs. In this view, the key objective is to manage charging loads to make the electricity system more efficient, thereby providing net benefits for all electricity customers. All customers also benefit from a more efficient grid, cleaner air, reduced carbon emissions, and potentially lower electricity costs over time. EVs also retain more dollars in local communities and charging infrastructure installation provides jobs and economic benefits.

f. Some stakeholders assert that if utilities are permitted to invest in charging infrastructure, consideration should be given to incentive mechanisms to align customer, societal and utility interests. These could include performance and utilization metrics, cost constraints, customer satisfaction, and other benchmarks.

g. Some stakeholders assert that market forces are driving demand for EVs and associated services and that any subsidies or public intervention could hinder market development in the long run. They point to private companies such as Charge-Point, Tesla, EVgo, and Plugshare, which are installing EV charging stations under various business models, including free alternatives with employers, businesses, and municipalities, without extraordinary utility assistance or funding.

h. Some stakeholders assert that before the Commission could consider policy to expend utility funds to support EVs on environmental grounds, a legislative directive would be required, as existing law may not provide a clear policy basis. In this view, EV growth policies based on its system optimization benefits would be within current state regulatory jurisdiction.

i. Some stakeholders assert that public money for EV support should be appropriated by the general assembly from general or special tax sources or bond issues instead of utility customer funding authorized by regulators.

Charging infrastructure is one of many EV policy issues. Space in this report does not permit in depth analysis of each issue. However, stakeholder proposals to address other aspects of TE include the following:

13.2 Stakeholder Recommendations re: TE Policies

[Note that policy options and recommendations are the proposals and ideas of individual stakeholders and do not reflect agreement by working group participants.]

a. Target marketing of hourly pricing and other TOU rate structures to EV owners, including educating auto dealers and providing onsite information and enrollment materials.

b. Pilot TOU rates that would apply only to the EV charging portion of household usage. The extra cost of a second meter could be avoided by using the charger itself to measure usage, adding a module, or using disaggregation software to calculate EV energy usage.

c. Pilot smart charging programs under which a utility would modulate charging among participating vehicles to optimize loads based on real time variables to prevent ramping or neighborhood peak issues, coordinate with renewable energy output, optimize local load shape, and use aggregated EV loads as DR resources. EV DR could also be done by non-utility aggregators as is being piloted in California, and the added value, if any, of having a third party involved could be examined.[21]

d. Study workplace charging: If solar power penetration ever reaches a point (as in parts of California today), where there is plentiful solar generation in peak afternoon periods, support for workplace charging would be a way to sync charging with renewable energy output and increase system and public benefits.

e. Consider multi-unit building issues: Large buildings with parking lots pose particular challenges for EV charging because the combined loads of many cars charging simultaneously could overwhelm a building's electricity system. Some stakeholders suggest that dynamic management of charging flows to each plugged-in vehicle could prevent overloads while allowing all vehicles to charge (though at a slower pace). While these issues must be managed by building owners, property managers and homeowners associations, these stakeholders assert that all customers have an interest in avoiding costly distribution system upgrades, raising questions of whether utility support and regulatory involvement in EVSE at large buildings may be beneficial. Some stakeholders project that whether a tenant or owner in a multi-unit building has a right to plug in an electric vehicle or install EVSE, or whether these decisions should be left to private discretion and market forces will become a public policy issue.

f. Consider street lights as a public charging option: Many potential EV owners do not own a garage or have access to electricity where they park their car. In urban areas consumers may only have street parking or have no place to plug in. Some stakeholders suggest that existing street lights may present a significant opportunity to expand charging access at a marginal cost. Street lights are adjacent to parked cars, have electric connection already, and are dispersed plentifully. New street light systems can incorporate simple pay-per-use Level 1 connections that can be inexpensively added to poles. With the shift to more efficient LED streetlights, there may be ample capacity to accommodate EV charging at low power. However, street lights are usually charged on a separate utility rate structure or provided free to a municipality and recovered through a franchise fee. The ICC could study these rate structures and franchise agreements to determine if there is an opportunity to enable cities a cost-effective new option to support TE in their communities.

g. Educate customers about the benefits of EVs and empower them to make energy-informed buying decisions with respect to vehicle choice and home charging infrastructure. From this viewpoint, utilities could promote market transparency and transformation, by enabling customers to compare vehicles and other options based on their energy merits.

h. EV Charging Coordination: Some stakeholders suggest that utilities should create publicly available maps or mapping tools that indicate where grid infrastructure is sufficient for DCFC. This would allow EV charging station hosts to estimate necessary infrastructure upgrade costs by location and plan for cost-effective siting. These stakeholders assert that such a tool could also serve as a platform for tracking planned installations so that multiple hosts could coordinate.

