

# A Tale of Three Cities:

## *Solar Power and the Irresistible Lure of “Free Money”*



By Kim Crockett and Bill Glahn

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### Introduction

In recent years, a number of local governments across Minnesota have been installing solar panels to generate a portion of their electricity. Cities and schools embrace these solar installations despite the fact that they can take 40, 50 and even 100 years to pay for themselves. Local governments are able to make these poor “investments” thanks to cash grants from the federal government and electric utilities. Though just a tiny corner of the federal spending juggernaut, federal grants still add to the nation’s \$17 trillion dollar debt. Subsidies from electric utilities—mandated by the state—represent a larger, slightly more visible burden on Minnesotans in the form of higher energy rates.

In this report we look at three solar power projects undertaken by local governments in Minnesota. By exploring how each city made the decision to accept cash grants, we can begin to get a picture of how uneconomic projects get funded, with each party involved making apparently rational decisions in their own best but narrow interests. In light of how these decisions were made, we offer some alternatives for city officials to consider even when they feel compelled to move forward with uneconomic projects.

We were graciously welcomed by these cities and found the staff, elected officials and volunteers we interviewed to be well informed and well intentioned. We do not want this report to be viewed as a personal criticism. As we told the people we interviewed, we bring a different perspective on the project dollars they viewed as “free.” Federal dollars come from only two sources: current federal taxpayers contributing to the national treasury and future taxpayers who will pay back the borrowing used to fund current spending. State mandated subsidies push up energy costs which raise prices. This may not be noticed by most people but it is a burden for low-income Minnesotans and can impact, for example, job growth in energy intensive industries.

As noted above, we hope this report will encourage citizens, city councils and their staff to think about these opportunities differently in the future.

## Sources of Solar Subsidies

**Federal Stimulus Grants:** Back in early 2009, Congress passed the American Recovery and Reinvestment Act (ARRA), the \$1 trillion annual economic stimulus package that was intended to jump start the economy by funding worthy “shovel-ready” projects and putting American workers back on the job. Energy projects were a particular emphasis under ARRA, with \$31 billion set aside for renewable energy and energy efficiency projects.<sup>1</sup> Drilling down deeper, more than \$3 billion worth of Federal taxpayer dollars were put toward funding renewable energy and energy efficiency projects through state and local governments.<sup>2</sup> And over \$400 million went to fund projects in Minnesota.<sup>3</sup> As with most efforts of this type, the ARRA was passed during an economic crisis, but the projects actually funded would not be installed until years later.

**Minnesota Conservation Improvement Program (CIP):** The State of Minnesota mandates that all electric and natural gas utilities—regardless of ownership structure (stockholder, cooperative, or municipal)—must provide energy efficiency programs to their retail customers. A certain portion of CIP funds can be used to subsidize renewable energy. Utilities spent \$140 million in 2011 on energy efficiency and renewable energy through the CIP.<sup>4</sup>

**Renewable Development Fund:** In return for the privilege of storing nuclear waste in Minnesota, Xcel contributes money—\$24 million in 2014—toward the Renewable Development Fund, which provides production incentives and grants for renewable energy.

**Renewable Energy Standard (RES):** The State of Minnesota mandates that electric utilities obtain a significant amount of their energy needs from renewable sources. The mandate to buy higher cost renewables represents a substantial subsidy. Depending on the utility, a requirement exists stating that 25 to 30 percent of all energy must come from qualifying types of renewable power. As a practical matter, it turns out that the vast majority of renewable energy acquired by state utilities has come from wind power. In 2013, the state legislature passed an additional requirement that utilities obtain a further 1.5 percent of their total energy requirements from solar power.

A number of other state programs also provide tax incentives, direct grants, and subsidized loans to encourage the development of renewable energy. For a more complete list, see Appendix A in Peter J. Nelson, *Recommendations for Promoting Affordable and Competitive Energy Rates in Minnesota* (Center of the American Experiment 2011).

