Résultats Sélection de features

| **Features** | **Corr avec KWH** | **Corr avec DOLLAREL** |
| --- | --- | --- |
| MONEYPY | 0.19132925259304961 | 0.22233532499052971 |

| **Features** | **Description** | **Corr avec KWH** | **Corr avec DOLLAREL** |
| --- | --- | --- | --- |
| ELPAY | Qui paye l’électricité ? | -0.033541746000209975 | -0.02570364589538601 |

## Correlation Analysis on All Dimensions

seuil\_corr = 0.25

| **Num** | **Features** | **Corr avec KWH** | **Corr avec BTUEL** | **Corr avec DOLLAREL** |
| --- | --- | --- | --- | --- |
| 1 | SQFTEST | 0.457875 | 0.457610 | 0.423518 |
| 2 | TOTCSQFT | 0.429363 | 0.429187 | 0.353517 |
| 3 | SQFTRANGE | 0.428137 | 0.427597 | 0.395356 |
| 4 | TOTROOMS | 0.402977 | 0.403161 | 0.374151 |
| 5 | TOTSQFT\_EN | 0.393136 | 0.392644 | 0.375695 |
| 6 | BEDROOMS | 0.393029 | 0.392288 | 0.373351 |
| 7 | TVCOLOR | 0.390913 | 0.390480 | 0.366060 |
| 8 | TOTHSQFT | 0.385807 | 0.385819 | 0.348165 |
| 9 | NCOMBATH | 0.379262 | 0.378730 | 0.339889 |
| 10 | SWIMPOOL | 0.375599 | 0.374900 | 0.343420 |
| 11 | DRYRUSE | 0.355838 | 0.356319 | 0.325130 |
| 12 | WASHLOAD | 0.355415 | 0.355810 | 0.327177 |
| 13 | NUMFRIG | 0.342159 | 0.342612 | 0.326252 |
| 14 | NUMCFAN | 0.332963 | 0.342612 | 0.255242 |
| 15 | TYPEHUQ | 0.333803 | 0.333409 | 0.291730 |
| 16 | SIZRFRI2 | 0.329272 | 0.329272 | 0.310718 |
| 17 | WINDOWS | 0.322728 | 0.322428 | 0.338686 |
| 18 | MONPOOL | 0.321479 | 0.321479 | 0.307733 |
| 19 | OTHROOMS | 0.321458 | 0.321458 | 0.292189 |
| 20 | TVSIZE3 | 0.320346 | 0.320346 | 0.302203 |
| 21 | NHSLDMEM | 0.317797 | 0.317797 | 0.333315 |
| 22 | H2OAPT | 0.314016 | 0.314016 | 0.278109 |
| 23 | STUDIO | 0.311256 | 0.311256 | 0.279629 |
| 24 | SOLAR | 0.301971 | 0.301971 | 0.247753 |
| 25 | HEATAPT | 0.299975 | 0.299975 | 0.272236 |
| 26 | POOLPUMP | 0.299147 | 0.299147 | 0.291859 |
| 27 | NUMSMPHONE | 0.296734 | 0.296734 | 0.315350 |
| 28 | AGERFRI2 | 0.296336 | 0.296336 | 0.275545 |
| 29 | TVSIZE2 | 0.293085 | 0.293085 | 0.274292 |
| 30 | TVTYPE3 | 0.289055 | 0.289055 | 0.271773 |
| 31 | TYPERFR2 | 0.288335 | 0.288335 | 0.273782 |
| 32 | OUTLET | 0.282755 | 0.282755 | 0.255632 |
| 33 | ATTIC | 0.275976 | 0.275976 | 0.255100 |
| 34 | PRKGPLC1 | 0.274449 | 0.274449 | 0.256300 |
| 35 | REGIONC\_x0\_SOUTH | 0.274440 | 0.274440 | 0.109555 |
| 36 | OUTGRILL | 0.272181 | 0.272181 | 0.263227 |
| 37 | CONCRETE | 0.267483 | 0.267483 | 0.242645 |
| 38 | TVONWE3 | 0.266745 | 0.266745 | 0.251690 |
| 39 | DWASHUSE | 0.266180 | 0.266180 | 0.250399 |
| 40 | TVONWD3 | 0.264112 | 0.264112 | 0.250692 |
| 41 | ATTICFAN | 0.262340 | 0.262340 | 0.248860 |
| 42 | DRYER | 0.259576 | 0.259576 | 0.227147 |
| 43 | COOLAPT | 0.258848 | 0.258848 | 0.236447 |
| 44 | TOPFRONT | 0.257449 | 0.257449 | 0.242732 |
| 45 | CWASHER | 0.255412 | 0.255412 | 0.228397 |
| 46 | HOUSEFAN | 0.253012 | 0.253012 | 0.238922 |
| 47 | GARGCOOL | 0.251543 | 0.251543 | 0.210152 |
| 48 | ATTCCOOL | 0.250104 | 0.250104 | 0.214451 |

