

# Making Prosocial Social: The Effectiveness of Social Proof for Energy Conservation using Social Media

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## Abstract

Social media can be an effective tool for encouraging prosocial behavior, such as energy conservation, making it a key avenue to address the challenges associated with climate change. We examine how social media can be best leveraged to encourage energy-saving behavior. We theorize that two characteristics of social media messages are of particular importance in the context of nudging prosocial behavior: the recipient's affiliation with the message sender and whether the content of the message contains a social proof appeal. We use a multi-method approach to test the importance of these characteristics, including a large-scale energy efficiency campaign and a controlled experiment. We find that social media messages sent by a group with which the recipient is affiliated are substantially more effective, particularly when providing evidence of social proof. We discuss the practical impact on the environment.

**Keywords:** social media; prosocial marketing; energy efficiency; social proof; climate change.

**JEL classification codes:** D03, L22, Q42, Q48

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# 1 Introduction

Addressing the current climate crisis requires behavioral change (Weber, 2015; Frank, 2020), and social media may potentially be a powerful tool to help influence such change, through which activists may provide social proof. Social media is a cheap and scalable channel, which enables users to reach an audience of similarly-minded individuals in order to encourage environmentally sustainable behavior, such as saving energy. Indeed, climate activist Greta Thunberg has been widely successful in using social media to encourage fellow students from around the world to participate in weekly school strikes to raise awareness about climate change. Her movement, which started with her posting a picture of just herself striking, snowballed as her peers saw more and more fellow students join her. Thus, she leveraged two powerful marketing tactics: affiliation with her fellow students and social proof as millions joined her. However, clearly not every social media campaign about climate change is as successful as Thunberg’s has been. This raises two important questions: Relative to other communication mediums, how effective is social media at nudging energy-saving behavior? And, perhaps more importantly, how can social media be best leveraged to nudge mass behavioral changes to address the climate crisis? Given the needs of the climate crisis to reach a large audience quickly, answering these questions are vital. In this paper, we begin to do so by examining a real state-wide energy efficiency campaign.

There is substantial heterogeneity in the effectiveness of social media due to characteristics of the social media message itself, such as the identity of the sender (Gong et al., 2017), the identity of the recipient (Lambrecht et al., 2018), the content of the message (Berger and Milkman, 2012), and the timing of the message (Seiler et al., 2017; Kanuri et al., 2018). In a meta-analysis, de Oliveira Santini et al. (2020) find that customer engagement is driven by satisfaction, positive emotions, and trust. In prosocial contexts, such as activism for climate change, we propose that two social media message characteristics may be of particular importance: the message recipient’s affiliation with the message sender and the message content.

Specifically, we propose that prosocial social media messages have the potential to be substantially more effective at nudging behavior if they are sent from a group to which the receiver belongs (“affiliate groups”), such as their workplace, church, town hall, etc., even if the affiliate group is not otherwise connected to the focal prosocial behavior (e.g., church does not directly relate to energy-saving behaviors). This is counter to what one might predict in other contexts, such as using social media to sell consumer goods, in which non-affiliate message senders (e.g., influencers, celebrities, domain experts, etc.) may be more effective, especially if they have more domain knowledge or perceived autonomy (Valsesia et al., 2020).

In prosocial domains, we expect that prosocial social media sent from affiliates will be more effective than those sent from non-affiliates—even non-affiliates that are domain-experts for the focal prosocial behavior—for several reasons. First, prosocial behavior is, by nature, tied to community; to engage in prosocial behavior is to do something for the good of the community. Thus, when a group that a person belongs (e.g., one’s place of work) encourages a prosocial behavior, it is implied that engaging in that behavior would benefit in-group members, which should increase engagement with the behavior (Levine et al., 2005).

Second, we argue that affiliate groups have an increased ability to provide information about the value in engaging in the prosocial behavior (Cialdini, 2007; Castillo et al., 2014; Goldstein et al., 2008; Han et al., 2018; Kraft-Todd et al., 2018). In other words, prosocial behavior encouraged by an affiliate group (such as one’s place of work) should be more likely to be interpreted as normative behavior within that community (i.e., provincial norms), thereby encouraging engagement with the prosocial behavior, than if a non-affiliate group (such as an organization one does not work for) encouraged the same behavior. For example, Grinstein and Nisan (2009) find that minority groups are less responsive to government pro-environmental demarketing efforts than majority groups are because minority groups tend to have lower national attachment.

Third, and more broadly, perceptions of similarity tend to lead to greater influence on consumers’ behavior (Goldstein and Cialdini, 2007). For example, Munz et al. (2020) find

that individuals are more likely to open an email, click on a link, and donate to a teacher who shared their own surname, since that similarity alone can reduce social distance. Thus, since consumers should feel greater similarity to affiliate groups (i.e., groups they belong to) than to non-affiliate groups, affiliate groups should exert greater influence on nudging energy-saving behaviors. Formally, we predict:

**Hypothesis 1.** *Prosocial messages will more effectively influence behavior if they come from an affiliate than if they come from a non-affiliate.*

Relatedly, we propose that the message content—specifically, using appeals of social proof—is also an important characteristic of prosocial social media messaging. In particular, we suggest that social media messages that contain a social proof appeal (Cialdini, 2006) will be more effective coming from an affiliate than from a non-affiliate. This may occur for several reasons. A social proof appeal should emphasize the implication of provincial social norms (Cialdini, 2007; Goldstein et al., 2008) by highlighting that other group members are engaging in the behavior. Moreover, for prosocial behaviors such as energy conservation, impression management may also be important. For example, in the context of charitable donations, Ariely et al. (2009) demonstrated that image is indeed an important part of the motivation to behave prosocially. The explicit use of appeals by affiliated groups based on social proof can increase efficacy even more, exhibiting a powerful influence on subsequent behavior (Cialdini, 2007). For example, when researchers went door-to-door to secure commitments to recycle, these face-to-face interactions led to clear lifts in recycling rates. On Facebook, Castillo et al. (2014) find that notifications about peer donations increase the likelihood of donating. Just as the previous literature shows that in-person interactions that draw upon affiliation and social proof can be effective, we posit that social media that draws upon affiliation and social proof may be effective as well. After all, social media allows for public displays and inherently emphasizes social ties, which might strengthen the response to such tactics.

The effect of social proof appeals coming from non-affiliates is less known. While social proof from affiliates is likely to be interpreted as in-group behavior, non-affiliates could appeal

to social proof in multiple ways: 1) explicitly referencing behavior of others in the target audience’s own community (that the non-affiliate is not part of), 2) explicitly referencing behavior of others in a community that the target audience is not part of, or 3) referencing behavior of others while being vague about what community the referenced others belong to. A global non-profit organization dedicated to counteracting climate change (a non-affiliate group for most consumers) may also attempt to encourage energy-saving behaviors by using a social proof appeal with information about how others in the target audience’s community behaves (e.g., “7 out of 10 people in your zip code have committed to reducing their energy usage”). On one hand, such a message still does contain information about how people in one’s own community are behaving, and thus could still influence compliant behavior. On the other hand, and as we suggest, focusing on non-affiliates may be less impactful in influencing provincial norms, making the social proof overall less effective. Moreover, it is possible that social proof appeals to engage in prosocial behavior from non-affiliate groups could even backfire. Learning from an outsider (i.e., a non-affiliate group) that everyone in one’s community is doing something might make a person feel left out instead of invited to also participate in the behavior (Wirth, 2016). Research on social exclusion has shown that people who feel left out are less likely to engage in a wide variety of prosocial behaviors, including cooperation (Twenge et al., 2007) and recycling (Zhou et al., 2017). Thus, we predict that social proof appeals—whether they reference others’ behavior in the target audience’s own community or not—will not be as effective coming from a non-affiliate than if coming from an affiliate. We formally predict:

**Hypothesis 2.** *Social proof appeals about engaging in prosocial behavior will be more effective when coming from an affiliate group than when coming from a non-affiliate group.*

We test our predictions across two studies, beginning with a field study of a state-wide energy efficiency campaign followed by a controlled experiment. Additionally, while the studies were designed with our two hypotheses in mind, this paper comes from a quantitative/economic tradition. As such, we also rely on a data-driven approach to derive important

insights about other elements of the field study campaign, such as the effectiveness of using financial appeals, the role of in-person events, and the overall environmental and cost effectiveness of different marketing communications (social media, newspaper, etc.) in the campaign.

In Study 1, we examine the effects of messaging for prosocial behavior using rich data on marketing interactions and responses from a real-world energy efficiency campaign, the Rhode Island Energy Challenge (RIEC) “Find Your Four” program. The program attempted to spur people to conserve energy by asking them to commit to a subset of energy-saving actions, with options ranging from turning off lights when not needed to switching from single-pane to double-pane windows. The broader objective of the program was to conserve electricity, and thus reduce greenhouse gas and local air pollutant emissions.

In Study 2, we build on the field data by using a tightly controlled experimental design to test the most conservative conditions of our hypotheses: using a domain-relevant non-affiliate (a non-profit dedicated to energy-saving behaviors) and a social proof appeal that pertains to the message recipient’s own community, even when coming from the non-affiliate. Doing so also allows us to directly compare the effectiveness of the message content without other potential confounding differences, such as potential differences in the likelihood of seeing a communication or attention to messages sent from the affiliate versus a non-affiliate source.

The current work makes several contributions. First, we contribute to the limited, but growing, literature regarding the effectiveness of social media on consumer behavior (Kumar et al., 2016; Lovett and Staelin, 2016; Rossi and Rubera, 2021). However, measuring the effectiveness of social media can be a challenge (Seiler et al., 2017; Lambrecht et al., 2018). By leveraging the exact timing of all marketing communications, we are able to identify causal effects of social media messaging on behavior. Second, we contribute to the marketing literature on prosocial behavior by identifying social media as a particularly effective marketing instrument in prosocial domains, particularly if the messaging comes from affiliate groups (as opposed to common traditional marketing tactics of using non-affiliate groups)

and contains a social proof appeal. Our results also have substantive import for the fight against climate change: Using the switch from single-pane to double-pane windows as a representative action, we find that the net present value from the reduction in carbon emissions from this action alone (\$103) greatly exceeds the customer acquisition cost of just over \$20. The customer acquisition costs when using the other marketing instruments or when not appealing to social proof is an order of magnitude larger.

## 2 Study 1: The Rhode Island Energy Challenge

### 2.1 Background

The RIEC was a partnership between SmartPower (the non-profit organization facilitating the campaign) and National Grid (the electric utility) to create a high visibility, community-based, on-the-ground campaign to increase energy efficiency. SmartPower is a leading non-profit marketing firm dedicated to promoting clean, renewable energy and energy efficiency, and National Grid is an electric utility. The program challenges Rhode Islanders to change their energy behavior by committing to four concrete actions that will reduce their energy use and/or improve energy efficiency. Example actions that were listed on the Find Your Four website include using energy-efficient bulbs, regulating house temperatures while away, using a powerstrip, and replacing single-pane windows with double-pane windows.<sup>1</sup> Participants sign up on the website to list the four actions they are committing to and to join the communications list. These participants then receive regular e-mails with energy tips and links to National Grid’s energy efficiency programs.

An essential component of the campaign was the use of “affiliate groups.” The affiliate group partners in the RIEC included local municipalities, businesses, non-profits, and faith-based organizations. The program was designed under the hypothesis that marketing

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<sup>1</sup>A more comprehensive list of other activities is provided on the website (with information about the number of people who committed to each) and are listed in Table A.1 in Appendix A.

communications sent from “affiliate groups” would be more effective, especially when providing social proof since other members of one’s affiliate group would be more personally relevant.

The affiliate groups who participated pledged to achieve a participation rate between five and ten percent of all their affiliated households. The program began with one municipality and three organizations in May 2013, at the same time as the broader kick-off of the state-wide communications effort. From there it expanded to further municipalities and organizations. Thus, from an analysis perspective, there are really two programs: the affiliate (municipality and organization-based) intensive grassroots efforts and the broader communications effort across Rhode Island. The official state-wide kickoff was on May 29, 2013. The staggered start dates for the municipal programs were due to logistical constraints for SmartPower (due to limited manpower) and not determined by the municipality.

Details of the campaigns can be found in Appendix A, including a map of the municipality affiliates (Figure A.1) and the timing of all campaigns (Appendix Tables A.2 and A.3).

## 2.2 Data

The source of the data used in this study is SmartPower and their affiliate partners. The data begin on May 9, 2013 when the Find Your Four website became active and the first commitment to saving energy occurred, and end on June 14, 2015. The dataset includes the following:

1. Program commitments: The individual’s name, e-mail address, time and date of the commitment (to partaking in four activities), the referrer (how the person learned about Find Your Four), IP address, location down to the zip code level, and affiliate group. As described above, the affiliate is the organization, which could be the municipality, employer, or local group (such as a church).
2. Web data: The daily number of web sessions by town. We also have referral traffic aggregated across towns.



3. Events and Meetings: The date of the event, target audience, attendance, and number of interactions with SmartPower (i.e., marketing touches).
4. E-mail and Newsletters: The sending organization (e.g., SmartPower or another partner) and the number of recipients. For SmartPower e-mails, we have the bounce rate, open rate, and click-through rate.
5. Media: The date of the event or media coverage. For newspapers, we have links to the article and the circulation of the paper; for social media, we have the creative and the number of followers (non-affiliate sources are the utility and the RIEC).

We also collected data on communications from non-affiliate sources such as the electric utility, SmartPower, and non-local newspapers (e.g., state-wide papers as opposed to local papers). Thus, we can directly compare the effectiveness of the message source type (i.e., whether the message came from an affiliate or a non-affiliate) and how it interacts with the message content (i.e. whether or not the message utilizes a social proof appeal). Importantly, we observe all marketing actions during the campaign period, including newsletters, newspaper articles, etc. This allows us to account for the effect of other forms of communication that occurred alongside the social media messages when measuring the impact of the social media exposures (Moe and Schweidel, 2014). It also allows us to compare the effectiveness of social media messaging to the other mediums of communication.

The average number of marketing touches are shown by instrument in Table A.4. Across all affiliate groups, we observe a total of 92 events, 41 newsletters sent, 480 social media messages sent, 14 local (town) newspaper articles and 11 non-local articles, nine web articles, two TV segments, and one radio story. During the campaigns, our data indicate tens of thousands of marketing touches and 6,234 total commitments, 4,525 through the affiliate groups (Table A.5). A histogram of commitments per day per affiliate is shown in Figure A.2. The commitments can happen either at events or online. The top referral site is the non-profit Energyfederation.org, followed by Facebook.com. However, municipal and organization sites also are featured highly in this list, providing further evidence of the role

of RIEC-affiliate messaging on commitments (see Table A.6 in Appendix A for the list).

A hypothesis-blind research assistant coded all 480 social media messages for whether or not they contained a social proof appeal. A social proof appeal is any message that references others engaging in a behavior (Cialdini, 2006). Accordingly, the research assistant was given the following to code the social media messages: “A post contains social proof if it references others’ engagement with the Rhode Island Energy Challenge (RIEC). By engagement, we mean any interaction with the RIEC: signing up, committing, attending a RIEC-related event or concert, etc.” The research assistant coded each message with a 1 if there was any reference to social proof and with a 0 if there was no reference to social proof.<sup>2</sup>

## 3 The Effectiveness of Different Marketing Vehicles

### 3.1 Estimation Approach

Our approach leverages the exact timing of the marketing communications and the very clear short-term response to these activities to identify causal effects of different marketing instruments, including social media, effectively the same as the strategy in Lewis and Reiley (2013), who use the exact timing of Super Bowl ads to assess their effect on online search behavior. In Appendix B, we use data visualization to demonstrate that the timing of commitments almost always occur on the same days as the marketing touches.

In this study, we are particularly interested in the effectiveness of social media exposures that reference social proof. Table 1 lists the eight social media messages that coincided with the most energy saving commitments. All explicitly leveraged the affiliate, an event, or social proof. Examples of utilizing social proof include thanking those people who had signed up and suggesting people ask friends and neighbors about how they save energy. When referencing the event, the message may simply refer to the event (and the free coffee

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<sup>2</sup>Within the campaigns, social proof appeals almost exclusively reference the behavior of those in in-groups.

