BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the Empire District Electric Company for Authority to File Tariffs Increasing Rates for Electric Service Provided to Customers in the Company's Missouri Service Area	)))))	File No. ER-2016-0023

RESPONSE TO NOTICE OF COMPLETION OF PAYS STUDY

COMES NOW Office of the Public Counsel (OPC), by and through counsel, and submits this Response to Notice of Completion of PAYS Study. The OPC respectfully states as follows to the Public Service Commission (Commission):

1. In accordance with a Stipulation and Agreement regarding Empire District Electric Company's (Empire) Demand Side Management tariffs, approved by the Commission on August 10, 2016, Empire agreed to complete a study on the feasibility of the implementation of PAYS as a Demand Side Management program.

2. Empire contracted with the Cadmus Group LLC to complete said feasibility study.

3. The study was completed and thereafter presented to the Commission on May 31, 2018, with a finding that a PAYS Demand Side Management program would be feasible for Empire.

4. In response to Empire's feasibility study, the Energy Efficiency Institute, Inc. (EEI), the proprietary owner of PAYS, reached out to the OPC with concerns regarding Cadmus Group's methodology.

5. The EEI provided the OPC with documentation of its concerns, and said document is hereto attached as **OPC-1**.

WHEREFORE, the OPC respectfully submits this Response to Notice of Completion of PAYS Study and tenders **OPC-1** for future consideration of the Commission regarding analysis of

the PAYS program. The OPC does not request any particular action of the Commission at this time.

Respectfully,

OFFICE OF THE PUBLIC COUNSEL

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing was served, either electronically or by hand delivery or by First Class United States Mail, postage prepaid, on this 27th day of June, 2018, with notice of the same being sent to all counsel of record.

/s/ Caleb Hall

Response to "The Empire District PAYS Feasibility Study"
prepared by the
Energy Efficiency Institute, Inc.
for
Missouri Office of the Public Counsel

The Energy Efficiency Institute, Inc. (EEI) reviewed the Cadmus Group LLC's (Cadmus) May 31, 2018 "The Empire District Electric Company PAYS (sic)[1] Feasibility Study". EEI was one of the firms that bid to perform this study with Synapse Energy and EEtility and has a unique perspective that we think would be valuable to anyone reading the Cadmus study. EEI was not only the originator of the Pay As You Save® system, it was also involved to varying degrees in the regulatory approval, design, and implementation of all 17 programs in the seven states where programs based on the PAYS system have been operated.

The PAYS system uses a different approach than other resource efficiency programs and consequently is often misunderstood. Instead of attempting to eliminate a single barrier such as first cost or access to capital, PAYS seeks to eliminate all of the barriers that keep customers from accepting offers from utilities to install resource efficiency measures in their homes and businesses and that keep utilities from making these offers. The goal of PAYS is to make an offer to customers that they will accept. That's why PAYS programs around the country have experienced offer acceptance rates of 50 percent and higher.

While we have concerns about some of the assumptions used in the report and their implications for what is possible at Empire, which we discuss later, we are encouraged that the report's description of PAYS on pages 9 and 10 evidences a good basic understanding of the PAYS system (though there is no PAYS program in Virginia; it's at Roanoke Coop in North Carolina). Many previous assessments of PAYS have not gotten even these basic descriptions right.

Similarly, while the report evidences some errors that led to its recommendation of a more limited role for PAYS at Empire than we believe is realistic, some of the findings correctly highlight the unique opportunity that PAYS provides for renters and hard to reach customers including those with lower incomes:

- *Based on the study findings, Cadmus concludes that a PAYS program is feasible (TRC greater than 1) for Empire under certain scenarios described in this report*. (p.vii)

- *Should Empire decide to offer a PAYS program, a typical PAYS program design is the best approach. Like existing cooperative utility programs, target high use, lower income all-electric homes through a direct outreach model that facilitates close communication with participants. To mitigate the administrative burden, hire a third-party implementer for at least the initial years of the program*. (p. 71)

- *Federal census data indicates 43% of Empire customers have electric heat, indicating a*

[1] The report title should include the registered trademark symbol. In 2003 (PAYS®) and 2005 (Pay As You Save®), the US Trademark and Patent Office awarded EEI trademarks for its system and its acronym. As of those dates, there is no such thing as a PAYS-like program or a generic Pay As You Save program. Using the name or its acronym must refer to EEI's system (i.e., has all the essential elements and meets all the minimum program requirements) and should be accompanied by the registration mark. It must also be used when utilities receive permission to use PAYS as part of their branding. EEI has never charged a program for using the mark.