i. Modify Class Definition to Support TE: Some stakeholders recommend that the ICC define a new class -- the equivalent of the "railroad" rate class for public transit electric rail fleets –

[21] https://www.utilitydive.com/news/honda-offers-demand-response-charging-program-to-ev-drivers/529045/

for public transit electric bus fleets. The railroad rate class has historically received a discounted demand charge ("distribution facilities charge"), in part based on the fact that electric rail transit service provides public benefits because it is an affordable, low-emissions transportation mode that encourages compact development. These stakeholders suggest that public transit electric bus fleets provide the same benefits. This concept could be broadened to other public fleets, such as school buses or emergency response vehicles. As in other rate class considerations, cost causality and allocation would be regulatory issues. These are further addressed by Working Group 7.

j. Use electrification of public buses as one way to bring TE benefits to LMI communities, which will also advance the cause of environmental justice. Also consider other strategies such as EV car sharing programs in LMI neighborhoods.

14. Concerns of Low and Moderate Income (LMI) Customers and Communities

Many low and moderate income (LMI) households struggle to pay their utility bills. LMI utility customers can be defined as those households with annual income below 200% of the federal poverty level of $24,300 (in 2014) or 80% of the annual median income, which in Illinois is $60,960 (calculating to LMI ceiling defined as $48,768).[22] In the ComEd territory, 47% of the population lives on less than 80% of annual median income; in the Ameren Illinois territory the number is 41%.

A stronger economy in recent years has not eased the energy cost burden for many households, as a 2017 survey found a 7% increase in households reporting trouble paying their utility bills.[23] Statistics abound: The annual EIA study of household energy use found that 31% of households reported a challenge in paying energy bills or sustaining adequate heating and cooling.[24] A study by the American Council for an Energy Efficient Economy found that 25% of Chicago's low-income households in multi-family housing experienced an energy burden of 14.6% of income, more than four times the median.[25] A study by the Center for Financial Services Innovation reported that utility bills are the number one use for small-dollar credit products, including payday loans, pawn loans, direct deposit advance loans, auto title loans, and non-bank installment loans (which often come with high fees or interest rates and can lead consumers into a cycle of repeat usage and mounting debt). [26]

Some stakeholders view grid modernization as a unique opportunity to drive economic development, including sustainable investment and jobs, at the neighborhood, community, city, and state level, which would benefit disadvantaged communities. In this view, workforce training efforts should target clean and advanced energy economy job opportunities, and Smart Cities programs should be leveraged for community and regional development to enhance economic opportunity in disadvantaged communities.

14.1 LMI Customers and DER

LMI customers face barriers to participation in emerging DER opportunities that do not depress participation among higher income customers. These include inability to pay any up-front costs,

[22] The IPA uses 80% AMI to define LMI for the purposes of its programs

[23] http://defgllc.com/publication/the-long-struggle-continues-improving-service-to-low-income-customers-in-the-utility-sector/

[24] https://www.eia.gov/consumption/residential/reports/2015/energybills/?src=%E2%80%B9%20Consumption%20%20%20%20%20%20Residential%20Energy%20Consumption%20Survey%20(RECS)-f1

[25] See http://aceee.org/sites/default/files/publications/researchreports/u1602.pdf

[26] A Complex Portrait: An Examination of Small-Dollar Credit Consumers, August 2012, Rob Levy, Manager, Innovation and Research; Joshua Sledge, Analyst, Innovation and Research.

unwillingness or inability to take on new debt, low rates of home ownership, lack of access to capital even for the most cost-effective energy investments, ineffficient housing stock, old and inefficient appliances supplied by landlords, lack of trust in unregulated vendors, lack of internet service and lack of energy information.

However, LMI customers are engaged in energy savings efforts. More than 80% report that they are interested in finding ways to save on utility bills and more than half report having taken measures during the past year to do so, such as getting efficient appliances, bulbs, or thermostats.[27]

Access to new technology is not uniform among customers, particularly in its early stages, when those able to afford initial investment and who are well-informed about energy options become early adopters. Therefore, one social and regulatory task will be to ensure that all customers, particularly those in low-income, vulnerable, and underserved communities will benefit from new technology, new markets, and new options.