## Correlation Analysis on Categorized Data

seuil\_corr = 0.15

| **Num** | **Catégories** | **Features** | **Corr avec KWH** | **Corr avec BTUEL** | **Corr avec DOLLAREL** |
| --- | --- | --- | --- | --- | --- |
| 1 | Behavioral Characteristics | DRYRUSE | 0.355838 | 0.355838 | 0.325389 |
| 2 | WASHLOAD | 0.355415 | 0.355415 | 0.327964 |
| 3 | MONPOOL | 0.320818 | 0.320818 | 0.306167 |
| 4 | OUTGRILL | 0.271669 | 0.271669 | 0.262796 |
| 5 | DWASHUSE | 0.267279 | 0.267279 | 0.251467 |
| 6 | TVONWE3 | 0.265716 | 0.265716 | 0.250282 |
| 7 | TVONWD3 | 0.263802 | 0.263802 | 0.250165 |
| 8 | GARGCOOL | 0.253653 | 0.253653 | 0.210703 |
| 9 | ATTCCOOL | 0.250237 | 0.250237 | 0.213865 |
| 10 | USECFAN | 0.235568 | 0.235568 | 0.175217 |
| 11 | TVONWE2 | 0.235039 | 0.235039 | 0.214341 |
| 12 | WASHTEMP | 0.230745 | 0.230745 | 0.205929 |
| 13 | TVONWD2 | 0.222554 | 0.222554 | 0.205029 |
| 14 | ATTCHEAT | 0.218874 | 0.218874 | 0.188982 |
| 15 | GARGHEAT | 0.216310 | 0.216310 | 0.188274 |
| 16 | LGTIN4TO8 | 0.209232 | 0.209232 | 0.198150 |
| 17 | OVENUSE | 0.200917 | 0.200917 | 0.190828 |
| 18 | LGTOUTNITE | 0.198527 | 0.198527 | 0.160451 |
| 19 | LGTIN1TO4 | 0.197939 | 0.197939 | 0.181303 |
| 20 | MONTUB | 0.190924 | 0.190924 | 0.183193 |
| 21 | DWCYCLE | 0.180969 | 0.180969 | 0.161264 |
| 22 | LGTINMORE8 | 0.172478 | 0.172478 | 0.160983 |
| 23 | COOKTOPUSE | 0.161794 | 0.161794 | 0.148989 |
| 24 | LGTOUTLED | 0.159660 | 0.159660 | 0.129825 |
| 25 | TEMPHOMEAC | 0.156020 | 0.156020 | 0.106254 |
| 26 | TEMPNITEAC | 0.155883 | 0.155883 | 0.105279 |
| 27 | LGTOUTANY | 0.154454 | 0.154454 | 0.124186 |
| 28 | LGTOUTCAN | 0.150451 | 0.150451 | 0.120372 |
| 1 | GEOGRAPHY | REGIONC\_x0\_SOUTH | 0.274440 | 0.274440 | 0.110705 |
| 2 | REGIONC\_x0\_NORTHEAST | 0.176397 | 0.176397 | 0.001915 |
| 3 | DIVISION\_x0\_West South Central | 0.152716 | 0.152716 | 0.050478 |
| 1 | WEATHER | CDD30YR\_PUB | 0.215377 | 0.215377 | 0.141347 |
| 2 | DBT1 | 0.208065 | 0.208065 | 0.073338 |
| 3 | GWT | 0.198236 | 0.198236 | 0.140400 |
| 4 | CDD65 | 0.195630 | 0.195630 | 0.142556 |
| 5 | HDD65 | 0.158819 | 0.158819 | 0.103371 |
| 6 | HDD30YR\_PUB | 0.157275 | 0.157275 | 0.100166 |
| 1 | HOUSEHOLD CHARACTERISTICS | NHSLDMEM | 0.316398 | 0.316398 | 0.331898 |
| 2 | NUMADULT1 | 0.215918 | 0.215918 | 0.246421 |
| 3 | NUMCHILD | 0.203775 | 0.203775 | 0.197118 |
| 4 | MONEYPY | 0.191329 | 0.191329 | 0.222335 |
| 1 | Home Characteristics | SQFTEST | 0.457875 | 0.457875 | 0.424113 |
| 2 | TOTCSQFT | 0.429363 | 0.429363 | 0.354125 |
| 3 | SQFTRANGE | 0.428137 | 0.428137 | 0.395830 |
| 4 | TOTROOMS | 0.402977 | 0.402977 | 0.374232 |
| 5 | TOTSQFT\_EN | 0.393136 | 0.393136 | 0.376534 |
| 6 | BEDROOMS | 0.393029 | 0.393029 | 0.373871 |
| 7 | TOTHSQFT | 0.385807 | 0.385807 | 0.348779 |
| 8 | NCOMBATH | 0.379262 | 0.379262 | 0.340706 |
| 9 | SWIMPOOL | 0.375599 | 0.375599 | 0.343621 |
| 10 | TYPEHUQ | 0.333803 | 0.333803 | 0.291768 |
| 11 | WINDOWS | 0.322728 | 0.322728 | 0.338758 |
| 12 | MONPOOL | 0.320818 | 0.320818 | 0.306167 |
| 13 | OTHROOMS | 0.320628 | 0.320628 | 0.291891 |
| 14 | STUDIO | 0.312021 | 0.312021 | 0.280029 |
| 15 | POOLPUMP | 0.299281 | 0.299281 | 0.291072 |
| 16 | ATTIC | 0.276856 | 0.276856 | 0.255131 |
| 17 | PRKGPLC1 | 0.276062 | 0.276062 | 0.256841 |
| 18 | CONCRETE | 0.269025 | 0.269025 | 0.243596 |
| 19 | SIZEOFGARAGE | 0.247022 | 0.247022 | 0.218682 |
| 20 | BASEOTH | 0.245526 | 0.245526 | 0.237470 |
| 21 | CRAWL | 0.244473 | 0.244473 | 0.225413 |
| 22 | STORIES | 0.240493 | 0.240493 | 0.246750 |
| 23 | KOWNRENT | 0.226861 | 0.226861 | 0.206525 |
| 24 | ATTICFIN | 0.222864 | 0.222864 | 0.194976 |
| 25 | SQFTINCA | 0.215794 | 0.215794 | 0.189243 |
| 26 | CELLAR | 0.215332 | 0.215332 | 0.224076 |
| 27 | SQFTINCG | 0.214365 | 0.214365 | 0.191041 |
| 28 | MONTUB | 0.190924 | 0.190924 | 0.183193 |
| 29 | RECBATH | 0.185747 | 0.185747 | 0.181362 |
| 30 | DOOR1SUM | 0.170793 | 0.170793 | 0.183173 |
| 31 | NHAFBATH | 0.166012 | 0.166012 | 0.184884 |
| 1 | Appliances  (électroménager) | DRYRUSE | 0.355838 | 0.355838 | 0.325389 |
| 2 | WASHLOAD | 0.355415 | 0.355415 | 0.327964 |
| 3 | NUMFRIG | 0.342159 | 0.342159 | 0.325917 |