Table 1: Top Affiliate Social Media Messages

Message	Organization	Commitments
The Preservation Society is supporting the efforts of the city of Newport and the RI Energy Challenge to help us all become more energy efficient	Preservation Society of Newport County	225
Energy saving tip: talk w your friends & neighbors about how they save energy & save \$310/yr	Warwick†	224*
Councilwoman Camille Vella-Wilkinson takes a break from gathering Energy Challenge pledges at Warwick’s National Night Out for a photo and some fun with Lt. Gilbert.	Warwick†	224*
Thank you to everyone at Westbay Community Action for supporting the #RI #Energy Challenge!	Warwick†	178
Heritage Day and free Coffee promo	No. Smithfield	41
Heritage Day and free Coffee promo	No. Smithfield	40
Thanks to Warwick Parks & Recreation, the Norwood Association and The Jesse Liam Band for supporting the Warwick Energy Challenge at the concert Wednesday evening! Left to right: Jesse Liam Gauthier leader of The Jesse Liam Band and Jeff Baker of the Norwood Association at the Warwick Parks & Recreation summer concert - Norwood Gazebo on Pawtuxet Avenue.	Warwick†	35

† This message was also separately sent by SmartPower.

\* Indicates that these were on the same day so we cannot separate their effects.

promotion) or explicitly combine social proof with the event reference, such as the message highlighting the Councilwoman soliciting commitments to save energy at Warwick’s National Night Out.

### 3.2 Model

To estimate the effect of the different marketing touches, we first create a daily panel for the 18 affiliates, including the four municipalities. Summary statistics are include in Appendix B. We use an OLS fixed effects estimator, with  $\log(1 + Y_{it})$  (where  $Y_{it}$  is the number of commitments) as the dependent variable due to the long right tail of the distribution, as shown in Figure A.2:

$$\log(1 + Y_{it}) = X_{it}\beta + \mu_i + \delta_t + \epsilon_{it}. \tag{1}$$

We include all marketing touches on the current day in the  $X_{it}$ .<sup>3</sup> We allow for a two-day effect of events by include marketing touches at in-person events for the current and previous day.<sup>4</sup> Social media touches are categorized based on the content of the messages. The  $\mu_i$  are affiliate fixed effects and the  $\delta_t$  are time fixed effects.  $\epsilon_{it}$  is an affiliate-day unobservable, which we cluster at the affiliate-group level.

### 3.3 Identification

In order to identify effects of different communication channels, we must have sufficient variation in when these marketing touches occur. For the municipal campaigns, Figure B.1 shows that the affiliate communications do not all happen concurrently, and that the events and newsletters are fairly evenly spaced throughout the campaigns (as are social media messages). The correlation between the number of event interactions, the number of newsletter recipients, the number of affiliate social media recipients, and the number of

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<sup>3</sup>We also tested version including touches over the previous three day period, and over the previous five period. Our results are robust to changing the duration over which the marketing touches have impact.

<sup>4</sup>When separating the current and lagged event touches, the one-day lag effect is significant.

newspaper recipients is essentially zero. The correlation matrix is shown in Appendix B.

When we include month fixed effects as the time fixed effects (using daily data), identification hinges on the assumption that certain marketing instruments are not utilized over others as a function of expected response. Given the even pacing of instruments used over the municipal campaigns, and the fact that non-municipal affiliates time their activities based on other unrelated events, such as when the newsletter is sent, the timing of the different marketing tools being used is plausibly exogenous. This exogeneity assumption can be relaxed when day fixed effects are included. Day-of-sample fixed effects allow for the sending organizations to send their messages based on temporal factors specific to any given day that might increase response (such as Earth Day).

When day fixed effects are included, identification rests on differences in responses across affiliates within a particular day, as a function of the affiliate messages. One downside is that day fixed effects preclude identifying the effect of non-affiliate messages, since the only variation for these is across days.

### 3.4 Main Results

Coefficient estimates are shown in Table 2. In column (1), we do not separate social media messages based on content, in order to assess average effectiveness. We see that the average affiliate social media message is seven times as effective as a non-affiliate message. This provides support for Hypothesis 1, although in such a real-life context, we can not rule out other explanations to the message content being more persuasive – it also may be the case that recipients are more likely to see and take notice to messages from affiliates. The controlled experiment will help rule out this alternative explanation being the only reason for the difference. We also see that an in-person interaction at an event is 26 times as effective as a social media touch (social media touches are measured in thousands, and we model event interactions as having a two-day effect). Affiliate newspaper touches are three times as effective as the average social media touch and 30 times more effective than non-affiliate

Table 2: Estimated Effects

	(1)	(2)	(3)	(4)
interactions at event	0.0013*** (0.0003)	0.0013*** (0.0003)	0.0013*** (0.0003)	0.0013*** (0.0003)
lagninteract				
affiliate newsletter recipients	0.0000 (0.0006)	0.3028*** (0.0592)	0.0001 (0.0006)	0.3011*** (0.0598)
newsletter recipients	0.0012 (0.0084)		0.0015 (0.0084)	
affiliate social media recipients	0.1026** (0.0440)	0.1034** (0.0430)	-0.0268** (0.0108)	-0.0192 (0.0117)
affiliate social media recipients, financial			0.0599*** (0.0121)	0.0471*** (0.0142)
affiliate social media recipients, social proof			0.1685** (0.0694)	0.1596** (0.0688)
affiliate social media recipients, event			0.7522*** (0.1623)	0.7497*** (0.1739)
non-affiliate social media recipients	0.0155*** (0.0041)		0.0147*** (0.0043)	
non-affiliate social media recipients, financial			-0.0004 (0.0069)	
non-affiliate social media recipients, social proof			0.0017 (0.0050)	
non-affiliate social media recipients, event			0.0048 (0.0150)	
affiliate newspaper recipients	0.0249 (0.0235)	0.0249 (0.0198)	0.0123 (0.0084)	0.0121** (0.0050)
non-affiliate newspaper recipients	0.0016 (0.0011)		0.0011 (0.0010)	
email recipients	0.0016 (0.0020)		0.0018 (0.0020)	
number of web articles	0.0050 (0.0193)		0.0101 (0.0185)	
TV	-0.1235** (0.0552)		-0.0935* (0.0498)	
radio	0.0448 (0.0566)		0.0467 (0.0566)	
video challenge	0.0289 (0.0195)		0.0330 (0.0193)	
video challenge x during town campaign	0.2350*** (0.0191)	0.2264*** (0.0212)	0.2305*** (0.0209)	0.2221*** (0.0227)
affiliate dummy variables	Y	Y	Y	Y
month dummy variables	Y	N	Y	N
day dummy variables	N	Y	N	Y
R-squared	0.151	0.218	0.160	0.226
N	10916	10916	10916	10916

Notes: An observation is a campaign-day. Affiliate-clustered standard errors in parentheses. \*\*\* indicates significant at the 01% level, \*\* at the 5% level, \* at the 10% level.

newspaper touches.

In column (2), we replace the month dummies with daily dummies. Now identification is obtained from comparing commitment behavior within the same day, across affiliates. We can no longer identify the effect of non-affiliate touches since the only variation in these variables is time-series variation, but this specification allows us to demonstrate the robustness of the estimated effect of affiliate social media messages. When allowing for daily fixed effects, we also see a large, positive effect of affiliation newsletter recipients. This is what we would expect, and is similar to what we hypothesized for social media, but the effect is not robust to the aggregation of the time fixed effect, and we can only compare to non-affiliate newsletters when only including month fixed effects.

In columns (3) and (4), we again first use the monthly fixed effects and then the daily fixed effects, but in these two specifications we also code whether the social media messages included either describes financial benefits of adopting, appeals to social proof, and/or makes explicit reference to an event. For social proof, we use the research assistant coding (see Appendix A for RA instructions and coding).<sup>5</sup>

Both columns show a positive and significant effect of making financial appeals for affiliate social media messages, relative to a baseline message with none of these three characteristics. However, the increase from a message making social proof appeals leads to a lift 3.5 times as big. This is a striking result: in prosocial contexts, financial appeals in the absence of social proof are limited in their effectiveness. Messages that can explicitly reference an event are even more effective (almost five times as effective as social proof appeals with no event). Note that a message can do any combination of the three, and we assume an additive structure.

For the non-affiliate social media touches, we again find that the average touch is insignificant (column 3). We must be a little more cautious in interpreting the point estimates due to potential endogeneity of the timing of when the message is sent. However, if we are willing to assume that the content of these messages is exogenous to the timing, then we

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<sup>5</sup>Financial appeals include anything about saving money or winning something as a result of signing up.

can compare the point estimates for messages with and without social proof appeals. We find no difference in the effectiveness of messages when the messages appeal to either the financial benefits of energy conservation, provide social proof, or reference an event. We further investigate the effect of non-affiliate social media messages that contain social proof in the controlled experiment.

Our finding that social media communications are substantially more effective when sent from an affiliate group to which the individual belongs supports Hypothesis 2. It also implies that in order to more effectively use social media in prosocial contexts, partnering with other organizations can have large benefits, but only when the messages provide social proof. Although it may seem intuitive that social proof appeals work substantially better when the referenced behavior is about other in-group members, in most cases the social proof leveraged by firms and policymakers do not use affiliate groups. Furthermore, the quantification of this effect is important since it allows us to assess the cost effectiveness of utilizing to affiliate groups.

Costs of activities are shown in Appendix C. Given the high costs of tabling at an event and the low average number of commitments, the cost per commitment at an event is \$296. Non-affiliate press releases are much less cost effective, leading to a cost of over \$6000 per commitment. Non-affiliate social media exposures are relatively inexpensive to send (\$9.71 per message) but reach 2,154 people on average with a small effect on commitments, leading to a cost of \$307 per commitment.

In contrast, affiliate social media exposures are surprisingly cost effective. Despite the \$20.80 cost to visit the affiliate, the average affiliate then sends seven messages; this puts the increased effectiveness of an average social media touch leads to a cost of only \$11.40 per commitment. Messages that do not appeal to financial benefits are ineffective. The cost per commitment for messages appealing to financial benefits is \$35.50. The cost is only \$8.26 per commitment for those appealing to social proof. Messages that reference events are even more effective, but there is also the cost of the event to consider. The combined cost per



commitment of holding an event and visiting the affiliate who then sends seven social media messages (one of which can reference the event and the other six of which we assume have average lift) is \$26.90. Thus, affiliate social media is the most cost effective instrument.

The environmental benefit will depend on which actions the individuals take. Under reasonable assumptions (see Appendix C for details), the environmental benefit is \$6.27 per year when getting a single household to switch from single-pane to double-pane windows, a net present value of \$125 when using a discount rate of 0.95.

One limitation of our study is that we were not provided the data to examine the actual energy savings as a result of the program. However, according to a report issued by National Grid in a follow-up survey sent to all program participants in January 2014, over 90% reported following through with at least one activity, and 64% reported implementing all four actions to which they had committed.<sup>6</sup> 85% of households replaced their lighting with CFLs and LEDs (National Grid provided discounts), and 69% installed high-efficiency HVAC equipment, a smart thermostat, or recycled a second refrigerator or freezer.

Even if we assume that those individuals who commit follow through on only one action, the benefits greatly exceed the customer acquisition costs when using affiliate social media that provide social proof, even at zero baseline commitments. In contrast, the costs of non-affiliate social media (and press releases) may exceed the environmental benefits, depending on how many of the actions are undertaken. In-person events are cost effective (although less so) when also referencing the event using social media.

## 4 Study 2: Controlled Experiment

As with all field data, there could be unidentified exogenous factors that explain the effects observed in the Rhode Island Energy Challenge campaign. For example, it is possible that the social media followers of the affiliate groups were simply more pro-environment and therefore

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<sup>6</sup>The survey response rate was 15%, resulting in over 160 survey responses. [https://rpsc.energy.gov/sites/default/files/publication/c-945\\_RIEC%20Survey%20Results.pdf](https://rpsc.energy.gov/sites/default/files/publication/c-945_RIEC%20Survey%20Results.pdf).

responded to appeals about the RIEC more than the followers of the non-affiliate groups. This might explain differences in the responsiveness to affiliate versus non-affiliate messaging. However, this explanation is unlikely given that the affiliate groups are specific businesses, towns, and other organizations that are not directly associated with environmental causes. If anything, the non-affiliate SmartPower messages would be more likely to be received by people who self-selected into following SmartPower due to environmental preferences. In a similar vein, those recipients who receive messages that use social proof appeals may have some characteristics that also correlate with concern for the environment. While such unidentified exogenous factors are unlikely, we cannot entirely rule them out. Moreover, given the nature of the field experiment, we could not perfectly balance the content of messages across affiliates and non-affiliates since each group wrote their own messages. Nor could we control for potential differences in likelihood of seeing a message from an affiliate versus non-affiliate source. Thus, it is possible that unidentified differences actually drive the observed results rather than the recipient's relationship with the message source and the inclusion of social proof, as we conceptualize.

Thus, we designed an experiment with the goal of replicating our findings regarding social media characteristics, using a carefully controlled experimental design that manipulates whether the same social media message (social proof vs. control) comes from an affiliate or a non-affiliate source. Importantly, we designed this experiment to test Hypotheses 1 and 2 under the most conservative conditions. First, we use an affiliate that is not directly tied fighting climate change (one's city hall) and a non-affiliate that is directly connected to the cause of fighting climate change (an energy efficiency non-profit organization). Thus, the non-affiliate source has an advantage in its domain-relevance. Additionally, in the social proof conditions, we specified that the referenced others come from "your community," regardless of whether the message source is an affiliate or non-affiliate. Thus, the even the non-affiliate provides social proof information that pertains to the participant. Finally, we used a subtle manipulation that mimicked the level of exposure of seeing a social media post

in the RIEC campaign.

## 4.1 Method

We employed a 2 (message source: affiliate vs. non-affiliate) X 2 (message content: social proof vs. control) between-subjects design.<sup>7</sup> Based on pilot testing, we estimated a small effect size ( $f = 0.1$ ). An a priori power analysis indicated that a target sample of 325 per cell (total  $N = 1300$  for a 4-cell design) was required to detect the predicted interaction effect at 95% power and Type 1 error probability set to 0.05 (Faul et al., 2007). We thus recruited 325 participants per cell ( $N = 1300$ ) on Amazon’s Mechanical Turk. Given that our manipulation was designed based on the U.S. electricity system and the U.S. local government structure, we excluded observations that were not from the United States ( $n = 84$ ) and, given the reading-based manipulation, we also excluded observations that indicated English was not their first language ( $n = 10$ ). This left a final sample of 1206 participants ( $M_{\text{age}} = 37.27$ ,  $SD = 12.26$ ; 47.7% male, 51.9% female, 0.4% non-binary). Results with the full sample are consistent and are reported in Appendix D as a robustness check.

Participants were asked to imagine that they were scrolling through their social media feed and were randomly assigned to see a post from “your city hall” (in the affiliate condition; participants were to think of it as their own city hall) or “an energy efficiency non-profit organization” (in the non-affiliate condition). This operationalization of affiliate and non-affiliate mirrors the RIEC campaign.

For half of the participants, the content of the post’s message explicitly referenced that others in the participants’ community have signed up for the energy challenge (the social proof condition): “Join everyone who has signed up in your community in supporting the

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<sup>7</sup>Note that in our original design, we wanted to follow up on an ancillary insight from the RIEC that mentioning a related in-person event in the social media post could serve as social proof itself and explicitly test it as a third factor (event mentioned vs. no event mentioned) in a 3-way fully-crossed design. However, post-testing revealed that this manipulation was a confound to the message source condition: people in the non-affiliate message source condition appeared to assume that the event was put on by an affiliate group. As such, we dropped the “event mentioned” conditions in the analysis and only report on the “no event mentioned” conditions, making it a 2-way design. See Appendix D for full reporting of the post-test.

