

Community Energy as Shared Municipal Service

Establishing a New York Municipal Electric Collaborative (NYMEC)

Framework for a new electric utility model

The framework proposed is the creation of a municipally shared service organization that would allow municipalities to share the underlying services of an Energy Services Company (ESCO) as well guide and manage participating communities in the establishment and operations of Community Choice Aggregation (CCA) and Community Distributed Generation (CDG) programs. By combining the roles of CCA Administrator and CDG Sponsor as defined under these two policies it would be possible to spread out the benefits of local Distributed Energy Resources equitably to the entire community. Having direct access to shared ESCO-like services would significantly reduce fees and provide further flexibility in choice of energy supply. It is expected that with the reduced costs by cutting out intermediaries that it would be possible to ensure 100% renewable supply to the entire community at less cost than the current default supply option from the local Investor Owned Utility (IOU). The proposed organization would enable local communities to rapidly expand local renewables while retaining financial benefits and decision making in the hands of local communities. It would also prepare participating communities for future changes and opportunities by bringing positively aligned local representation and expertise on energy issues within the purview and decision-making authority of local communities instead of relying on external organizations.

Electric utility history

The first electric utility is often sighted as the generation facility built by Thomas Edison in lower Manhattan on Pearl Street in 1882 [1]. However, the history of people-owned and operated utilities has a little known history that puts Edison's status as pioneer into question. More than two years before Edison lit up the area around Pearl Street in NYC, in the farm community of Wabash Indiana, mechanics connected a threshing machine to the Wabash County Courthouse.

"Within minutes, lights atop the courthouse bathed downtown Wabash in brilliant light. The Wabash City Council's decision to own its electric lighting system instead of franchising the new utility to a private company created America's first municipal utility...Wabash created a model in 1880 that would be adopted by thousands of American communities since, a model that still thrives" [2].

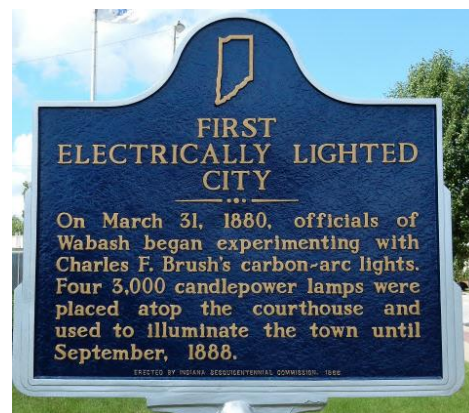
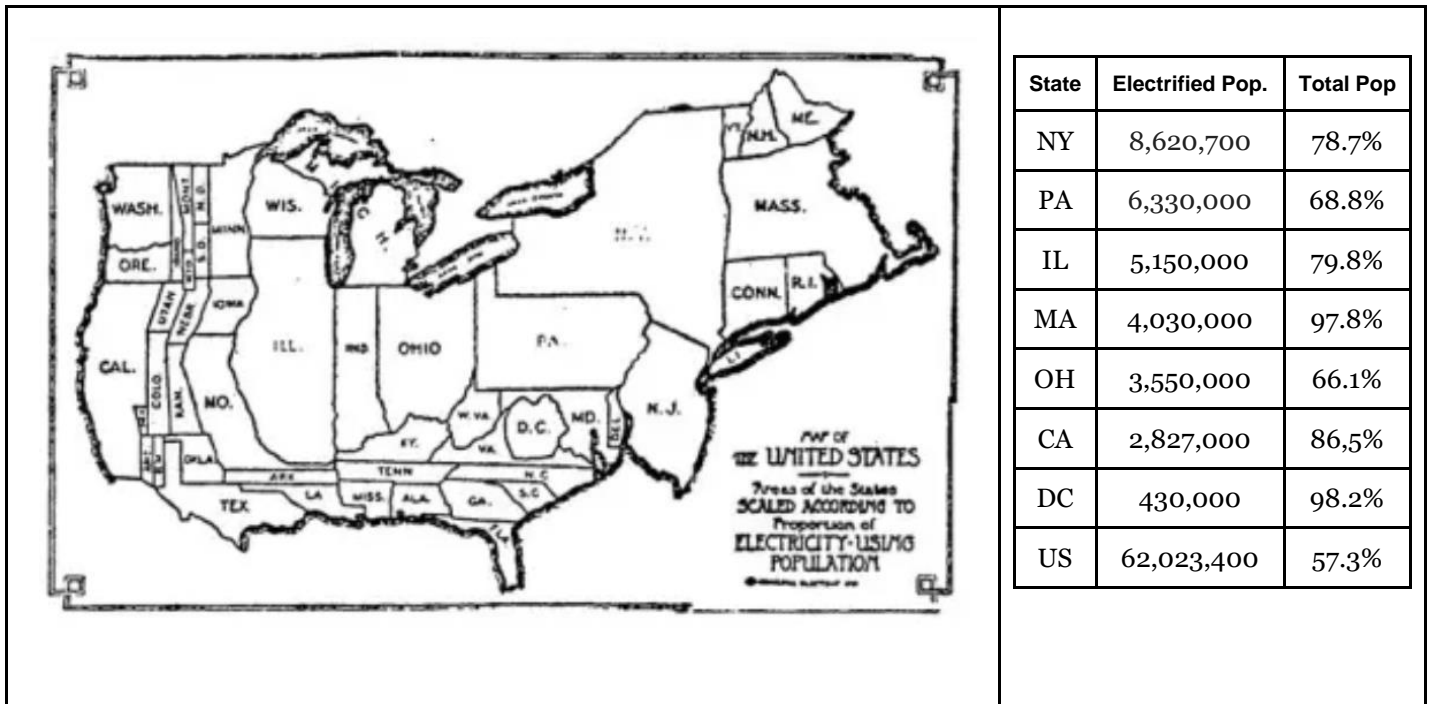


