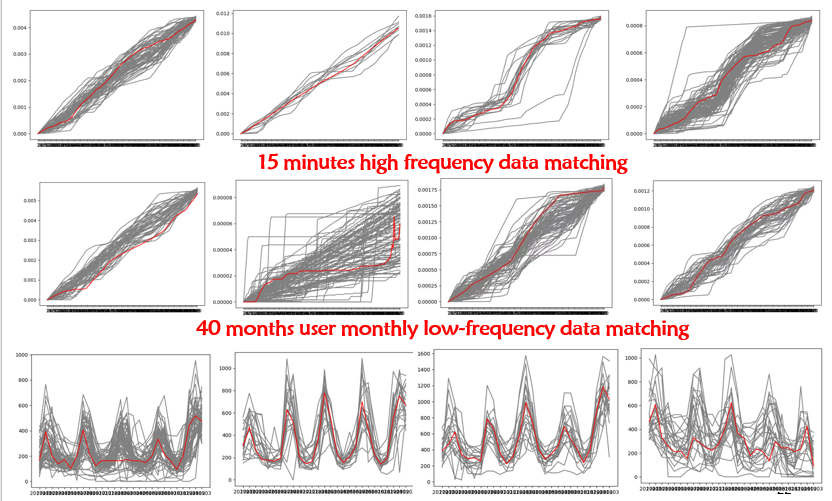
Supplemental Information

**Incentive-based Electricity Demand Response effectively and vulnerable friendly reduce peak load during hot spell**



**Figure S1. Randomly selected groups of matched households' electricity consumption behavior patterns**

**Table S1. Relationship between temperature and electricity consumption**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variables** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** |
| *Temp* | 0.0398\*\*\*  (0.0022) | 0.0445\*\*\*  (0.0023) | 0.0422\*\*\*  (0.0022) | 0.0448\*\*\*  (0.0023) | **0.0590\*\*\***  **(0.0041)** |
| *weekend* |  | 0.0335\*\*\*  (0.0120) | -0.0330\*\*\*  (0.0076) |  | 0.0216\*  (0.0125) |
| *week* |  | -0.0195\*\*\*  (0.0027) |  | -0.0136\*\*\*  (0.0017) | -0.0164\*\*\*  (0.0029) |
| Controls |  |  |  |  |  |
| *PM2.5* | No | No | Yes | Yes | Yes |
| *Wind\_direction* | No | No | Yes | Yes | Yes |
| *Wind\_speed* | No | No | Yes | Yes | Yes |
| *Wind\_level* | No | No | Yes | Yes | Yes |
| *Humidity* | No | No | Yes | Yes | Yes |
| *Atmos\_pressure* | No | No | Yes | Yes | Yes |
| *Vapor\_pressure* | No | No | Yes | Yes | Yes |
| Observations | 43,912 | 43,912 | 43,912 | 43,912 | 43,912 |
| R-squared | 0.0084 | 0.0101 | 0.0088 | 0.0099 | 0.0110 |

*Standard errors in parentheses*

*\*\*\* p<0.01, \*\* p<0.05, \* p<0.1*

**Table S2. Descriptive statistics of electricity consumption and weather-related data in the sixth EDR pilot**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | EDR  (N=16,758;  Survey sub-sample N=746) | Control  (N=105,374;  Survey sub-sample N=2,285) | All  (N=122,132;  Survey sub-sample N=3,031) | All  (N=122,132  Survey sub-sample N=3,031) |
| Frequencies (%) |  |  |  | Range |
| Countryside | 16% | 27% | 26% | / |
| City | 84% | 73% | 74% | / |
| Elderly (Survey) | 58% | 57% | 57% | / |
| Children (Survey) | 61% | 64% | 63% | / |
| Mean (SD) |  |  |  |  |
| Mean monthly electricity consumption | 216.43(147.62) | 189.18(139.84) | 192.92(141.24) | 1 to 1000 |
| Temperature | 31.95(0.86) | 31.85(1.00) | 31.86(0.99) | 30.2 to 33.4 |
| Mean electricity consumption  during pilot (base day) | 1.13(1.19) | 1.01(1.15) | 1.03(1.16) | 0 to 9.95 |
| Mean electricity consumption  during pilot (response day) | 1.00(1.16) | 0.99(1.14) | 0.99(1.14) | 0 to 9.83 |

