

Supplemental Information (SI)

Data Access:

The data for this study were obtained directly from Opower, now Oracle Utilities, under a non-disclosure agreement (NDA). The underlying experiment was designed and implemented by Opower in partnership with a utility in California. Opower conducted the randomization and generated treatment materials, such as the HER and PER. The partner utility provided consumption reads from smart meters, which were used to populate the treatment messages. We never obtained data directly from the utility and we cannot personally identify any customer.

The proprietary data are the intellectual property of Oracle Utilities. Anyone wanting to replicate our analysis will have to sign an NDA with Oracle Utilities to access the proprietary data. The person to contact to obtain this NDA is Richard Caperton at Oracle Utilities. His email is richard.caperton@oracle.com.

Data Overview and Cleaning Procedures:

Opower provided access to three source files:

1. Two files with energy consumption reads from August 1, 2014, to September 30, 2014. The data structure of these files is a panel of unique customer identifiers generated by Opower and hourly consumption in kilowatt hours. Each consumption read was recorded for a specific date and hour and represents the total amount of energy consumed in that time period.
2. A file containing the treatment assignment for all households in the experiment. The treatment assignment data contain the treatment status of each household, including the household's assignment to the HER and the PER. The data also indicate the communication channel used for the delivery of the PER (automated phone call, automated phone call and email, or email only).

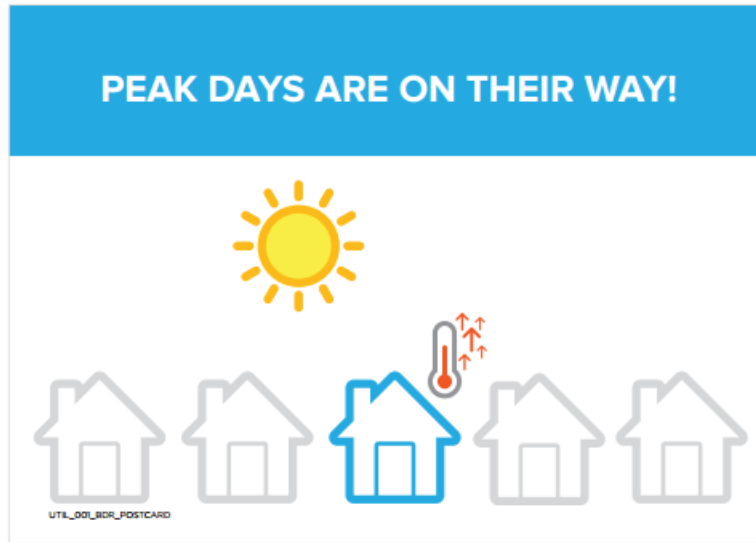
Overall, we observe 61,562,391 hourly consumption decisions. These observations can be divided into three periods: (i) 27,298,414 observations in the pre-intervention period (August 1 to August 27); (ii) 3,027,189 observations on three days with peak load events; and (iii) 31,236,788 observations between peak load events and after the last event. The average hourly consumption is 0.863 kilowatt hours with a standard deviation of 1.17. The minimum read is 0 and the maximum we observe is an hourly consumption of 31.78 kilowatt hours.

We combined all consumption reads and matched them with a household's treatment assignment based on Opower's unique household identifiers. From these data, we created binary indicators for treatment groups, event days, peak hours, and the interaction of these variables. We log-transformed usage reads for our main specifications. We excluded observations based on three rules:

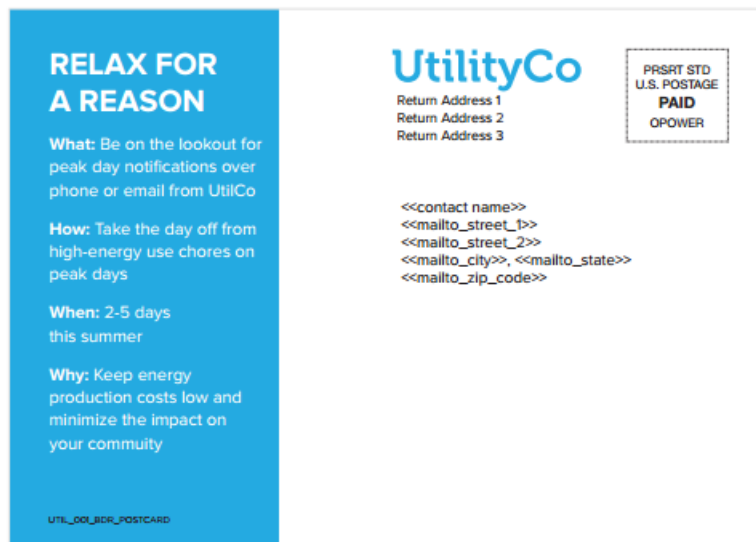
1. None of our data contain negative reads but there are 181,354 (or about 0.29%) observations with zero consumption. Zero-usage observations are uncorrelated with treatment status and we lose such observations when log-transforming the usage reads.
2. About 0.5% of households only received the email version of the PER. This delivery channel was not intended by Opower and indicates technical issues for a given household. These households are excluded from all specifications.
3. We do not use households from an additional, smaller experiment that only contained a control group and a treatment group exposed to the PER. The experiment did not use the HER and is thus of no interest for this study.

The basis for all specifications reported in the main text is a dataset restricted to observations in the pre-intervention period, from August 1 to August 27, 2014, and consumption on the three days with peak load events, August 28, September 5, and September 18, 2014. Alternative specifications in the *SI Appendix* use the full panel from August 1 to September 30, 2014, including observations between the three days with peak load events and observations after the last event.