## City of Kasson in the Zumbrota River Valley



### Kasson, MN

Kasson owns its own electric utility, serving 2,600 customers (households and businesses) within the community.

Kasson, Minnesota, is a small but bustling and growing community in the southeastern part of the state, situated in the Zumbrota River valley just 13 miles west of Rochester and home to a little less than 6,000 people. The City's population grew almost 35 percent between the censuses of 2000 and 2010. Kasson has grown rapidly due to its proximity to prosperous Rochester, home of the world-famous Mayo Clinic medical complex. Unlike the other cities included in this report, Kasson owns its own electric utility, serving 2,600 customers (households and businesses) within the community.

We interviewed Nancy Zaworski, the city's finance director, and the town's Administrator, Randy Lenth, about the decision making around that city's solar power project.

At least in theory, power produced by the project reduces the amount the City's utility needs to purchase from its wholesale power provider, the Central Minnesota Municipal Power Agency (CMMPA). As a municipal utility owner, Kasson is better positioned than other communities to capture the value produced by the solar power project, in the form of electricity, transmission, and ancillary services they avoid buying at wholesale because they are producing power locally.

As you can see in the nearby photo, Kasson's City Hall was also a good candidate for solar because the panels are on an angled roof with a southern exposure, though, when we visited on a sunny winter's day in 2013, the roof was mostly covered in snow (see photo).

Kasson is many years ahead of schedule in complying with Minnesota's renewable energy mandate. According to Kasson's City Administrator Randy Lenth, "As a utility we are between 25 and 30 percent (for) renewable energy. We've purchased a lot of wind energy and now we have the solar components."

The solar project was installed in July 2011 (about 2½ years after the passage of ARRA) on the roof of City Hall. The 45 panels are capable of producing 10.35 kilowatts of electricity. Total project costs came in at \$65,250. Federal stimulus (ARRA) funds covered 40 percent of the cost (\$26,100) while City funds covered the remaining 60 percent (\$39,150).

With a price tag of \$65,250, Kasson's solar power project is only a small part of the capital improvements being made in the growing city. Larger projects include a new aquatic center, library, and wastewater treatment projects.



Based on the total cost, the Kasson solar project will never show a profit. Kasson estimates that the solar panels will produce electricity worth \$1,400 per year. At that rate of savings, the project will pay back its installation cost of \$65,250 in 46.6 years. The equipment is under warranty for only 25 years (some components for even shorter time periods) and would not be expected to last much beyond that date. If the solar panels or related equipment require any repair or maintenance during the life of the project, the payback period would stretch even further in the future.

From the City's perspective, the Federal stimulus funds are the equivalent of found money. Yet as stated above, federal dollars come from only two sources: current federal taxpayers contributing to the national treasury and future taxpayers who will pay back the borrowing used to fund current spending. Proportionately, since so little of the \$26,100 federal grant was (or will be) generated within the confines of Kasson, from the City's view, the federal money is "free."

The City's share came from its electric utility in the form of Conservation Improvement Program (CIP) money. CIP is a state-mandated program requiring each electric utility to spend an equivalent of 1.5 percent of the utility's annual revenue on projects related to energy efficiency or renewable energy (see sidebar).

In Kasson, the City Council serves as the governing body for both the city government and the electric utility. From its standpoint, the project was essentially free: the Federal ARRA money came from outside the city and the utility's contribution came from money that would have been spent anyway, under the CIP mandate.

Federal money turned out to be a strong incentive. City of Kasson Finance Director Nancy Zaworski commented on the \$26,100 Federal stimulus grant for city's solar project this way, "It's something that we might not have done but for the grant."

“ ‘It’s something that we might not have done but for the grant,’ says Nancy Zaworski, Kasson’s finance director. ”

Kasson, of course, does not have to answer to every federal taxpayer, it only has to answer to the citizens that live within the city limits. If you assume that the City's share of the project, \$39,150, could have been productively employed elsewhere in town, then the payback period represents a more palatable 28 years.