Figure 1 – City of Wabash IN

Through roughly four decades between the early 1880s and the late 1910s electricity went from being largely a very limited novelty that was only available to the wealthy, to a service that was available in most urban environments. The map below created in 1921 [3] shows the relative size of a state based on the number of electrified households in that state. Clearly New York was in the lead as far as number of households, but possibly more relevant are the percentage of populations with electricity shown in the table to the right, including the most covered area,

Washington DC with 98.2% of households, but still at that time the Total US number of homes with electricity in the US was only 57.3%.



Like water, sewer, schools and roads, by the end of the 20s electricity became something people expected, and that society depended upon. However, the market crash in 1929 caused many for-profit (IOU)s to fail and threw the industry into turmoil along with everything else in the economy at the time. This shake-up caused several changes in the electric utility industry including incorporation of some failed companies into public owned utilities, as well as consolidation among the IOUs. For example, in 1929, 59 former independently operated electric companies in NY were incorporated into the Niagara Hudson Power Corporation. Over the years Niagara Hudson would reorganize, consolidate, and change its internal structure several times until most recently in 2002 it was purchased by the UK privatized national utility, National Grid. The underlying model however, remained as a for-profit IOU throughout [4].

From the beginning of electricity distribution other non-profit and quasi-governmental organizations were formed to be watchdogs for abuse of power by the IOUs given its nature as a natural monopoly; meaning there is no feasible rationale for more than one company to make the investments required to deliver electricity in the same territory. As the country suffered in the 30s through the Great Depression, distrust of private utilities grew, and the public began to push for public ownership of electric utilities. This makes sense given that it was already in existence and a proven alternative to the concerns of monopoly power when operated by private IOUs. A pivotal point came with one of the major “New Deal” public works initiatives undertaken to pull the nation out of the economic crisis of the Great Depression, the creation of the Tennessee Valley Authority(TVA).