Figure S1: Welcome Postcard

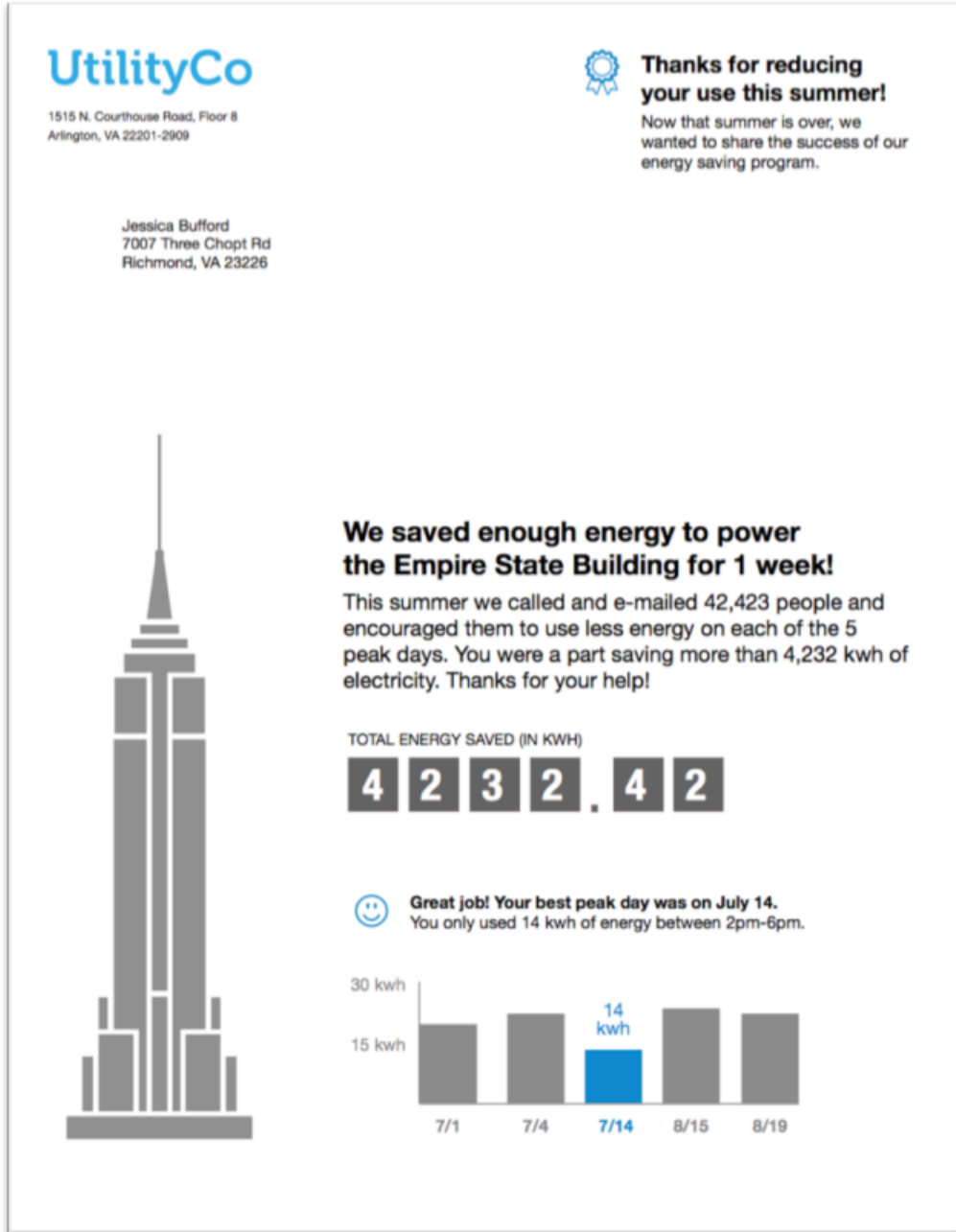


Front



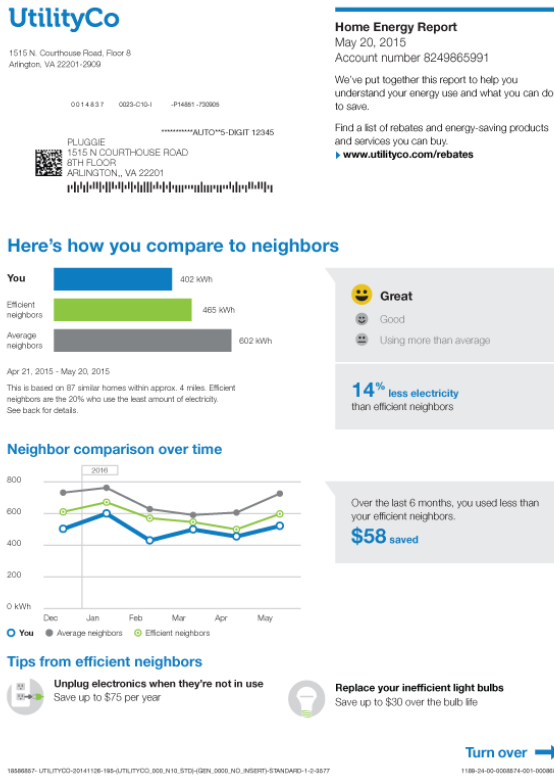
Notes: Customers in the the PER Group and the HER+PER Group receive this postcard prior to the 2014 summer season around August 1.

Figure S2: End-of-Season Postcard

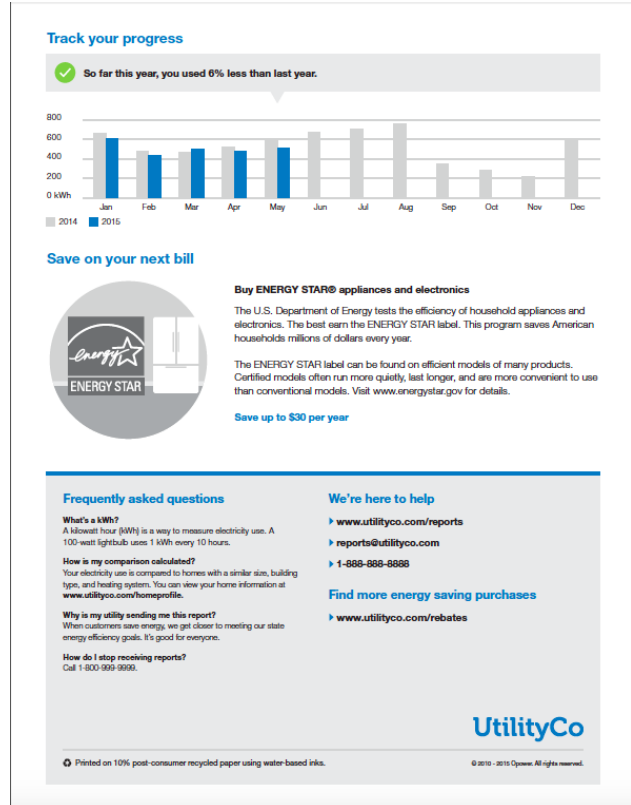


Notes: Customers in the the PER Group and the HER+PER Group receive this postcard after the 2014 summer season around October 1.