Provided that everything continues to work, the solar equipment will wear out at about the time the original City investment share is paid back. This analysis does not take into consideration the time value of money. To truly break even, in today's dollars, the payback period would have to be much quicker.

Beyond the financial return, the City points to environmental benefits, like the amount of CO<sub>2</sub> emissions avoided (22.2 tons/year) and the equivalent of trees saved (273) to illustrate the environmental benefits produced by local solar power.

"Part of our solar program," according to Administrator Lenth, "is based on education," meaning that cities like Kasson feel an obligation to "educate" the citizenry about the benefits of solar power.

Bottom line, no business manager taking a total cost perspective would have given Kasson's solar power project a go ahead. Its costs, plus any ongoing maintenance expense, will never be offset by savings or revenue throughout the life of the equipment. But from the City's perspective, with the combination of "free" federal money and state-mandated "conservation" spending that would have happened anyway, the project is a clear winner.

## Next stop, City of Royalton



### Royalton, MN

At one time, Royalton had a city-owned electric utility, but is now served by the Duluth-based, Minnesota Power Company.

The next stop on our municipal solar power tour was the town of Royalton, Minnesota, located in the central part of the state. It is a quiet, beautiful town with many young families, but it is easy to miss Royalton's true character unless you veer off the beaten path of Highway 10. The population in Royalton surged between the 2000 and 2010 censuses, increasing by more than 52 percent to 1,200 people, owing to its proximity to the regional center, St. Cloud, located 21 miles to the south.

At one time, Royalton had a city-owned electric utility, but is now served by the Duluth-based, Minnesota Power Company.

As with Kasson, Royalton participates in the public-private partnership GreenStep Cities. GreenStep recognizes local communities for efforts in conservation, renewable energy, and environmental protection. Among dozens of other activities, installing a city-owned solar power project earns the community additional points under the GreenStep recognition program.

Achieving the increasing levels of recognition under GreenStep does not generate any cash or confer any direct financial benefits on the participating city. However, city officials are recognized in front

of their peers in GreenStep publications and annual awards events conducted by the statewide League of Minnesota Cities.

Earlier this year, we interviewed Royalton Mayor Andrea Lauer, now serving her second term in the post.

The Royalton solar project was written up as a case study by the Minnesota Department of Commerce, the state agency which served to distribute energy-related Federal ARRA grants.<sup>5</sup> Like Kasson's project, the Royalton solar panels were installed on the roof of City Hall but we could not see them because the roof is flat.

The Department's write up quotes the mayor as saying,

We were excited to see the benefit to the environment and to the bottom line for our city. Thanks to federal stimulus funds, we were able to provide work for two Minnesota companies and save energy and dollars for the residents of Royalton.

Total installation cost of the 7.55 kW solar array amounted to \$84,000 for the project completed in November 2011. Federal ARRA dollars contributed

\$33,600 (or 40 percent) of the project cost. Minnesota Power provided an additional \$16,000 rebate to support the project.

The remainder, \$34,400 (or 41 percent), was provided by the city, courtesy of Royalton's taxpayers. According to the Department of Commerce, the project reduces City Hall's electricity requirements by 20 percent, generating \$850 in annual savings.

Mayor Lauer told us, "The part that really appealed to me on this was the fact that the company that manufactures the solar panels is in Minnesota. The company that is leasing the project is also a Minnesota company. The company that installed the solar panels is a Minnesota company. It was really important for me to know that Minnesota companies were benefitting from this project, not just the City of Royalton."

As in Kasson, from Royalton's viewpoint, the federal funds were "free" money, with little of the taxpayer-funded grant having been provided by Royalton taxpayers. Likewise, Royalton represents only a tiny fraction of Minnesota Power's customer base. For Royalton's purposes, the costs of Minnesota Power's rebate of \$16,000 and making up the \$850 in lost sales will be funded by utility customers in Duluth, Grand Rapids, and other cities served by Minnesota Power.