Energy Challenge to help us all become more energy efficient.” For the other half of participants, the message did not reference community participation and instead just called for people to join the challenge (control condition): “Join in on supporting the Energy Challenge to help us all become more energy efficient.” The message in both conditions ended with the same call to action: “Commit to reducing your energy usage.” Importantly, the messages were carefully designed to be as balanced as possible while still manipulating social proof, the only difference being the insertion of a reference to others engaging in the behavior at the beginning of the social proof condition message. Then, to increase the realism of seeing the post on social media, participants indicated how, if at all, they would engage with the post (like it, share it, comment on it, or other). Engagement with the post does not predict the dependent measure and therefore will not be discussed further.

The dependent measure was participants’ self-reported intentions to increase their energy efficiency. Specifically, participants were first asked to indicate the extent to which they agree with the statement: “I am likely to make changes to be more energy efficient in the near future” (1 = *strongly disagree*, 7 = *strongly agree*). Then, they indicated the extent to which they agreed with the statement: “After seeing the post, I would be very likely to sign a commitment to be more energy efficient” (1 = *strongly disagree*, 7 = *strongly agree*). These two items were averaged together to create a commitment index ( $r = 0.56$ ,  $p < 0.001$ ). Finally, participants completed basic demographic information, including whether they live in a town with its own local government.

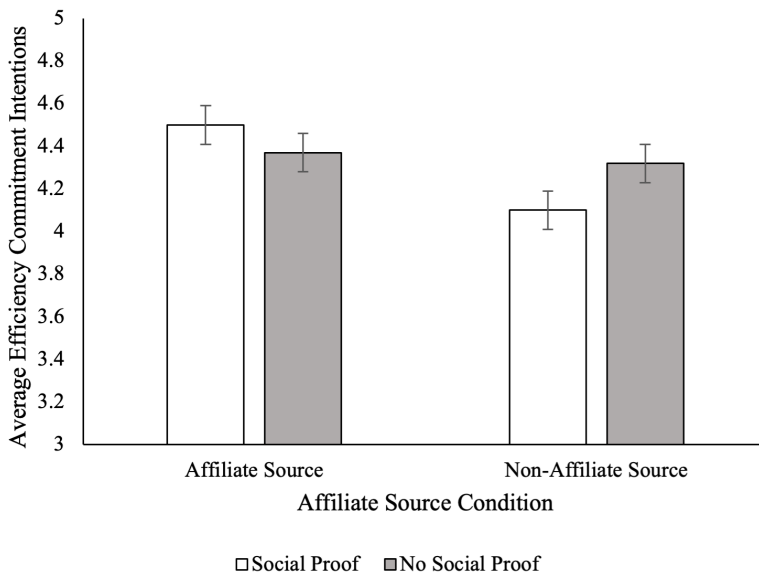
## 4.2 Results

Consistent with the outcome of the RIEC campaign and Hypothesis 1, a two-way ANOVA of the commitment index ( $M = 4.32$ ,  $SD = 1.52$ ) by message source (affiliate vs. non-affiliate) and the content of the message (social proof vs. control) revealed the predicted main effect of message source: Messages from the affiliate ( $M_{\text{affiliate}} = 4.43$ ,  $SD = 1.57$ ) were significantly more effective at boosting commitment to energy-saving actions than messages

from the non-affiliate ( $M_{\text{non-affiliate}} = 4.21$ ,  $SD = 1.46$ ;  $F(1, 1202) = 6.63$ ,  $p = 0.010$ ). There was a non-significant main effect of the message content ( $F(1, 1202) = 0.31$ ,  $p = 0.579$ ). Importantly, these main effects were qualified by a significant interaction ( $F(1, 1202) = 4.23$ ,  $p = 0.040$ ).

To probe the pattern of the interaction, we first examined whether a message containing social proof is more effective coming from the affiliate than from the non-affiliate (Hypothesis 2). As expected, including a social proof appeal in the content of the message boosted energy-saving commitment when the message came from an affiliate ( $M_{\text{affiliate} \times \text{social proof}} = 4.50$ ,  $SD = 1.57$ ) relative to when the message came from a non-affiliate ( $M_{\text{non-affiliate} \times \text{social proof}} = 4.10$ ,  $SD = 1.50$ ;  $F(1, 1202) = 10.67$ ,  $p = 0.001$ ). See Figure 1.

Figure 1: Study 2 Results: Commitment Intention



Highlighting the importance of social proof appeals in increasing the effectiveness of messages sent from affiliate groups, the control messages from the affiliate and non-affiliate groups do not differ from each other ( $p = 0.713$ ). However, unlike with our main specification using the RIEC data, in this data, social proof appeals did not significantly improve the effectiveness of an affiliate group’s message relative to an affiliate group’s message that does not appeal to social proof ( $M_{\text{affiliate} \times \text{social proof}} = 4.50$ ,  $SD = 1.57$  vs.  $M_{\text{affiliate} \times \text{control}} = 4.37$ ,

$SD = 1.56$ ;  $F(1, 1202) = 1.12$ ,  $p = 0.290$ ). Instead, the significance of the interaction effect is due to the combined effects of the directional increase in the effectiveness of the affiliate messages when using a social proof appeal, combined with the (marginal) decrease in effectiveness of non-affiliate messaging when using a social proof appeal. This may be because social proof appeals may most effective when they represent real community behavior, as in the Rhode Island Energy Challenge, rather than hypothetical behavior, as in the experiment.

Moreover, in these data, appealing to social proof backfires for non-affiliate groups. Messages from a non-affiliate group marginally decreased commitment intentions when they contained a social proof appeal relative to the control message condition ( $M_{\text{non-affiliate} \times \text{social proof}} = 4.10$ ,  $SD = 1.50$  vs.  $M_{\text{non-affiliate} \times \text{control}} = 4.32$ ,  $SD = 1.42$ ;  $F(1, 1202) = 3.42$ ,  $p = 0.065$ ). We did not see this negative effect of utilizing social proof in our main specification using the RIEC data, simply the lack of the positive effect. However, this is consistent with our reasoning that social proof that references behavior of others' in one's own community from a non-affiliate may make the recipient feel excluded and therefore disengage from prosocial behavior. We further explore this potential back-fire effect in a supplemental experiment, in which we again observed the negative effect of non-affiliates using social proof (see Appendix E).

## 5 Conclusions

In this paper, we establish that social media can be effective at inducing prosocial behavior when the message content uses a social proof appeal, but only when affiliates—such as local employers, faith-based organizations, or municipal governments—send the message. We establish this using evidence from both a large-scale energy efficiency campaign and a controlled experiment.

As noted by Weber (2015), behavioral or economic solutions in of themselves will not be sufficient. A comprehensive approach is going to be required to get us to a sustainable

climate. The RIEC is just one example of the type of intervention that might be able to leverage affiliate groups for behavior change to reduce emissions and mitigate climate change. The overall objective of the RIEC was to save energy and thus reduce greenhouse gas and local air pollutant emissions from electricity generation. The aforementioned National Grid report states that the utility met 102% of its 2013 target residential electric savings goal and 113% of its target gas savings goal. And the benefits accrue for much longer – the energy saving actions will result in both short and long-term response in energy usage reduction. The LED energy savings alone that result from the municipal campaigns will save over a thousand megawatts-hours of electricity per year, equivalent to installing 25 residential solar systems (at 5 kW each) but at much lower cost.<sup>8</sup>

In addition to the substantive importance of our findings, we also contribute to the literature on measuring the effectiveness of social media and other marketing instruments and the literature on social proof. Indeed, over 70% of the National Grid survey respondents reported that it was encouraging to hear about the Challenge from local community members serving as advocates for energy conservation. It may not be entirely surprising that affiliate touches are more effective at invoking energy savings commitments than non-affiliate messaging, especially when appealing to social proof, but the magnitude of the increase in effectiveness in our study is impressive. Although this paper is limited to the analysis of a specific context (energy efficiency commitments), we would expect to see the same substantial lift from social norm appeals in other prosocial contexts. By combining social proof appeals with the ease of use, scalability, and cost effectiveness of social media, new media in marketing can help play a role in affecting positive change along many social dimensions, including behavior related to climate change.

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<sup>8</sup>This calculation uses a 124 installation per month treatment effect that we estimate for the municipal campaigns as described in Appendix F, assumes no rebound effect, and uses an 85% LED adoption rate for those who commit, consistent with the survey.

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# Appendices

## A Program Details

Table A.1: List of Energy Saving Activities

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Install double-paned windows
Lower your thermostat a few degrees in the winter
Raise your thermostat a few degrees in the summer
Hang laundry to dry
Use computer power-saving modes
Unplug electronics when they're not in use
Zone heat with baseboard heaters
Turn off your computer at night
Wash clothes with cold water
Power down your cable or DVR box when it's not in use
Turn off lights when not needed
Ask your property owner to make energy-saving upgrades
Reduce pool temperature
Plan for a year of savings
Talk about savings
Reduce pool pump run time
Adjust the display on your television
Be smart about dishwashing
Reduce your water heater's temperature
Close your shades in the summer
Open your shades on winter days
Turn your water heater off or down when you're away
Avoid over-drying clothes
Clear the area around baseboard heaters
Turn down your thermostat when using your fireplace
Shave a minute off shower time
Set your refrigerator's temperature to 38°F
Spotlight your work spaces
Clear the area around your AC
Clear area around vents
Clean your refrigerator coils
Use heated blankets and turn down the thermostat
Block drafts of cold air

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Figure A.1: Map of Rhode Island illustrating the four municipal campaigns

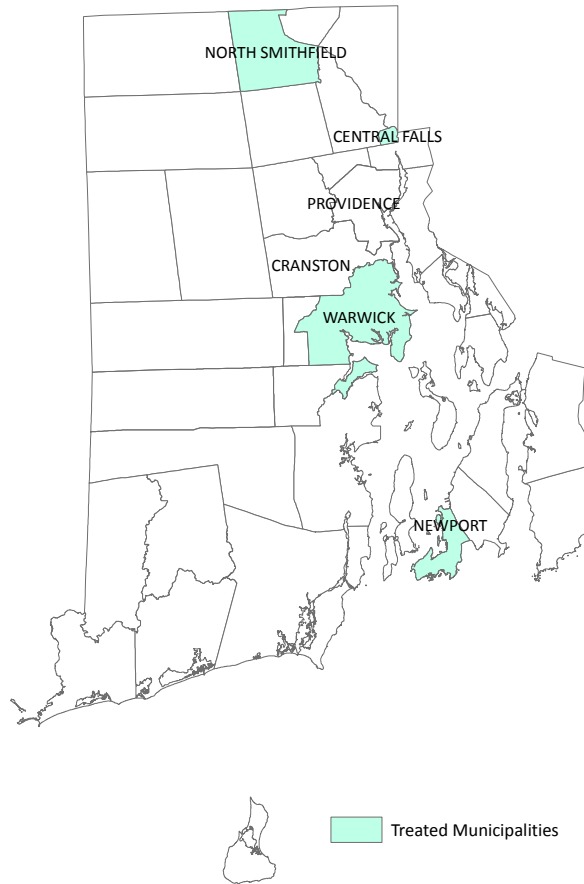


Table A.2: Timeline of Municipal Campaigns

Challenge	Total Commitments	Start Date	End Date
North Smithfield	189	5/29/13	12/13/13
Newport	762	10/7/13	4/30/14
Warwick	1593	4/1/14	8/18/14
Central Falls	63	9/21/14	1/21/15

Notes: Cranston did not have the engagement of the municipal leaders and did not fully get off the ground, so is not included.

Table A.3: Timing of Non-Municipal Campaigns

Challenge	Total Commitments	Type	Date
URI	0	University	3/8/14
UPS	117	Business	7/10/14
Blue Cross Blue Shield of RI	173	Business	8/5/13, 4/25/14, 9/5/14, 4/22/15
Fidelity	275	Business	6/10/14-6/12/14
GTECH	104	Business	5/1/14, 8/26/14-8/28/14
Citizen	144	Business	8/16/13
St. Peter's by-the-Sea	0	Faith	8/24/14
Emmanuel Church	19	Faith	3/23/14
Channing Memorial Church	29	Faith	4/27/14
St. James	0	Faith	9/21/14
Concordia Spiritual Center	0	Faith	6/22/14
Newman Congregational	3	Faith	2/16/14
Kings Cathedral	0	Faith	11/14
Video Challenge	NA	Contest	10/15/14-2/15/15

Table A.4: Average Marketing Touches

Activity	Obs	Mean	Std. Dev.	Min	Max
Event	47	101.0709	104.5771	10	500
Newsletter	20	1596.6	1487.723	100	4991
Affiliate newsletter	221	2319.538	2986.552	43	9000
Tax Letter	1	80000	n/a	80000	80000
Social Media	30	2154.367	2245.717	2	7945
Affiliate Social Media	4828	2531.641	1354.53	7	14416
Newsletter	9	11511.11	3447.624	7900	15000
Affiliate newsletter	136	48540.5	36767.24	7062	85000
Videochallenge	1564	1	0	1	1

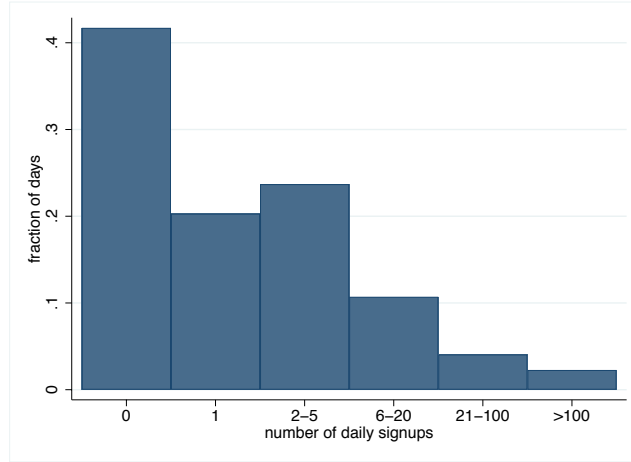
Table A.5: Total Marketing Touches

	Number Reached
Direct Interaction	11,250
Video Challenge Pageviews	13,452
Newspaper Article Circulation	308,664
Newsletter Viewers	74,529
Social Media Follower Interactions	893,926
Total Affiliate Commitments	4,525
Total Commitments	6,234

Table A.6: Top Referral Websites

Site	Type	Sessions	Unique Users
energyfederation.org	Non-profit	510	371
facebook.com	Social media	328	144
m.facebook.com	Social media	290	233
smartpower.org	SmartPower	255	124
semalt.semalt.com	Analytics Tool	228	228
intranet.corp.internal.citizensbank.com	Corporate Affiliate	182	170
insideblue	Not Sure	146	136
l.facebook.com	Social media	138	74
us7.campaign-archive1.com	e-mail marketing service (Mail Chimp)	125	15
buttons-for-website.com	Web share tool	97	97
cranstonri.com	Town Affiliate	95	51
ripower.org	Non-profit Affilaite	70	54
lm.facebook.com	Social media	69	36
t.co	Social Media	69	52
warwickri.gov	Town affiliate	43	42
cardis.com	Corporate Affiliate	30	13
nsmithfieldri.org	Town affiliate	30	27
makemoneyonline.7makemoneyonline.com	Other	27	27
turnto10.com	Media	27	26
us7.campaign-archive2.com	e-mail marketing service (Mail Chimp)	27	4
edline.net	Learning Community (Blackboard)	23	6
us-mg6.mail.yahoo.com	Not sure	23	23
10.254.254.4:81	Not sure	19	17
ri-ipl.org	Church Affiliate	19	12
valleybreeze.com	Media	19	18
cranstonlibrary.org	Town affiliate	18	17
smartpower.wpengine.com	SmartPower	17	1
studio.stupeflix.com	Video Site	16	0
nationalgridus.com	Utility	13	9
efi.org	Non-profit (Energy Federation)	12	12
smartpress.tumblr.com	SmartPower	12	8
us-mg5.mail.yahoo.com	Not Sure	11	9
pbn.com	Media	10	8

Figure A.2: Histogram of commitments per day



## Coding Instructions

Coding Scheme for Social Proof in Social Media Posts

### BEGIN INSTRUCTIONS

Dear [RA name],

This dataset contains real social media messages about the Rhode Island Energy Challenge (RIEC), which was a state-wide campaign to encourage energy-saving behaviors. In the challenge, Rhode Island residents were asked to "Find Your Four" and commit to at least four different energy-saving behaviors. We are interested in understanding how the content of the message affected people's engagement with the campaign and need your help to categorize the messages. In particular, we would like you to categorize each message as either containing a social proof or not. Instructions:

- Read the coding scheme in full.
- Read the post you are coding. Read the post in full first, so you know what it says.
- Enter a value for each and every cell.
- When you are finished, save the completed document with your initials at the end, and send it back.