Figure 2 - FDR - Fireside Chat

“The administration of Franklin D. Roosevelt created the Tennessee Valley Authority to develop hydroelectric power. In his famous “Portland Speech,” on September 21, 1932, Roosevelt said that inexpensive public power would serve as a “yardstick” against which to judge private utilities’ rates and service. “The very fact that a community can, by vote of the electorate, create a yardstick of its own, will, in most cases, guarantee good service and low rates to its population,” he said. “I might call the right of people to own and operate their own utility something like this: a ‘birch rod’ in the cupboard to

be taken out and used only when the ‘child’ gets beyond the point where a mere scolding does no good” [5]. As late as the mid-1930s, nine out of 10 rural homes were still without electric service [6]. Similar to the argument today by cable and phone companies about providing internet access to rural areas, power companies at the time said they could not justify the cost with so few residents per mile of line. The idea of providing federal assistance to accomplish rural electrification gained ground rapidly when President Roosevelt took office in 1933. In 1937 a model law that states could adopt, called the Electric Cooperative Corporation Act enabled the formation and operation of not-for-profit, consumer-owned electric cooperatives. The result was that the least populace areas of the US now had much more power and decision-making authority over their electric utility than did the larger metropolis areas. This persists to this day and in these rural areas, despite the increased cost to deliver electricity to remote locations the average price for electricity in non-profit rural cooperatives is significantly lower than in areas operated by IOUs.

Electric utilities in recent history

The changes from the end of the 1930s to the 1990s were largely technology based but didn't affect the organizational structure of the three main models providing electricity (i.e. IOUs, Public, and Coop).

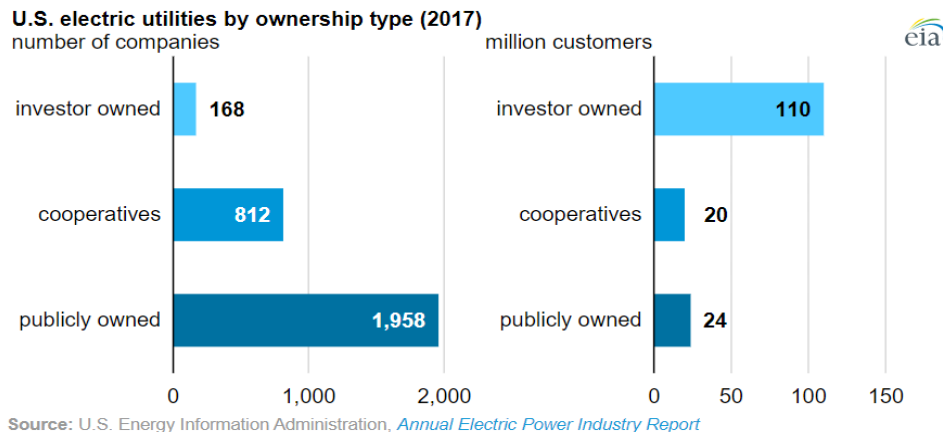


Figure 3

Data from 2017 shows that 72% of US electricity customers (110 million) were served by 168 for-profit investor owned utilities (IOU)s [7]. While that is nearly $\frac{3}{4}$ of the population it is worth noting that 56% of the US landmass is served by over 800 cooperatives [8] and in addition to that there are an additional 1,958 publicly owned utilities. The big difference today is that we are seeing what will likely be the next evolution of the electricity grid with Solar, Wind, Energy Storage, Smart Grid technologies, and new technologies that can make unnecessary the main value that utilities provide, which beyond billing, is primarily maintaining and upgrading the distribution and transmission infrastructure.

The changes that are coming are likely to cause a much larger shift than was seen in the past, this will be more than just a technology change this will be a change in the organizational structures of electric utilities. The IOU model in particular will become less relevant and less necessary as technology becomes more distributed and more easily managed at a local level. The complexities of the aging systems and reliance on the knowledge and financial power of the IOUs is fading. The new future opens opportunities to re-evaluate the models in which we provide electricity. Fortunately, much can be learned from the publicly owned and cooperative models, but these structures also have their weaknesses with years of status quo operations and shoe-string budgets that have made them for the most part, very reluctant or incapable of embracing innovation. The way in which the IOUs are run as regulated monopolies, meaning that they are guaranteed a 'reasonable return' if they follow the rules means their culture is one of caution and status quo as well. This does not fit well with the integration of new technologies, especially when those technologies erode the foundation on which the IOUs business model is founded.