| 4 | SIZRFRI2 | 0.329054 | 0.329054 | 0.310458 |
| 5 | AGERFRI2 | 0.296552 | 0.296552 | 0.275388 |
| 6 | TYPERFR2 | 0.287772 | 0.287772 | 0.273561 |
| 7 | OUTGRILL | 0.271669 | 0.271669 | 0.262796 |
| 8 | DWASHUSE | 0.267279 | 0.267279 | 0.251467 |
| 9 | DRYER | 0.259805 | 0.259805 | 0.227717 |
| 10 | TOPFRONT | 0.258587 | 0.258587 | 0.244075 |
| 11 | CWASHER | 0.256428 | 0.256428 | 0.229663 |
| 12 | SIZFREEZ | 0.246944 | 0.246944 | 0.200877 |
| 13 | ICE | 0.242672 | 0.242672 | 0.200884 |
| 14 | NUMFREEZ | 0.239941 | 0.239941 | 0.194050 |
| 15 | SIZRFRI1 | 0.236225 | 0.236225 | 0.225257 |
| 16 | WASHTEMP | 0.230745 | 0.230745 | 0.205929 |
| 17 | FREEZER | 0.230052 | 0.230052 | 0.187104 |
| 18 | AGEFRZR | 0.222411 | 0.222411 | 0.173460 |
| 19 | UPRTFRZR | 0.218202 | 0.218202 | 0.176736 |
| 20 | OVEN | 0.207792 | 0.207792 | 0.200267 |
| 21 | OVENUSE | 0.200917 | 0.200917 | 0.190828 |
| 22 | DISHWASH | 0.184432 | 0.184432 | 0.158226 |
| 23 | AGECDRYER | 0.181843 | 0.181843 | 0.160012 |
| 24 | DWCYCLE | 0.180969 | 0.180969 | 0.161264 |
| 25 | COOKTOP | 0.178234 | 0.178234 | 0.165363 |
| 26 | AGECWASH | 0.169628 | 0.169628 | 0.151180 |
| 27 | ELFOOD | 0.163372 | 0.163372 | 0.101968 |
| 28 | COOKTOPUSE | 0.161794 | 0.161794 | 0.148989 |
| 29 | COOKTOPINDT | 0.152677 | 0.152677 | 0.122613 |
| 30 | WINECHILL | 0.144832 | 0.144832 | 0.160425 |
| 31 | LOCRFRI2 | 0.150334 | 0.150334 | 0.146056 |
| 1 | Electronics | TVCOLOR | 0.390913 | 0.390913 | 0.366252 |
| 2 | TVSIZE3 | 0.320325 | 0.320325 | 0.301776 |
| 3 | NUMSMPHONE | 0.295927 | 0.295927 | 0.313276 |
| 4 | TVSIZE2 | 0.292950 | 0.292950 | 0.274405 |
| 5 | TVTYPE3 | 0.288869 | 0.288869 | 0.271488 |
| 6 | TVONWE3 | 0.265716 | 0.265716 | 0.250282 |
| 7 | TVONWD3 | 0.263802 | 0.263802 | 0.250165 |
| 8 | TVONWE2 | 0.235039 | 0.235039 | 0.214341 |
| 9 | TVTYPE2 | 0.228577 | 0.228577 | 0.211915 |
| 10 | TVONWD2 | 0.222554 | 0.222554 | 0.205029 |
| 11 | PLAYSTA | 0.218013 | 0.218013 | 0.208452 |
| 12 | INTSTREAM | 0.216066 | 0.216066 | 0.204496 |
| 13 | NUMTABLET | 0.213476 | 0.213476 | 0.222216 |
| 14 | ELPERIPH | 0.209518 | 0.209518 | 0.221861 |
| 15 | COMBODVR | 0.205241 | 0.205241 | 0.210024 |
| 16 | NUMLAPTOP | 0.200452 | 0.200452 | 0.221946 |
| 17 | TVSIZE1 | 0.197618 | 0.197618 | 0.183681 |
| 18 | TVAUDIOSYS | 0.183017 | 0.183017 | 0.178009 |
| 19 | DESKTOP | 0.181125 | 0.181125 | 0.189989 |
| 20 | SMARTSPK | 0.180233 | 0.180233 | 0.191724 |
| 21 | DVD | 0.161820 | 0.161820 | 0.142557 |
| 1 | Space Heating | HEATAPT | 0.300785 | 0.300785 | 0.272467 |
| 2 | GEOHP | 0.237513 | 0.237513 | 0.157865 |
| 3 | ELWARM | 0.230244 | 0.230244 | 0.137960 |
| 4 | ATTCHEAT | 0.218874 | 0.218874 | 0.188982 |
| 5 | GARGHEAT | 0.216310 | 0.216310 | 0.188274 |
| 6 | NUMFIREPLC | 0.153502 | 0.153502 | 0.130238 |
| 1 | Air Conditioning | NUMCFAN | 0.332963 | 0.332963 | 0.254276 |
| 2 | ATTICFAN | 0.263380 | 0.263380 | 0.249193 |
| 3 | COOLAPT | 0.259750 | 0.259750 | 0.236840 |
| 4 | HOUSEFAN | 0.253852 | 0.253852 | 0.239218 |
| 5 | GARGCOOL | 0.253653 | 0.253653 | 0.210703 |
| 6 | ATTCCOOL | 0.250237 | 0.250237 | 0.213865 |
| 7 | USECFAN | 0.235568 | 0.235568 | 0.175217 |
| 8 | ELCOOL | 0.157057 | 0.157057 | 0.107647 |
| 9 | AIRCOND | 0.157057 | 0.157057 | 0.107647 |
| 1 | Thermostat | TYPETHERM | 0.175162 | 0.175162 | 0.129065 |
| 2 | TEMPHOMEAC | 0.156020 | 0.156020 | 0.106254 |
| 3 | TEMPNITEAC | 0.155883 | 0.155883 | 0.105279 |
| 1 | Water Heating | H2OAPT | 0.314833 | 0.314833 | 0.278519 |
| 2 | ELWATER | 0.249691 | 0.249691 | 0.170061 |
| 3 | MORETHAN1H2O | 0.176713 | 0.176713 | 0.142555 |
| 1 | Lighting | LGTIN4TO8 | 0.209232 | 0.209232 | 0.198150 |
| 2 | LGTOUTNITE | 0.198527 | 0.198527 | 0.160451 |
| 3 | LGTIN1TO4 | 0.197939 | 0.197939 | 0.181303 |
| 4 | LGTINMORE8 | 0.172478 | 0.172478 | 0.160983 |
| 5 | LGTOUTLED | 0.159660 | 0.159660 | 0.129825 |
| 6 | LGTOUTANY | 0.154454 | 0.154454 | 0.124186 |
|  | LGTOUTCAN | 0.150451 | 0.150451 | 0.120372 |
| 1 | Energy Bills | SOLAR | 0.302685 | 0.302685 | 0.247474 |
| 2 | OUTLET | 0.284040 | 0.284040 | 0.256631 |
| 0 | Energy Assistance | PAYHELP | 0.058925 | 0.058925 | 0.048679 |