potentially large market for the measures most likely to be well-suited to PAYS. (p. iv)

- *Offering a financing program to residential customers may help Empire increase uptake of energy efficiency measures, particularly in some hard-to-reach markets*. (p. 70)

- *A PAYS program appears to be the best program model to remove financing-related barriers to making energy efficiency upgrades in rental housing, due to the tied-to-the-meter feature*. (p. 70)

- *Based on preliminary cost estimates, we found the PAYS program can be cost-effective at a modest level of participation*. (p. 69)

PROBLEMATIC ASSUMPTIONS

There are a number of assumptions included in the Cadmus analysis, however, that significantly reduce the reported cost effectiveness of implementing PAYS in Missouri: higher program costs than those used by existing PAYS programs, costs that have unnecessarily been passed on to participants, savings that are not included, cost reduction mechanisms used by most PAYS programs not included, and basing cost effectiveness on average customer usage. These assumptions have led to Cadmus' recommendations that PAYS at Empire be limited to too few measures and too few customers.

If the discussions in Missouri go forward using these assumptions, Empire customers, other Missouri customers, and customers of utilities who look to Missouri for leadership and precedent will unreasonably and unnecessarily be denied access to the resource efficiency opportunities that the PAYS® system can provide. A review of these assumptions and the problems they create are grouped below in order to facilitate understanding of their impacts.

1. Unnecessarily high program cost estimates

A. Utility Start-up costs

The report states:
Specific up-front costs were not reported by either program [Kentucky and North Carolina].
However, such costs could include the following categories:

- *Staff time, including both program design and legal/regulatory support*
- *Updates to utility billing software and systems*
- *Consulting and licensing fees for PAYS program design and intellectual property (estimated at between $40,000 and $50,000, based on other Cadmus research).* (p. 39)

Regulatory Approvals. Five state utility commissions have established precedent for authorizing PAYS programs, authorizing utilities to use a PAYS tariff, authorizing all resource savings, authorizing assignment of PAYS obligations to a location rather than to an individual customer, authorizing disconnection for non-payment of PAYS charges, and authorizing extended payment durations to ensure cost recovery of non-payment, vacancies, or foreclosures. Additionally, white papers are available that document the regulatory authority to approve PAYS tariffs in two states that have not initiated programs yet: New York and Vermont. These commission precedents and research have simplified the approval process in states that have recently initiated PAYS programs. While Cadmus correctly reports that the Kentucky process, highlighted by a six-month reconsideration by its Commission, was lengthy, Ouachita Electric received quick approval of its application in approximately three months.

The report states:
Interviews with Empire staff and other PAYS administrators did not provide clarity on legal considerations that may affect a PAYS program. Empire staff noted that tying the tariff to the meter might create a difficult customer relations situation for the utility, but was not sure if existing laws or regulations could also be a barrier to this aspect of the program. (p. 40)

There is no reference in report to the extensive work that has already been done around the country addressing the legal and operational issues that Cadmus raises. Since Empire already has staff assigned to investigate and determine the viability and effectiveness of its efficiency programs and to work on regulatory matters, and since there are now legal precedents and the success of 17 programs in seven states, there should be no incremental program cost for Empire staff time for these functions.

Program Design & Licensing Fees. Recently, EEtility, a B corporation, has arranged to provide residential services with no program design or licensing fees to implementing utilities. Utilities interested in running a residential program can contract with EEtility without any upfront licensing or program design fees should they want to replicate EEtility's success in Arkansas and North Carolina with residential single or multifamily customers.

Cadmus recommends: *Should Empire decide to offer a PAYS program, a typical PAYS program design is the best approach. Like existing cooperative utility programs, target high use, lower income all-electric homes through a direct outreach model that facilitates close communication with participants. To mitigate the administrative burden, hire a third-party implementer for at least the initial years of the program.*" (p, 71)

Cadmus should redo its cost-effectiveness analysis assuming no start-up or licensing fees. They can use EEtility's operations costs noted below.

Note: Custom-designed programs may include licensing and consulting fees if the vendor is providing intellectual property for use by the utility, especially if the utility is interested in markets other than residential (e.g., municipal customers, schools and hospitals, industrial customers, or some commercial markets).