Electric utilities in the future

Distributed Energy Resource (DER) technologies (e.g. solar, wind, energy storage, demand response, etc.) are already proving they can be less expensive than fossil fuel generation, even without incentives. They also have a lot of potential to make it less necessary to make the huge investments that otherwise would have gone to maintain the large centralized system. These huge investments were often the reason for the existence of the large IOUs, with the idea that the government could not afford to make these investments. Now with strategically placed renewables paired with energy storage and made more efficient through smart grid solutions, we can do more with less electricity and we can create and use it more locally, which also increases efficiency since there are significant losses in addition to costs to transport electricity over the many miles to the centralized power plants.

As often occurs with the advent of new technology, previous organizational structures become obsolete and must adapt to the changes or go down with the ship. In the case of IOUs delivering electricity in this new way is something they have spent the last several years at first scoffing at the potential of solar, wind, energy storage and smart grid, to changing their stance to saying it was too expensive, to then when the prices rapidly came down to using their immense power and monopoly status to either actively or passive block progress with renewables that challenged their status quo operations. It seems there is more general acceptance that these changes are going to happen, and some utilities will certainly figure out

how to adapt and offer value in new and different ways. Many of the IOUs also have very healthy financials that they can use to invest in innovation, however they are just now waking up to this fact and realize they need to innovate to survive. Changing ways for large organizations is not easy and offers opportunities for new entrants. Therefore, it may be time to consider changing to other models. There are examples that are already available for new models wherein customers are generally more satisfied with the service, have lower costs and more direct say either through shared ownership in cooperative models or as a tax paying resident. Maybe it is time for people to pick up Roosevelt's birch rod and tell the children it's time to move out of the house.

Charging into a new era of electricity

What could be the new ways we provide electricity to the public? There are a lot of ways it could go and there will likely be several attempts at different approaches. Things are going to change, and that change starts with people starting to demystify the electricity grid and realize that in fact, it is something that can be done locally. In fact, it is already being done locally by nearly 3000 non-profit or cooperatively owned organizations right now in the US. Of course, those organizations suffer in many cases from a similar complacency and inertia of status quo like the IOUs. The models of coops and publicly owned utilities on the other hand can be a very useful tool for innovative minds to create new approaches that better incorporate the benefits of sustainability, resilience and local choice in the decision making that goes into infrastructure investments. This can also be done without the ever-present need to feed profits to shareholders, but rather focus on what the best decisions are for the members of the community.

Deregulation and the ESCO enigma

The next big changes to organizational structure in the utility industry came in 1992 when the National Energy Policy Act was approved. It involved a series of market regulation changes that were called energy deregulation. Energy deregulation divided the ownership and control of the for-profit IOUs requiring them to choose between transmission and distribution (T&D), or generation of electricity [9]. In 1996 the New York State Public Service Commission (NYPSC) began to deregulate the state's electric industry [10]. The big change for end-users of electricity that came about from deregulation was the appearance of many new middle-men companies called Energy Services Companies (ESCO)s that were created to offer customers 'choice'. The introduction of this 'choice' was very confusing to consumers and often these ESCOs have employed unethical and misleading practices, such as low prices for electricity that balloon to very high rates after an introductory period. This relies heavily on the consumer tendency to simply pay their electricity bill when they receive it and many simply cannot understand the charges in the first place. Overall there has been a general dissatisfaction with the ESCOs, and this has led to regulators doing more to reign in their activities [11]. While some are of the opinion that deregulation has benefited consumers [12]; by and large the result was confusion and often higher prices for the households lacking a good understanding of the agreements they entered with ESCOs.

Given the aggressive marketing approaches employed by ESCOs the experience left many customers suspect of making any changes to the electricity services. In fact, today nearly 25 years after deregulation the majority of customers do not actively choose an alternative ESCO supplier and therefore have their supply provided by their local utility which retains the responsibility to provide a default supply based on the open market. While ESCOs have not been adopted widely in households in commercial accounts the opposite is the case. Any business beyond mom and pop status is highly likely to have a contract with an ESCO and with their larger utilization of electricity and staff with at least some understanding of the way the market works, in general it is likely that for business ESCOs have been beneficial for savings and in some cases additional efficiency and more complex programs like demand response programs.