Figure S3: Home Energy Report (HER)



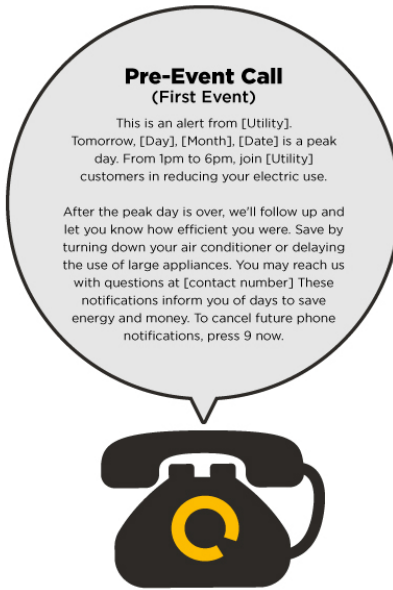
(a) Front



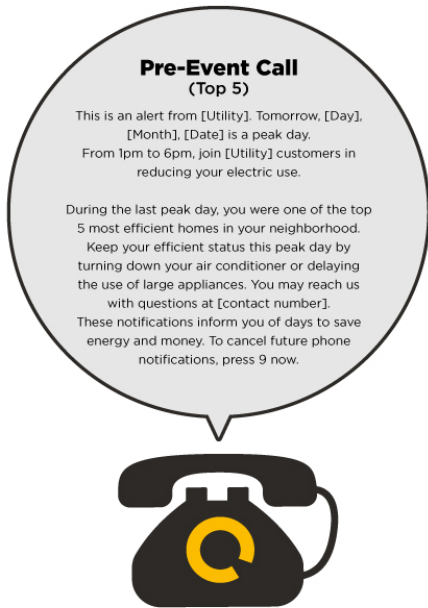
(b) Back

Notes: Example full Home Energy Reports (HER). HERs are delivered to customers in the HER Group and the HER+PER Group bimonthly by mail beginning in 2009 or 2011. The design of the mailers is identical across the two HER deployment waves and treatment groups.

Figure S4: Peak Energy Report (First Event and Top 5)



(a) Before First Event



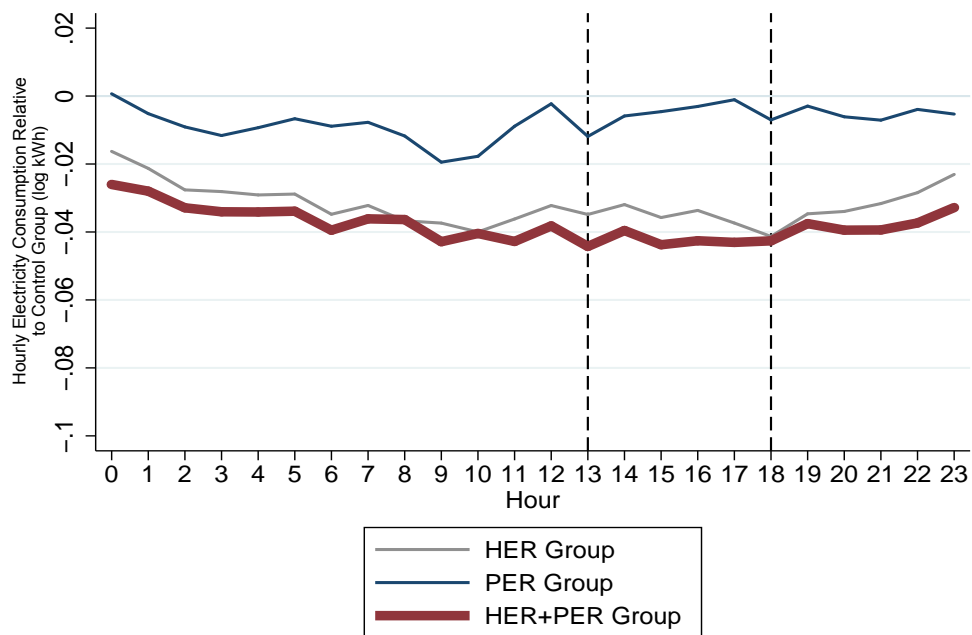
(b) Pre-Event Call (Top 5)



(c) Post-Event Call (Top 5)