| **Catégories** | **Nombre de features** |
| --- | --- |
| Behavioral Characteristics | 28 |
| Geography | 3 |
| Weather | 6 |
| Household Characteristics | 4 |
| Home Characteristics | 31 |
| Appliances | 31 |
| Electronics | 21 |
| Space Heating | 6 |
| Air Conditioning | 9 |
| Thermostat | 3 |
| Water Heating | 3 |
| Lighting | 7 |
| Energy Bills | 2 |
| Energy Assistance | 0 |
| **Total** | 126 |

## Information Gain

seuil\_importance = 0.05

| **Num** | **Categories** | **Features** | **IG avec KWH** | **IG avec BTUEL** | **IG avec DOLLAREL** |
| --- | --- | --- | --- | --- | --- |
| 1 | Behavioral Characteristics | DRYRUSE | 0.106657 | 0.107865 | 0.093143 |
| 2 | MONPOOL | 0.085309 | 0.080927 | 0.084263 |
| 3 | TVONWE3 | 0.037565 | 0.055108 | 0.028986 |
| 1 | Geography | REGIONC\_x0\_SOUTH | 0.5449339 | 0.5449339 | 0.184391 |
| 2 | state\_postal\_x0\_AZ | 0.07843347 | 0.07843346 | 0 |
| 3 | STATE\_FIPS | 0.07400574 | 0.07190265 | 0.249574 |
| 4 | DIVISION\_x0\_West North Central | 0.06996338 | 0.06996337 | 0 |
| 5 | state\_postal\_x0\_DC | 0.06619251 | 0 | 0.116761 |
| 6 | state\_name\_x0\_District of Columbia | 0 | 0.06619251 | 0 |
| 7 | state\_name\_x0\_Hawaii | 0.00002231459 | 0.00002231463 | 0.126071 |
| 8 | REGIONC\_x0\_WEST | 0 | 0 | 0.124902 |
|  | state\_name\_x0\_Connecticut | 0 | 0.001735190 | 0.09632249 |
| 1 | Weather | HDD30YR\_PUB | 0.189766 | 0.188867 | 0.185724 |
| 2 | CDD65 | 0.188071 | 0.168233 | 0.198857 |
| 3 | HDD65 | 0.176339 | 0.194429 | 0.187789 |
| 4 | CDD30YR\_PUB | 0.172342 | 0.170128 | 0.200622 |
| 5 | GWT | 0.104953 | 0.106644 | 0.100498 |
| 6 | DBT1 | 0.101060 | 0.096482 | 0.071915 |
| 7 | DBT99 | 0.067470 | 0.075216 | 0.054596 |
| 1 | Household Characteristics | HHAGE | 0.266988 | 0.270440 | 0.258963 |
| 2 | NHSLDMEM | 0.133148 | 0.134553 | 0.149814 |
| 3 | EDUCATION | 0.118295 | 0.109989 | 0.099517 |
| 4 | MONEYPY | 0.106373 | 0.109158 | 0.114939 |
| 5 | ATHOME | 0.061469 | 0.068778 | 0.066198 |
| 6 | EMPLOYHH | 0.056203 | 0.052105 | 0.060519 |
| 1 | Home Characteristics | SQFTEST | 0.189185 | 0.1899139 | 0.168328 |
| 2 | TOTCSQFT | 0.088376 | 0.09006785 | 0.092113 |
| 3 | MONPOOL | 0.059596 | 0.0576655 | 0.007180 |
| 4 | TYPEHUQ | 0.052032 | 0.05136956 | 0.006723 |
| 5 | BEDROOMS | 0.023648 | 0.0233657 | 0.056623 |
| 1 | Appliances | DRYRUSE | 0.1206519 | 0.1186612 | 0.077784 |
| 2 | NUMFRIG | 0.07637526 | 0.03723398 | 0.023012 |
| 3 | AGERFRI2 | 0.03329946 | 0.03262753 | 0.104352 |
| 4 | AMTMICRO | 0.04549451 | 0.04270198 | 0.053798 |
| 1 | Electronics | TVCOLOR | 0.134321 | 0.134380 | 0.034068 |
| 2 | NUMSMPHONE | 0.053584 | 0.053743 | 0.059797 |
| 3 | TVONWE1 | 0.047731 | 0.048442 | 0.056631 |
| 1 | Space Heating | EQUIPAGE | 0.125886 | 0.122318 | 0.143837 |
| 2 | ELWARM | 0.114404 | 0.114404 | 0.052133 |
| 3 | USEEQUIPAUX | 0.076281 | 0.078765 | 0.073090 |
| 4 | NUMPORTEL | 0.063661 | 0.064213 | 0.049249 |
| 5 | USEHUMID | 0.042937 | 0.044949 | 0.051881 |
| 1 | Air Conditioning | NUMCFAN | 0.178855 | 0.176050 | 0.115167 |
| 2 | ACEQUIPAGE | 0.115507 | 0.116109 | 0.120311 |
| 3 | NUMFLOORFAN | 0.087175 | 0.089391 | 0.104516 |
| 4 | USECFAN | 0.066341 | 0.071112 | 0.066229 |
| 1 | Thermostat | TEMPGONEAC | 0.145090 | 0.143684 | 0.135712 |
| 2 | TEMPHOME | 0.134450 | 0.137015 | 0.125983 |
| 3 | TEMPNITE | 0.132071 | 0.134176 | 0.132543 |
| 4 | TEMPNITEAC | 0.122050 | 0.121365 | 0.122704 |
| 5 | TEMPGONE | 0.119802 | 0.119797 | 0.145521 |
| 6 | TEMPHOMEAC | 0.114810 | 0.114554 | 0.123421 |
| 7 | COOLCNTL | 0.078322 | 0.079213 | 0.056501 |
| 8 | HEATCNTL | 0.071755 | 0.070921 | 0.080799 |
| 1 | Water Heating | H2OMAIN | 0.319557 | 0.318697 | 0.328483 |
| 2 | ELWATER | 0.209431 | 0.209431 | 0.122832 |
| 3 | WHEATAGE | 0.123819 | 0.122351 | 0.142148 |
| 4 | WHEATSIZ | 0.082142 | 0.087532 | 0.093530 |
| 5 | WHEATBKT | 0.046087 | 0.045627 | 0.060897 |
| 1 | Lighting | LGTIN1TO4 | 0.182727 | 0.190932 | 0.182554 |
| 2 | LGTINMORE8 | 0.171372 | 0.172364 | 0.133146 |
| 3 | LGTIN4TO8 | 0.155249 | 0.155199 | 0.167313 |
| 4 | LGTINLED | 0.106487 | 0.104970 | 0.108367 |
| 5 | LGTINCAN | 0.093201 | 0.082119 | 0.074683 |
| 6 | LGTINCFL | 0.087386 | 0.083262 | 0.086235 |
| 7 | LGTOUTNITE | 0.083626 | 0.083661 | 0.073115 |
| 1 | Energy Bills | AMTMICRO | 0.046419 | 0.04693333 | 0.03560089 |
| 1 | Energy Assistance | NOACDAYS | 0.180290 | 0.1736417 | 0.205301 |
| 2 | NOHEATDAYS | 0.167179 | 0.1140140 | 0.116205 |
| 3 | SCALEB | 0.108659 | 0.1133261 | 0.151127 |
| 4 | SCALEG | 0.077458 | 0.1291646 | 0.074569 |
| 5 | ENERGYASST16 | 0.05405975 | 0.05458136 | 0.037413 |

| **Catégories** | **Nombre de features** |
| --- | --- |
| Behavioral Characteristics | 3 |
| Geography | 9 |
| Weather | 7 |
| Household Characteristics | 6 |
| Home Characteristics | 5 |
| Appliances | 2 |
| Electronics | 4 |
| Space Heating | 5 |
| Air Conditioning | 5 |
| Thermostat | 8 |
| Water Heating | 6 |
| Lighting | 7 |
| Energy Bills | 6 |
| Energy Assistance | 5 |
| **Total** | 76 |