Please email me with any questions.

Coding Scheme for Social Proof: A post contains social proof if it references others' engagement with the Rhode Island Energy Challenge. By engagement, we mean any interaction with the RIEC: signing up, committing, attending a RIEC-related event or concert, etc.

- If there is ANY reference to social proof in a given post, code it as a 1
- If there is NO reference to social proof in a given post, code it as a 0
- If a post contains no text, code it as a 0

The first six posts are coded as examples.

## END INSTRUCTIONS

Table A.7 includes all social media messages with over six words.

Table A.7: Social Media Messages

affiliate	socialproof	subjectofpost
0	0	for ReNewable Energy <a href="http://smartpress.tumblr.com/post/81389840908/smartpower-and-renewable-now-launch-media-partnership">http://smartpress.tumblr.com/post/81389840908/smartpower-and-renewable-now-launch-media-partnership</a>
0	0	#Energy saving tip: Turn off your computer at night and save up to \$45 per year!
0	0	<a href="https://ngri.opower.com/ei/app/tip/tip062_turn_off_computer_at_night">https://ngri.opower.com/ei/app/tip/tip062_turn_off_computer_at_night</a> via @NationalGridUS
0	0	#Energy saving tip: check your air filters on a monthly basis to ensure they're clean, which will help your furnace circulate air and save you up to \$105 per year. <a href="https://ngri.opower.com/ei/app/tip/tip026_clean_air_filters">https://ngri.opower.com/ei/app/tip/tip026_clean_air_filters</a>
0	0	#Energy saving tip: power down your cable/DVR box when not in use & save 440 kWh/yr & up to \$40 <a href="http://ow.ly/BEFyf">http://ow.ly/BEFyf</a> via @NationalGridUS
0	0	#RI named leader of offshore wind #energy <a href="http://ow.ly/AzFwC">http://ow.ly/AzFwC</a> via @TESMag
0	0	.@NationalGridUS Offers Lessons in Saving #Energy and Money <a href="http://www.longisland.com/news/08-22-14/nat-grid-saving-energy-money.html">http://www.longisland.com/news/08-22-14/nat-grid-saving-energy-money.html</a> via @longisland
0	0	.@SmartPower_org and @ReNewableNowTV Now Announce Media Partnership <a href="http://ow.ly/vqWA4">http://ow.ly/vqWA4</a> via @worldnetdaily
0	0	26 states saved enough electricity to power two million households for a year. Here's how. <a href="http://blog.opower.com/2014/04/26-states-saved-enough-electricity-to-power-two-million-households-for-a-year-heres-how/">http://blog.opower.com/2014/04/26-states-saved-enough-electricity-to-power-two-million-households-for-a-year-heres-how/</a> via @Opower
0	1	54 North Providence residents joined the RI Energy Challenge on Saturday. Thank you to the Mayor's Youth Commission members for working at the event for Find Your Four Team North Providence.
0	0	A new report from @ACORE underscores the renewable #energy momentum in #RI #CT and other states in the Northeast <a href="http://ow.ly/yEyTF">http://ow.ly/yEyTF</a>
0	0	Always keep furniture away from heating vents. Blocked vents can use up to 25% more energy to distribute warm air.
0	0	Another great energy saving tip from National Grid!
0	0	Attention Tiverton and Little Compton residents! National Grid has an exclusive, limited time offer for you. Learn more about National Grid's no-cost DemandLink program to cut your bills and energy consumption. <a href="https://mygrid.com/demandlink">https://mygrid.com/demandlink</a>
0	0	By the numbers: A 2014 State Energy Efficiency Scorecard preview!
0	0	Calculate home energy use How To
0	0	Call Made for Green Startups in Rhode Island <a href="http://www.ecori.org/green-economy/2014/4/11/call-made-for-green-startups-in-rhode-island.html">http://www.ecori.org/green-economy/2014/4/11/call-made-for-green-startups-in-rhode-island.html</a>
0	0	Call kids ages 13+! The Rhode Island Video Challenge <a href="http://ow.ly/EdnSj">http://ow.ly/EdnSj</a> #RI
0	0	Chafee sees #RI as future leader in #wind energy <a href="http://ow.ly/BM2FL">http://ow.ly/BM2FL</a> via @bostonherald
0	0	Chafee sees #RI as future leader in wind energy!
0	0	Check out the updated deadlines for the #RI Video Challenge! <a href="http://www.findyourfour.com/videochallenge/">http://www.findyourfour.com/videochallenge/</a>
0	0	Come Find Your Four at the RI Home Show March 5 - 8.
0	0	Come visit the SmartPower booth in the Energy Expo at the #RIHomeShow March 5-8th. See you there! <a href="http://bit.ly/1EG8gdj">http://bit.ly/1EG8gdj</a>
1	1	The Edward King House is supporting the efforts of the city of Newport and the RI Energy Challenge to help us all become more energy efficient.
1	1	The Preservation Society is supporting the efforts of the city of Newport and the RI Energy Challenge to help us all become more energy efficient.
1	1	This Health Care Leader... Now An Energy Champion! Check out the Buzz... the Sm@rtPwr Buzz! <a href="http://ow.ly/BFpsu">http://ow.ly/BFpsu</a> @BCBSRI
1	1	Warwick sports leagues are "All Stars" w the #RI Energy Challenge. Thanks to Deputy Recreation Dir Michael Rooney <a href="http://ow.ly/i/62ZTh">http://ow.ly/i/62ZTh</a>



0	1	Congrats to our associates who participated in the @SmartPower_org @nationalgridus RI Energy Challenge!
0	1	Congrats! Two #RI schools win awards for being green <a href="http://ow.ly/wi5RN">http://ow.ly/wi5RN</a> via @projo
		Cool your home with a whole-house fan this summer instead of AC and save \$125 per year. <a href="https://ngri.opower.com/ei/app/tip/tip079_stay_cool_and_save_with_a_whole_house_fan">https://ngri.opower.com/ei/app/tip/tip079_stay_cool_and_save_with_a_whole_house_fan</a> Get more energy saving tips at <a href="http://www.findyourfour.com/">http://www.findyourfour.com/</a> .
0	0	Declare your independence from energy waste! Join #RI Energy Challenge at <a href="http://www.findyourfour.com">http://www.findyourfour.com</a> . Happy July 4th!
0	0	<a href="http://ow.ly/i/67oB4">http://ow.ly/i/67oB4</a>
0	0	money!
		Did you find your four yet? Take the video challenge and show what you're doing to save energy and you could win!
0	0	<a href="http://www.findyourfour.com/videochallenge/">http://www.findyourfour.com/videochallenge/</a>
		Did you find your four? Once we help you identify 4 simple energy actions you can take to reduce your energy usage, consider joining
0	0	the Video Challenge and you could win! <a href="http://www.findyourfour.com/videochallenge/">http://www.findyourfour.com/videochallenge/</a>
		Did you know that by installing a high-efficiency dryer, you could receive a \$200 rebate from @NationalGridUS?
0	0	<a href="https://www1.nationalgridus.com/DryerRI">https://www1.nationalgridus.com/DryerRI</a> #RI
		Did you know that high-efficiency dryers are 30 percent more energy efficient than standard ones? Receive a \$200 mail-in rebate from
0	0	National Grid when you install a qualifying high-efficiency clothes dryer: <a href="https://www1.nationalgridus.com/DryerRI">https://www1.nationalgridus.com/DryerRI</a>
		Did you know that if you recycle your old refrigerator by December 31, 2014, you'll receive a \$50 reward from National Grid RI? You'll
0	0	also save \$150 per year in energy. Get the details: <a href="https://www1.nationalgridus.com/FridgeRecycleRI-RI-RES?ng=us">https://www1.nationalgridus.com/FridgeRecycleRI-RI-RES?ng=us</a>
		Did you know that replacing incandescent bulbs with LEDs or CFLs saves up to \$200 a year? Find Your Four today for more energy
0	0	saving tips! <a href="http://www.findyourfour.com/">http://www.findyourfour.com/</a>
		Did you know that replacing your inefficient light bulbs could save you up to \$65 over the life of the bulb? National Grid also has some
0	0	great rebates on CFL and LED bulbs: <a href="https://ngri.opower.com/ei/app/tip/tip047_use_efficient_lighting">https://ngri.opower.com/ei/app/tip/tip047_use_efficient_lighting</a>
		Did you know turning off your computer at night could save up to \$45 per year? Get more energy saving tips at <a href="http://www.findyourfour.com">www.findyourfour.com</a> .
0	0	#RI
0	0	#RI
0	0	Don't get shut out - ONLY 3 DAYS TO VOTE! You might win Bruins or Red Sox tickets just by voting.
0	0	EE Street Lamps in News and NG
0	1	Eiffel Tower now has wind turbines on it and they look really cool. <a href="http://bit.ly/1A3vDqA">http://bit.ly/1A3vDqA</a>
		Energy Saving Tip: Add storm windows to reduce heating and cooling leaks and save up to \$130 per year <a href="https://ngri.opower.com/ei/app/tip/tip031_add_storm_windows">https://ngri.opower.com/ei/app/tip/tip031_add_storm_windows</a> Get your personalized energy saving tips at <a href="http://www.findyourfour.com/">http://www.findyourfour.com/</a>
0	0	<a href="http://www.findyourfour.com/">http://www.findyourfour.com/</a>
		Energy Saving Tip: Spotlight your work spaces instead of using overhead lights to reduce energy consumption and save up to \$35 per
0	0	year <a href="https://ngri.opower.com/ei/app/tip/tip048_light_only_needed_areas">https://ngri.opower.com/ei/app/tip/tip048_light_only_needed_areas</a>
		Energy Saving Tip: Unplug your electronics when they're not in use and save \$75 annually
0	0	<a href="https://ngri.opower.com/ei/app/tip/tip060_unplug_devices">https://ngri.opower.com/ei/app/tip/tip060_unplug_devices</a> #RI
		Energy Saving Tip: Use computer power-saving modes after 20 minutes of inactivity to reduce energy consumption and save up to \$90
0	0	per year. <a href="https://ngri.opower.com/ei/app/tip/tip061_computer_power_saving_modes">https://ngri.opower.com/ei/app/tip/tip061_computer_power_saving_modes</a>
0	1	Energy Source of Providence wins Top Kilowatt Savings Performer
0	0	Energy saving tip via @NationalGridUS: turn off the lights when you leave a room and save up to \$35 per year <a href="http://ow.ly/zQELZ">http://ow.ly/zQELZ</a> #RI
0	0	Energy saving tip via @NationalGridUS: use a fan this summer instead of AC and save up to \$30 per year <a href="http://ow.ly/yuhE9">http://ow.ly/yuhE9</a> #RI
		Energy saving tip: A/C generally works the hardest at the hottest part of the day, between 2pm-5pm. This is often when many of us are
0	0	at work. So, turn off your A/C when you're out of the house and use a Wi-Fi thermostat to turn it back on about 30 minutes before you
0	0	arrive home. You won't notice the difference...except the \$120 a year savings on your energy bill, of course. <a href="http://tinyurl.com/lkrzv4h">http://tinyurl.com/lkrzv4h</a>
		Energy saving tip: Add shade coverings & awnings to reduce up to 77% of the heat gain from windows in the summer
0	0	<a href="https://ngri.opower.com/ei/app/tip/tip086_add_window_coverings">https://ngri.opower.com/ei/app/tip/tip086_add_window_coverings</a>
		Energy saving tip: Adjust the display on your television. You'll use 5-20 percent less energy and save up to \$35 per year.
0	0	<a href="https://ngri.opower.com/ei/app/tip/tip063_adjust_tv_display_setting">https://ngri.opower.com/ei/app/tip/tip063_adjust_tv_display_setting</a>
		Energy saving tip: Adjust your thermostat a few degrees and you could save more than \$200 per year!
0	0	<a href="https://ngri.opower.com/ei/app/tip/tip032_set_thermostat_wisely">https://ngri.opower.com/ei/app/tip/tip032_set_thermostat_wisely</a>
		Energy saving tip: Cool your home with a whole-house fan and save up to \$125 per year
0	0	<a href="https://ngri.opower.com/ei/app/tip/tip079_stay_cool_and_save_with_a_whole_house_fan">https://ngri.opower.com/ei/app/tip/tip079_stay_cool_and_save_with_a_whole_house_fan</a>
		Energy saving tip: Maintain your heating system and save up to \$90 per year
0	0	<a href="https://ngri.opower.com/ei/app/tip/tip041_maintain_furnace_or_boiler">https://ngri.opower.com/ei/app/tip/tip041_maintain_furnace_or_boiler</a>
		Energy saving tip: Replace your incandescent bulbs with LEDs or CFLs and save up to \$200 a year!
0	0	<a href="http://www.energyfederation.org/100216/default.php">http://www.energyfederation.org/100216/default.php</a>
		Energy saving tip: Use your computer's power-saving modes and save up to \$90 annually.
0	0	<a href="https://ngri.opower.com/ei/app/tip/tip061_computer_power_saving_modes">https://ngri.opower.com/ei/app/tip/tip061_computer_power_saving_modes</a>
		Energy saving tip: Zone heat with baseboard heaters and you could save up to \$65 per year. Learn more:
0	0	<a href="https://ngri.opower.com/ei/app/tip/tip044_zone_heat_with_baseboards">https://ngri.opower.com/ei/app/tip/tip044_zone_heat_with_baseboards</a>
		Energy saving tip: adjust the display on your TV. Changing the display can reduce power usage 5-20 percent without impacting picture
0	0	quality. <a href="https://ngri.opower.com/ei/app/tip/tip063_adjust_tv_display_setting">https://ngri.opower.com/ei/app/tip/tip063_adjust_tv_display_setting</a>
		Energy saving tip: adjust your thermostat a few degrees this summer to save on cooling costs and save up to \$205 annually.
0	0	<a href="https://ngri.opower.com/ei/app/ideas/free">https://ngri.opower.com/ei/app/ideas/free</a> Get your personalized tips at <a href="http://www.findyourfour.com/">http://www.findyourfour.com/</a>
0	0	Energy saving tip: close your shades in the summer to block heat on sunny days and save up to \$20 annually
		Energy saving tip: did you know that your dryer makes up about 6 percent of electricity use? Hanging your laundry out to dry can save
0	0	you up to \$135 per year. <a href="https://ngri.opower.com/ei/app/tip/tip010_hang_dry_laundry">https://ngri.opower.com/ei/app/tip/tip010_hang_dry_laundry</a>
		Energy saving tip: improve the shading for your windows and save up to \$35 per year. From National Grid: Why? If the sun creates
0	0	overwhelming heat in your home during the warmer months, you may wish to make targeted investments to improve the way you
0	0	shade your windows. <a href="https://ngri.opower.com/ei/app/tip/tip018_improve_window_shading">https://ngri.opower.com/ei/app/tip/tip018_improve_window_shading</a>
		Energy saving tip: maintain your AC. Cleaning your filter can save 5-15% of the air conditioner's energy costs
0	0	<a href="https://ngri.opower.com/ei/app/tip/tip015_maintain_ac">https://ngri.opower.com/ei/app/tip/tip015_maintain_ac</a> #RI