*Standard errors in parentheses*

**Table S3. Impact of EDR policy and temperature change on households' electricity consumption behavior**

This table shows the regression results before group matching (columns (1)~(4)) and after group matching (columns (5)~(8)), where columns (1)/(2)/(5)/(6) are the regression result of equation 2, column (3)/(4)/(7)/(8) is the regression result of equation 3.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **Not-matched** | | | |  | **Matched** | | | |
| **(1)** | **(2)** | **(3)** | **(4)** |  | **(5)** | **(6)** | **(7)** | **(8)** |
| *EDR\*PostEDR\*TempDiff* |  |  | 0.0451\*\*  (0.0195) | 0.0460\*\*  (0.0195) |  |  |  | 0.0451\*\*  (0.0195) | **0.0460\*\***  **(0.0195)** |
| *EDR\* TempDiff* |  |  | -0.0669\*\*\*  (0.0251) | -0.0479\*\*  (0.0225) |  |  |  | -0.0536\*\*  (0.0222) | -0.0471\*\*  (0.0221) |
| *PostEDR\*TempDiff* |  |  | 0.0023  (0.0056) | 0.0132\*  (0.0072) |  |  |  | 0.0023  (0.0056) | 0.0133\*  (0.0072) |
| *EDR\*PostEDR* | -0.1028\*\*\*  (0.0084) | -0.1035\*\*\*  (0.0084) | -0.1082\*\*\*  (0.0093) | -0.1091\*\*\*  (0.0093) |  | -0.1028\*\*\*  (0.0084) | **-0.1035\*\*\***  **(0.0084)** | -0.1082\*\*\*  (0.0093) | -0.1091\*\*\*  (0.0093) |
| *Post* | -0.0231\*\*\*  (0.0028) | -0.0737\*\*\*  (0.0046) | -0.0236\*\*\*  (0.0034) | -0.0326\*\*\*  (0.0098) |  | -0.0231\*\*\*  (0.0028) | -0.0492\*\*\*  (0.0046) | -0.0236\*\*\*  (0.0034) | -0.1149\*\*\*  (0.0053) |
| *EDR* | 0.1204\*\*\*  (0.0099) | -0.0223\*\*  (0.0089) | 0.1229\*\*\*  (0.0109) | -0.1400\*\*\*  (0.0053) |  | 0.0048  (0.0088) | -0.0069  (0.0088) | 0.0249\*\*\*  (0.0097) | 0.0174\*  (0.0096) |
| *TempDiff* |  |  | -0.0593\*\*\*  (0.0076) | -0.2408\*\*\*  (0.0091) |  |  |  | 0.1647\*\*\*  (0.0068) | 0.2480\*\*\*  (0.0090) |
| Base Controls |  |  |  |  |  |  |  |  |  |
| *PM2.5* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Wind\_direction* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Wind\_speed* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Humidity* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Atmos\_pressure* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Vapor\_pressure* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| Other Controls | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Month\_ave* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *City\_level* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *D\_level* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| Observations | 244,264 | 244,264 | 244,264 | 244,264 |  | 244,264 | 244,264 | 244,264 | 244,264 |
| R-squared | 0.0005 | 0.2219 | 0.0011 | 0.2265 |  | 0.2526 | 0.2594 | 0.2562 | 0.2642 |