## 

## Intersection des 3 méthodes

| **Num** | **Features** | **Catégories** | **Description** | **Moyenne** | **Ecart-type** |
| --- | --- | --- | --- | --- | --- |
| 1 | DRYRUSE | Appliances / **Behaviors** | Fréquence d’utilisation du sèche-linge par semaine | 3.321421 | 3.615459 |
| 2 | BEDROOMS | Home Characteristics | Nombre de chambres | 2.887111 | 1.083542 |
| 3 | NHSLDMEM | Household Characteristics | Nombre de personnes dans le ménage | 2.460856 | 1.370600 |
| 4 | TVCOLOR | Electronics | Nombre de TV utilisé | 2.326990 | 1.354223 |
| 5 | TOTCSQFT | Home Characteristics | Surface du logement climatisé | 1393.568880 | 1168.308994 |
| 6 | NUMCFAN | Air Conditioning | Nombre de ventilateur de plafond utilisé | 2.254542 | 2.026369 |
| 7 | MONPOOL | Home Characteristics / **Behaviors** | Nombre de mois d’utilisation de la piscine | -1.511732 | 1.923482 |
| 8 | REGIONC\_x0\_SOUTH | Geography | Région de recensement | 0.347426 | 0.476165 |
| 9 | TYPEHUQ | Home Characteristics | Type de logement | 2.547145 | 1.119777 |
| 10 | NUMSMPHONE | Electronics | Nombre de smartphones utilisé | 1.969615 | 1.306604 |
| 11 | SQFTEST | Home Characteristics | Surface du logement | 1724.221453 | 907.606312 |
| 12 | HOUSEFAN | Air Conditioning | Utilise un ventilateur | -0.410143 | 0.925989 |
| 13 | SOLAR | Energy Bills | Utilise des panneaux solaires | -0.338397 | 0.816661 |
| 14 | TVONWE3 | Electronics / **Behaviors** | Nombre d’heures d’utilisation de la 3e TV le week-end | -0.109618 | 3.355043 |
| 15 | OUTLET | Energy Bills | Possède une prise électrique proche du parking | 0.356672 | 1.010302 |

|  | **Moy KWH** | **Moy BTUEL** | **Moy DOLLAREL** | **Classement énergétique** |
| --- | --- | --- | --- | --- |
| **Cluster 0** | 6191.349791 | 21124.885401 | 916.507733 | 2 |
| **Cluster 1** | 11912.958807 | 40647.015410 | 1540.943260 | 1 |

| **Cluster 0** | Corr. avec KWH | Corr. avec BTUEL | Corr. avec DOLLAREL |
| --- | --- | --- | --- |
| REGIONC\_x0\_SOUTH | 0.311977 | 0.311977 | 0.049402 |
| DRYRUSE | 0.301108 | 0.301108 | 0.202794 |
| BEDROOMS | 0.300870 | 0.300870 | 0.304977 |
| TOTCSQFT | 0.292248 | 0.292248 | 0.177036 |
| NHSLDMEM | 0.283999 | 0.283999 | 0.305745 |
| TVCOLOR | 0.280987 | 0.280987 | 0.252353 |
| SQFTEST | 0.272350 | 0.272350 | 0.236428 |
| NUMSMPHONE | 0.249411 | 0.249411 | 0.269017 |
| TVONWE3 | 0.214110 | 0.214110 | 0.186892 |
| NUMCFAN | 0.179899 | 0.179899 | 0.096503 |
| OUTLET | 0.081567 | 0.081567 | 0.085616 |
| SOLAR | -0.009577 | -0.009577 | -0.015790 |
| HOUSEFAN | -0.020338 | -0.020338 | -0.022865 |
| TYPEHUQ | -0.078192 | -0.078192 | -0.078215 |
| MONPOOL | NaN | NaN | NaN |

| **Cluster 1** | Corr. avec KWH | Corr. avec BTUEL | Corr. avec DOLLAREL |
| --- | --- | --- | --- |
| SQFTEST | 0.383777 | 0.383777 | 0.358967 |
| TOTCSQFT | 0.369567 | 0.369567 | 0.297857 |
| TVCOLOR | 0.343824 | 0.343824 | 0.323364 |
| MONPOOL | 0.309607 | 0.309607 | 0.298100 |
| NHSLDMEM | 0.282336 | 0.282336 | 0.299851 |
| BEDROOMS | 0.277986 | 0.277986 | 0.269833 |
| REGIONC\_x0\_SOUTH | 0.277879 | 0.277879 | 0.113028 |
| NUMSMPHONE | 0.274624 | 0.274624 | 0.293631 |
| DRYRUSE | 0.273232 | 0.273232 | 0.256437 |
| NUMCFAN | 0.260104 | 0.260104 | 0.183441 |
| TVONWE3 | 0.242686 | 0.242686 | 0.229119 |
| OUTLET | 0.064668 | 0.064668 | 0.052919 |
| SOLAR | -0.002118 | -0.002118 | -0.114584 |
| HOUSEFAN | -0.004400 | -0.004400 | 0.016455 |
| TYPEHUQ | -0.133392 | -0.133392 | -0.089727 |

### Tab Résumé 6 clusters (avec les -2)

| **Features** | **Cluster 0** | **Cluster 1** | **Cluster 2** | **Cluster 3** | **Cluster 4** | **Cluster 5** | **Comm** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| DRYRUSE | 5.08 | 4.41 | 2.09 | 1.41 | 5.15 | 2.37 | moyenne |
| TVONWD2 | 10.29 | 1.63 | 0.62 | 0.54 | 2.11 | 1.12 |  |
| LGTINMORE8 | 2.79 | 1.95 | 1.44 | 1.31 | 3.02 | 1.52 |  |
| TVONWE3 | 8.07 | -0.30 | -1.14 | -1.43 | 0.27 | -1.1 |  |
| LGTIN4TO8 | 4.21 | 4.54 | 3.04 | 2.50 | 5.75 | 2.80 |  |
| TEMPNITEAC | 64.82 | 71.75 | X | 70.83 | 71.25 | 70.87 |  |
| GARGCOOL | -1.37 | 0.39 | X | -1.82 | -0.23 | -1.56 |  |
| LGTIN1TO4 | 5.23 | 6.99 | 4.57 | 3.67 | 8.23 | 3.99 |  |
| WASHLOAD | 5.03 | 4.42 | 2.25 | 1.49 | 5.12 | 2.42 |  |
| TEMPHOMEAC | 65.31 | 72.61 | X | 71.66 | 72.05 | 71.55 |  |
| LGTOUTNITE | 0.03 | X | -0.63 | X | 3.46 | 2.05 |  |
| COOKTOPUSE | -0.98 | 0.30 | -0.85 | -1.55 | 1.03 | -1.47 |  |
| MONTUB | -1.75 | -1.10 | -1.47 | -1.87 | -0.85 | -1.78 |  |
| ATTCCOOL | -1.12 | -0.45 | X | -1.69 | -0.33 | -1.37 |  |
| DWCYCLE | -0.07 | 1.67 | 0.03 | -0.27 | 1.92 | -0.09 |  |
| WASHTEMP | 2.02 | 2.33 | 1.37 | 1.14 | 2.28 | 1.69 |  |
| DWASHUSE | 1.37 | 3.27 | 0.94 | 0.46 | 4.04 | 0.71 |  |
| TVONWD3 | 7.23 | -0.39 | -1.20 | -1.45 | 0.07 | -1.14 |  |
| OUTGRILL | 0.72 | 0.80 | 0.49 | 0.31 | 0.85 | 0.49 |  |
| TVONWE2 | 11.24 | 1.91 | 0.80 | 0.70 | 2.53 | 1.36 |  |
| USECFAN | 1.56 | 1.79 | 0.28 | 0.49 | 2.04 | 1.1 |  |
| GARGHEAT | -1.34 | -0.36 | -1.29 | -1.84 | -0.19 | -1.60 |  |
| MONPOOL | -1.58 | -1.25 | -1.84 | -1.93 | -0.84 | -1.86 |  |
| ATTCHEAT | -1.06 | -0.46 | -1.33 | -1.70 | -0.33 | -1.40 |  |
| LGTOUTLED | -0.72 | X | -1.13 | X | 0.73 | 0.60 |  |
| LGTOUTANY | 0.49 | 0 | 0.33 | 0 | 1 | 1 |  |
| OVENUSE | -1.35 | -0.56 | -1.26 | -1.66 | -0.13 | -1.61 |  |