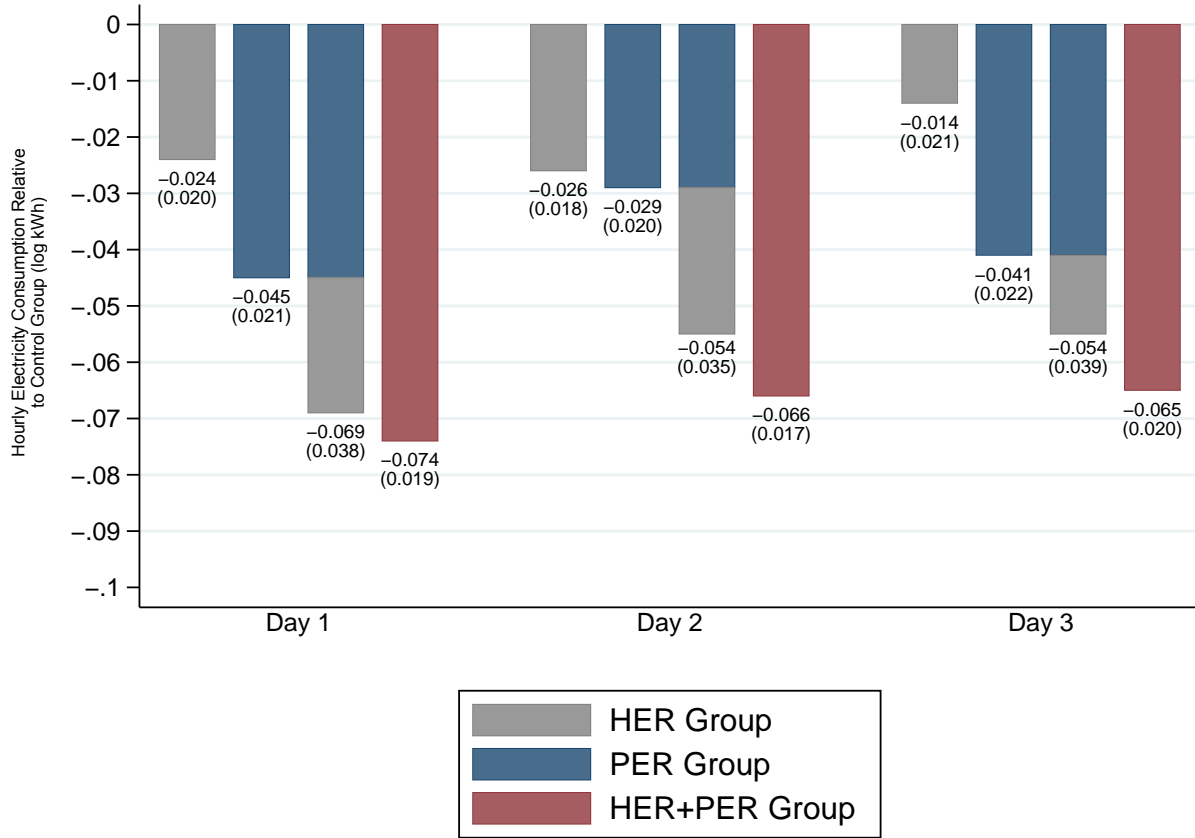
Notes: Peak Energy Reports (PERs) are delivered to households in the PER Group and the HER+PER Group by automated phone call around three days with peak load events in the summer of 2014. Households receive a pre-event phone call on the day before the peak load event and a post-event phone call on the day after the peak load event. Before the first peak load event day, households cannot receive a neighborhood comparison because the necessary data to generate the comparison are missing. Customers in the top 5 of their neighborhood comparison group receive a different call highlighting their accomplishment.

Figure S5: Treatment Effects in Electricity Consumption during the Last Baseline Week



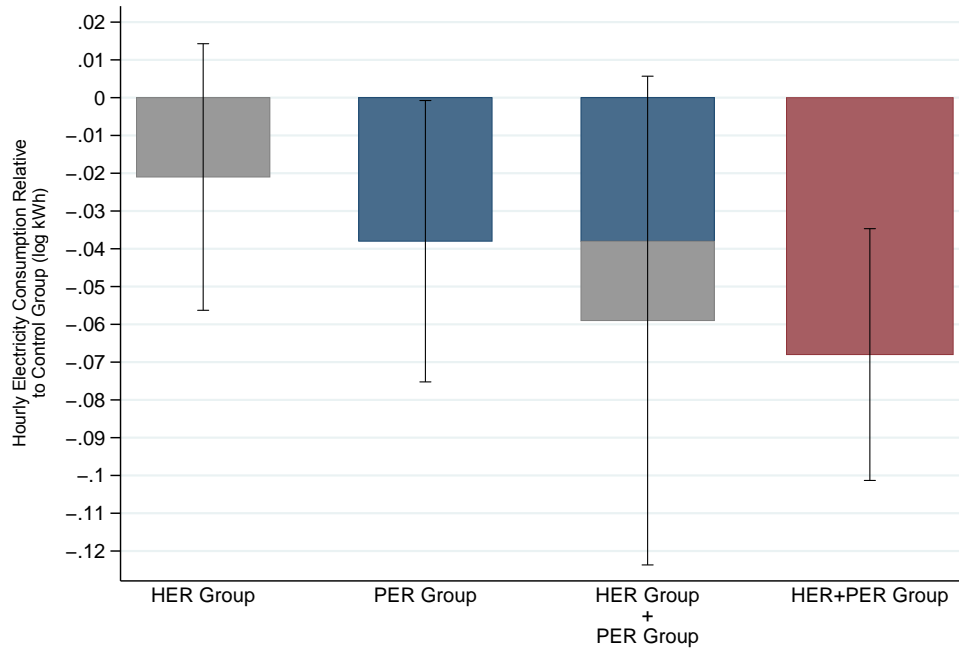
Notes: We plot the differences in the log of electricity use between each treatment group and the Control Group during the last baseline week, from August 20 to August 26. Vertical lines indicate the peak hours from 1-6pm.

