Electric Co-Ops: A Path to Rural Broadband

Electric cooperatives are well positioned to deliver broadband to underserved rural areas – if they follow the right strategies.

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Rural areas of the United States continue to be on the wrong side of the digital divide, with 53 percent of the rural population lacking access to broadband services of 25 Mbps/3 Mbps, according to the FCC. Failure to find a solution will impact rural economic development, income growth, household income, employment, primary and secondary education, and access to health care and government services. Already, the lack of rural broadband promotes population migration from rural to urban areas. One can easily concur with the FCC that broadband is not being deployed to all Americans in a reasonable and timely fashion. Yet amid these concerns, there is the potential for good news on rural broadband, with rural electric membership cooperatives (REMCs) as the catalyst.

In the mid-1930s, 90 percent of homes in rural areas didn't have electricity, and businesses built their offices and factories in major metropolitan areas to gain easy access to electric power. Today, electric service is ubiquitous in rural America in the same way broadband service should be.

Historically, electric cooperatives have attempted to meet the broadband needs of their members via wireless, satellite and broadband over power line technologies, with mixed results. Clearly, the issue is not demand for broadband, because these membership-owned electric co-ops exist in territories that are either unserved or underserved by broadband today.

ELECTRIC CO-OPS IN PRIME POSITION

By virtue of geography alone, electric cooperatives are in prime position to be part of the rural broadband solution. In Indiana, for example, approximately 80 percent of the geographic territory is served by rural electric cooperatives, according to Indiana Electric Cooperatives (IEC), a service organization for cooperatives. Unlike most cable firms and Internet service providers, which often cherry-pick the highest-density areas in a market, REMCs already provide electricity to every household in their territory, and their members are generally eager for affordable broadband service.

The questions for any REMC are whether it has sufficient resources to build and operate a fiber optic broadband network, under what business conditions it might do so, and whether this activity is consistent with its service mission.

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In a recent study for IEC, the Digital Policy Institute (DPI) documented that the basic ingredients for broadband development, including a robust fiber optic backhaul network, already exist in most rural areas of Indiana. Therefore, future investment decisions should focus on middle-mile and last-mile construction costs within each REMC territory and follow a phased strategic plan that avoids the pitfalls of some of the municipally owned broadband deployments highlighted in the study.

To establish the metrics for success, we examined more than 30 companies actively engaged in deploying fiber to the home (FTTH) around Indiana and reviewed more than 16 REMC broadband deployments across 11 states. To help predict costs, we applied a regression model developed by the engineering firm Vantage Point Solutions back in 2010. The explanatory power of the formula developed was so high, with linear density alone explaining 87 percent of variance in construction costs per location, that a similar approach is now used by the FCC to predict construction costs.

Based on the Vantage Point Solutions model, more than a dozen of the 38 IEC member cooperatives in Indiana, which have an average density of eight members per linear mile, are prime potential locations for both middle-mile (smart grid fiber to the substations) and last-mile, FTTH broadband deployment. These cooperatives should be considered as possible regional broadband hubs for providing interconnect and content services to adjacent, less densely populated REMC territories. These top REMCs could, in theory, embark on developing a phased approach to broadband deployment for their territories, independent of federal funding. However, our research also shows that creative partnerships and consortia can help mitigate construction and operational costs for the last mile.

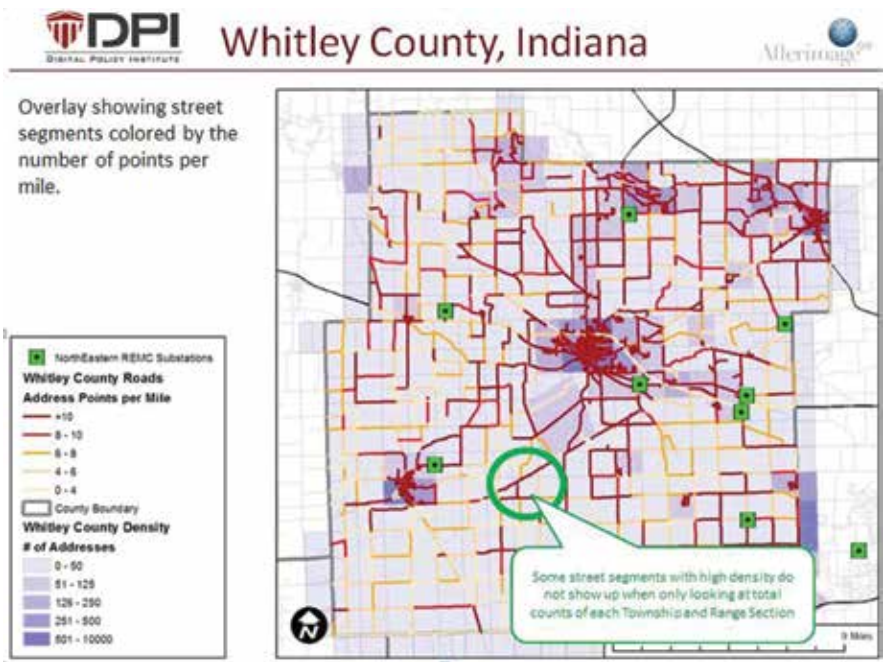
Beyond high-bandwidth anchor institutions, such as primary and secondary schools, hospitals, government offices and businesses, rural telephone companies are likely to have the greatest interest in partnering on last-mile construction costs. Already pressured by the loss of landline subscribers to cellular technology and increased competition by VoIP providers, the rural telephone firms are at a crossroads and have a strong incentive to become competitive in the provision of broadband services to the home.