Some stakeholders assert that key challenges for addressing the future needs of LMI customers include how to:

- engage and inform LMI customers of opportunities to cut their energy bills;
- protect them from abusive practices and marketing;
- provide access to independent reviews of measure success and vendor competence;
- design innovative billing and payment options to make energy more affordable and to allow payments to be coordinated with variations and timing of income;
- bring the benefits of DER and grid modernization to LMI communities;
- implement innovative financing mechanisms (as discussed earlier in EE section);
- provide trustworthy information that LMI customers need to make energy-smart choices;
- ensure that utilities have incentives to maintain affordable service and help LMI customers avoid disconnection;
- modify credit and collections procedures to account for a customer's ability to pay for arrearages;
- Design programs and initiatives based on dwelling types with potentially different solutions for single and multifamily units, and for home owners and tenants.

Some stakeholders assert that innovative proposals to empower LMI customers through market-based initiatives should be combined with regulatory and utility efforts to address barriers, provide assistance, and motivate behavioral change to reduce energy burdens. Analysis of AMI data and plug loads can provide a means for LMI and other customers to understand their usage patterns and make good choices that result in lower bills.

14.2 Engagement of LMI Customers

LMI customers may lack high speed internet service but are increasingly connected through smartphones.[28] More than nine out of ten people with annual income below $30K have a cellphone and about three out of four have smartphones. This is fairly consistent across racial lines, although smartphone ownership falls off sharply among older adults, a statistic that is anticipated to change over

[27] http://defgllc.com/publication/the-long-struggle-continues-improving-service-to-low-income-customers-in-the-utility-sector/

[28] http://www.pewresearch.org/fact-tank/2017/08/31/smartphones-help-blacks-hispanics-bridge-some-but-not-all-digital-gaps-with-whites/

time.[29] The amount of time spent by consumers on mobile devices has reached a daily average of 3.1 hours and continues to grow.[30] Average daily non-voice time spent on smartphones is anticipated to reach 2 hours 42 minutes by 2019.[31] Clearly digital engagement through apps, messaging, and social media may be an important aspect of new customer engagement strategies for all customers, including those of low and moderate income.

14.3 Customer Assistance

Illinois does not presently have "lifeline" utility rates, but there are a variety of programs directed at reducing energy burdens for LMI households. State programs include the Percent of Income Payment Plan (PIPP) and Low-Income Home Energy Assistance Program (LIHEAP). Funding for these programs is inadequate to the task as demonstrated by the fact that in 2017 there were 118,235 Illinois households enrolled in LIHEAP out of 1,092,303 households with income less than 150% of the federal poverty level.[32] PIPP, under which participants' gas and electricity costs are limited to 6% of household income, served just 24,940 customers in the most recent program year, spending $23,523,268, or about $943 each.[33]

ComEd and Ameren Illinois have customer assistance programs of their own to address special hardship cases, active military and veterans, and low-income customers with critical medical care needs. ComEd assisted 16,000 customers in 2017 with these "ComEd CARE" programs.

14.1 Stakeholder Recommendations re: Policies to Support LMI Customers and Communities

[Note that policy options and recommendations are the proposals and ideas of individual stakeholders, do not reflect agreement by working group participants, and were not necessarily discussed in detail by the working group.]

In addition to stakeholder recommendations intended to benefit all customers (discussed earlier in this report), the following proposals were made by different stakeholders to address affordability and other LMI issues:

a. Increase the resources available for LIHEAP, PIPP, and other programs, which are presently insufficient to meet the need for payment assistance and serve only a fraction of eligible customers.

b. Consider changes in policy and practice to provide new options for billing, payment, service deposits and deferred payment arrangements intended to maintain and resume service for customers who cannot afford to pay their entire bills.

[29] http://www.pewinternet.org/fact-sheet/mobile/

[30] Kleiner Perkins data [get citation from Kevin Dick]

[31] https://www.emarketer.com/Article/US-Adults-Now-Spend-12-Hours-7-Minutes-Day-Consuming-Media/1015775

[32] http://www.homeenergyaffordabilitygap.com/03a_affordabilityData.html

[33] Data from Office of Community Assistance, Program Status Summary, Policy Advisory Council, 7/19/2018

c. Consider elimination of the customer deposit requirement, which makes establishing service unaffordable to some customers.

d. Protect customers from debt obligations by designing DER payment obligations that run with the meter.

e. Bundle and coordinate utility programs. To streamline program delivery across utility divisions and present a package of options individualized for each customer, utilities should explore ways to combine energy efficiency, demand response, rate options, payment assistance and other services for LMI customers. Ideally this could be done by ComEd in partnership with Peoples Gas and Nicor. Offering a "bundle" of options should lead to efficiencies in program delivery and higher enrollment. For example, customers who receive LIHEAP assistance or participate in the PIPP program could be given an energy consultation that reviews options and identifies programs that may support that customer, including billing and payment assistance, pricing options, community solar, energy audits, EE and other opportunities. Customers could enroll in multiple programs at one time, a more efficient and customer-friendly process.