Figure S6: Treatment Effects across Days with Peak Load Events



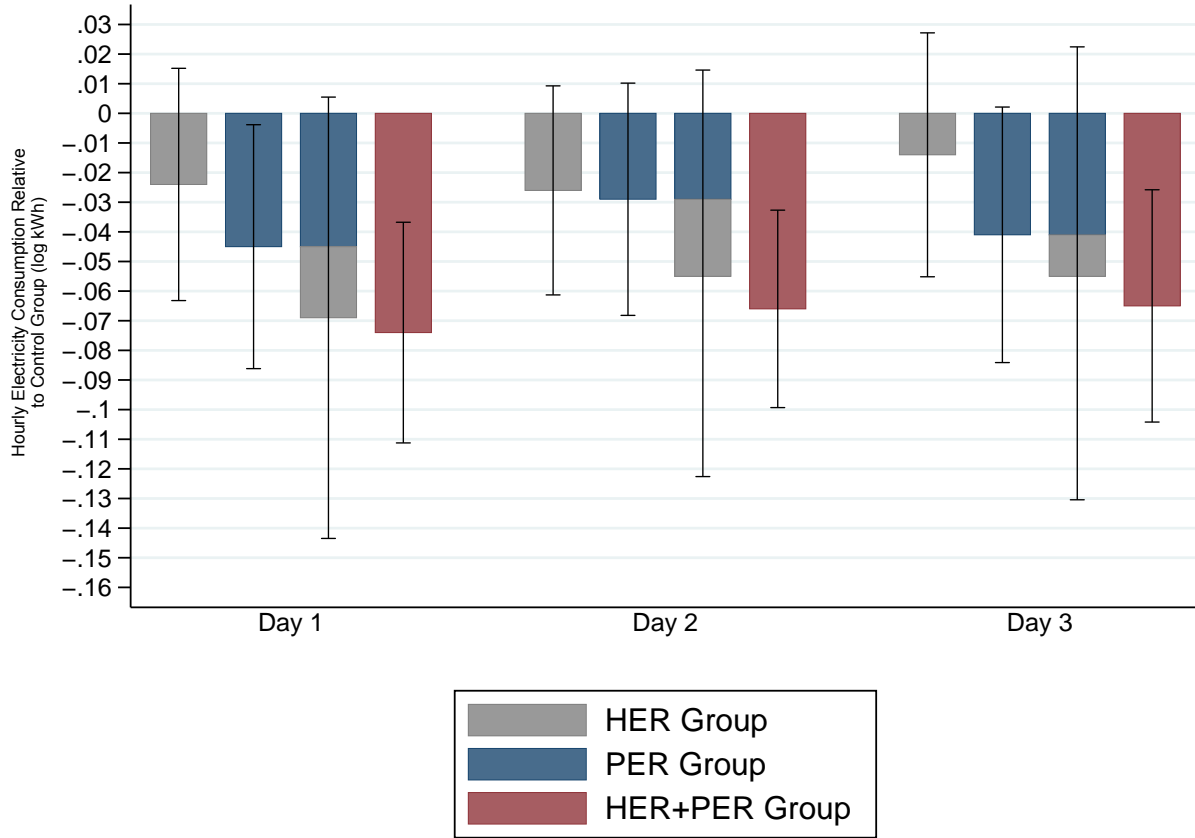
Notes: Average treatment effects during peak hours (1-6pm) from a regression of log electricity use on treatment indicators and controls for each hour in the sample, the HER deployment wave, and the medium used to communicate the PER. We plot the total treatment effects on each day with a peak load event in the summer of 2014. Bar labels represent the point estimates and we report corresponding standard errors in parentheses.

Figure S7: Treatment Effects in Electricity Consumption during Peak Hours



Notes: Average treatment effects during peak hours (1-6pm) from a regression of log electricity use on treatment indicators and controls for each hour in the sample, the HER deployment wave, and the medium used to communicate the PER. We plot the total treatment effects on the three days with peak load events in the summer of 2014. Error bars represent the 95% confidence interval of each point estimate.

Figure S8: Treatment Effects across Days with Peak Load Events



Notes: Average treatment effects during peak hours (1-6pm) from a regression of log electricity use on treatment indicators and controls for each hour in the sample, the HER deployment wave, and the medium used to communicate the PER. We plot the total treatment effects on each day with a peak load event in the summer of 2014. Errors bars represent the 95% confidence interval of each point estimate.

Table S1: Summary Statistics, Effect of the HER, and Balance

| | Peak Hours (1pm-6pm) | Shoulder Hours (10am-1pm, 6pm-9pm) | Off-Peak Hours (12am-1am, 6pm-12am) | All Hours |
|--|----------------------------|---|--|----------------------|
| <i>Panel A: Average Hourly Usage During Pre-Event Period [μ, (σ)]</i> | | | | |
| Control Group | 1.277 (1.196) | 0.989 (0.845) | 0.712 (0.573) | 0.829 (0.673) |
| PER Group | 1.276 (1.175) | 0.980 (0.820) | 0.702 (0.534) | 0.822 (0.644) |
| HER Group | 1.244 (1.182) | 0.955 (0.823) | 0.687 (0.537) | 0.803 (0.649) |
| HER+PER Group | 1.228 (1.155) | 0.946 (0.804) | 0.682 (0.529) | 0.795 (0.636) |
| <i>Panel B: Effect of the HER During Pre-Event Period [Δ, (SE)]</i> | | | | |
| HER Group | -0.033 (0.021) | -0.034 (0.014)** | -0.025 (0.009)*** | -0.026 (0.011)** |
| HER+PER Group | -0.049 (0.019)** | -0.043 (0.013)*** | -0.030 (0.009)*** | -0.034 (0.011)*** |
| <i>Panel C: Balance During Pre-Event Period [Δ, (SE)]</i> | | | | |
| Control vs. PER Group | -0.001 (0.022) | -0.009 (0.016) | -0.010 (0.010) | -0.007 (0.012) |
| HER vs. HER+PER Group | -0.016 (0.014) | -0.009 (0.010) | -0.005 (0.006) | -0.008 (0.008) |

Notes: Average electricity consumption in the baseline period from August 1 to August 27. In Panel A, we report the average hourly consumption in kilowatt hours (kWh) and the corresponding standard deviation in parentheses for each treatment group. In Panel B, we report the treatment effect of the HER, i.e., the difference between the Control Group and the two groups that received the HER (HER Group and HER+PER Group). In Panel C, we establish the balance in our sample by presenting differences in the average hourly baseline consumption across the treatment groups that did not receive the HER (Control Group and PER Group) and those that did (HER Group and HER+PER Group). Parentheses report the standard error of the difference in means for Panel B and Panel C. *** denotes significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table S2: Treatment Effects and Crowd-Out [Log Electricity Consumption]