For a net upfront investment of \$34,400, Royalton is able to capture the \$850 in annual savings, for a simple payback of 40.5 years. Even assuming no repair or maintenance expense along the way,

Royalton stands little chance of recovering its investment before the solar equipment reaches the end of its useful life.

When you consider the total cost of \$84,000, however, an annual savings of \$850 results in a simple payback of 98.8 years. But that is not Royalton's perspective.

As Mayor Lauer explains, "Any city that's going to decide to do something like this, whether it's an energy project or whether it's a wastewater project, if there is money out there that will help you do the project, you are going to take it. Because, if you don't, there is somebody else who is going to. But it has to make sense to your budget first. Then you may look at other benefits."

Mayor Lauer considers the project a success for Royalton when viewed in combination with other energy efficiency efforts undertaken around the same time. All told, Royalton was able to reduce City Hall's net energy purchases by 39 percent, when accounting for the additional conservation-related savings. (We did not ask about the cost of these additional measures encouraged by the GreenSteps program.)

Again, no financial manager taking a total cost perspective would support an investment taking a century to pay off. Still, the Royalton solar project was considered enough of a success to draw a visit to the town by U.S. Senator Al Franken as part of a statewide tour of solar projects.<sup>6</sup>



## On to Green Edina where “It’s a demonstration project.”



### Edina, MN

Edina does not own an electric utility. The electricity provider for both city government, local residents and businesses is Xcel Energy.

Our last stop was Edina, Minnesota, a city adjacent to Minneapolis and a community considerably larger than Kasson or Royalton. With a population just over 49,000, this fully-developed western suburb added only 500 people between 2000 and 2010.

Unlike Kasson, the city does not own an electric utility. The electricity provider for both city government, local residents and businesses is Xcel Energy.

We interviewed Edina’s city manager, Scott Neal, about the city’s solar power project which was installed at the end of 2011. Neal joined Edina’s staff in 2010, after a stint as the city manager of neighboring Eden Prairie. We also met retired attorney, Dianne Plunkett Latham, a resident and active volunteer on the Edina Energy & Environment Commission. She is also chair of the Recycling & Solid Waste Working Group. The City’s environmental engineer, Ross Bintner, also joined the meeting.

When discussing the origin of the project, Plunkett Latham said, “It was really grassroots level. It came from our Energy Working Group. On that we have Bill Sierks who works for the Pollution Control Agency and we also had several members who work in the solar industry.”

The City certainly is enthusiastic about trying new “green” technologies. For example, it now has an

electric car for staff to use for inspections. The cost of the car was defrayed in part by a Pollution Control Agency grant of \$5,000 that requires Edina to “promote local air quality and sustainability initiatives at the City through the use of [a] colorful vehicle wrap...” The total cost of the car and the vehicle wrap are not included on the website.

Like Kasson and Royalton, the City of Edina belongs to the GreenStep Cities program. Edina was one of a handful of cities participating in a pilot project that served as the predecessor to GreenStep. Edina lists the city-owned solar power array atop City Hall as one of its achievements under the GreenStep program. In 2012, it was announced that Edina had achieved Step 3 status under the program, with Royalton achieving the Step 2 level. Kasson is at the Step 1 level.



According to GreenStep Cities,

Participating cities earn awards in the form of “recognition blocks” made from reclaimed urban wood. When a city completes step three, it will have a set which recreates the logo of GreenStep Cities and reflects the community’s sustained commitment and continuous improvement.<sup>7</sup> (See Royalton photo)

Edina reports that the 24-kW solar power project saves approximately \$1,300 in electricity purchases *per year*. Even though the Edina solar project is larger than the Kasson and Royalton projects combined, the electricity purchase savings are relatively smaller. That’s because Edina’s City Hall building hosts an on-site diesel electric generator to support the operations of the local police department. With the local generator available, Edina purchases electricity from Xcel at a discounted price, further reducing the value of the City Hall-produced solar electricity.