0	0	Energy saving tip: power down your cable or DVR box when it's not in use and save 440 kWh per year and up to \$40. <a href="https://ngri.opower.com/ei/app/tip/tip111_unplug_your_set_top_box">https://ngri.opower.com/ei/app/tip/tip111_unplug_your_set_top_box</a>
0	0	Energy saving tip: test you ducts for leaks & save up to \$165/ yr <a href="http://ow.ly/yBAAfE">http://ow.ly/yBAAfE</a> Get personalized tips at <a href="http://www.findyourfour.com/E">#RI</a>
0	0	Expanded renewable energy program expansion considered RI Gen Assembly
0	0	Gov @LincolnChafee Holds Ceremonial Signing Of #Energy Security Act <a href="http://ow.ly/Cg4G7E">http://ow.ly/Cg4G7E</a> via @RINPR #RI
0	1	Gov @LincolnChafee sees #RI as future leader in wind #energy! <a href="http://ow.ly/BzcXjE">http://ow.ly/BzcXjE</a> via @nbc10
0	0	Gov. Chafee Creates Climate Change Council
0	1	Great Energy Efficiency training with local parish pastors! Helping congregations go green!
0	0	Great energy saving tip from National Grid!
0	0	Great energy saving tips from National Grid!
0	0	Great job RI! The Ocean State is leading the way in offshore wind development: <a href="http://www.southcoasttoday.com/apps/pbcs.dll/article?AID=%2F20140710%2FNEWS%2F140719998">http://www.southcoasttoday.com/apps/pbcs.dll/article?AID=%2F20140710%2FNEWS%2F140719998</a>
0	0	Great offer from National Grid to help Find Your Four ways to save! 4 LED bulbs for just \$9.95 <a href="http://bit.ly/1x8ab9z">http://bit.ly/1x8ab9z</a>
0	0	Great tips from @NationalGridUS on how to improve #energy efficiency during the school year! <a href="http://ow.ly/Bo6kL">http://ow.ly/Bo6kL</a>
0	0	Great tips on how to find an energy efficiency light bulb! Get personalized tips for your home at <a href="http://www.findyourfour.com/">http://www.findyourfour.com/</a> . Shared via National Grid.
0	0	Great tips on saving energy this summer from @Energy <a href="http://ow.ly/xWqNSE">http://ow.ly/xWqNSE</a> Get your personalized tips at <a href="http://www.findyourfour.com/E">#RI</a>
0	0	Great tips on ways to reduce plastic waste! <a href="http://www.huffingtonpost.com/fay-johnson/6-ways-to-reduce-plastic_b_5602344.html">http://www.huffingtonpost.com/fay-johnson/6-ways-to-reduce-plastic_b_5602344.html</a>
0	0	Get your personalized tips at <a href="http://www.findyourfour.com/">http://www.findyourfour.com/</a>
0	1	Great videos are being submitted for the #RI Video Challenge! Submit yours today: <a href="http://www.findyourfour.com/videochallenge/">http://www.findyourfour.com/videochallenge/</a>
0	0	Grid report and RI EE Jobs
0	0	Grid report and RI EE Jobs
0	0	Happy Earth Day from everyone at RIEC! Check out some great ideas from the RI Dept of Environmental Management on ways to celebrate and remember to Find Your Four! <a href="http://www.findyourfour.com/">http://www.findyourfour.com/</a> <a href="http://www.golocalprov.com/lifestyle/ri-dem-offers-ideas-for-celebrating-earth-day-2014/">http://www.golocalprov.com/lifestyle/ri-dem-offers-ideas-for-celebrating-earth-day-2014/</a>
0	0	Happy Green Halloween from the #RI #Energy Challenge! <a href="http://ow.ly/i/7qnG8">http://ow.ly/i/7qnG8</a>
0	0	Happy first day of spring! Check out these Solar SunFlowers--giant animatronic solar-powered sculptures embedded with SunPower #solar cells. It tracks the sun, provides AC outlets for charging, and serves as a traveling teaching tool. <a href="http://poetickinetics.com/portfolio/solar-sunflowers-2/">http://poetickinetics.com/portfolio/solar-sunflowers-2/</a>
0	0	Have you checked out the great prizes for the winners of the video challenge? You could win an Energy Star iPad, Blu-ray player and more! <a href="http://www.findyourfour.com/videochallenge/">http://www.findyourfour.com/videochallenge/</a>
0	0	Have you found your four yet? Get a comprehensive, no-cost in-home energy assessment from National Grid today! Learn more: <a href="https://www1.nationalgridus.com/HomeRI-RI-RES">https://www1.nationalgridus.com/HomeRI-RI-RES</a>
0	0	Have you joined the Video Challenge yet? Upload your video by January 31st!
0	0	Help Your Wallet and the Environment by Switching to #Energy Efficient Appliances <a href="http://ow.ly/Bwe3QE">http://ow.ly/Bwe3QE</a> via @gbelements
0	0	Here's one way to find your four: Get a comprehensive, no-cost in-home #energy assessment from @NationalGridUS <a href="https://www1.nationalgridus.com/HomeRI-RI-RESE">#RI</a>
0	0	Heritage Day and free Coffee promo
0	0	Heritage Day and free Coffee promo
0	0	Home energy saving tips USDOE FYF tip
0	0	It's finally starting to feel like spring! Check out these 10 #energy saving tips from Energy Department
0	0	Johnston Newspaper
0	0	Providence
0	0	Join the #RI video challenge! Show us how to reduce #energy use & you can win! <a href="http://www.findyourfour.com/videochallenge/">http://www.findyourfour.com/videochallenge/</a>
0	0	Labor Day Green Tips: <a href="http://www.koit.com/Labor-Day-Green-Tips/18758889?pid=424168#.VACf8aPvLmc">http://www.koit.com/Labor-Day-Green-Tips/18758889?pid=424168#.VACf8aPvLmc</a>
0	0	Labor Day weekend energy saving tip: As the end of summer is within sight, the air conditioner will not be needed for much longer. But since it's still in the 80's, there are many ways you can keep your house cool without using the AC. For example, adjust window blinds as the sun moves from one side of the house to the other. When sunlight passes through windows it heats the home and the AC has to work harder. Adjusting your blinds can save up to \$20 per year on your energy bill. If you're thinking about installing new blinds, go with a light color as they are most effective at reflecting sunlight.
0	1	Learn from one man's journey of buying #solar panels--how he did it, how it works and what he's saving now. Great post via Slate! <a href="http://slate.me/1FuH8wF">http://slate.me/1FuH8wF</a>
0	0	Less than 3 weeks to go to submit your videos! Enter by January 31 and you could win! <a href="http://www.findyourfour.com/videochallenge/">http://www.findyourfour.com/videochallenge/</a>
0	0	Less than three weeks left to submit your #energy-saving video for the Rhode Island Video Challenge! Need some cool ideas or tips on how to make a video using your iPhone? Check out our blog post here: <a href="http://bit.ly/1AQriuk">http://bit.ly/1AQriuk</a> Good luck!
0	0	Looking for a #solar beer for the #Superbowl? Consider this: MillerCoors just unveiled the largest solar array of any U.S. brewery <a href="http://bit.ly/164SRGI">http://bit.ly/164SRGI</a>
0	0	Low Flow shower Head as EE tip
0	0	MA and RI EE rankings 2013
0	0	MT @NationalGridUS You still have time to enter the #RI Energy Challenge. Share how you save & you could win <a href="http://bit.ly/1xD8cp0E">#savings</a>
0	1	Members of the Mayor's Youth Commission prepare help residents join the Rhode Island Energy Challenge at the North Providence rabies vaccination clinic held this morning.
0	0	Missed White House Chronicle this past Sunday with @bfkeane? No problem! Watch it online: <a href="http://www.whchronicle.com/?p=2330">http://www.whchronicle.com/?p=2330</a>
0	0	Model home and #energy expo among draws at 2014 #RI Home Show <a href="http://ow.ly/vC9KuE">http://ow.ly/vC9KuE</a> via @projo
0	0	NG Celebrates careers in Energy Week
0	0	NG EE Programs enhance economy
0	0	NG RI EE & save \$ ideas
0	0	Nat. Grid Light up Library Promo

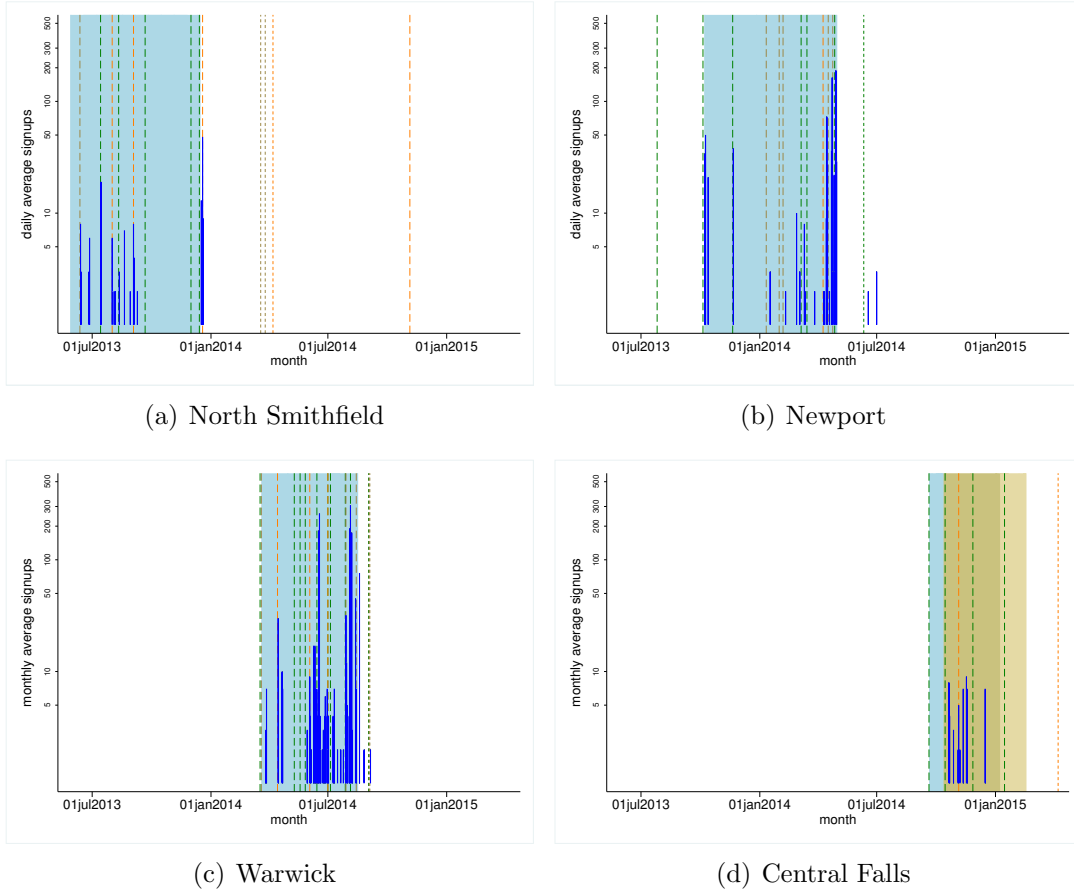
0	0	North Smith. Picture of Town Hall
0	0	Not sure if you're still trying to decided between an energy efficient light bulb or a candle, but Ask Umbra has your answer! (We had no idea a paraffin wax candle emitted so much carbon...) <a href="http://bit.ly/1bJW8gV">http://bit.ly/1bJW8gV</a>
0	0	OER Report on Green Jobs
0	0	Oakland Beach signup
0	0	Offshore Wind
0	0	Only 3 days left before we pull the plug on entries to the Rhode Island Video Contest! <a href="http://bit.ly/1uFnIE9">http://bit.ly/1uFnIE9</a>
0	0	Opower Report
0	0	Opower energy use
0	0	Pull of Rhode Island's Rivers is Powerful <a href="http://www.ecori.org/public-safety/2014/7/21/pull-of-rhode-islands-rivers-is-powerful.html">http://www.ecori.org/public-safety/2014/7/21/pull-of-rhode-islands-rivers-is-powerful.html</a>
0	0	RI in top 10 states for renewale energy jobs <a href="http://energigital.com">energigital.com</a>
0	0	RI-IPL Speech at Launch
0	1	RIEC was on-site at UPS RI's headquarters
0	0	RMUEE Nat Grid, Opower, and SP announcement
0	0	RT @NationalGridUS Did you know that distracted driving causes 55% of accidents in #RI? By staying alert, we can all make our communities safer. #DriveSafe
0	0	RT @NationalGridUS Today we thank all our #Veterans for their service to our country & are proud to provide #vets careers in #energy: <a href="http://bit.ly/1xleuUA">http://bit.ly/1xleuUA</a>
0	0	RT @bfkeane What's the buzz?? It's the Sm@rtpw Buzz! Check it out: <a href="http://us7.campaign-archive2.com/?u=d288e3b401df02ecd7eb4be04&amp;id=31e0954e81&amp;e=4ad463299b">http://us7.campaign-archive2.com/?u=d288e3b401df02ecd7eb4be04&amp;id=31e0954e81&amp;e=4ad463299b</a>
0	0	RT @nationalgridus Dry your dishes by hand or let them air dry instead of using your washer's drying cycle. You'll #SaveEnergy by changing one simple habit!
0	0	Recycling in RI and Navy Employee appreciation day
0	0	Renewable Now SmartPower's Energy Challenge Up-Date M. Ray
0	1	Residential Solar on Rise in Rhode Island <a href="http://www.ecori.org/renewable-energy/2014/8/31/residential-solar-on-rise-in-rhode-island.html">http://www.ecori.org/renewable-energy/2014/8/31/residential-solar-on-rise-in-rhode-island.html</a>
0	0	Rhode Island is in the top 10 of most energy efficient states! Did your state make the list? <a href="http://wallstcheatsheet.com/business/10-most-energy-efficient-states-in-america.html/?a=viewall">http://wallstcheatsheet.com/business/10-most-energy-efficient-states-in-america.html/?a=viewall</a>
0	0	<a href="http://www.energyfederation.org/100216/default.php">http://www.energyfederation.org/100216/default.php</a>
0	1	Session Winners: Renewable #Energy, Composting <a href="http://ow.ly/yIbCC">http://ow.ly/yIbCC</a> via @EcoRI #RI
0	0	Share via National Grid: Give your lights a break! When you leave the room, be sure to flip that switch. They'll appreciate the time off and you'll consume less energy.
0	0	Share via National Grid: IEC: Energy Saving Tip: Use computer power-saving modes after 20 minutes of inactivity to reduce energy consumption and save up to \$90 per year. <a href="https://ngri.opower.com/ei/app/tip/tip061_computer_power_saving_modes">https://ngri.opower.com/ei/app/tip/tip061_computer_power_saving_modes</a>
0	0	Share via National Grid: Need a little down time after a long day? Hop into a warm shower instead of a bath! #TipTuesday
0	0	Share via RIEC: Call kids ages 13+! The Rhode Island Video Challenge!
0	0	Share via RIEC: Congrats to Rhode Island for ranking in the top 5 of WalletHub's list of the most energy efficient states in 2014! <a href="http://wallethub.com/edu/most-and-least-energy-efficient-states/7354/">http://wallethub.com/edu/most-and-least-energy-efficient-states/7354/</a>
0	0	Share via RIEC: Congrats to Rhode Island for ranking in the top 5 of WalletHub's list of the most energy efficient states in 2014! <a href="http://wallethub.com/edu/most-and-least-energy-efficient-states/7354/">http://wallethub.com/edu/most-and-least-energy-efficient-states/7354/</a>
0	0	Share via RIEC: Have you heard about the Video Challenge? Please join us by creating a unique video highlighting how easy it is to find 4 ways to be energy efficient at home, school and work. Get the details! <a href="http://www.findyourfour.com/videochallenge/">http://www.findyourfour.com/videochallenge/</a>
0	1	Share: Troops to Energy Jobs is designed to help veterans make a successful transition to a rewarding career in the energy industry.
0	0	Shared via National Grid: Is your home sealed with the proper insulation? Learn how to check so that you don't waste cooling and heating costs through leaks. #TipTuesday <a href="http://bit.ly/1DfhP1K">http://bit.ly/1DfhP1K</a>
0	0	Sign up at Oakland Beach Fireworks
0	0	Smart Strip promo for Grid and Cadmus
0	0	SmartPower's Energy Challenge Renewable Now
0	0	Stop by the #RI Home Show on April 3-6 to learn more about energy efficiency <a href="http://bit.ly/1gu4Sa0">http://bit.ly/1gu4Sa0</a> Get more tips at <a href="http://www.findyourfour.com">http://www.findyourfour.com</a>
0	0	Take advantage of Mass Save's Slim Pack promotion & get three ENERGY STAR LED bulbs for only \$9 <a href="http://ow.ly/Cvfn">http://ow.ly/Cvfn</a> via @NationalGridUS
0	1	Thank you to Concordia Center for Spiritual Living for hosting the #RI #Energy Challenge! <a href="http://ow.ly/15ZZU">http://ow.ly/15ZZU</a>
0	1	Thank you to Rhode Island Housing who invited us to speak with employees about the Challenge during a brown bag lunch. Going Green on St. Patrick's Day!
0	1	Thank you to everyone at King's Cathedral who signed up for RIEC on 11/2! [photo album]
0	1	The ArchiBlox Positive house consumes no energy while producing energy with #solar--the energy positive house. <a href="http://bit.ly/1H26Xri">http://bit.ly/1H26Xri</a>
0	0	The Ocean State is the third most energy efficient state in the nation! Keep up the great work!
0	0	The Rhode Island Video Challenge Launches! Utility Wants to See Your Star-Power!
0	0	True or False: A plugged in charger or appliance uses energy even when not in use.
0	0	True or False: A plugged in charger or appliance uses energy even when not in use.
0	0	U.S. Secretary of Energy Ernest Moniz is in #RI today to discuss regional energy policy! Get the details: <a href="http://connecticut.cbslocal.com/2014/04/21/us-energy-officials-to-review-new-england-policy/">http://connecticut.cbslocal.com/2014/04/21/us-energy-officials-to-review-new-england-policy/</a>
0	0	US Energy Secretary Moniz to visit Rhode Island <a href="http://www.chron.com/news/article/US-Energy-Secretary-Moniz-to-visit-Rhode-Island-5407165.php">http://www.chron.com/news/article/US-Energy-Secretary-Moniz-to-visit-Rhode-Island-5407165.php</a>
0	0	Via National Grid: If it's too hot in your kitchen, turn to small appliances. Electric skillets release almost no heat while helping you make tasty stir-fries and fish dishes. #TipTuesday
0	0	Wash Clothes in Cold Water Tip
0	1	We want to be the greenest municipality in the RI Energy Challenge
0	1	We're excited to see so many great videos submitted for the RI Video Challenge! Don't miss your chance to show us what you're doing to save energy. You could win one of the great prizes, including an iPad, Blu-ray player, hockey tickets, a signed copy of Green is Good, and more! Submit your entry by January 31: <a href="http://www.findyourfour.com/videochallenge/">http://www.findyourfour.com/videochallenge/</a>