The interesting thing about ESCOs is that many are little more than marketing organizations and the real value of the services they provide are often outsourced to other companies that handle the actual energy market transactions and interactions with the IOUs for customer billing management. The fact that so many ESCOs are such small organizations leads to the realization that if so many of these companies can simply act as marketing middleman and still find a way to make a profit, it stands to reason that a cooperative or community could also hire a small staff and outsource the heavy lifting to the same kind of company and, if run as a non-profit, they can do so as a way to reduce costs, by effectively becoming their own ESCO. There is a currently example of an operating cooperative ESCO [13] and it was one of the first ESCOs to be established after deregulation in NY. They are small but have very good ratings with customers as well as with the Public Service Commission which regulates the activities of ESCOs and qualifies them on behalf of the public. Every member of this ESCO is also a co-owner, though in practice, like with many cooperatives this ownership is not always understood or exercised by the members, but it is interesting to see that the models already exist within the current market, so it is not far fetched to propose the idea of a cooperative or municipally owned ESCO.

With the growth of renewables the choice of energy supply has become not only a question of price, but also the source of the energy and how much of it came from renewable sources. Many households and some businesses have been willing to pay a small premium to contract with an ESCO that provides a certain percentage or 100% renewable supply. For the ESCOs this is more like an additional margin they can make based on decisions they are likely making regardless. There are situations already and likely more in the future where renewable energy ends up being less expensive than buying on the market, so the premium charges applied end up being low risk arbitrage opportunities for ESCO to make even more from the marketing relationship with clients.

Renewable energy policy development

New York State has a good record historically when it comes to renewable energy policy. It adopted net-metering also known as net energy metering (NEM) legislation in 1997. "NEM customers directly use the electricity generated on-site by their distributed generation DG systems (e.g. solar, wind). If the amount of electricity the NEM customer's DG system produces

exceeds the amount of electricity that customer can use, the excess amount is exported to the utility's electric grid....NEM has been widely implemented as a customer-sited distributed generation (DG) compensation mechanism at the state level in the United States since 1983. Currently, 41 states...have mandatory net metering policies in place" [14]. NEM policies were adopted because they were very simple and worked with even the older electricity meters that would have a spinning disc to measure usage. The solar generation produced on site would slow or reverse the direction of this disc when more was produced than used, thus during the day you could sort of run your odometer backwards leading to a smaller electricity bill. No complex meters were needed, no direct action from the utility, it just worked and you were effectively paid the same amount for what you produced as you would have paid if you had instead consumed it from the utility (pure simplicity). For years this solution worked fine, and the number of installed solar systems was so small and the solution so easy that IOUs didn't have a problem with it. However, as more installations occurred and as they likely in house began to do their projections of more and more people installing solar they got very concerned and claimed that it was not fair for them because the cost they were effectively paying homes for electricity was the same as the homes would pay, whereas they purchased that electricity at a much lower price and sell it to homes with their margin included. You can see how when this was small, they did not care, but as it grew, they saw the writing on the wall.

CDG Policy (aka Community Solar) The next evolution in DG NEM policy was to extend net metering to an installation remote from the account for which it would be credit. First called remote net metering in New York the policy originally required that individuals pay for a second meter that would be placed out in a field with several other meters all hook up independently to several small solar installations. The credits from the energy created remotely were then applied to the account of both meters. There are many reasons why you may want to install remotely, for instance if you rent or live in an area with lots of shade, as well there are economies of scale to be had by installing remotely in a field with perfect alignment for maximizing solar production. However, the original policy requiring multiple meters, inverters and separate systems in the fields eroded many of the benefits of scale and really ended up being quite wasteful. After lots of complaints by developers the program was transformed into the current Community Distributed Generation (CDG) [15] policy where the Distributed Energy Resource (DER) is installed in a remote location as a single system with all the scale benefits and a single interconnection (i.e. meter). The energy production is then simply allocated to the members of the CDG project. This approach also opened up the opportunity for developers to invest the capital for these projects and then effectively be in a way like an ESCO and sell the energy generated in the project to members without them having to make any investment at all; the attraction being clean energy and a guaranteed discount usually ranging from 5 to 20% of what they would have otherwise paid. The developer or generally another 3rd party would take on the role of CDG sponsor and allocate the credits and communicate that information to the utility and then in most cases separately bill the customer and demonstrate the percentage savings. There are many complications to the billing that causes confusion, but late in 2019 a consolidated billing option like the billing process with ESCOs is now underway which will hopefully make for more clarity for customers. The idea that the developer must work with a 3rd party for the CDG sponsor activity is however the area of opportunity for municipalities either

alone or through cooperation, why wouldn't they handle this role. It is not all that complex once it is set up, and the companies providing this service are adding additional costs that could result in possibly another 5% discount to the members. This is part of the proposed strategy framework discussed later.