The solar panels were installed during December 2011.<sup>8</sup> Daily electricity production of the array can be monitored at <http://home.solarlog-web.net/953.html>. Total installation costs for the project amounted to \$200,000. A Federal ARRA grant of \$80,000 offset 40 percent of the project’s cost. The remaining \$120,000 was covered by a grant from Xcel, part of a rate-payer funded program to promote both solar power and Minnesota-based manufacturers of solar power components.

In the end, the City of Edina contributed nothing to the project’s costs, save the space on the roof of City Hall. However, the City does stand in line to pocket the \$1,300 per year in electricity purchase savings enabled by the solar power production.

When asked about the need and the goal for solar power for the residents of Edina, Plunkett Latham said, “We wanted to stimulate residents to use this sort of technology which does not produce greenhouse gases. If the City has experience doing that and can help answer questions about it, then residents have more confidence in the technology and want to try it themselves. It’s a demonstration

project.” When asked if they knew how the panels would be disposed of at the end of their useful life, the City did not know.

“ If you are a local resident and property taxpayer in Edina, the solar power project looks like a great deal. Local residents paid nothing down and look to save \$1,300 in the City’s annual operating budget for the next couple of decades. ”

If you are a local resident and property taxpayer in Edina, the solar power project looks like a great deal. Local residents paid nothing down and look to save \$1,300 in the City’s annual operating budget for the next couple of decades, barring any ongoing repair and maintenance costs. The city government of Edina, therefore, made the only logical choice: take the “free” money and “free” savings of this apparently costless (to the city) project.

Once again, because it bears repeating, if you were managing these resources based on the full cost to all, the \$200,000 investment in Edina solar power looks to be a terrible decision. The \$200,000 initial cost, divided by \$1,300 per year in annual savings, produces a 153.8-year payback period.

According to City Manager Scott Neal, “There was a moment there, even with all the subsidies, we weren’t sure that we were going to do it because the return on investment was not quite good enough.” But the supplier (“tenKsolar”) lowered the price, putting the City’s cost at zero.

In reality the project will never pay for itself, because the equipment installed on the roof of Edina City Hall has a useful life of only a few decades, at most, not a century and a half.

## Solar Panel Financial and Operating Data

	Edina	Kasson	Royalton
Federal Dollars	\$80,000	\$26,100	\$33,600
Utility Ratepayer Dollars	\$120,000	\$39,150	\$16,000
Local Dollars	\$0	\$0	\$34,400
Total Cost	\$200,000	\$65,250	\$84,000
kW Produced	24	10.35	7.55
Payback Period	153.8	46.6	98.8
Service Life of Equipment	25	25	25
Reduction in net energy purchases (\$/Year)	\$1,300	\$1,400	\$850

### How should local governments respond to these stimulating offers?

To review, city officials cited a number of reasons for why they moved ahead and installed solar panels. Not surprisingly, all were strongly swayed by the financial incentives from the federal government and the utilities. And all were buoyed by the recognition and kudos they received from the GreenStep Cities recognition and other good press. Kasson and Edina officials also cited the perceived environmental benefits and the public education opportunities. Royalton considered supporting Minnesota jobs another important factor. Finally, Royalton made the persuasive point often heard in city council meetings across the state, “if we don’t use the subsidy, someone else will.”

How do these reasons stack up? Are there alternative ways to respond to the allure of someone else’s money?

To begin, the federal money from the ARRA “stimulus” programs, while discontinued, could be offered again in one form or another so it bears repeating that federal tax dollars are not “free” even if you are not a federal taxpayer. And they have not proven to be particularly stimulating to the economy either.

Supporting “Minnesota jobs” sounds really great, especially in the midst of our sluggish economy, but

it does not hold up to scrutiny either. Since solar projects do not provide any true economic payback, these projects simply cannot offer a net gain in jobs. To the extent they do stimulate certain jobs, the jobs tend to be dependent on government programs rather than real demand for products and services; they are “make-work” type jobs and as such, short term. “Make-work” industries feed into the kind of boom and bust economic cycles that we have seen in the renewable energy industries in Europe.