Billing and Information system modifications. Of the 17 utility programs based on the PAYS system, only one municipal utility, the Town of Windsor, CA, has reported expenses to change it billing and information system. Both IOUs operating PAYS programs did not do so, nor did the three cooperative utilities noted in Cadmus' report. Windsor's software contractor updated its system to EEI's specifications for less than $40,000.

There is no reason to include a cost for modifying billing and information systems for a small program serving 400 customers a year (or fewer). Even if Empire ran a reasonably sized program and served 4% of their customers over a span of five years, and even assuming doubling Windsor's cost for billing and information system upgrades, the cost would likely entail a one-time cost of pennies spread among all customers or constitute approximately a dollar per participant. Therefore, for planning purposes, there needs to be no incremental cost for such changes.

Not charging participants for startup costs. Most experts would agree that there are benefits to all customers when some customers install resource efficiency and renewable energy upgrades that may not show up in rates and in the rate impact measure test. For example, such benefits may include cleaner air, demand savings (including deferring new capacity), reduced transmission and distribution

costs, reduced line losses, meeting portfolio requirements (if any), diversifying loads, increased system security, environmental benefits, reduced health and safety costs, fewer disconnections (no PAYS program participant has been disconnected for non-payment). Non-participants benefit from participants agreeing to pay for improvements at their locations, putting up with the hassle of contractors installing upgrades, and spending the time required for assessments, considering offers and being available for on-site inspections and verifications. Non-participants are getting a free ride.

As noted above, EEI recommends that startup costs, if any, be paid by the implementing utility and cost recovery be from all customers especially since all customers with cost effective opportunities are eligible for the PAYS tariff without any barriers to participation. Additionally, there is no equitable way to charge participants since there is no way to know how many customers will participate (unless demand is artificially limited).

B. Ongoing program costs

Several cost variables affect the cost effectiveness of installed upgrades. These include the cost for products, cost for installation, costs for program operations charged to participants, interest rates, and fees charged to participants (e.g., loss reserve fund fees, opportunity costs, or transaction costs).

Program design mechanisms to reduce installation costs. Most of the utilities implementing PAYS programs, and all of the recent PAYS implementers (Windsor, City of Hayward, Ouachita, and Roanoke) have employed EEI's recommendations that lower installation costs. Recommendations include but are not limited to using requests for proposals (RFPs) to lower the cost for high-quality products, RFPs to weed out bad contractors and obtain the lowest possible installation prices, and storing products at existing utility storage facilities to lower storage costs and ensure product availability. RFPs can also be used to obtain extended manufacturer and contractor warranties. These utilities realized savings of 10 - 25% compared estimates from local contractors for the cost to install upgrades. These savings make more upgrades qualify for the tariff or reduce the need for large customer copays.

Operations costs. Cadmus summarizes fixed ($197,960) and variable ($777 per participant) costs for implementing a PAYS program in Tables 21 and 22 on page 43. In its table, it refers to a pilot serving less than 71 customers.

EEtility prefers to be paid for performance and fees for typical services are $600 per participant for an implementing utility and $300 for each participating customer to be repaid as part of their project. It would not be possible under this performance-based fee structure for EEtility to provide services for a pilot as small as 70 or even 100 customers. If we assume a pilot installing upgrades at the locations of 400 customers per year, a number smaller than we recommend for a utility the size of Empire, annual operations costs – assuming typical services are desired – would be $240,000 not $315,633 ($60,000 + ([400-71]*$777) based on the information in Tables 21 & 22. Cadmus' estimates of operations costs are 30% higher than EEtility's costs would be. Additionally, given their comprehensive services, some of the other cited costs such as the call center could be eliminated or at least reduced. Those are significant savings.

Loss reserves. Most of the utilities implementing programs based on the PAYS system have reported less than one tenth of one percent bad debt associated with PAYS programs (i.e., excluding uncollectables resulting from utilities dismissal of charges for customer service reasons). Should a

reserve fund be included as a program feature, it should be sized to be no more than 1% of all utility PAYS investments. For any utilities that have business-as-usual uncollectables greater than .5%, a reserve fund for a PAYS program is not necessary since the program uncollectables can be expected to be much smaller than that amount.