*Standard errors in parentheses*

*\*\*\* p<0.01, \*\* p<0.05, \* p<0.1*

**Table S4. Impact of EDR policy and temperature rising on households' electricity consumption behavior**

The model here is similar to equation 2 and equation 3, the only difference is that the dummy variable (*Tempdiff*) is replaced with a continuous variable (*Temp*) that reflects temperature changes. In our sample, the value range of *Temp* is 0.1-3°C, reflecting the temperature rise at 20:00 between the response day and the benchmark day.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **Not-matched** | | | |  | **Matched** | | | |
| **(1)** | **(2)** | **(3)** | **(4)** |  | **(5)** | **(6)** | **(7)** | **(8)** |
| *EDR\*PostEDR\*Temp* |  |  | 0.0209\*  (0.0112) | 0.0206\*  (0.0112) |  |  |  | 0.0209\*  (0.0112) | **0.0206\***  **(0.0112)** |
| *EDR\* Temp* |  |  | -0.0165  (0.0140) | 0.0329\*\*\*  (0.0126) |  |  |  | 0.0223\*  (0.0125) | 0.0290\*\*  (0.0124) |
| *PostEDR\*Temp* |  |  | 0.0062\*  (0.0036) | 0.0032  (0.0049) |  |  |  | 0.0062\*  (0.0036) | 0.0032  (0.0050) |
| *EDR\*PostEDR* | -0.1234\*\*\*  (0.0137) | -0.1212\*\*\*  (0.0139) | -0.1449\*\*\*  (0.0217) | -0.1439\*\*\*  (0.0219) |  | -0.1234\*\*\*  (0.0138) | -0.1215\*\*\*  (0.0139) | -0.1449\*\*\*  (0.0217) | -0.1439\*\*\*  (0.0219) |
| *Post* | -0.0253\*\*\*  (0.0043) | -0.0562\*\*\*  (0.0214) | -0.0343\*\*\*  (0.0078) | 0.1248\*\*\*  (0.0272) |  | -0.0253\*\*\*  (0.0043) | 0.0466\*\*\*  (0.0212) | -0.0343\*\*\*  (0.0078) | 0.0801\*\*\*  (0.0275) |
| *EDR* | 0.1166\*\*\*  (0.0156) | -0.0377\*\*\*  (0.0142) | 0.1024\*\*\*  (0.0240) | -0.0905\*\*\*  (0.0128) |  | -0.0535\*\*\*  (0.0139) | -0.0405\*\*\*  (0.0140) | -0.0798\*\*\*  (0.0217) | -0.0905\*\*\*  (0.0217) |
| *Temp* |  |  | -0.1032\*\*\*  (0.0046) | -0.0592\*\*\*  (0.0128) |  |  |  | 0.0026  (0.0041) | -0.0407\*\*\*  (0.0126) |
| Base Controls |  |  |  |  |  |  |  |  |  |
| *PM2.5* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Wind\_direction* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Wind\_speed* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Humidity* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Atmos\_pressure* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Vapor\_pressure* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| Other Controls | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Month\_ave* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *City\_level* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *D\_level* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| Observations | 101,570 | 101,570 | 101,570 | 101,570 |  | 101,570 | 101,570 | 101,570 | 101,570 |
| R-squared | 0.0009 | 0.1976 | 0.0122 | 0.2360 |  | 0.2211 | 0.2297 | 0.2656 | 0.2730 |

*Standard errors in parentheses*

*\*\*\* p<0.01, \*\* p<0.05, \* p<0.1*

**Table S5. Influence of the incentive-based EDR policy on reductions in rural and urban households’ electricity consumption**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **(1) Rural households** | **(2) Rural households** | **(3) Urban households** | **(4) Urban households** |
| *EDR\*PostEDR\*TempDiff* |  | -0.0200  (0.0317) |  | 0.0791\*\*  (0.0319) |
| *EDR\* TempDiff* |  | -0.0397  (0.0369) |  | -0.0406  (0.0336) |
| *PostEDR\*TempDiff* |  | 0.0214\*  (0.0113) |  | -0.0050  (0.0119) |
| *EDR\*PostEDR* | -0.0663\*\*\*  (0.0159) | -0.0566\*\*  (0.0244) | -0.1101\*\*\*  (0.0096) | -0.1152\*\*\*  (0.0100) |
| *Post* | -0.0413\*\*\*  (0.0109) | -0.2406\*\*\*  (0.0127) | -0.0836\*\*\*  (0.0066) | -0.0997\*\*\*  (0.0069) |
| *EDR* | 0.0062  (0.0186) | 0.0245  (0.0270) | 0.0106  (0.0098) | 0.0136  (0.0103) |
| *TempDiff* |  | 0.4517\*\*\*  (0.0146) |  | 0.1254\*\*\*  (0.0132) |
| Base Controls |  |  |  |  |
| *PM2.5* | Yes | Yes | Yes | Yes |
| *Wind\_direction* | Yes | Yes | Yes | Yes |
| *Wind\_speed* | Yes | Yes | Yes | Yes |
| *Humidity* | Yes | Yes | Yes | Yes |
| *Atmos\_pressure* | Yes | Yes | Yes | Yes |
| *Vapor\_pressure* | Yes | Yes | Yes | Yes |
| Other Controls |  |  |  |  |
| *Month\_ave* | Yes | Yes | Yes | Yes |
| *City\_level* | Yes | Yes | Yes | Yes |
| *D\_level* | Yes | Yes | Yes | Yes |
| Observations | 62,310 | 62,310 | 181,954 | 181,954 |
| R-squared | 0.3180 | 0.3360 | 0.2487 | 0.2494 |