0	0	Weather stripping guide USDOE FYF tip
0	0	What are the cleanest cities in the world? Well, Birmingham, England is slashing emissions like a CO2 ninja, while Oslo boasts the honor of having not a single landfill. Copenhagen is shooting to be carbon neutral by 2025 and Chicago is covering its rooftops in luscious greenery. See what cities around the world are doing more to clean up their act! <a href="http://bit.ly/1vH5MJT">http://bit.ly/1vH5MJT</a>
0	0	What's the buzz?? It's the Sm@rtPwr Buzz! Check it out: <a href="http://us7.campaign-archive2.com/?u=d288e3b401df02ecd7eb4be04&amp;id=31e0954e81&amp;e=4ad463299bEÉ">http://us7.campaign-archive2.com/?u=d288e3b401df02ecd7eb4be04&amp;id=31e0954e81&amp;e=4ad463299bEÉ</a>
0	0	When not in use, close the flue on your chimney to keep warmth from escaping.
0	0	Window heat-shrink saves FYF tip
0	1	With Kathy Black and Beth Milham at RI Interfaith Power And Light Annual Meeting
0	0	tips on energy efficiency and RIEC push
0	1	.@SmartPower_org Matt Ray @nationalgridus Nick Corsetti make introductions @ our RI Energy Champion award reception
0	0	Attention Rhode Islanders: Show us your energy saving ideas and you could win! Visit <a href="http://www.findyourfour.com/videochallenge/">http://www.findyourfour.com/videochallenge/</a> for details.
0	0	Ceremonial Signing of the Affordable Clean #Energy Security Act w Gov @LincolnChafee @SenWhitehouse <a href="http://ow.ly/ClyzgE">#RI</a>
0	0	Check out National Grid's energy saving tip for Thanksgiving!
0	0	Energy saving tip: talk w your friends & neighbors about how they save energy & save \$310/ yr
0	0	<a href="https://ngri.opower.com/ei/app/tip/tip108_talk_about_savings_via">@NationalGridUS</a>
0	1	Environmentalists & developers support RI clean energy Projo
0	0	Gov. Lincoln Chafee and other leaders held a ceremonial signing of the Affordable Clean Energy Security Act today. Get the details from Rhode Island Public Radio: <a href="http://ripr.org/post/governor-holds-ceremonial-signing-energy-security-act">http://ripr.org/post/governor-holds-ceremonial-signing-energy-security-act</a>
0	0	Governor Lincoln Chafee, Senator Sheldon Whitehouse, and other state leaders spoke about the Affordable Clean Energy Security Act at an event in Slater Mill in Pawtucket.
0	0	Happy Thanksgiving from everyone at SmartPower! <a href="http://www.smartpower.org/happy-thanksgiving/">http://www.smartpower.org/happy-thanksgiving/</a>
0	0	Investment in rooftop #solar along the East Coast is soaring, in part, because of popular #solarize programs. Why? Because solarize programs take a common sense and grassroots approach to marketing. Great write up in CleanEnergyAuthority.com Read more: <a href="http://bit.ly/1JIXqID">http://bit.ly/1JIXqID</a>
0	0	Join the RI Video Challenge! Upload your video of easy ways for people to be more energy efficient. Get the details at: <a href="http://www.findyourfour.com/videochallenge/">http://www.findyourfour.com/videochallenge/</a>
0	1	Linda & Chris Mathiesen sign up for the #RI Energy Challenge at the @NationalGridUS Energy Expo at the RI Home Show <a href="http://ow.ly/i/5ac30">http://ow.ly/i/5ac30</a>
0	0	Looking forward to Senator Sheldon Whitehouse's 5th Annual Rhode Island Energy and Environmental Leaders Day this Friday!
0	1	NGRI names No Smithfield R.I. energy champion smartpress
0	1	National Grid RI names No Smithfield R.I. "energy champion" PBN
0	0	Recycle your working refrigerator with National Grid RI in an environmentally friendly way and receive a \$50 reward. Get the details: <a href="https://www1.nationalgridus.com/FridgeRecycleRI-RI-RES">https://www1.nationalgridus.com/FridgeRecycleRI-RI-RES</a>
0	0	Send us pictures of you finding your four!
0	0	Shared via National Grid: 4 Essential Home Upgrades Almost No One Sees
0	0	Shared via RIEC: Check out the great photos from Sen. Sheldon Whitehouse's Rhode Island Energy & Environmental Leaders Day held this summer: <a href="http://www.whitehouse.senate.gov/news/photos/gallery/rhode-island-energy-and-environmental-leaders-day">http://www.whitehouse.senate.gov/news/photos/gallery/rhode-island-energy-and-environmental-leaders-day</a>
0	0	Shared via RIEC: Governor Lincoln Chafee, Senator Sheldon Whitehouse, and other state leaders spoke about the Affordable Clean Energy Security Act at an event in Slater Mill in Pawtucket.
0	0	Tell the world you support solar by uploading your #gosolar pictures! Learn more: <a href="http://www.smartpower.org/smartpower-shouts-out-for-solar/">http://www.smartpower.org/smartpower-shouts-out-for-solar/</a>
0	0	Thanks to Matt Ray and SmartPower for Event
0	1	The latest Northern Rhode Island Chamber of Commerce newsletter is out. Thanks for including the Rhode Island Energy Challenge: Find Your Four! <a href="http://srh.r.mailjet.com/nl/1s2r/xgy81.html">http://srh.r.mailjet.com/nl/1s2r/xgy81.html</a>
0	0	Thrilled to have Rhode Island Governor Gina Raimondo and Sen. Sheldon Whitehouse joining us for the phase 2 launch of the groundbreaking #solarize RI campaign! <a href="http://buff.ly/1CZUYW2">http://buff.ly/1CZUYW2</a>
0	0	We're helping Rhode Islanders find 4 simple energy actions they can take to reduce energy use. It's all part of the Rhode Island Energy Challenge: Find Your Four. Reducing energy use saves energy and money - that's good for you and your community. Please join us by creating a unique video, no longer than 60 seconds highlighting how easy it is to find 4 ways to be energy efficient at home, school and work.
1	1	of the Colombian-American Cultural Society brought some youthful energy to the Find Your Four: Central Falls table at the Bright Future Festival last Saturday.
1	1	Announcing the winners for the Find Your Four! Video Contest! The winners for Best Video are individuals who have created the most clever and informative videos on how they are being more energy efficient. They will receive prizes to encourage their future creativity and the top video will be shown at the NewportFILM "Green Screen" event this spring. First Place: Kerri Luchka and Family - Prizes: An iPad Air 2, an Advanced Power Strip, an autographed copy of SmartPower President Brian Keane's book Green Is Good and screening of their video at NewportFILM "Green Screen" event Second Place: Stephanie Racine and her NEED Science Students from Calcutt Middle School in Central Falls - Prizes: Energy Star Blu-Ray Player with Advanced Power Strip for the Classroom, Autographed copies of Green is Good, and a commemorative sign for the campus Third Place: Anita Sousa - Prizes: Solar Charger and an autographed copy of Green Is Good Congratulations to all!
1	1	Avedisian encourages residents, businesses to take part in Warwick Energy Challenge <a href="http://www.warwickonline.com/stories/Avedisian-encourages-residents-businesses-to-take-part-in-Warwick-Energy-Challenge,94737">http://www.warwickonline.com/stories/Avedisian-encourages-residents-businesses-to-take-part-in-Warwick-Energy-Challenge,94737</a>
1	1	Check out our second place winner in the Find Your Four! Video Contest! Stephanie Racine and her NEED Science Students from Calcutt Middle School in Central Falls won a Energy Star Blu-Ray Player with Advanced Power Strip for the Classroom, Autographed copies of Green is Good, and a commemorative sign for the campus. Congratulations!
1	1	Check out the latest news from the Newport Chamber: Women in Business, RI Energy Challenge and More <a href="http://conta.cc/OKVeEB">http://conta.cc/OKVeEB</a>
1	0	Congrats to Warwick for signing up 5% of residents to the RI Energy Challenge and winning a \$7,500 grant from National Grid! <a href="http://www.providencejournal.com/breaking-news/content/20140904-energy-saving-challenge-undertaken-by-warwick-residents-reap-7500-grant-from-national-grid.ice">http://www.providencejournal.com/breaking-news/content/20140904-energy-saving-challenge-undertaken-by-warwick-residents-reap-7500-grant-from-national-grid.ice</a>

1	1	Congrats to Warwick! Keep up the great work! <a href="http://warwickpost.com/national-grid-names-warwick-an-energy-champion/2442/">http://warwickpost.com/national-grid-names-warwick-an-energy-champion/2442/</a>
1	1	Councilwoman Camille Vella-Wilkinson takes a break from gathering Energy Challenge pledges at Warwick's National Night Out for a photo and some fun with Lt. Gilbert.
1	0	Enjoyed spending time with Central Falls residents this weekend at the Third Annual Bright Future Festival. Thank you to everyone who helped make this festival possible!
1	0	In just 9 weeks, #Solarize North Smithfield broke records with 84 sign ups for a total of 624 kW of #solar! <a href="http://bit.ly/1Cb0ZI">http://bit.ly/1Cb0ZI</a>
1	1	Leaders across Rhode Island, including North Smithfield Town Administrator Paulette Hamilton, Mayor Harry Winthrop of Newport and Mayor Scott Avedisian of Warwick, have challenged colleagues to encourage their residents to participate in the Rhode Island Video Challenge. Get the details! <a href="http://www.smartpower.org/rhode-island-leaders-embrace-video-challenge/">http://www.smartpower.org/rhode-island-leaders-embrace-video-challenge/</a>
1	0	Newport EE Comm. Promotes Program at Harvest Fair
1	0	Newport at Clean City Recycling Day
1	1	NewportFILM to showcase winning video from #RI Video Challenge! Deadline extended for video submissions until 1/31! <a href="http://www.smartpower.org/newportfilm-to-showcase-winning-video-from-rhode-island-video-challenge/">http://www.smartpower.org/newportfilm-to-showcase-winning-video-from-rhode-island-video-challenge/</a>
1	0	North Smithfield is Active in RIEC
1	0	Share via RIEC: Great night at Halloween in the park - Central Falls, Rhode Island!
1	0	Shared: Warwick residents urged to help city win energy-savings grant <a href="http://www.providencejournal.com/breaking-news/content/20140729-warwick-residents-urged-to-help-city-win-energy-savings-grant.ece">http://www.providencejournal.com/breaking-news/content/20140729-warwick-residents-urged-to-help-city-win-energy-savings-grant.ece</a>
1	1	Thank you to Warwick for stepping up to take the Rhode Island Energy Challenge! Learn more about what you can do to save energy and money by signing up at Find Your Four <a href="http://www.findyourfour.com">www.findyourfour.com</a>
1	1	Thank you to everyone who stopped by the RIEC table at Central Falls on Halloween! [photo album]
1	1	capacity, will play for the NFL championship on Sunday in Super Bowl XLIX and bragging rights for fans of clean energy. Last year's World Series between the San Francisco Giants and Kansas City Royals also featured "solar champions," as did the 2013 World Series pairing the Boston Red Sox and St. Louis Cardinals and Super Bowl XLVI between the Patriots and New York Giants in 2012. <a href="http://bit.ly/1wFAnBz">http://bit.ly/1wFAnBz</a>
1	0	Warwick Joins the RI Energy Challenge
1	1	Warwick joined RI Energy Challenge: Find Your Four!
1	1	Warwick residents urged to help city win energy-savings grant <a href="http://www.providencejournal.com/breaking-news/content/20140729-warwick-residents-urged-to-help-city-win-energy-savings-grant.ece">http://www.providencejournal.com/breaking-news/content/20140729-warwick-residents-urged-to-help-city-win-energy-savings-grant.ece</a>
1	1	@BCBSRI named #RI energy champion by @NationalGridUS & @SmartPower_org <a href="http://ow.ly/BzwFq">http://ow.ly/BzwFq</a>
1	1	@NationalGridUS names North Smithfield 'Energy Champion' <a href="http://ow.ly/vofPEE">http://ow.ly/vofPEE</a> #RI
1	1	1,850 take challenge to make city an energy champion! <a href="http://www.warwickonline.com/stories/1850-take-challenge-to-make-city-an-energy-champion,95851">http://www.warwickonline.com/stories/1850-take-challenge-to-make-city-an-energy-champion,95851</a>
1	1	200+ people joined #RI Energy Challenge Find Your Four Warwick at Oakland Beach this weekend. Thanks Camille Vella-Wilkinson for your help!
1	1	First Place: Most Submitted Videos: Situate High School - Receiving a \$2,500 grant Second Place: North Kingstown Senior High School - Receiving a \$1,000 grant Third Place: John F. Deering Middle School, West Warwick - Receiving a \$500 grant Congratulations to all!
1	1	Central Falls Mayor James A. Diossa (L) and US Senator Jack Reed lend a hand in support of the Rhode Island Energy Challenge Find Your Four: Central Falls at the Bright Future Festival.
1	1	Check out @NationalGridUS' video from the event naming North Smithfield 'Energy Champion' - congrats! <a href="https://www.facebook.com/photo.php?v=619946011407116&amp;stream_ref=10">https://www.facebook.com/photo.php?v=619946011407116&amp;stream_ref=10</a> #RI
1	1	Everyone in Warwick is "teaming up" to help Warwick win the Rhode Island Energy Challenge including players from the Sheridan Electric Team of Warwick American Little League. Thanks to Brian Cahill, League President and Michael Rooney of the Warwick Parks and Recreation Department.
1	1	Had a great time at Warwick National's home field to speak with baseball families about the Challenge!
1	1	It was great seeing US Senator Jack Reed and Mayor James Diossa at the Central Falls Brighter Future Festival! Thank you for helping Rhode Islanders become more energy efficient.
1	1	Many thanks Mayor James A. Diossa and US Senator Jack Reed for helping Rhode Islanders become more energy efficient. Shared via RIEC: Central Falls Mayor James A. Diossa (L) and US Senator Jack Reed lend a hand in support of the Rhode Island Energy Challenge Find Your Four: Central Falls at the Bright Future Festival.
1	1	National Grid names North Smithfield 'Energy Champion' <a href="http://www.valleybreeze.com/2014-03-26/woonsocket-north-smithfield/national-grid-names-north-smithfield-energy-champion#.Uz1vqJCrm">http://www.valleybreeze.com/2014-03-26/woonsocket-north-smithfield/national-grid-names-north-smithfield-energy-champion#.Uz1vqJCrm</a>
1	1	National Grid names North Smithfield 'Energy Champion' <a href="https://www.valleybreeze.com/2014-03-26/woonsocket-north-smithfield/national-grid-names-north-smithfield-energy-champion#.UzXy-aJCrng">https://www.valleybreeze.com/2014-03-26/woonsocket-north-smithfield/national-grid-names-north-smithfield-energy-champion#.UzXy-aJCrng</a>
1	0	Newport EE Commission Thanks for RIEC
1	1	North Smithfield is a #RI Energy Champion! <a href="http://ow.ly/viUYF">http://ow.ly/viUYF</a>
1	1	RT @SmartPower_org This Health Care Leader... Now An Energy Champion! Check out the Buzz... the Sm@rtPwr Buzz! <a href="http://ow.ly/BFpsu">http://ow.ly/BFpsu</a> @BCBSRI
1	1	RT @hotearth Reducing energy is health insurance; thanks @BCBSRI and @SmartPower_org: Check out the Sm@rtPwr Buzz! <a href="http://ow.ly/BFpsu">http://ow.ly/BFpsu</a>
1	1	Reducing energy is health insurance; thanks @BCBSRI and @SmartPower_org: Check out the Sm@rtPwr Buzz! <a href="http://ow.ly/BFpsu">http://ow.ly/BFpsu</a>
1	0	Shared via RIEC: Central Falls Mayor James A. Diossa (L) and US Senator Jack Reed lend a hand in support of the Rhode Island Energy Challenge Find Your Four: Central Falls at the Bright Future Festival.
1	1	Thanks to Beth Milham, a volunteer from Newport, who signed up participants for the #RI Energy Challenge at the #RI Home Show... Thanks to Coach Brian, Evan & Sylvia of Warwick Firefighters Soccer League for supporting the #RI Energy Challenge! <a href="http://ow.ly/i/5RUe3">http://ow.ly/i/5RUe3</a>
1	1	Thanks to Warwick Parks & Recreation, the Norwood Association and The Jesse Liam Band for supporting the Warwick Energy Challenge at the concert Wednesday evening! Left to right: Jesse Liam Gauthier leader of The Jesse Liam Band and Jeff Baker of the Norwood Association at the Warwick Parks & Recreation summer concert - Norwood Gazebo on Pawtuxet Avenue.
1	1	Thanks to the Warwick Lions Club for including the #RI Energy Challenge in Cruise Night at Oakland Beach! <a href="http://ow.ly/i/66Jck">http://ow.ly/i/66Jck</a>