Costs charged to participants. Cadmus assumed charging participants an opportunity cost for capital of 2.88% and a 5% surcharge to set up a loss reserve fund:
The California Standard Practice Manual for assessing DSM program cost-effectiveness describes the basic benefit and cost methodologies we used for the tests. Cadmus modified these methodologies to incorporate costs specific to financing, such as opportunity cost of using capital for financing, nonpayment loss protection fees assigned to participants, and financing costs for the participants. (p. 19)

Charging participants for a reserve fund (5%) and opportunity costs for capital (2.88%) distorts the cost effectiveness analysis of PAYS program upgrades. Assigning these costs to participants more than doubles the cost of capital (7.88% plus 5.73% base cost of capital). This 13.61% participant cost, significantly increases participant payments for installed upgrades, making fewer upgrades qualify for the tariff and increasing participants' copayments.

Using Attachment 1, described below, a 13.61% adder to upgrades with a 10 year duration of payments results in upgrades with a simple payback of less than 4.4 years qualifying for the tariff without a copay. If the interest were simply the cost of capital (5.73%) and if we assume a payment term of 10 years, upgrades or upgrade packages with a simple payback of 6.1 years would qualify for the tariff without a copay. Since the implementing utility will recover almost all costs for upgrades from participants, the decision to charge these fees to participants is unreasonable and counter-productive. [NOTE: Since the utility collects its costs for capital from participants and either sets the cost of capital or selects a third party who sets the cost of capital, we do not understand charging anyone an opportunity cost for capital].

2. Unreasonably low savings estimates

Not counting or underestimating savings also distorts the cost-effective analysis by reducing the assumed benefits of running an efficiency program.

Counting only electricity savings. The tariffs of all of the utilities implementing PAYS pilots have included all resource savings that participants receive from installation of upgrades as part of the upgrade qualification process regardless of the resource supplied by the implementing utility[2]. Some tariffs also allowed savings from documented avoided maintenance costs to be included in participants' cost effectiveness analyses. If only savings from the resource supplied by the implementing utility are included when calculating savings, at any location with more than one utility service (e.g., water, electricity, some type of fossil fuel), savings that could be realized by customers would be ignored and upgrades that might pay for themselves when the savings from all resources are considered will either not qualify for the tariff or require a much larger than necessary copay.

All customers pay for utility programs. If only the implementing utility's energy is included in savings, customers who heat or cool with a different source of energy (or who are billed for water), will suffer de facto discrimination.

[2] The exception being Hawaii in which the only upgrade considered were solar water heaters displacing electricity.

Even if electric rates were high enough to qualify some upgrades without considering savings from other resources, including only the savings from the implementing utility's resource would require multiple utility programs to serve customers, which is burdensome to customers and unnecessarily costly (since ignoring all potential savings means fewer upgrades qualify). Since customers are paying for all of a project's cost, less rebates that the utility has determined to be the lowest amount to induce customer action and an amount that is cost effective for the utility and all its customers, implementing utilities should be required to serve all their customers, count all savings from upgrades that would accrue from installing upgrades, and apply their existing rebates in accordance with current protocols. Cadmus should evaluate to what extent its findings would be changed if all resource savings were considered when participants' upgrades are assessed.

Underestimating savings. Savings for upgrade qualification should be based on all savings realized by participating customers. Savings calculations should include avoided taxes and volumetric fees including fuel adjustment charges: savings that customers installing upgrades will realize in addition to the reduction of direct charges for kWh or Therms. There is no mention in the study that Cadmus included avoided taxes or volumetric fees.

Use of deemed savings. As noted on page 14 of the report, Cadmus used deemed savings for it's cost-effectiveness calculations. Deemed savings are based on averages. Using averages means that about half of customers are likely to have higher savings, so estimates based on deemed savings ignore the number and value of the most cost-effective opportunities.

- PAYS works where there are cost-effective opportunities based on an accurate assessment of individual locations to ensure that customers do not make payments without receiving sufficient savings. Deemed savings do not create an accurate picture about the number of customers or the extent of savings likely to result from a program at Empire.
- EEI recommends that when trying to figure out the feasibility of a PAYS pilot in a jurisdiction, for weather sensitive upgrades, the expert's analysis should be based on the usage of the 20% of all users with the greatest differential between usage during heating and cooling months compared to baseline months (months with little or no heating and cooling). For upgrades that are not weather sensitive, the expert's analysis should be based the highest-using customers (top 20%) based on some reasonable standard (square footage, type of end uses, etc.). Few utilities have operated programs that achieved comprehensive weatherization and retrofits for 20% of their residential customers (especially renters and low-moderate income customers) and/or comprehensive retrofits for 20% of their non-residential customers, so a comprehensive program that targeted 20% of a utility's customers would be reasonable.