*Standard errors in parentheses*

*\*\*\* p<0.01, \*\* p<0.05, \* p<0.1*

**Table S6. Influence of the incentive-based EDR policy on reductions in vulnerable households’ electricity consumption**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **(1) Households with children** | **(2) Households with children** | **(3) Households with elderly** | **(4) Households with elderly** |
| *EDR\*PostEDR\*TempDiff* |  | 0.1636  (0.1819) |  | 0.1976  (0.2144) |
| *EDR\*TempDiff* |  | -0.1816  (0.1668) |  | -0.2418  (0.2178) |
| *PostEDR\*TempDiff* |  | -0.0299  (0.1127) |  | -0.1430  (0.1291) |
| *EDR\*PostEDR* | -0.0494  (0.0553) | -0.0619  (0.0582) | -0.1929\*\*\*  (0.0627) | -0.2072\*\*\*  (0.0653) |
| *Post* | 0.0812  (0.0450) | 0.0541  (0.0585) | 0.1028\*\*  (0. 0495) | 0.1541\*\*\*  (0.0565) |
| *EDR* | -0.0252  (0.0545) | -0.0132  (0.0577) | 0.0944  (0.0613) | 0.1150\*  (0.0636) |
| *TempDiff* |  | -0.0714  (0.1372) |  | 0.2729\*\*  (0.1394) |
| Base Controls |  |  |  |  |
| *PM2.5* | Yes | Yes | Yes | Yes |
| *Wind\_direction* | Yes | Yes | Yes | Yes |
| *Wind\_speed* | Yes | Yes | Yes | Yes |
| *Humidity* | Yes | Yes | Yes | Yes |
| *Atmos\_pressure* | Yes | Yes | Yes | Yes |
| *Vapor\_pressure* | Yes | Yes | Yes | Yes |
| Other Controls |  |  |  |  |
| *Month\_ave* | Yes | Yes | Yes | Yes |
| *City\_level* | Yes | Yes | Yes | Yes |
| *D\_level* | Yes | Yes | Yes | Yes |
| Observations | 3,846 | 3,846 | 3,458 | 3,458 |
| R-squared | 0.2775 | 0.2780 | 0.2632 | 0.2643 |

*Standard errors in parentheses*

*\*\*\* p<0.01, \*\* p<0.05, \* p<0.1*

Based on electricity consumption data for 864 households that received invitation text messages consecutively in six EDR trials, combined with the hourly temperature data during the same period, the individual fixed effect model was expressed as follows:

Among these terms, *Electricity* refers to the total electricity consumption of households *i* in period *t* from 20:00 to 21:30; is the individual fixed effect, which refers to those influencing factors that do not change with time, such as age and income*.*  represents the number of times that households *i* participated in EDR trials. represents the subsidy price for six EDR trials (respectively $ 0.071/kWh, $ 0.086/kWh, $ 0.1/kWh, $ 0.114/kWh, $ 0.129/kWh, $ 0.143/kWh). is the temperature of six EDR trials at 20:00. *Controls* represent the remaining control variables, including the air quality and climate related variables, namely, PM2.5, wind direction (*Wind\_direction*), wind speed (*Wind\_speed*), relative humidity (*Humidity*), atmospheric pressure (*Atmos\_pressure*), and water pressure (*Vapor\_pressure*).