| | Peak Hours (1pm-6pm) | Shoulder Hours (10am-1pm, 6pm-9pm) | Off-Peak Hours (12am-1pm, 6pm-12am) | All Hours |
|---|----------------------------|---|--|----------------------|
| <i>Panel A: Pre-Event Period (8/1/14-8/27/14)</i> | | | | |
| HER Group | -0.029 (0.016)* | -0.032 (0.013)** | -0.029 (0.012)** | -0.029 (0.012)** |
| PER Group | -0.003 (0.017) | -0.011 (0.014) | -0.012 (0.013) | -0.010 (0.013) |
| HER+PER Group | -0.039 (0.015)*** | -0.040 (0.013)*** | -0.035 (0.011)*** | -0.036 (0.012)*** |
| <i>Panel B: Marginal Effect on Peak-Event Days (8/28/14, 9/5/14, 9/16/14)</i> | | | | |
| HER Group | 0.008 (0.008) | 0.004 (0.006) | 0.006 (0.005) | 0.006 (0.005) |
| PER Group | -0.035 (0.009)*** | -0.001 (0.007) | 0.005 (0.005) | -0.003 (0.005) |
| HER+PER Group | -0.029 (0.008)*** | -0.003 (0.006) | 0.004 (0.004) | -0.003 (0.005) |
| <i>Panel C: Total Effect on Peak-Event Days (8/28/14, 9/5/14, 9/16/14)</i> | | | | |
| HER Group | -0.021 (0.018) | -0.027 (0.015)* | -0.023 (0.013)* | -0.023 (0.013)* |
| PER Group | -0.038 (0.019)** | -0.012 (0.016) | -0.007 (0.014) | -0.013 (0.014) |
| HER+PER Group | -0.068 (0.017)*** | -0.043 (0.014)*** | -0.032 (0.012)*** | -0.039 (0.012)*** |
| <i>Panel D: Test of HER+PER Group vs. HER Group + PER Group [Δ, (SE)]</i> | | | | |
| H_0 : No Crowd-Out | -0.009 (0.022) | -0.004 (0.019) | -0.001 (0.016) | -0.003 (0.017) |

Notes: Regression of log hourly electricity consumption on treatment indicators and controls for each hour in the sample, the HER deployment wave, and the medium used to communicate the PER. We report regression coefficients and corresponding estimated standard errors in Panel A and Panel B. In Panel C, we estimate the total effect on days with peak load events, i.e., the summation of the baseline effect (Panel A) and the marginal effect on peak load events (Panel B) for each treatment group. Finally, in Panel D we test the null-hypothesis (H_0) of no crowd-out, i.e., we test whether the total effect in the HER+PER Group equals the summation of the total effects of the HER Group and the PER Group. For this test, we report the difference in means and the estimated standard error of the difference. Robust standard errors are clustered at the household level. *** denotes significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table S3: Treatment Effects and Crowd-Out [Electricity Consumption in kWh]

| | Peak Hours (1pm-6pm) | Shoulder Hours (10am-1pm, 6pm-9pm) | Off-Peak Hours (12am-1pm, 6pm-12am) | All Hours |
|---|----------------------------|---|--|----------------------|
| <i>Panel A: Pre-Event Period (8/1/14-8/27/14)</i> | | | | |
| HER Group | -0.026 (0.020) | -0.030 (0.014)** | -0.022 (0.009)** | -0.023 (0.011)** |
| PER Group | -0.001 (0.022) | -0.011 (0.015) | -0.011 (0.010) | -0.009 (0.012) |
| HER+PER Group | -0.043 (0.019)** | -0.039 (0.013)*** | -0.028 (0.009)*** | -0.031 (0.011)*** |
| <i>Panel B: Marginal Effect on Peak-Event Days (8/28/14, 9/5/14, 9/16/14)</i> | | | | |
| HER Group | 0.003 (0.012) | -0.004 (0.009) | -0.001 (0.005) | 0.000 (0.006) |
| PER Group | -0.066 (0.013)*** | -0.010 (0.010) | -0.001 (0.006) | -0.014 (0.007)** |
| HER+PER Group | -0.066 (0.012)*** | -0.022 (0.009)** | -0.009 (0.005)* | -0.021 (0.006)*** |
| <i>Panel C: Total Effect on Peak-Event Days (8/28/14, 9/5/14, 9/16/14)</i> | | | | |
| HER Group | -0.023 (0.027) | -0.034 (0.020)* | -0.024 (0.013)* | -0.023 (0.015) |
| PER Group | -0.066 (0.029)** | -0.021 (0.021) | -0.012 (0.014) | -0.023 (0.016) |
| HER+PER Group | -0.109 (0.026)*** | -0.061 (0.019)*** | -0.036 (0.012)*** | -0.051 (0.014)*** |
| <i>Panel D: Test of HER+PER Group vs. HER Group + PER Group [Δ, (SE)]</i> | | | | |
| H_0 : No Crowd-Out | -0.019 (0.034) | -0.006 (0.025) | -0.001 (0.016) | -0.005 (0.019) |

Notes: Regression of hourly electricity consumption (in kWh) on treatment indicators and controls for each hour in the sample, the HER deployment wave, and the medium used to communicate the PER. We report regression coefficients and corresponding estimated standard errors in Panel A and Panel B. In Panel C, we estimate the total effect on days with peak load events, i.e., the summation of the baseline effect (Panel A) and the marginal effect on peak load events (Panel B) for each treatment group. Finally, in Panel D we test the null-hypothesis (H_0) of no crowd-out, i.e., we test whether the total effect in the HER+PER Group equals the summation of the total effects of the HER Group and the PER Group. For this test, we report the difference in means and the estimated standard error of the difference. Robust standard errors are clustered at the household level. *** denotes significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table S4: Treatment Effects and Crowd-Out [without Movers]

| | Peak Hours (1pm-6pm) | Shoulder Hours (10am-1pm, 6pm-9pm) | Off-Peak Hours (12am-1pm, 6pm-12am) | All Hours |
|---|----------------------------|---|--|----------------------|
| <i>Panel A: Pre-Event Period (8/1/14-8/27/14)</i> | | | | |
| HER Group | -0.025 (0.016) | -0.031 (0.014)** | -0.030 (0.012)** | -0.029 (0.012)** |
| PER Group | -0.001 (0.017) | -0.009 (0.015) | -0.009 (0.013) | -0.007 (0.013) |
| HER+PER Group | -0.034 (0.015)** | -0.036 (0.013)*** | -0.032 (0.011)*** | -0.032 (0.012)*** |
| <i>Panel B: Marginal Effect on Peak-Event Days (8/28/14, 9/5/14, 9/16/14)</i> | | | | |
| HER Group | 0.004 (0.008) | 0.004 (0.006) | 0.005 (0.004) | 0.005 (0.004) |
| PER Group | -0.042 (0.008)*** | -0.007 (0.006) | -0.001 (0.004) | -0.010 (0.004)** |
| HER+PER Group | -0.038 (0.007)*** | -0.008 (0.005) | -0.002 (0.004) | -0.009 (0.004)** |
| <i>Panel C: Total Effect on Peak-Event Days (8/28/14, 9/5/14, 9/16/14)</i> | | | | |
| HER Group | -0.021 (0.018) | -0.028 (0.015)* | -0.025 (0.012)** | -0.024 (0.013)* |
| PER Group | -0.043 (0.019)** | -0.015 (0.016) | -0.010 (0.013) | -0.017 (0.014) |
| HER+PER Group | -0.072 (0.017)*** | -0.044 (0.014)*** | -0.033 (0.012)*** | -0.041 (0.012)*** |
| <i>Panel D: Test of HER+PER Group vs. HER Group + PER Group [Δ, (SE)]</i> | | | | |
| H_0 : No Crowd-Out | -0.008 (0.023) | -0.001 (0.019) | 0.002 (0.016) | 0.000 (0.017) |