3. Low participation assumptions

Cadmus attributes its operation costs and minimum program size estimates to a PAYS third-party implementer:

In addition, the PAYS third-party implementer assumes a minimum implementation fee of $5,000 per month if participation does not exceed 71 homes. Cadmus assumes this minimal implementation cost would apply to most program models, and so structured the cost-effectiveness analysis to apply the $60,000 per year minimum for participation levels below 72, and to use the per participant variable cost for participation of 72 and above. (p. 42)

PAYS programs are operated by electric or gas utilities in 6 states. Utilities in three of them do not use third-party implementers. The cited costs do not apply to those program models. One third-party implementer, EEtility, provides services in Arkansas (HELP PAYS®) and North Carolina (Upgrade

to $ave). Another third-party operator provides services in Kentucky (Mountain Association for Community Economic Development's How$mart®KY). There are no other third-party implementers of PAYS programs for electric or gas utilities.

Neither of these third-party implementers requires participation costs of $5,000 per month if participation does not exceed 71 homes per year, and there is no reason to use 72 units as the minimum number per year.

EEtility, the only third-party implementer that currently provides services in more than one state, has said it would not contract for services if the available capital and expectations for production are fewer than several hundred completed jobs per year. If EEtility is used as the program operator or its fees are considered for a feasibility study, the study should assume a minimum of several hundred completed units per year.

EEI has advised clients that any pilot targeting fewer than 200 customers a year will not be cost effective from an operational perspective. Since a single staff person with office support can serve 200 - 300 locations in a year, any participation less than that amount will be inefficient.

The most successful PAYS programs have reached 3 to 4% of their customers in 3 to 10 years. Empire has 170,000 electric customers and 43,000 gas customers and a population of over 450,000 (https://www.empiredistrict.com/About). Fewer than 100 customers (an estimate noted in Table 21 on page 43) is a tiny fraction of a percent of Empire's customers – too small an amount to make realistic conclusions about the cost effectiveness of a pilot program.

Programs with more participants have lower per-participant start-up and operation costs. Typically, we recommend three-year pilots; two years should be a minimum. Additionally, pilots should be designed to serve no less than 200 - 300 participants each year and given its size, Empire should be studying the feasibility of a two to three-year pilot with a goal of reaching 600 - 800 of its customers per year (i.e., a program capable of reaching 4% of Empire's customers in ten years). If the feasibility study does not create confidence in the viability of a three-year pilot with the potential to serve 600 - 800 of its customers per year, a pilot should not be run.

CONCLUSION AND RECOMMENDATIONS

Cadmus' The Empire District Electric Company PAYS Feasibility Study is the first study about PAYS in Missouri since 2004. Therefore, it is important that the study be as accurate as possible and not set precedents for similar studies, such as the one currently underway for Ameren, that distort the potential for PAYS programs in Missouri.

There are a number of assumptions used in this study that unrealistically discount the cost effectiveness of a potential Empire program:

- Assuming third-party startup and operation costs that are not in-line with currently operating PAYS programs;
- Charging participants for a reserve fund and an opportunity cost for capital make projects even more expensive by adding fees of 7.88% to each project;
- Unnecessarily high product and installation costs (i.e., not employing reasonable efforts to obtain below market costs) result in fewer upgrades qualifying without copays;
- Assuming average savings rather than savings based on the end uses and behavior of the 20% of Empire customers with the highest use suggests unrealistically low cost effectiveness for an

Empire program;
- Assuming only electricity savings and not all of the savings available to customers (i.e., from other resource costs, from reduced volumetric fees and taxes, and deferred maintenance) excludes significant savings that could benefit participants; and
- Assuming a tiny pilot rather than one of a realistic size that can take advantage of economies of scale and reach a reasonable percentage of Empire customers over a ten-year period.

Taken together, these choices distort the true value to participants of installing upgrades with PAYS or any program, making this feasibility study inaccurate and not useful.

EEI offers this analysis of the Cadmus study in the hopes that if Cadmus can do so, it will rerun its calculations to develop a more accurate report of the potential of a PAYS program at Empire District. If that is not feasible, at a minimum, we would hope that stakeholders would use this information to modify how Empire plans to implement and evaluate a PAYS pilot, should Empire decide to implement one.