**Table S7. Sustainability of the incentive-based EDR effect**

|  |  |
| --- | --- |
| **Variables** | **(1)** |
| *Att\_cnt* | **0.0458\*\*\***  **(0.0146)** |
| *Price* | 0.0102  (0.0431) |
| *Temp* | -0.0324\*\*  (0.0157) |
| Controls | Yes |
| Observations | 5,184 |
| R-squared | 0.0084 |

*Standard errors in parentheses*

*\*\*\* p<0.01, \*\* p<0.05, \* p<0.1*

**Table S8. Impact of EDR policy and temperature change on households' electricity consumption behavior (Robustness test)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **Not-matched** | | | |  | **Matched** | | | |
| **(1)** | **(2)** | **(3)** | **(4)** |  | **(5)** | **(6)** | **(7)** | **(8)** |
| *EDR\*PostEDR\*TempDiff* |  |  | -0.1175  (0.0934) | -0.0964  (0.0768) |  |  |  | -0.1165  (0.0923) | -0.0954  (0.0756) |
| *EDR\* TempDiff* |  |  | -0.0049  (0.0310) | 0.0005  (0.0284) |  |  |  | -0.0143  (0.0333) | -0.0064  (0.0324) |
| *PostEDR\*TempDiff* |  |  | 0.0620  (0.0900) | 0.4588  (0.4122) |  |  |  | 0.0619  (0.0892) | 0.4587  (0.4122) |
| *EDR\*PostEDR* | 0.0636  (0.0742) | 0.0376  (0.0549) | 0.0802  (0.0901) | 0.0592  (0.0727) |  | 0.0627  (0.0732) | 0.0367  (0.0539) | 0.0792  (0.0890) | 0.0582  (0.0715) |
| *Post* | -0.0401  (0.0737) | 0.1223  (0.1581) | -0.0512  (0.0897) | -0.2933  (0.2722) |  | -0.0403  (0.0731) | -0.1000  (0.1581) | -0.0512  (0.0889) | -0.2698  (0.2694) |
| *EDR* | 0.1012\*\*\*  (0.0116) | 0.0389  (0.0247) | 0.0996\*\*\*  (0.0128) | 0.0401\*  (0.0240) |  | 0.0053  (0.0186) | 0.0112  (0.0184) | 0.0161  (0.0195) | 0.0133  (0.0195) |
| *TempDiff* |  |  | -0.0274\*\*  (0.0110) | 0.1580\*\*\*  (0.0397) |  |  |  | 0.1508\*\*\*  (0.0325) | 0.1671\*\*\*  (0.0444) |
| Base Controls |  |  |  |  |  |  |  |  |  |
| *PM2.5* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Wind\_direction* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Wind\_speed* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Humidity* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Atmos\_pressure* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Vapor\_pressure* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| Other Controls | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *Month\_ave* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *City\_level* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| *D\_level* | No | Yes | No | Yes |  | No | Yes | No | Yes |
| Observations | 174,561 | 174,561 | 174,561 | 174,561 |  | 174,561 | 174,561 | 174,561 | 174,561 |
| R-squared | 0.0000 | 0.0014 | 0.0000 | 0.0016 |  | 0.0128 | 0.0129 | 0.0129 | 0.0130 |

*Standard errors in parentheses*

*\*\*\* p<0.01, \*\* p<0.05, \* p<0.1*

**Table S9. Influence of the incentive-based EDR policy on reductions in rural and urban households’ electricity consumption (Robustness test)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **(1) Rural households** | **(2) Rural households** | **(3) Urban households** | **(4) Urban households** |
| *EDR\*PostEDR\*TempDiff* |  | -0.0003  (0.0369) |  | -0.1154  (0.0944) |
| *EDR\* TempDiff* |  | -0.0044  (0.0410) |  | 0.0691  (0.0456) |
| *PostEDR\*TempDiff* |  | 0.0277\*\*  (0.0130) |  | 0.4663  (0.4492) |
| *EDR\*PostEDR* | -0.0211  (0.0185) | -0.0213  (0.0255) | 0.0644  (0.0770) | 0.0719  (0.0827) |
| *Post* | 0.1160\*\*\*  (0.0111) | -0.1276\*\*\*  (0.0142) | -0.2347  (0.2631) | -0.3035  (0.3203) |
| *EDR* | -0.0239  (0.0208) | -0.0231  (0.0278) | 0.0173  (0.0200) | 0.0128  (0.0206) |
| *TempDiff* |  | 0.5153\*\*\*  (0.0195) |  | 0.0620  (0.0465) |
| Base Controls |  |  |  |  |
| *PM2.5* | Yes | Yes | Yes | Yes |
| *Wind\_direction* | Yes | Yes | Yes | Yes |
| *Wind\_speed* | Yes | Yes | Yes | Yes |
| *Humidity* | Yes | Yes | Yes | Yes |
| *Atmos\_pressure* | Yes | Yes | Yes | Yes |
| *Vapor\_pressure* | Yes | Yes | Yes | Yes |
| Other Controls |  |  |  |  |
| *Month\_ave* | Yes | Yes | Yes | Yes |
| *City\_level* | Yes | Yes | Yes | Yes |
| *D\_level* | Yes | Yes | Yes | Yes |
| Observations | 37,748 | 37,748 | 136,813 | 136,813 |
| R-squared | 0.3194 | 0.3356 | 0.0128 | 0.0128 |