Notes: Regression of log hourly electricity consumption on treatment indicators and controls for each hour in the sample, the HER deployment wave, and the medium used to communicate the PER. We exclude households that moved out of their homes during the experiment. We report regression coefficients and corresponding estimated standard errors in Panel A and Panel B. In Panel C, we estimate the total effect on days with peak load events, i.e., the summation of the baseline effect (Panel A) and the marginal effect on peak load events (Panel B) for each treatment group. Finally, in Panel D we test the null-hypothesis (H_0) of no crowd-out, i.e., we test whether the total effect in the HER+PER Group equals the summation of the total effects of the HER Group and the PER Group. For this test, we report the difference in means and the estimated standard error of the difference. Robust standard errors are clustered at the household level. *** denotes significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table S5: Treatment Effects and Crowd-Out [FEs differ by Wave]

| | Peak Hours (1pm-6pm) | Shoulder Hours (10am-1pm, 6pm-9pm) | Off-Peak Hours (12am-1pm, 6pm-12am) | All Hours |
|---|----------------------------|---|--|----------------------|
| <i>Panel A: Pre-Event Period (8/1/14-8/27/14)</i> | | | | |
| HER Group | -0.028 (0.016)* | -0.032 (0.013)** | -0.029 (0.012)** | -0.029 (0.012)** |
| PER Group | -0.003 (0.017) | -0.011 (0.014) | -0.012 (0.013) | -0.010 (0.013) |
| HER+PER Group | -0.039 (0.015)*** | -0.040 (0.013)*** | -0.035 (0.011)*** | -0.036 (0.012)*** |
| <i>Panel B: Marginal Effect on Peak-Event Days (8/28/14, 9/5/14, 9/16/14)</i> | | | | |
| HER Group | 0.008 (0.008) | 0.005 (0.006) | 0.006 (0.005) | 0.006 (0.005) |
| PER Group | -0.035 (0.009)*** | -0.001 (0.007) | 0.005 (0.005) | -0.003 (0.005) |
| HER+PER Group | -0.029 (0.008)*** | -0.003 (0.006) | 0.004 (0.004) | -0.003 (0.005) |
| <i>Panel C: Total Effect on Peak-Event Days (8/28/14, 9/5/14, 9/16/14)</i> | | | | |
| HER Group | -0.021 (0.018) | -0.027 (0.015)* | -0.023 (0.013)* | -0.022 (0.013)* |
| PER Group | -0.038 (0.019)** | -0.012 (0.016) | -0.007 (0.014) | -0.013 (0.014) |
| HER+PER Group | -0.068 (0.017)*** | -0.043 (0.014)*** | -0.031 (0.012)*** | -0.039 (0.012)*** |
| <i>Panel D: Test of HER+PER Group vs. HER Group + PER Group [Δ, (SE)]</i> | | | | |
| H_0 : No Crowd-Out | -0.009 (0.022) | -0.004 (0.019) | -0.002 (0.016) | -0.003 (0.017) |

Notes: Regression of log hourly electricity consumption on treatment indicators and controls for each hour in the sample and the medium used to communicate the PER. We allow these control variables to vary by the HER deployment wave. We report regression coefficients and corresponding estimated standard errors in Panel A and Panel B. In Panel C, we estimate the total effect on days with peak load events, i.e., the summation of the baseline effect (Panel A) and the marginal effect on peak load events (Panel B) for each treatment group. Finally, in Panel D we test the null-hypothesis (H_0) of no crowd-out, i.e., we test whether the total effect in the HER+PER Group equals the summation of the total effects of the HER Group and the PER Group. For this test, we report the difference in means and the estimated standard error of the difference. Robust standard errors are clustered at the household level. *** denotes significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table S6: Treatment Effects during the Peak Load Window with Household-Level Controls

| | Peak Hours (1pm-6pm) | Shoulder Hours (10am-1pm, 6pm-9pm) | Off-Peak Hours (12am-1pm, 6pm-12am) | All Hours |
|--|----------------------------|---|--|-------------------|
| <i>Panel A: Difference-in-Differences Model with Household Fixed Effects</i> | | | | |
| HER Group | 0.009 (0.008) | 0.006 (0.006) | 0.008 (0.005)* | 0.008 (0.005)* |
| PER Group | -0.033 (0.009)*** | 0.000 (0.007) | 0.007 (0.005) | -0.002 (0.005) |
| HER+PER Group | -0.027 (0.008)*** | -0.002 (0.006) | 0.004 (0.004) | -0.002 (0.005) |
| <i>Panel B: Intervention Period only with Household Average Pre-Intervention Consumption</i> | | | | |
| HER Group | 0.007 (0.012) | -0.002 (0.010) | -0.001 (0.008) | 0.000 (0.008) |
| PER Group | -0.026 (0.013)* | -0.001 (0.010) | 0.003 (0.009) | -0.003 (0.009) |
| HER+PER Group | -0.031 (0.012)*** | -0.009 (0.009) | -0.002 (0.007) | -0.008 (0.008) |