More importantly, stakeholders should reach agreement regarding what assumptions should govern subsequent feasibility studies planned or currently being implemented.

ADDENDUM

MISINFORMATION THAT SHOULD BE CORRECTED

There is information in Cadmus report presented as fact and used as the basis for assumptions that is not correct. EEI has listed below errors that we have identified so that Cadmus can correct the report and future feasibility studies of the PAYS system will not repeat them. In this section, we have copied the statement from Cadmus study and then explained the error. Where the report's assertions based on interviews differ from EEI's, EEI is prepared to provide letters from the sources who can verify their statements.

1. *Roanoke does tie the tariff to the meter, but noted they did no research on the legal implications of this, they "just did it*." (p. 41)
   Roanoke Electric worked with the originators of the PAYS tariff who were involved directly or indirectly in all of the dockets approving PAYS tariffs in New Hampshire, Hawaii, Kansas, Kentucky and Arkansas. They consulted with their own attorney regarding the legal implications on both macro (its authority to implement a tariff) and micro (the tariff and all agreements) levels. Roanoke received pro bono written counsel from the Southern Environmental Law Center regarding their authority to implement a PAYS tariff.

2. *As we were not aware of PAYS programs that have been implemented by IOUs*... (p. 11)
   The first and second PAYs programs were implemented by IOUs. (Smart Start by Public Service of New Hampshire now Eversource; Solar$aver by Hawaiian Electric Companies' three utilities). Eversource has continued to run its program since 2002.

3. *The cooperatives both relied, wholly or in part, on federal grants to provide program capital*. (p. v)
   Of the programs that focused on residential weatherization at cooperative utilities (Roanoke Electric Cooperative, Ouachita Electric Cooperative, Midwest Energy, MACED's How$mart®KY, or New Hampshire Electric Cooperative) none used federal grants to provide capital for their weatherization programs except MACED which used some of their core Community Development Financial Institution grant to supplement other funds for capital. Roanoke used a federal loan for its program capital.

4. *Cadmus modeled the loss reserve fee on that implemented by the MACED How$mart KY program, and assumed it would be sufficient to cover all nonpayment and related costs*. (p. 43)
   (Cadmus assumed a 5% loss reserve fee.)
   - The Kentucky Public Service Commission approved several cooperatives' pilot in 2010. MACED coordinated their effort, and the utilities agreed to participate only if they could include a 5% charge to participants for administration. At that time was no mention of a loss reserve fund. During the pilot, the uncollectables were about 2%, and MACED made some program adjustments. MACED now verifies that all deed holder(s) are signatories to the owner agreement, mortgage payments are current, there are no filings for foreclosure in process, and the homeowner's insurance is current.
   - In 2012, when these utilities applied to end their pilots and expand to full programs, they kept the 5% fee charged to participants but requested only 1% for administration and asked for the remaining 4% be used as a loan loss reserve fund. However, they reserved the right to access these funds if loss reserves were not needed.

- Since August 2013, there has been one non-payment (representing an uncollectable rate of 0.4%). MACED's position is that "1% is enough to cover losses for a well-designed and implemented programbecause its post-pilot experiences align with national default rates of less than half of one percent " (communications. from Chris Woolery).
- MACED doesn't have an official position on whether risk mitigation funds should be paid by participants or ratepayers; it hopes CADMUS did not come to its conclusion based on an assumption that MACED recommends charging participants.
- Curtis Wynn stated that Roanoke does not advocate charging participants for loss reserves, especially since the Meister Consulting Group analysis showed the impact of losses on non-participants was negligible. The reserve fund available to Roanoke that is cited by Cadmus, was originated by the North Carolina Sustainable Energy Association to promote the use of PAYS in North Carolina and other southern states. Roanoke's customers are not charged for this fund.