*Standard errors in parentheses*

*\*\*\* p<0.01, \*\* p<0.05, \* p<0.1*

**Table S10. Influence of the incentive-based EDR policy on reductions in vulnerable households’ electricity consumption (Robustness test)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **(1) Households with children** | **(2) Households with children** | **(3) Households with elderly** | **(4) Households with elderly** |
| *EDR\*PostEDR\*TempDiff* |  | -0.0122  (0.1536) |  | -0.2363  (0.2513) |
| *EDR\* TempDiff* |  | -0.2277  (0.1813) |  | -0.0461  (0.2482) |
| *PostEDR\*TempDiff* |  | -0.1312  (0.1438) |  | 0.0224  (0.1668) |
| *EDR\*PostEDR* | -0.0295  (0.0509) | -0.0301  (0.0535) | -0.0219  (0.0568) | -0.0096  (0.0584) |
| *Post* | 0.0527  (0.0480) | 0.0365  (0.0604) | 0.1617\*\*\*  (0.0518) | 0.1712\*\*\*  (0.0583) |
| *EDR* | 0.0192  (0.0555) | 0.0343  (0.0583) | -0.0378  (0.0598) | -0.0339  (0.0617) |
| *TempDiff* |  | -0.0049  (0.1461) |  | 0.0783  (0.1595) |
| Base Controls |  |  |  |  |
| *PM2.5* | Yes | Yes | Yes | Yes |
| *Wind\_direction* | Yes | Yes | Yes | Yes |
| *Wind\_speed* | Yes | Yes | Yes | Yes |
| *Humidity* | Yes | Yes | Yes | Yes |
| *Atmos\_pressure* | Yes | Yes | Yes | Yes |
| *Vapor\_pressure* | Yes | Yes | Yes | Yes |
| Other Controls |  |  |  |  |
| *Month\_ave* | Yes | Yes | Yes | Yes |
| *City\_level* | Yes | Yes | Yes | Yes |
| *D\_level* | Yes | Yes | Yes | Yes |
| Observations | 3,026 | 3,026 | 2,723 | 2,723 |
| R-squared | 0.3137 | 0.3148 | 0.2991 | 0.2995 |

*Standard errors in parentheses*

*\*\*\* p<0.01, \*\* p<0.05, \* p<0.1*

**Table S11. Conversion standard for power and electricity of household appliances**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Working time / min  Power / W  Electricity saved / Wh | Air conditioner  (bedroom)  1102.5W | Air conditioner  (living room)  2205W | Refrigerator  150W | Washing machine  300W | Water heater  2000W | Television  180W | Electric fan  40W | Microwave oven  1200W | Vacuum cleaner  800W |
| Total (103.5Wh) | 5.6 | 2.8 | 41.4 | 20.7 | 3.1 | 34.5 | 155.3 | 5.2 | 7.8 |
| Urban households (110.1Wh) | 6.0 | 3.0 | 44.0 | 22.0 | 3.3 | 36.7 | 165.2 | 5.5 | 8.3 |
| Rural households (66.3Wh) | 3.6 | 1.8 | 26.5 | 13.3 | 2.0 | 22.1 | 99.5 | 3.3 | 5.0 |
| Households with elderly (192.9Wh) | 10.5 | 5.2 | 77.2 | 38.6 | 5.8 | 64.3 | 289.4 | 9.6 | 14.5 |

Note. Air conditioner (bedroom) is generally 1.5 horsepower, and one horsepower is about 735W; when the air conditioner is in the cooling mode, lower the setting temperature by one degree, and the 1.5 horsepower air conditioner will consume 0.3kWh more electricity for five hours continuously.