## B Daily Data Descriptive Analyses

Figure B.1: Intervention and Commitment Timing in Municipal Campaigns



In these figures, the x-axis is a day and the vertical lines indicate each intervention. Green dashed lines indicate town events such as concerts, parades, baseball games, etc. Orange dotted lines indicate newsletters. Brown short-dashed lines indicate earned newspaper media (with the thin dashed lines indicating reporting on past success). Pink long-dashed lines refer to web media specific to the town. The campaign period is shown in the blue shaded area. The tan shaded area shown in the Central Falls figure indicates the period of the video challenge, which overlapped with the campaign.

In Figure B.1, we use data visualization to demonstrate the timing of commitments and marketing touches for all of the other marketing instruments used (excluding social media) by graphing the commitments over time using blue bars, overlaid with with color-coded dotted lines that indicate the timing of marketing communications, for each of the municipal campaigns. Taking North Smithfield as an example, we see nine commitments on the day of the first intervention. On that day, the campaign published an article in *The Valley Breeze*, which describes how North Smithfield was pitted against Cranston in a challenge to save energy (Cranston was supposed to start a municipal campaign but did not follow through with it). There are no commitments in the following days until the date when the REIC sent its June newsletter, when there is another mass of commitments. The next

spike of commitments occurs on the same day of the North Smithfield concert kickoff, with no commitments in the following days. This pattern is reflected in all four towns and in all affiliates: most marketing interventions lead to an immediate spike in commitments, with virtually no carryover effect. This lack of carryover is important to accurately attribute commitments to the interventions that just occurred. The immediate response also contrasts with brand advertising, in which case it is often not possible to make a purchase at the time of advertising exposure, so identifying the effect of exposure on purchase is difficult (Berman, 2018). The fact that it is very easy to commit to saving energy immediately upon receiving a marketing touch in the RIEC, coupled with the fact that we see *all* of the marketing touches associated with the campaigns, enables us to use the timing of interventions and commitments for identification in our empirical analysis.

Table B.1: Daily Summary Statistics

Variable	Mean	Std. Dev.
interactions at event	0.492	10.054
affiliation newsletter recipients (1000s)	0.133	3.222
newsletter recipients (1000s)	0.049	0.546
affiliation social media recipients (1000s)	0.015	0.238
affiliation social media recipients, financial appeals (1000s)	0.003	0.084
affiliation social media recipients, norm appeals (1000s)	0.004	0.13
social media recipients (1000s)	1.138	1.46
social media recipients, financial appeals (1000s)	0.191	0.651
social media recipients, norm appeals (1000s)	0.142	0.615
affiliation newspaper recipients (1000s)	0.009	0.341
newspaper recipients (1000s)	0.63	6.902
email recipients (100s)	0.257	2.242
number of web articles	0.018	0.144
TV	0.003	0.057
radio	0.002	0.04
video challenge	0.149	0.356
video challenge x during town campaign	0.008	0.091
N	11,088	

Notes: An observation is a day-campaign. There are four municipal campaigns and 14 affiliate campaigns. The dataset runs from 5/9/2013 to 1/14/2015.

Table B.2: Affiliate Marketing Touch Correlations

interactions at event	1			
affiliate newsletter recipients (1000s)	-0.0013	1.0000		
affiliate social media recipients (1000s)	0.0621	-0.0015	1.0000	
affiliate newspaper recipients (1000s)	0.0076	-0.0012	0.0919	1.0000

In Table B.1, we show the basic summary statistics. In Table B.2, we show the correlation between affiliate marketing touches, and Figure A.2 shows the histogram of commitments.

## C Cost-Effectiveness of the Intervention

Costs per activity are shown in Table C.1. In order to work through affiliates, SmartPower bears a cost to present to the affiliate group, and we assume that the cost to draft and post a social media message for the affiliate is the same as it is for SmartPower. Costs are based on labor and travel. For affiliate social media, we assume that each visit leads to seven social media messages (the average observed value in the data).

Table C.1: Costs of Interventions

Activity	Total Cost
Tabling at an event	\$77.64
Visiting an affiliate	\$20.80
Sending out tweets	\$9.71
Posting on Facebook	\$9.71
Giving a presentation to a group	\$38.82
Partner/supporter email	\$38.82
Draft Press Release	\$77.64
Business visits	\$77.64
Elected Official/Opinion Leader	\$19.41

Notes: Costs are based on hourly and fixed costs, including time and travel.

We assume that each visit results in seven social media messages, the average in the data. The cost per commitment for specific activities is shown in Table C.2. Given the non-linear relationship in our log-linear model in the main specification (the dependent variable is the logarithm of one plus the number of commitments), these are the costs per commitment at zero baseline commitments. The cost per commitment decreases by a factor of  $1/(1 + \text{number of commitments})$  at higher levels.

To get a handle on the potential energy savings, we make a set of illustrative calculations based on the potential gain from switching to double-pane windows, which is one of the “Find Your Four” suggested actions. Heat loss is calculated as:

$$[\text{heatloss}] = \frac{[\text{area}] \times [\text{heatingdegreedays}] \times 24}{R - \text{value}} \quad (2)$$

in which the R-value is measured at the hourly level. Approximately 60% of a home’s heat is lost through windows (in single-pane window homes). Thus, changing from single-pane windows (R value of  $1.1 \text{ ft}^2\text{Fh/Btu}$ ) to double-pane ((R value of  $4.0 \text{ ft}^2\text{Fh/Btu}$ )) leads to a 43% reduction in energy use from heating. Natural gas prices fluctuate but were approximately \$15 per thousand cubic feet for the period of our study. A 2,000 square foot home in a severe winter climate requires about 5 million BTUs to heat (for the year), and a



Table C.2: Costs Effectiveness of Interventions

Activity	Cost	Average touches	Commitments per 1000 interactions	Cost per commitment
Tabling at an event	\$77.64	101	2.60 <sup>†</sup>	\$296
Non-affiliate press release	\$77.64	11,511	0.0010	\$6,750
Non-affiliate social media message	\$9.71	2,154	0.0147	\$307
Affiliate visit, for average social media message	\$20.80	7 × 2,532	0.103	\$11.40
Affiliate visit, for social media message referencing financial benefits	\$20.80	7 × 2,532	0.033	\$35.50
Affiliate visit, for social media message referencing social proof	\$20.80	7 × 2,532	0.142	\$8.28
Tabling plus affiliate visit, for social media message referencing event <sup>‡</sup>	\$77.64	101	2.60	\$26.90
	\$20.80	7 × 2,532	0.725	

Notes: Costs are based on hourly and fixed costs, including time and travel.

Cost per commitment estimates are at zero baseline commitments; the commitments per 1000 interactions at any other level are the values in column (3) divided by 1+number of commitments.

<sup>†</sup> Two-day effect for each interaction

<sup>‡</sup>  $(77.64 + 20.80)/(101 * 2.6/1000 + 2532 * 0.7254/1000 + 6 * 2532 * .103/1000)$

cubic foot of natural gas has 1015 BTUs. This means that the cost of heating a house (with natural gas) costs decreases from \$7,400 to \$4,220, a reduction of \$3,200 in heating costs to the household.

In terms of the social benefit of investing in these types of programs to get people to save energy, natural gas produces 53 kg of CO<sub>2</sub> per million BTU. Thus the reduction in heat usage from 5 million BTU to 2.85 million BTU leads to a reduction in carbon emissions of 114 kg of carbon per year, which is valued at \$50 per ton as calculated by the U.S. Interagency Working Group on Social Cost of Carbon for 2019 using today’s dollars. This means the environmental benefit is \$6.27 per year when getting a single household to switch from single-pane to double-pane windows, a net present value of \$125 when using a discount rate of 0.95. Of course this program is called “Find Your Four,” so assuming each action has similar savings, the social value of participating is four times as large if people commit to and follow through on all four actions.

## D Study 2 Details

In this section of the appendix, we provide further details on Study 2.

### Robustness Check: Results with the Full Sample (N = 1300)

A two-way ANOVA of the efficiency commitment index ( $M = 4.33$ ,  $SD = 1.51$ ,  $\min = 1$ ,  $\max = 7$ ) by message source condition (affiliate vs. non-affiliate) and message content condition (social proof vs. control) reveals a marginal 2-way interaction ( $F(1, 1296) = 3.34$ ,  $p = 0.068$ ), a significant main effect of message source ( $M_{affiliate} = 4.42$  vs.  $M_{non-affiliate} = 4.23$ ,  $F(1, 1296) = 5.60$ ,  $p = 0.018$ ), and a non-significant main effect of message content ( $F(1, 1296) = 0.10$ ,  $p = 0.754$ ).

Follow up analyses reveal that social proof is more effective at boosting commitment to energy-saving actions when the message comes from an affiliate than when it comes from a non-affiliate ( $M_{affiliate \times socialproof} = 4.49$ ,  $SD = 1.57$  vs.  $M_{non-affiliate \times socialproof} = 4.14$ ,  $SD = 1.49$ ;  $F(1, 1296) = 8.80$ ,  $p = 0.003$ ). The effectiveness of the control message does not differ across message source conditions ( $p = 0.703$ ). Additionally, there is no significant differences between the message content conditions when they are sent by the non-affiliate ( $M_{non-affiliate \times nosocialproof} = 4.32$ ,  $SD = 1.41$ ;  $F(1, 1296) = 2.29$ ,  $p = 0.130$ ).

### Post-Test of Event Conditions

The original design of this study was a 2 (event mentioned vs. not) X 2 (social proof vs. control) X 2 (affiliate vs. non-affiliate) between-subjects design. The event conditions mentioned a “Spring Festival” in the message, with the intent for participants to attribute the event to the source of the message (i.e., either to the city hall or to the non-profit organization, depending on the message source condition). Specifically, participants saw:

*Imagine that you are scrolling through your social media feed. As you scroll, you notice a post from [your city hall / a non-profit energy efficiency organization]:*

*Social Proof X Event:* “Join everyone who signed up at the Spring Festival in supporting the Energy Challenge to help us all become more energy efficient. Commit to reducing your energy usage.”

*Social Proof X No Event:* “Join everyone who has signed up in your community in supporting the Energy Challenge to help us all become more energy efficient. Commit to reducing your energy usage.”

*No Social Proof X Event*: “Join in after the Spring Festival in supporting the Energy Challenge to help us all become more energy efficient. Commit to reducing your energy usage.”

*No Social Proof X No Event*: “Join in on support the Energy Challenge to help us all become more energy efficient. Commit to reducing your energy usage.”

Table D.1: Post-Test of Event Conditions

			Perceived Organizer of Event			Total
			Local	Non-Local	Other	
Message Source Condition	Non-Affiliate	Count	78	86	15	179
		% within source condition	43.6%	48.0%	8.4%	100.0%
		% within organizer of event	37.9%	68.8%	51.7%	49.7%
	Affiliate	Count	128	39	14	181
		% within source condition	70.7%	21.5%	7.7%	100.0%
		% within organizer of event	62.1%	31.2%	48.3%	50.3%
Total	Count	206	125	29	360	
	% within source condition	57.2%	34.7%	8.1%	100.0%	
	% within organizer of event	100.0%	100.0%	100.0%	100.0%	

However, post-testing revealed that participants in the non-affiliate condition tend to attribute the Spring Festival event to an affiliate group source, which confounds the message source manipulation. We recruited participants on Amazon Mechanical Turk (N = 360; age: M = 34.85, SD = 9.88, min = 20, max = 68; gender: 63.3% male, 36.4% female, 0.3% non-binary) to participate in a 2 (message source: affiliate vs. non-affiliate) between-subjects study. In this study, everyone completed the social media scrolling imagination task as in the main study, and all participants imagined seeing a message that said, “Join in after the Spring Festival in supporting the Energy Challenge to help us all become more energy efficient. Commit to reducing your energy usage,” from either “your city hall” (affiliate condition) or “an energy efficiency non-profit organization” (non-affiliate condition). After the imagination task, they were asked in a free response question who they thought organized the Spring Festival event that was mentioned in the message. They then self-coded their response, indicating whether it was an organizer that is local to their community (e.g., the local government, a local school, etc.), whether it was an organizer that is not a part of their community (e.g., a different city government), or other (e.g., “do not know”).

A chi-square analysis of message source condition (affiliate vs. non-affiliate) and event organizer self-code category (local, non-local, other) is significant ( $\chi^2(2) = 29.83, p =$

0.001). See Table D.1. A follow up z-test comparing the proportion of local self-codes reveals non-significant differences between the affiliate source condition and the non-affiliate source condition ( $p > 0.05$ ). Moreover, participants within the non-affiliate condition were equally as likely to attribute the event to a local (i.e., affiliate) organizer as they were to a non-local (i.e., non-affiliate) organizer ( $p > 0.05$ ).