5. *There were no available estimates for write-offs or shut-off/turn-on costs. However, the IL OBF report estimated a nonpayment rate of 0.16% in its first three years, the Roanoke Upgrade to $ave program referenced an effective default rate of 0.75%, but noted they are still working with some of those customers, and the MACED How$mart KY program referenced a default rate of 1.9%. Cadmus assumed this fee was included in the financed amount*." (p. 43)
   - Cadmus reports the uncollectables resulting from the MACED pilot as 1.9%. However, since the 2012 design changes, uncollectables declined to 0.4%. Unless a utility plans to repeat the same mistakes now avoided by MACED, they should be using MACED's current rate of uncollectables, or the rate reported from all other utilities reporting rates of uncollectables which are less than one-tenth of one percent.
   - According to Curtis Wynn, General Manager of Roanoke Electric Cooperative, there is no basis for Cadmus assertion that Roanoke has an effective default rate of 0.75%. To date Roanoke has no projects for which non-payments have been classified as uncollectable to be written off nor has it sought funds from the loss reserve fund available to their utility. Curtis Wynn noted that they are still working with the two out of 315 customers with completed projects. Mr. Wynn recently reported that Roanoke agrees with an estimate of less than a tenth of a percent for PAYS related uncollectables which is less than its business-as-usual case of .25%. The statement about Roanoke's uncollectables should be corrected.

6. *Roanoke, after initially managing the implementation of its Upgrade to $ave program internally, later hired a third-party program operator to oversee the audit and installation process...* (p. 41)
   Roanoke never managed its program internally. Roanoke Electric Cooperative is independent of the Roanoke Center, its preferred program operator that was replaced due to lack of experience.

7. *Arkansas Ouachita HELP PAYS* (sic) *program completed 198 projects from 2016 to 2017 (representing nearly 10% of their residential meters*). (p 45)
   According to Mark Cayce, General Manager of Ouachita Electric Cooperative, from April 2016 through December 31, 2017, the HELP PAYS® program served 81 multi-family (residential) customers, 197 residential customers, and 5 commercial customers, approximately 4% of Ouachita Electric's customers. Approximately $500,000 was used to fund the upfront costs at each of these three types of customers.

8. *However, staff considered a PAYS program to be a difficult concept to communicate to customers*." (p. 45)
   None of the implementing utilities have reported any problem explaining program offers to their

customers. Perhaps that is why all but one of the programs have reported an offer acceptance rate of at least 50% and as high as 94% when there are no copays, even in service territories with predominately low- to average-income customers. Ease of explaining the PAYS offer to customers is one of its strengths. This 90 second video may help Empire District's staff: http://appvoices.org/2017/05/22/got-90-seconds-new-video-explains-electric-utility-financing-for-residential-energy-efficiency

9. *We found that the maximum tariff did not allow for the full measure cost to be financed in most cases. Two measures, the 15 SEER and 16 SEER ASHP that replaced working gas or propane furnaces, result in negative electric savings by replacing gas use with electricity. No tariff is possible for those two measures*." (p. 27)
   PAYS tariffs typically include language allow implementing utilities to screen participants' projects for inclusion based on a variation of the 80% rule and including all participant savings, regardless of the source of energy provided by the implementing utility. Since participants pay for the costs of their upgrades, utilities come out ahead when compared to direct install or other programs.
   Heat pumps should use about one-third the energy of a typical fossil fuel heating system as a result of the efficiency of the appliance. Sometimes, replacing gas used for heating with a high efficiency heat pump using one-third or less energy (e.g., as measured in BTUs), also results in cost savings. If such savings are combined with cooling savings (assuming a less efficient cooling unit is also replaced) and the savings qualify under the 80% rule, then the fact that electric use increases is moot to the customer who is trying to lower their bills and reduce energy waste. The cost effectiveness of these upgrades for participants should be recalculated.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

AFFIDAVIT OF HARLAN LACHMAN

STATE OF VERMONT)
) SS.
CHITTENDEN COUNTY)

COMES NOW HARLAN LACHMAN and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *RESPONSE TO NOTICE OF COMPLETION OF PAYS® STUDY;* and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

Harlan Lachman
President, Energy Efficiency Institute, Inc.

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the Chittenden County, State of Vermont, at my office in Colchester, on this 27th day June, 2018.

Elizabeth C Peacock

Notary Public

My Commission expires 2/10/2019.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

AFFIDAVIT OF PAUL A. CILLO

STATE OF VERMONT)
) SS.
CALEDONIA COUNTY)

COMES NOW PAUL A. CILLO and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *RESPONSE TO NOTICE OF COMPLETION OF PAYS STUDY;* and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

Paul A. Cillo
Vice-President, Energy Efficiency Institute, Inc.

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for Caledonia County, State of Vermont, at my office in Hardwick, on this 28th day June 2018.

Notary Public

My Commission expires 02/10/2019.