Environmental benefits are also hard to demonstrate. First, putting aside the whole debate about global warming/climate change and the contention that carbon emissions are warming the planet and/or changing our climate, solar projects are not an effective strategy for reducing carbon emissions.

While solar panels may indeed reduce carbon emissions, the projects of the scale that a typical city would consider are simply too small to create any measurable reduction in carbon emissions. Even if you accept the argument that all these small efforts add up to a lower overall emissions rate, money spent on solar panels would almost certainly offer a better result if spent on other conservation measures that deliver largerm more immediate returns. As these cities demonstrate, solar projects typically take decades to pay for themselves, even when just the city’s portion is taken into account. This “local” approach does not take into account the fact that the production of solar panels uses energy—and creates polluted water and toxic



sludge that has to be properly disposed of at often far-way disposal sites. Furthermore, there is also no plan for disposing of these large panels when they break or wear out.

“ To maximize actual environmental benefits as opposed to illusory ones, cities may wish to instead spend money on other local projects. ”

To maximize actual environmental benefits as opposed to illusory ones, cities may wish to instead spend money on other local projects. For example, \$200,000 would have gone a long way toward improving Nine Mile Creek in Edina. If they're really worried about losing out on a matching subsidy, there are other environmental matching grants, both public and private, that may deliver a better return to society.

As for the goal of education, we reject the idea that government should be using taxpayer dollars to “educate” residents about the benefits of solar power through uneconomic demonstration projects. If the goal truly is education, cities should be presenting a full and transparent accounting of the cost and benefits—both economic and emission reductions as part of the decision-making process, along with a recognition that the manufacturing and disposal of solar panels also have environmental costs. Then if residents and their elected officials still want to proceed, at least they do so on a fully informed basis.

Such an analytical approach would be the best “demonstration” to citizens who might be considering solar panels for their homes or businesses. And surely citizens are quite capable of making those decisions without taxpayer funded “education” by local government.

We wonder of the City of Edina, for example, would have proceeded with the much-publicized project if it had to post on the news releases and website alongside the photos of the solar project a 154-year payoff period.

### The moral of the story? Citizens must educate city hall.

These vignettes go some distance to explaining why it's so hard to gain control over America's finances and any accountability over Minnesota's renewable energy subsidies.

In each instance in the three featured cities, diligent and conscientious city officials and volunteers acted in the interest of local taxpayers and in a manner likely to earn individual and community recognition from higher-level authorities and high-ranking elected officials.

The utilities involved in each transaction, as members of one of our most heavily regulated industries, were merely complying with state mandates to promote renewable energy and local manufacturing. They were not asked to vet projects for economic viability or to maximize environmental benefits, but only to process valid claims from conforming applicants.

At no point did any market, or public official, or other *deus ex machina* intervene and say “no” to any of these uneconomic investments. From a total cost perspective, not one of these projects represented a close call. Further, the environment would be far better off if the subsidies were directed to more effective projects. All should have been rejected out of hand.

The *Star Tribune* recently reported that “more city buildings around the metro are sprouting solar panels.”<sup>9</sup> These cities are following the same logic as our neighbors in Kasson, Royalton and Edina. We strongly encourage city officials to instead follow the example of the City of Crystal's mayor and finance director. As reported by the *Star Tribune*, Crystal Mayor Jim Adams and his finance director ran the numbers and concluded that “it is unfair to use state and federal tax dollars or corporate rebates

to subsidize a local solar power project.” Adams explained how it “is fiscally irresponsible because that money comes from citizens’ state and federal taxes and Xcel funds.”

According to the *Star Tribune*,

Adams was one of the three council members who voted against the projects. They were skeptical of vendor Newport Partners’ estimates of low maintenance and projected energy savings resulting in a \$365,000 net advantage over 40 years.