## E Supplemental Experiment

The purpose of this supplemental experiment was to follow-up on our finding in Study 2 that referencing social proof could backfire for non-affiliates. Given that we did not observe this backfire effect in the field study (rather, we observed a null effect of social proof for non-affiliates), we wanted to conceptually replicate the backfire effect in a second experiment.

Additionally, we wanted to explore the potential role of the desire to (no longer) be part of the affiliate community in explaining this backfire effect. Specifically, we reason that learning from an outsider (i.e., a non-affiliate) that everyone in one’s community is doing something might make a person feel left out (Wirth, 2016), whereas being invited by an insider (i.e., an affiliate) to participate with everyone else might not have the same exclusionary effect. Research on social exclusion has shown that people who feel left out are less likely to engage in a wide variety of prosocial behaviors, including cooperation (Twenge et al., 2007) and recycling (Zhou et al., 2017). Further, social exclusion can make salient a more independent (vs. interdependent) mindset for some people (Wang and Tu, 2014), which is associated with less desire to be part of a community (Markus and Kitayama, 1991). If a person feels excluded and has a decreased desire to be part of the community, they should be less likely to conform to the behavior of others in that community.

### Method

To test this prediction, we recruited three hundred and seventy university student participants ( $M_{age} = 20.36$ ,  $SD = 0.69$ , 58.6% male, 41.1% female, 1 person declined to provide gender information) to participate in this 2(message source: affiliate vs. non-affiliate) X 2(message content: social proof vs. control) between-subjects study in exchange for course credit. We recruited university students because they have a shared affiliate group (the university) that we could directly reference in the study materials, as opposed to recruiting an online sample as in Study 2. Given behavioral lab sample limitations, though, we were not able to recruit sufficient sample ( $N = 1300$ ) to test the direct effect, per the power analysis reported in Study 2. Thus, the focus of this experiment was instead on the indirect effect

of desire to be part of the community, which is in line with recent thinking on mediation analyses (Zhao et al., 2010).

The message source and message content manipulations were the same as in Study 2, except the affiliate group was the name of the university (instead of "your city hall"). Then, participants completed the same "Energy Challenge" commitment form as in the Rhode Island Energy Challenge (i.e., Study 1). The number of activities selected (0-29) served as our focal dependent measure. As the mediator measure, participants completed a scale of desire to be part of the university's community (i.e., the affiliate group's community), which contained four items adapted from the Sense of Community scale (Peterson et al., 2008). Specifically, participants were instructed to think about the university community and to indicate how true of them each of the following statements were: "I desire to be a member of this community," "I want to feel like I belong in this community," "I want to increase how connected I am to this community," and "I desire to have a good bond with others in this community" (each 1 = *not at all true of me*, 7 = *very true of me*). We averaged these items together to form a desire for community index ( $\alpha = 0.93$ ). Finally, participants completed demographic questions.

## Results

We predicted that a message to commit to energy-efficient actions that contained a social proof appeal (vs. control) would decrease a desire to be part of the university community when the message came from a non-affiliate, but not when it came from an affiliate, and this would in turn decrease energy efficiency commitments. To test this model, we conducted a bootstrapped moderated mediation analysis with message content (1 = social proof, 0 = control) as the independent variable, message source (1 = affiliate, 0 = non-affiliate) as the a-path moderator, desire to be part of the university community ( $M = 5.43$ ,  $SD = 1.25$ ) as the mediator, and number of committed energy efficiency actions ( $M = 9.07$ ,  $SD = 6.10$ ) as the dependent measure (PROCESS Model 7; 5,000 bootstraps) Hayes (2017). The model revealed a significant index of moderated mediation (index = 0.90, bootstrapped SE = 0.41, 95% CI = [0.154, 1.748]).

As expected, desire to be part of the university community significantly increased energy efficiency commitments ( $b = 1.45$ ,  $SE = 0.24$ ,  $t(367) = 5.97$ ,  $p < 0.001$ ), and this community desire was influenced by both message content and message source. When a non-affiliate's message contained a social proof appeal (vs. control), there was a significant and negative indirect effect of desire to be part of the university community on energy efficiency commitments ( $ab = -0.35$ ,  $SE = 0.18$ ,  $t(366) = -1.91$ ,  $p = 0.057$ ). On the other hand, and consistent with our theorizing, message content did not significantly influence desires to be part of the

university community when the message came from an affiliate ( $a = 0.28$ ,  $SE = 0.18$ ,  $t(366) = 1.52$ ,  $p = 0.130$ ); people are already part of that group. As such, there was not an indirect effect of desire to be part of the community when the message came from the affiliate ( $ab = 0.40$ , bootstrapped  $SE = 0.30$ , 95%  $CI = [-0.151, 1.026]$ ). Thus, the observed backfire effect of non-affiliates using social proof is explained by decreasing the message recipient’s desire to be part of the community, presumably, because they feel excluded.

Of note, we also asked participants to complete an additional measure of energy efficiency commitment after the primary dependent measure (“After seeing the post about the Energy Challenge, I would be very likely to sign a commitment to be more energy efficient by choosing at least four of the energy-saving activities to commit to” where 1 = *strongly disagree*, 7 = *strongly agree*). As a robustness check, we re-ran the mediation model using this measure as the dependent variable ( $M = 3.89$ ,  $SD = 1.74$ ). The results were significant and in the same pattern as the focal dependent measure (index of moderated mediation = 0.26, bootstrapped  $SE = 0.12$ , 95%  $CI = [0.049, 0.529]$ ; indirect effect within the non-affiliate condition:  $ab = -0.14$ , bootstrapped  $SE = 0.08$ , 95%  $CI = [-0.305, -0.009]$ ; indirect effect within the affiliate condition:  $ab = 0.12$ , bootstrapped  $SE = 0.09$ , 95%  $CI = [-0.044, 0.306]$ ). Results of both models also significantly held when simultaneously and separately controlling for how frequently the participants reported making efforts to save energy (1 = *never*, 7 = *all the time*;  $M = 3.95$ ,  $SD = 1.31$ ) and how frequently participants reported using social media (1 = *never*, 7 = *all the time*;  $M = 5.65$ ,  $SD = 1.42$ ).

## F Municipal Program Effectiveness

In this appendix, we examine the overall effectiveness of the focused municipal campaigns. Identification rests on an assumption of the representativeness of the four selected municipalities. Table E.1 shows a list of all municipalities. Initial evidence of the effect of the campaigns can be seen in the data descriptives. In Figure E.1 we plot the number of monthly commitments in the participating municipalities against the *total* number of monthly commitments elsewhere in Rhode Island. We plot the total commitments elsewhere rather than per-capita commitments, since other areas had so few commitments on a per-capita basis (making it tough to see the variation in the graphs). The figure shows clear spikes in commitments in each town during the campaigns relative to the total commitments elsewhere. For each campaign we even see that there are campaign weeks with more commitments from that municipality than everywhere else in Rhode Island combined. A notable feature in the graphs is that prior to the municipal campaigns, there were extremely few commitments in any of the treated municipalities, and thus the pre-trends are similar. This provides evidence that

these municipalities would not have had many commitments without the campaigns and thus lends support to a causal interpretation of these effects. Since other events may have occurred state-wide during the campaigns, we use a difference-in-differences specification to compare the trends in the treated municipalities to the trends in all other municipalities in Rhode Island.

Table E.1: Municipalities in Rhode Island

Name	Type	County	Population
Barrington	Town	Bristol	16,310
Bristol	Town	Bristol	22,954
Burrillville	Town	Providence	15,955
<b>Central Falls</b>	City	Providence	19,376
Charlestown	Town	Washington	7,827
Coventry	Town	Kent	35,014
Cranston	City	Providence	80,387
Cumberland	Town	Providence	33,506
East Greenwich	Town	Kent	13,146
East Providence	City	Providence	47,037
Exeter	Town	Washington	6,425
Foster	Town	Providence	4,606
Glocester	Town	Providence	9,746
Hopkinton	Town	Washington	8,188
Jamestown	Town	Newport	5,405
Johnston	Town	Providence	28,769
Lincoln	Town	Providence	21,105
Little Compton	Town	Newport	3,492
Middletown	Town	Newport	16,150
Narragansett	Town	Washington	15,868
New Shoreham (Block Island)	Town	Washington	1,051
<b>Newport</b>	City	Newport	24,672
North Kingstown	Town	Washington	26,486
North Providence	Town	Providence	32,078
<b>North Smithfield</b>	Town	Providence	11,967
Pawtucket	City	Providence	71,148
Portsmouth	Town	Newport	17,389
Providence	City	Providence	178,042
Richmond	Town	Washington	7,708
Scituate	Town	Providence	10,329
Smithfield	Town	Providence	21,430
South Kingstown	Town	Washington	30,639
Tiverton	Town	Newport	15,780
Warren	Town	Bristol	10,611
<b>Warwick</b>	City	Kent	82,672
West Greenwich	Town	Kent	6,135
West Warwick	Town	Kent	29,191
Westerly	Town	Washington	22,787
Woonsocket	City	Providence	41,186

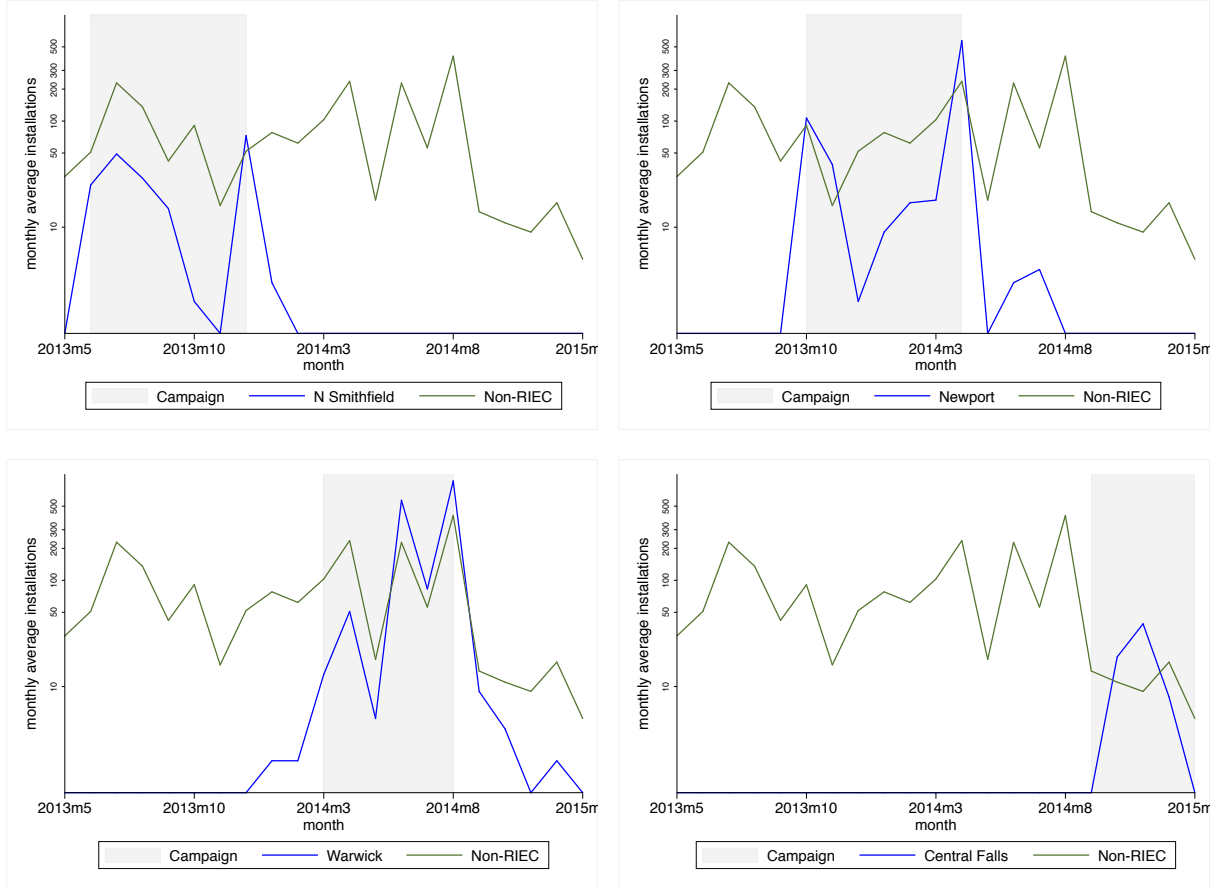
Notes: The treated municipalities are in bold: North Smithfield, Newport, Warwick, and Central Falls.

To estimate the treatment effect of the municipality campaigns, we model the number of commitments in municipality  $m$  in month  $t$  with the following linear model:

$$Y_{mt} = \beta T_{mt} + \mu_m + \delta_t + \epsilon_{mt}, \tag{3}$$

where  $T_{mt}$  is an indicator variable indicating that the municipality is participating in the

Figure E.1: Commitments in participating municipalities versus all other commitments



Note: Blue line - municipality. Green line - total commitments in towns not participating as RIEC affiliates. Campaign period - gray shaded area.

program in month  $t$ . We use a linear model for the count of commitments in our primary specification because we are merely trying to capture the average effectiveness of the town campaigns.

The control group in this specification is all other towns and cities in Rhode Island. While the graphs alone provide convincing evidence that we would see very few commitments without the campaigns, it is worth examining how similar the treatment municipalities are to others in Rhode Island. The four municipalities range from a population of 11,967 in North Smithfield to 82,672 in Warwick based on the 2010 Census. The remainder of the state has some very small, rural towns, with the smallest being New Shoreham (1,051 people) at one end of the population spectrum, and Providence, with 178,042 people, at the other end. Most towns in Rhode Island are of similar size to the treated municipalities. The median population in the treated municipalities is 24,672, while the median in the remainder of the state is 16,240. Similarly, the mean population in the treated municipalities (with the mean



taken over municipalities) is 43,815 and in the remainder of Rhode Island is 24,515. These indicate that our treated municipalities are larger than the average town in Rhode Island, although this smaller average is due to 10 non-treated towns in Rhode Island which have less than 10,000 in population. Without these small towns, the average municipality sizes are comparable. We find that our results are very robust to removing these towns, removing Providence, and in general to the choice of the treatment group, since the pre-treatment commitments are so small (we satisfy the parallel trends assumption since pre-treatment trends are near zero adoptions per month).<sup>9</sup>

Table E.2: Municipality Effectiveness Regression Results

	(1)	(2)	(3)	(4)
treatment	126.46*	124.01*	126.51*	124.04*
	(57.73)	(60.49)	(56.95)	(59.14)
municipality indicators	N	Y	N	Y
month indicators	N	N	Y	Y
R-squared	0.200	0.235	0.229	0.264
N	693	693	693	693

Notes: The treated municipalities are North Smithfield, Newport, Warwick, and Central Falls. All other municipalities in Rhode Island are included, with the exception of Cranston, which is dropped. The dependent variable is commitments. An observation is a municipality-month. Municipality-clustered standard errors in parentheses. \*\*\* indicates significant at the 0.1% level, \*\* at the 1% level, \* at the 5% level.

The results from estimating (3) with different combinations of municipality and month fixed effects are shown in Table E.2. We find a statistically significant treatment effect, which is robust across all specifications. In the final specification with all fixed effects included, we find that the campaigns lead to an average of 124 additional commitments per month. Our robustness check using a negative binomial model shows a marginal effect of 132 additional commitments per month, which is very highly statistically significant (at the 0.1 percent level). For a typical six-month campaign, this would imply 744 additional commitments. This shows clear evidence of the effectiveness of the municipality campaigns for inducing commitments.

<sup>9</sup>We also look at median household income using the 2009-2013 American Community Survey. We find that due to Central Falls being a lower-income city (median household income of \$27,993), the median household income is actually lower on average in the treated municipalities than in the remainder of Rhode Island (\$57,696 versus \$70,050 with the average taken across municipalities). Assuming income is positive correlated with commitments, this implies that if anything we underestimate our treatment effect.