Notes: We present coefficients from two regressions that include control variables for household-level behavior. In both panels, we regress log hourly electricity consumption on treatment indicators and controls for each hour in the sample. In panel A, we estimate a difference-in-differences model using the pre-intervention period and all three days with peak load events. We include household fixed effects and interactions of the treatment indicators with an indicator for days with peak load events. In panel B, we estimate a model on the three days with peak load events only. In addition to treatment indicators, we control for the average hourly consumption of each household in the pre-intervention period. Robust standard errors are clustered at the household level. *** denotes significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table S7: Spillover of Treatment Effects to Days Between Peak Load Events

| | Peak Hours (1pm-6pm) | Shoulder Hours (10am-1pm, 6pm-9pm) | Off-Peak Hours (12am-1pm, 6pm-12am) | All Hours |
|--|----------------------------|---|--|----------------------|
| <i>Panel A: Pre-Event Period (8/1/14-8/27/14)</i> | | | | |
| HER Group | -0.029 (0.016)* | -0.032 (0.013)** | -0.029 (0.012)** | -0.029 (0.012)** |
| PER Group | -0.003 (0.017) | -0.011 (0.014) | -0.012 (0.013) | -0.010 (0.013) |
| HER+PER Group | -0.039 (0.015)*** | -0.040 (0.013)*** | -0.035 (0.011)*** | -0.036 (0.012)*** |
| <i>Panel B: Marginal Effect on Non-Peak-Event Days from 8/29/14-9/15/14)</i> | | | | |
| HER Group | 0.011 (0.006) | 0.004 (0.005) | 0.002 (0.004) | 0.004 (0.005) |
| PER Group | -0.002 (0.007) | 0.003 (0.006) | 0.004 (0.005) | 0.002 (0.005) |
| HER+PER Group | 0.006 (0.006) | 0.007 (0.005) | 0.005 (0.004) | 0.005 (0.004) |

Notes: Regression of hourly electricity consumption (in kWh) on treatment indicators and controls for each hour in the sample, the HER deployment wave, and the medium used to communicate the PER. We restrict the sample to the baseline period and days between the first and last peak load event, excluding peak load event days. We report regression coefficients and corresponding estimated standard errors in Panel A and Panel B. Robust standard errors are clustered at the household level. *** denotes significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table S8: Spillover of Treatment Effects to Days After the Intervention

| | Peak Hours (1pm-6pm) | Shoulder Hours (10am-1pm, 6pm-9pm) | Off-Peak Hours (12am-1pm, 6pm-12am) | All Hours |
|---|----------------------------|---|--|----------------------|
| <i>Panel A: Pre-Event Period (8/1/14-8/27/14)</i> | | | | |
| HER Group | -0.029 (0.016)* | -0.032 (0.013)** | -0.029 (0.012)** | -0.029 (0.012)** |
| PER Group | -0.003 (0.017) | -0.011 (0.014) | -0.012 (0.013) | -0.010 (0.013) |
| HER+PER Group | -0.040 (0.015)*** | -0.040 (0.013)*** | -0.036 (0.011)*** | -0.036 (0.012)*** |
| <i>Panel B: Marginal Effect on Post-Peak-Event Days (9/17/14-9/30/14)</i> | | | | |
| HER Group | -0.006 (0.007) | 0.001 (0.006) | 0.001 (0.005) | -0.001 (0.005) |
| PER Group | -0.009 (0.007) | 0.004 (0.006) | 0.005 (0.005) | 0.002 (0.005) |
| HER+PER Group | -0.007 (0.007) | 0.007 (0.005) | 0.005 (0.005) | 0.002 (0.005) |

Notes: Regression of hourly electricity consumption (in kWh) on treatment indicators and controls for each hour in the sample, the HER deployment wave, and the medium used to communicate the PER. We restrict the sample to the baseline period and days after the last peak load event. We report regression coefficients and corresponding estimated standard errors in Panel A and Panel B. Robust standard errors are clustered at the household level. *** denotes significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table S9: Treatment Effect Heterogeneity by Baseline Electricity Consumption

| | Peak Hours (1pm-6pm) | Shoulder Hours (10am-1pm, 6pm-9pm) | Off-Peak Hours (12am-1pm, 6pm-12am) | All Hours |
|---|----------------------------|---|--|-------------------|
| <i>Panel A: Pre-Event Period (8/1/14-8/27/14)</i> | | | | |
| HER Group | 0.006 (0.014) | 0.001 (0.012) | -0.005 (0.011) | -0.003 (0.011) |
| PER Group | -0.002 (0.015) | -0.004 (0.013) | -0.007 (0.013) | -0.006 (0.013) |
| HER+PER Group | -0.009 (0.013) | -0.008 (0.011) | -0.012 (0.011) | -0.011 (0.011) |
| HER Group · High-User | -0.031 (0.021) | -0.032 (0.018)* | -0.020 (0.016) | -0.023 (0.016) |
| PER Group · High-User | -0.008 (0.022) | -0.018 (0.019) | -0.014 (0.018) | -0.012 (0.018) |
| HER+PER Group · High-User | -0.021 (0.020) | -0.029 (0.017)* | -0.019 (0.016) | -0.019 (0.015) |
| <i>Panel B: Marginal Effect on Peak-Event Days (8/28/14, 9/5/14, 9/16/14)</i> | | | | |
| HER Group | -0.001 (0.012) | -0.009 (0.010) | 0.001 (0.007) | 0.000 (0.008) |
| PER Group | -0.025 (0.013)* | -0.007 (0.010) | 0.003 (0.008) | -0.003 (0.008) |
| HER+PER Group | -0.025 (0.012)** | -0.009 (0.009) | 0.006 (0.007) | -0.001 (0.007) |
| HER Group · High-User | 0.018 (0.016) | 0.029 (0.013)** | 0.012 (0.009) | 0.014 (0.010) |
| PER Group · High-User | -0.018 (0.017) | 0.011 (0.014) | 0.005 (0.010) | 0.000 (0.010) |
| HER+PER Group · High-User | -0.007 (0.015) | 0.013 (0.012) | -0.002 (0.009) | -0.003 (0.009) |

Notes: Regression of log hourly electricity consumption on treatment indicators and controls for each hour in the sample, the HER deployment wave, and the medium used to communicate the PER. In addition, we interact all effects with a binary indicator for high-users in the baseline period, i.e., households with above-median average consumption before the first peak load event. We report regression coefficients and corresponding estimated standard errors in Panel A and Panel B. We omit the coefficients associated with the high-use indicators in the regression output. Robust standard errors are clustered at the household level. *** denotes significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.