In Indiana, for example, the 32 local exchange companies that are members of the Indiana Exchange Carrier Association indicated a near-unanimous interest in partnering with REMCs to provide last-mile services in their rural territories. The creation of an independent, not-for-profit 501(c) (12) information services corporation jointly owned by an REMC and a rural telephone company would allow profits from each phase to be later reinvested and used to underwrite subsequent phases of broadband expansion.

A second group of 10 member cooperatives in Indiana with average density of six to eight customers per linear mile were deemed prime locations for potential middle-mile and last-mile deployment of fiber but would most likely require federal funding for construction expenses and partnership agreements with anchor tenants and content providers. They might ideally interconnect through adjacent regional REMC hubs to mitigate operational costs.

> Electric co-ops with the densest populations per linear mile could serve as the hubs for regional hub-and-spoke fiber network deployments.

REMCs capable of providing hub-and-spoke services (eight members per linear mile and above) may be able to provide communications services to neighboring REMCs with lower density per linear mile. By creating a neutral, regional point of delivery (hub), an REMC can build out broadband service and leverage the assets of the hub design, dramatically reducing other REMCs' barriers to entry, capital expense and risk associated with entering new lines of business.



GIS density map of Northeastern REMC territory in Whitley County, Ind.
Source: Afterimage GIS Muncie, IN www.afterimagegis.com/index.cfm

In addition, REMCs can use their fiber networks to generate and explore new energy-saving measures, such as remote meter reading and load shedding, and new revenue streams, such as alarm monitoring, as they offer some combination of voice, data, and video broadband services to rural membership.

Finally, member cooperatives with an average density of less than six members per linear mile can be prime locations for middle-mile (smart-grid) deployments of fiber and may be ideal for wholesale or retail provision of bandwidth to support cellular service or wireless broadband (WiMAX or LTE) in their territories. For example, the Allamakee-Clayton Electric Cooperative serves a region of rural Iowa so scattered it has just four customers per mile of electric line. This cooperative is building a fiber optic and wireless broadband network in northeast Iowa with up to 25 Mbps broadband wireless service available in the less dense portions of its service area.

Presubscription and conducting surveys will help REMCs determine potential take rates and competitive offerings. Research conducted by DPI indicates a reasonable take rate expectation analysis for targeted FTTH deployments include a 25 percent presubscription benchmark before fiber deployment and a 50 percent take rate expectation for broadband services within a three-year period.

We propose a phased approach to deploying broadband as a means to avoid the pitfalls some municipal utilities have encountered in larger markets. This approach would use GIS mapping of an REMC territory to locate groups or clusters of high population density that are ideal for initial-phase deployment.

An example can be seen in a GIS map of Whitley County, Ind. The green boxes on the map indicate the locations of Northeastern REMC substations. Here it is easy to tell which substations are closest to high-density (darker) clusters of population and which high-density roads (dark red lines) connect those clusters. Density is based on township and range section population data, not on census block. This is an initial part of a phased approach to broadband deployment.

A second example can be found with NineStar Connect, the Greenfield, Ind., co-op that is a 501(c)(12) merger of Hancock Telecom and Central Indiana Power. NineStar has an average linear density of 15.77 members per mile. NineStar identified population clusters that exceeded 50 members per mile for its initial phase of fiber deployment. After each phase reached the break-even point, the profit was used to fund the next phase of construction in less-densely populated areas of the utility territory. The result is that for Hancock County, Ind., fiber penetration today stands at 98 percent.

A final example is Co-Mo Electric Cooperative in central Missouri, which was turned down for stimulus funding but wanted to proceed with a $60 million network phased approach – a pilot project to test the broadband model, followed by a larger project if the pilot was successful. Upon review, as one consultant noted, the best approach for co-ops is to eat the apple one bite at a time. This has proven to be a successful strategy when used in conjunction with the proper economic assessment, plans and budgets.

The bottom line is that waiting for the federal government alone to provide the solution hasn't worked. Only those local entities with a vision and a local, vested interest in providing a long-term solution for ubiquitous broadband service to rural areas will succeed. For REMCs, the process begins with a commitment to a middle-mile, smart grid fiber deployment connecting their substations, followed by a phased-approach business model with strategic growth focusing on last-mile customer density. Exploring local business partnership underwriting opportunities, examining the use of an efficient regional network design and combining multiple federal funding programs are the keys to rural broadband deployment success down the road. ❖

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