City Finance Director Charles Hansen used more conservative inflation and equipment maintenance costs that indicated a longer period to recoup costs. In a memo, he cautioned that over 40 years, “no one can reliably predict if this project will produce a net financial savings ...”

Crystal’s mayor deployed common sense and the kind of cost benefit analysis we have suggested. It should have been enough to stop an uneconomic project but he was out-voted by the city council. While Mayor Adams did not prevail, he demonstrated the kind of leadership that should encourage other elected officials to look behind the numbers.

It is indeed possible to get off the bandwagon and say “no” to these projects. Our recommended approach, however, will only succeed if elected officials hear from city residents. And therein lies the moral to this story about three Minnesota cities: ask your elected officials to think beyond the city’s narrow interest and the temptation of “free money” for your city. Insist on a more sophisticated analysis like the one presented here and used by the city finance director in Crystal. In the end, elected officials and their staff must answer to the electorate but only if they show up and ask questions. ■

### About the Authors

**Bill Glahn** served as Gov. Tim Pawlenty’s top energy official—for 2½ years until January 2011—as Director of the Minnesota Office of Energy Security and a Deputy Commissioner in the state’s Department of Commerce. He has since returned to Piedmont Consulting, the firm he founded in 2006. Prior

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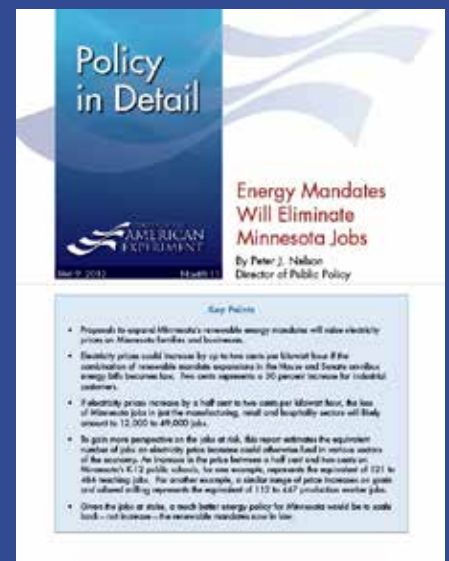
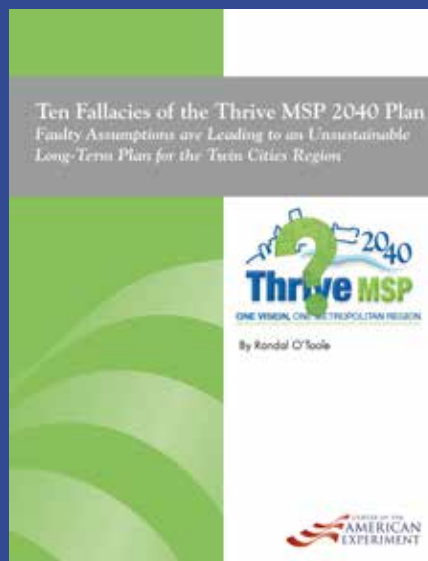
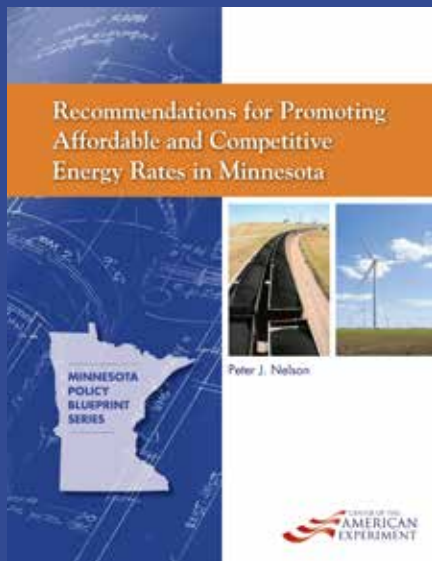


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