CCA Policy

Community Choice Aggregation (CCA) policy [16] has developed completely independently of renewable energy policy for solar, wind and other forms of DER. The policy here is one of creating scale on behalf of a community of members in the selection of an ESCO. Like any business if you can bring a large volume of customers to the table you can negotiate a better discount. So instead of each individual negotiating with one on one with an ESCO, CCA policy allows municipalities to pass local legislation that would make an ESCO selection on behalf of the entire community. The programs generally include everyone in the community, but have a provision wherein someone can choose to opt-out, however generally the rates are better than could be otherwise negotiated and even more likely it would be the case that someone getting the notice of this change wouldn't really understand, but as long as there are savings they are not going to fight it. CCA policy in NY differs to a great extent to other states that have CCAs. California for example is not deregulated in the same way as NY, so they do not have as many of the small ESCOs always trying to call you or mail you and trick you to switch. Instead in California the municipalities needed to stand up agencies usually with staff to implement a CCA program to interact with the utility in the way that any existing ESCO would in NY. This is a crucial difference because it is already assumed in California to implement a CCA program you need dedicated staff, whereas in NY CCA is viewed generally negotiated with yet another middleman company that acts as CCA Administrator and helps to set up the program as well as guide the ESCO selection and bidding process. The reality is that once this is complete there is little value provided by this CCA Administrator, but they continue to make a percentage of the savings that would otherwise go to the community. There is nothing prohibiting a municipality from being its own CCA Administrator or better yet working cooperatively with several municipalities together to administer the program and even negotiate with a larger customer volume. However, this is not the way the CCA program has developed in New York. This is another leg of the proposed framework to be outlined.

How municipality can take over the ESCO role

There are several ways that a municipality could establish an ESCO or ESCO-like entity that could provide the combined roles of CCA Administrator, CDG Sponsor, as well as benefit from additional advantages like negotiating directly Power Purchase Agreements (PPA) without the need of hiring outside consultants and paying their typically on-going associated fees. It also enables local decision making in a coordinated way across programs. Most importantly it could allow the benefits of CDG projects to not only go to select members, but rather spread those benefits out to the entire community. This is something that CDG developers spend upwards of \$1000 per customer to get members for their projects while a municipality acting in this role could easily offer all the members to a developer at once and even give the developer more incentive to build the next project.

So how could a municipality do this?

One way would be to simply do what other for profit ESCO companies do. Sign up with an organization that provides all the complexity of the back-end aspects of running an ESCO and cut one layer of middleman intermediary out of the cost equation. As mentioned early there is already an ESCO registered in New York that is organized as a cooperative and there is nothing saying that it could not be organized as a non-profit or municipal entity, it just hasn't happened yet. The rules for becoming an ESCO are clearly outlined on the Public Service Commission website [17]. Of course, even if a single municipality was concerned that it would be too much work or responsibility they could collaborate with other municipalities and leverage the benefit.

Counties could also set this up as a service to offer and guide all of their municipalities or even better yet an organization could be set up to provide this service to all counties in the state that would then communicate and manage the local specifics for their municipalities. There is even a specific law on the books since the 1960s called provides a framework for municipalities and counties to work together that would provide a ready-made and useful structure. "Article 5-G of the General Municipal Law (Sections 119-m through 119-oo) provides broad authority for "municipal corporations" and "districts" to cooperate with each other in carrying out their respective responsibilities" [18]. There are even state department staff ready to help and incentives for developing these programs to increase government efficiency.

Article 5-G, conveniently confusing with all of the cellular 5G talk these days, is traditionally used for consolidating police forces, guiding cooperation for joint water and sewer services and other projects that are normally viewed as under the purview of local government. However, there is one wonderful example of how this law has been used to successfully provide healthcare to government workers [19]. In discussion with staff at the state agency that oversees the program they said that they had never seen it used for energy, however there is no reason it couldn't be used.