### Tab Résumé 6 clusters

| **Features** | **Cluster 0** | **Cluster 1** | **Cluster 2** | **Cluster 3** | **Cluster 4** | **Cluster 5** | **Comm** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **CUISINE** | **CUISINE** | **CUISINE** | **CUISINE** | **CUISINE** | **CUISINE** | **CUISINE** | **CUISINE** |
| OVENUSE | 4.56 | **4.22** | 3.55 | 2.96 | **4.44** | 2.92 | moyenne |
| OUTGRILL | **72** | 80 | **49** | **31** | 85 | **49** | oui % |
| COOKTOPUSE | 7.40 | 8.65 | 7.93 | 6.24 | 9.08 | 5.93 | moyenne |
| **ELECTRO** | **ELECTRO** | **ELECTRO** | **ELECTRO** | **ELECTRO** | **ELECTRO** | **ELECTRO** | **ELECTRO** |
| DRYRUSE | **5** | **4.4** | 2 | **1.4** | **5.15** | **2.37** | moyenne |
| WASHLOAD | **5** | **4.4** | **2.25** | **1.5** | **5.12** | **2.42** | moyenne |
| DWASHUSE | 1.37 | **3.27** | **0.94** | 0.46 | 4.04 | 0.71 | moyenne |
| DWCYCLE | 2 | 2 | **2** | 2 | 2 | 2 | major type |
| WASHTEMP | **2** | 2 | **2** | **2** | 2 | **2** | major type |
| **TV** | **TV** | **TV** | **TV** | **TV** | **TV** | **TV** | **TV** |
| TVONWD2 | **10.29** | 2.53 | **3** | **2.87** | **2.77** | **2.88** | moyenne |
| TVONWE2 | **11.24** | 2.87 | 3.34 | **3.18** | **3.26** | **3.24** | moyenne |
| TVONWD3 | **7.74** | **1.52** | **2.05** | **1.70** | **1.74** | **1.61** | moyenne |
| TVONWE3 | **8.64** | **1.71** | **2.33** | **1.88** | **2.10** | **1.80** | moyenne |
| **HEAT** | **HEAT** | **HEAT** | **HEAT** | **HEAT** | **HEAT** | **HEAT** | **HEAT** |
| TEMPHOMEAC | 70.77 | 72.61 | X | 71.66 | 72.4 | 71.58 | moyenne |
| TEMPNITEAC | 70.24 | 71.75 | X | 70.83 | 71.60 | 70.90 | moyenne |
| GARGCOOL | 4.24 | 2.66 | X | 1.37 | 4.44 | 1.66 | oui % |
| ATTCCOOL | 5.95 | 3.58 | X | 2.89 | 4.70 | 3.82 | oui % |
| GARGHEAT | 11.17 | 8.83 | 23.91 | 3.53 | 10.57 | 4.59 | oui % |
| ATTCHEAT | 9.67 | 5.08 | 8.45 | 5.10 | 6.60 | 4.72 | oui % |
| USECFAN | **4** | 1-4 | **1** | **1** | 4 | **1** | major type |
| **LIGHT** | **LIGHT** | **LIGHT** | **LIGHT** | **LIGHT** | **LIGHT** | **LIGHT** | **LIGHT** |
| LGTIN1TO4 | 5.23 | 6.99 | 4.57 | 3.67 | 8.23 | 3.99 | moyenne |
| LGTIN4TO8 | 4.21 | **4.54** | **3.04** | 2.50 | 5.75 | 2.80 | moyenne |
| LGTINMORE8 | 2.79 | 1.95 | 1.44 | 1.31 | 3.02 | 1.52 | moyenne |
| LGTOUTNITE | 2.15 | X | 2.11 | X | **3.47** | 2.05 | moyenne |
| LGTOUTLED | 62 | X | 62 | X | 73 | 60 | oui % |
| LGTOUTANY | 49 | X | 33 | X | 99 | 100 | oui % |
| **POOL** | **POOL** | **POOL** | **POOL** | **POOL** | **POOL** | **POOL** | **POOL** |
| MONPOOL | **4.23** | **5.06** | **4.5** | 3.88 | **5.45** | 4 | moyenne |
| MONTUB | 4.60 | **5.90** | **6.51** | 3.72 | **5.97** | 3.56 | moyenne |

* Cluster 0 :

Cuisine : moyen

Electroménager : beaucoup

TV : Utilise énormément

Heat : utilise tout le temps le ventilateur de plafond

Light : Laisse la lumière allumée très longtemps en intérieur

Pool : moyen

Particularités : regarde énormément la TV

Le plus énergivore : les TV, ventilateur de plafond, le sèche-linge et lave-linge

* Cluster 1 :

Cuisine : moyen

Electroménager : beaucoup

TV : peu

Heat : moyen

Light : moyen

Pool : beaucoup

**Particularités** : n’allume pas de lumière la nuit

Le plus énergivore : la piscine, le sèche linge, la 3e TV

* Cluster 2 :

Cuisine : moyen

Electroménager : peu

TV : beaucoup

Heat : pas de climatiseur et utilise beaucoup le chauffage

Light : moyen

Pool : utilise beaucoup le jacuzzi

**Particularités** : Pas de climatiseur

Le plus énergivore : tout l’électroménager et les TV

* Cluster 3 :

Cuisine : peu

Electroménager : très peu

TV : moyen

Heat : moyen

Light : peu

Pool : peu

**Particularités** : n’allume pas de lumière la nuit

Le plus énergivore : tout l’électroménager, ventilateur de plafond et les TV

* Cluster 4 :

Cuisine : beaucoup

Electroménager : beaucoup

TV : moyen

Heat : moyen mais utilise tout le temps le ventilateur de plafond

Light : énormément mais surtout LED

Pool : beaucoup, surtout piscine

Particularités : utilise beaucoup la cuisine, l’électroménager et la piscine

Le plus énergivore : piscine, jacuzzi et les TV

* Cluster 5 :