f. Customers who apply but are not able to participate in assistance programs could be prioritized for outreach and participation in other utility programs that would help with energy burdens. Anonymous usage data could be combined with census data to identify high priority areas within a utility service territory for consultation events where combined program enrollment could take place.

g. Many small volume customers do not take advantage of EE and DER incentive programs, even when the customer is missing an opportunity for savings. It would be valuable to study which customers are not participating and why, and what program designs and implementation strategies would achieve higher participation rates and higher bill savings – particularly for LMI customers.

h. Provide more ways to access information. Initiate policies and pilot programs that better equip low-income customers with access to hourly pricing information by not requiring WiFi access, and doing so in a format that is more easily understood and actionable. For example, existing utility paging networks could send regular hourly pricing signals to display devices provided as needed to those low-income customers on hourly pricing.

i. Improve incentives and metrics. Include incentives to reduce energy burdens in any utility PBR initiatives, such as reductions in terminations, bad debt, usage reduction and other metrics. Measure the success of any regulatory program by its effect on vulnerable communities. A bilingual bicultural approach that speaks both to the interests of individuals and the economic welfare and health of the community should accompany all programs and initiatives.

j. Give customers the tools they need to manage costs, including those without the time or expertise to do it for themselves. Many customers are not going to engage with the utility about their energy options regardless of efforts in that direction because they are too busy or overwhelmed with survival issues. Benefits of new technologies – and particularly the more affordable bills they promise – should be delivered to LMI customers through such programs as community solar, targeted energy efficiency, PAYS® and other innovative financing options, and revised credit and collection procedures The central goal should be to reduce household and community energy burdens.

15. Grid Modernization and Very Large Commercial and Industrial Customers (VLC&I)

A very large energy-intensive manufacturing facility may use as much electricity as a small city. The 30 largest industrial customers in Illinois together use a total of 13 million MWH of electricity per year (and employ about 90,000 people).[34] Some employ energy managers to oversee energy activities, which may include procurement, usage optimization, and demand response participation.

15.1 Concerns of VLC&I Customers

The largest electricity customers advocate for reliable service at the lowest possible cost and seek rates they believe accurately reflect the cost of service to them. Some take the position that before any customer-provided funds are expended on grid modernization, new technology, or market changes, they should be shown in regulatory proceedings to have net customer benefits -- through lower rates or through other societal goals such as increased reliability, enhanced customer convenience, expanded customer choice, or expansion of competitive markets.

VLC&I average delivery service rates per kWh are lower than small commercial and residential rates because they generally have flatter load shapes and use less delivery service infrastructure, taking service at high voltage levels and using their own equipment to manage energy within their facilities. Delivery service rates of large customers have steadily increased over time but have been offset by lower energy costs, and total Illinois C&I unit costs remain below national averages. According to data from the Energy Information Administration, total average electric costs per kWh in Illinois are 13.21 cents for residential customers, 8.84 cents for commercial and 6.45 cents for industrials.[35] Nationally these numbers are 13.15, 10.51 and 6.82 respectively. Data from the Edison Electric Institute show the ComEd average all-in Large Industrial rate to be 5.73 cents/kWh vs. the national average of 7.00 cents/kWh. Some stakeholders assert that national averages are not a meaningful yardstick for companies competing in global markets. Moreover, they argue that they cannot raise their prices if electricity costs increase, and higher energy costs at Illinois facilities can cause production to be shifted to other locations.

Many VLC&I customers voluntarily participate in energy management efforts that are cost-effective for their own usage patterns, volumes and industrial applications. They assert that these also provide system benefits for which they should be credited. As discussed earlier, under FEJA, the General Assembly exempted VLC&I customers from paying into energy efficiency programs administered by the utilities.

Some VLC&I customers object to paying non-bypassable charges to fund renewable energy, zero-emissions credits, and other delivery service programs they do not use, as they argue that these charges make their facilities less competitive and increase the cost of the goods they produce, without a commensurate increase in the quality of services they receive. They assert that rising delivery service costs have fully offset the value of lower competitive energy commodity costs.

Some advocates for other customer classes express the opinion that regulatory policies and utility services that benefit the community, the environment, and smaller volume commercial and residential customers ultimately also benefit VLC&I customers, so it is fair and appropriate that they share in these costs. They assert that VLC&I customers also benefit from RPS and EE requirements because lower usage and growing renewable output, particularly wind power at night, puts downward pressure on market energy rates, particularly at night when many of the largest industrial customers are operating.

Issues pertaining to ratemaking, revenue requirements, and cost allocation are addressed also by Working Group 7.

[34] Estimate from Illinois Industrial Energy Consumers

[35] See EIA data at https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a