Now it is important to understand the difference between what is proposed in using a shared services agreement to manage the roles of CCA Administrator, CDG Sponsor and manage directly ESCO activities; and proposing the creation of a municipal electric utility or electric cooperative. Both routes are available to communities however they are indeed much more difficult and expensive as in most instances it requires owning and maintaining the local distribution infrastructure. There are several examples in New York State of public and cooperative utilities, so it is not impossible by any means, but often in proposing the ideas of a shared services to manage the specific CCA and CDG programs and ESCO activities discussed is not the same proposal and is significantly less expensive and difficult. However, it is worth noting that the establishment of shared services and staff could be useful in evaluating such a transition to Public or Coop utility over time, which is another value of bringing energy focused staff in house as opposed to relying on outside consultants.

Regardless of the path chosen there is a great opportunity in taking back control of these aspects and existing policies and law are available already to guide the way. One of the greatest difficulties in proposing this kind of an approach is everyone looks around and asks that

someone bring them the plan or tell them how they can join. However if Article 5-G is to be used it needs to be initiated by one or more municipalities. There may be a way to have a non-profit take this action, but so many non-profits already act in similar roles, take the Municipal Energy and Gas Alliance (MEGA) for example. They are a non-profit, but basically provide services like any consultant would and it would cut into their value proposition to expand something like what is discussed here because once it was set up, it would effectively make them irrelevant and thus unable to get their continual percentage of the action.

Additional benefits and integrating other local services

There are additional benefits that could be derived from a community-based energy services approach. Advocacy of course is a major aspect; the leveraged shared services could act as a concerted voice to the state and public service commission regarding the needs of all participating municipalities. A huge benefit would be to take over billing rather than utilizing the consolidated billing with the utilities. It used to be the case after deregulation that separate bills would go to customers from ESCOs they signed up with in addition to the bill from the utility. This caused confusion and eroded trust and though the utilities fought against it, eventually the PSC required the utilities to handle the billing for ESCOs. However, all of that occurred during the transition of deregulation when people used to call their electric utilities things like “trusted provider” the days of high regard for utilities are no longer, the systems that utilities use for billing are often very antiquated and limited in even providing the consolidated billing they are required to provide. This is an area that innovation could be used; wherein an underlying shared service for a bill with a community’s logo on it would inspire more trust than the ones they currently get from the IOUs. Further, many communities do have billing for sewer and water or dog licenses, etc. It could all be incorporated in one very personalized bill and the savings would be significant.

Conclusion and outline of proposed options and action plans

Where to go from here? First of all there needs to be a community to take the lead on this if they think it could be the right path for their future in making sure that energy choices remain local and renewables located in the community are developed in a way that actually benefits the local community. This model with adjustments can also work in other states. In many ways California is already working in a similar way given the fact that they do not have the same ESCO choice model that we have in New York. They had to create staff and organization in order to implement CCAs and they have used that staff to do more including doing things like investing in their own renewable generation that directly benefits their communities. Though it is not well known even by many residing in California, CCAs currently serve millions of households and they are expanding rapidly [20]. PG&E has taken notice of this of course and they are doing things to try and limit this expansion. It would be the same here in New York if such an initiative started to gain traction, so it is also important to be prepared for that and think strategically about how to react to the very powerful IOUs. There are ways to satisfy their short-term for profit goals while also ensuring long term benefits for communities some of these I am not interested in making too openly apparent at this point because you never know who may read something and there is no benefit in showing your hand before you are in the game. Suffice it to say that there will be change in the electric utility industry and that change presents opportunities for

communities to take control of the decision making in a way that has not been available previously. The current trajectory is for IOUs, ESCOs or other new-comer intermediaries to fill these roles and make on-going profits from community's electricity purchases even when the value they add is very short-term if really at all. By working together and leveraging the same services that are available to these intermediaries, communities can achieve 100% clean energy for their entire community and guarantee savings from taking out all of the margins that are currently siphoned away. Maybe more importantly they can have trusted staff shared among many municipalities that look out for the interests of the community, not the company or even non-profit that pays them. The future can be brighter, and communities can bring the power of power back to the people.

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