Cuisine : très peu

Electroménager : peu

TV : moyen

Heat : moyen

Light : peu mais peu de LED

Pool : peu

Particularités : utilise très peu la cuisine

Le plus énergivore : tout l’électroménager, la piscine et les TV

| **Features** | **Corr. avec KWH** | **Corr. avec BTUEL** | **Corr. avec DOLLAREL** |
| --- | --- | --- | --- |
| **CUISINE** | **CUISINE** | **CUISINE** | **CUISINE** |
| OUTGRILL | 0.271669 | 0.271669 | 0.262796 |
| OVENUSE | 0.200917 | 0.200917 | 0.190828 |
| COOKTOPUSE | 0.161794 | 0.161794 | 0.148989 |
| **ELECTRO** | **ELECTRO** | **ELECTRO** | **ELECTRO** |
| DRYRUSE | 0.355838 | 0.355838 | 0.325389 |
| WASHLOAD | 0.355415 | 0.355415 | 0.327964 |
| DWASHUSE | 0.267279 | 0.267279 | 0.251467 |
| WASHTEMP | 0.230745 | 0.230745 | 0.205929 |
| DWCYCLE | 0.180969 | 0.180969 | 0.161264 |
| **TV** | **TV** | **TV** | **TV** |
| TVONWE3 | 0.265716 | 0.265716 | 0.250282 |
| TVONWD3 | 0.263802 | 0.263802 | 0.250165 |
| TVONWE2 | 0.235039 | 0.235039 | 0.214341 |
| TVONWD2 | 0.222554 | 0.222554 | 0.205029 |
| **HVAC** | **HVAC** | **HVAC** | **HVAC** |
| GARGCOOL | 0.253653 | 0.253653 | 0.210703 |
| ATTCCOOL | 0.250237 | 0.250237 | 0.213865 |
| USECFAN | 0.235568 | 0.235568 | 0.175217 |
| ATTCHEAT | 0.218874 | 0.218874 | 0.188982 |
| GARGHEAT | 0.216310 | 0.216310 | 0.188274 |
| TEMPHOMEAC | 0.156020 | 0.156020 | 0.106254 |
| TEMPNITEAC | 0.155883 | 0.155883 | 0.105279 |
| **LIGHT** | **LIGHT** | **LIGHT** | **LIGHT** |
| LGTIN4TO8 | 0.209232 | 0.209232 | 0.198150 |
| LGTOUTNITE | 0.198527 | 0.198527 | 0.160451 |
| LGTIN1TO4 | 0.197939 | 0.197939 | 0.181303 |
| LGTINMORE8 | 0.172478 | 0.172478 | 0.160983 |
| LGTOUTLED | 0.159660 | 0.159660 | 0.129825 |
| LGTOUTANY | 0.154454 | 0.154454 | 0.124186 |
| LGTOUTCAN | 0.150451 | 0.150451 | 0.120372 |
| **POOL** | **POOL** | **POOL** | **POOL** |
| MONPOOL | 0.320818 | 0.320818 | 0.306167 |
| MONTUB | 0.190924 | 0.190924 | 0.183193 |

Analyse des variables comportementales

|  | **Features** | **Corr. avec KWH** | **Corr. avec BTUEL** | **Corr. avec DOLLAREL** |
| --- | --- | --- | --- | --- |
| 1 | DRYRUSE | 0.355838 | 0.355838 | 0.325389 |
| 2 | WASHLOAD | 0.355415 | 0.355415 | 0.327964 |
| 3 | MONPOOL | 0.320818 | 0.320818 | 0.306167 |
| 4 | OUTGRILL | 0.271669 | 0.271669 | 0.262796 |
| 5 | DWASHUSE | 0.267279 | 0.267279 | 0.251467 |
| 6 | TVONWE3 | 0.265716 | 0.265716 | 0.250282 |
| 7 | TVONWD3 | 0.263802 | 0.263802 | 0.250165 |
| 8 | GARGCOOL | 0.253653 | 0.253653 | 0.210703 |
| 9 | ATTCCOOL | 0.250237 | 0.250237 | 0.213865 |
| 10 | USECFAN | 0.235568 | 0.235568 | 0.175217 |
| 11 | TVONWE2 | 0.235039 | 0.235039 | 0.214341 |
| 12 | WASHTEMP | 0.230745 | 0.230745 | 0.205929 |
| 13 | TVONWD2 | 0.222554 | 0.222554 | 0.205029 |
| 14 | ATTCHEAT | 0.218874 | 0.218874 | 0.188982 |
| 15 | GARGHEAT | 0.216310 | 0.216310 | 0.188274 |
| 16 | LGTIN4TO8 | 0.209232 | 0.209232 | 0.198150 |
| 17 | OVENUSE | 0.200917 | 0.200917 | 0.190828 |
| 18 | LGTOUTNITE | 0.198527 | 0.198527 | 0.160451 |
| 19 | LGTIN1TO4 | 0.197939 | 0.197939 | 0.181303 |
| 20 | MONTUB | 0.190924 | 0.190924 | 0.183193 |
| 21 | DWCYCLE | 0.180969 | 0.180969 | 0.161264 |
| 22 | LGTINMORE8 | 0.172478 | 0.172478 | 0.160983 |
| 23 | COOKTOPUSE | 0.161794 | 0.161794 | 0.148989 |
| 24 | LGTOUTLED | 0.159660 | 0.159660 | 0.129825 |
| 25 | TEMPHOMEAC | 0.156020 | 0.156020 | 0.106254 |
| 26 | TEMPNITEAC | 0.155883 | 0.155883 | 0.105279 |
| 27 | LGTOUTANY | 0.154454 | 0.154454 | 0.124186 |
| 28 | LGTOUTCAN | 0.150451 | 0.150451 | 0.120372 |

|  | **Features** | **IG avec KWH** | **IG avec BTUEL** | **IG avec DOLLAREL** |
| --- | --- | --- | --- | --- |
| 1 | DRYRUSE | 0.122727 | 0.121309 | 0.095243 |
| 2 | MONPOOL | 0.083521 | 0.083541 | 0.097506 |
| 3 | LGTIN1TO4 | 0.071055 | 0.070102 | 0.066063 |
| 4 | TVONWD3 | 0.063613 | 0.043057 | 0.042876 |
| 5 | LGTIN4TO8 | 0.049131 | 0.051806 | 0.064918 |
| 6 | TEMPHOMEAC | 0.048468 | 0.048528 | 0.061792 |
| 7 | WASHLOAD | 0.048282 | 0.048928 | 0.042717 |
| 8 | LGTINMORE8 | 0.047315 | 0.045710 | 0.044049 |
| 9 | TEMPNITEAC | 0.044039 | 0.046708 | 0.045368 |
| 10 | TVONWE2 | 0.042953 | 0.042770 | 0.045950 |
| 11 | DWASHUSE | 0.042393 | 0.044997 | 0.057081 |
| 12 | USECFAN | 0.038806 | 0.037896 | 0.033796 |
| 13 | WASHTEMP | 0.034981 | 0.017137 | 0.018577 |
| 14 | TVONWD2 | 0.034457 | 0.036235 | 0.039525 |
| 15 | OVENUSE | 0.030586 | 0.030465 | 0.039590 |
| 16 | LGTOUTNITE | 0.028687 | 0.029901 | 0.026456 |
| 17 | COOKTOPUSE | 0.024554 | 0.025117 | 0.021312 |
| 18 | MONTUB | 0.023706 | 0.017517 | 0.018772 |
| 19 | DWCYCLE | 0.019097 | 0.019039 | 0.022700 |
| 20 | TVONWE3 | 0.017558 | 0.040901 | 0.033261 |
| 21 | GARGHEAT | 0.014103 | 0.011225 | 0.012359 |
| 22 | ATTCHEAT | 0.014100 | 0.012316 | 0.013974 |
| 23 | GARGCOOL | 0.012558 | 0.012229 | 0.007513 |
| 24 | ATTCCOOL | 0.011562 | 0.012593 | 0.010710 |
| 25 | LGTOUTLED | 0.010447 | 0.008891 | 0.010392 |
| 26 | OUTGRILL | 0.009975 | 0.010371 | 0.012977 |
| 27 | LGTOUTCAN | 0.008418 | 0.028008 | 0.010643 |
| 28 | LGTOUTANY | 0.002907 | 0.002704 | 0.003880 |

Intersection des 3 méthodes sur les données comportementales :

| **Num** | **Features** | **Description** | **Moyenne** | **Ecart-type** |
| --- | --- | --- | --- | --- |
| 1 | TVONWD3 | Nombre d’heures d’utilisation de la 3e TV la semaine | -0.245242 | 3.088052 |
| 2 | LGTIN4TO8 | Nombre d’ampoules d’intérieur allumé 4 à 8 heures par jour | 3.826125 | 4.661733 |
| 3 | DRYRUSE | Fréquence d’utilisation du sèche-linge par semaine | 3.321421 | 3.615459 |
| 4 | MONPOOL | Nombre de mois d’utilisation de la piscine | -1.511732 | 1.923482 |
| 5 | DWASHUSE | Fréquence d’utilisation du lave-linge par semaine | 1.979347 | 3.265855 |

|  | **Moy KWH** | **Moy BTUEL** | **Moy DOLLAREL** | **Classement Energivore** |
| --- | --- | --- | --- | --- |
| **Cluster 0** | 12633.347697 | 43104.982631 | 1624.257929 | 3 |
| **Cluster 1** | 8466.733863 | 28888.495751 | 1151.585177 | 4 |
| **Cluster 2** | 19002.439222 | 64836.322344 | 2386.534816 | 1 |
| **Cluster 3** | 13801.024767 | 47089.096320 | 1762.627453 | 2 |

Corrélations K-means

| **Cluster 0** | Corr. avec KWH | Corr. avec BTUEL | Corr. avec DOLLAREL |
| --- | --- | --- | --- |
| MONPOOL | 0.049843 | 0.049843 | 0.060792 |
| DWASHUSE | 0.075247 | 0.075247 | 0.087368 |
| LGTIN4TO8 | 0.090150 | 0.090150 | 0.088270 |
| **DRYRUSE** | 0.183193 | 0.183193 | 0.159728 |
| **TVONWD3** | 0.219091 | 0.219091 | 0.195410 |

| **Cluster 1** | Corr. avec KWH | Corr. avec BTUEL | Corr. avec DOLLAREL |
| --- | --- | --- | --- |
| MONPOOL | 0.045154 | 0.045154 | 0.051911 |
| DWASHUSE | 0.097047 | 0.097047 | 0.073750 |
| LGTIN4TO8 | 0.067311 | 0.067311 | 0.069003 |
| **DRYRUSE** | 0.317526 | 0.317526 | 0.268668 |
| **TVONWD3** | 0.192015 | 0.192015 | 0.183077 |

| **Cluster 2** | Corr. avec KWH | Corr. avec BTUEL | Corr. avec DOLLAREL |
| --- | --- | --- | --- |
| **MONPOOL** | 0.251570 | 0.251570 | 0.203646 |
| **DWASHUSE** | 0.209338 | 0.209338 | 0.207411 |
| **LGTIN4TO8** | 0.201193 | 0.201193 | 0.176699 |
| DRYRUSE | 0.162572 | 0.162572 | 0.173066 |
| TVONWD3 | 0.149681 | 0.149681 | 0.145926 |

| **Cluster 3** | Corr. avec KWH | Corr. avec BTUEL | Corr. avec DOLLAREL |
| --- | --- | --- | --- |
| **MONPOOL** | 0.187860 | 0.187860 | 0.142756 |
| DWASHUSE | 0.112832 | 0.112832 | 0.091121 |
| **LGTIN4TO8** | 0.175620 | 0.175620 | 0.163316 |
| **DRYRUSE** | 0.240621 | 0.240621 | 0.206230 |
| TVONWD3 | 0.102945 | 0.102945 | 0.102092 |

|  | Recommandation | Remarques |
| --- | --- | --- |
| Cluster 0 | Réduire l’utilisation du sèche-linge | Laisse allumer les lumières la nuit mais faible impact sur la consommation d’énergie |
| Cluster 1 | - | A un comportement globalement raisonnable |
| Cluster 2 | Réduire l’utilisation de la piscine et du lave-linge | - |
| Cluster 3 | Réduire l’utilisation du sèche-linge | Utilise beaucoup la 3e TV mais faible impact sur la consommation d’énergie |

|  | **Moy KWH** | **Moy BTUEL** | **Moy DOLLAREL** | **Classement Energivore** |
| --- | --- | --- | --- | --- |
| **Cluster 0** | 10176.803079 | 34723.252074 | 1345.075355 | 6 |
| **Cluster 1** | 17854.413674 | 60919.259148 | 2250.326525 | 3 |
| **Cluster 2** | 26733.908000 | 91216.092000 | 3043.47600 | 1 |
| **Cluster 3** | 14712.280541 | 50198.301081 | 1952.064865 | 5 |
| **Cluster 4** | 26447.201250 | 90237.850000 | 2901.936250 | 2 |
| **Cluster 5** | 17095.91125 | 58331.248750 | 1936.228750 | 4 |

Corrélations DBSCAN

| **Cluster 0** | Corr. avec KWH | Corr. avec BTUEL | Corr. avec DOLLAREL |
| --- | --- | --- | --- |
| MONPOOL | NaN | NaN | NaN |
| DWASHUSE | 0.253813 | 0.253813 | 0.230973 |
| LGTIN4TO8 | 0.194855 | 0.194855 | 0.186801 |
| **DRYRUSE** | 0.366115 | 0.366115 | 0.325432 |
| **TVONWD3** | 0.267678 | 0.267678 | 0.249549 |

| **Cluster 1** | Corr. avec KWH | Corr. avec BTUEL | Corr. avec DOLLAREL |
| --- | --- | --- | --- |
| **MONPOOL** | 0.244159 | 0.244159 | 0.205140 |
| **DWASHUSE** | 0.216956 | 0.216956 | 0.224083 |
| LGTIN4TO8 | 0.146831 | 0.146831 | 0.149094 |
| DRYRUSE | 0.187254 | 0.187254 | 0.197302 |
| TVONWD3 | 0.118951 | 0.118951 | 0.113163 |

| **Cluster 2** | Corr. avec KWH | Corr. avec BTUEL | Corr. avec DOLLAREL |
| --- | --- | --- | --- |
| **MONPOOL** | 0.892648 | 0.892648 | 0.690748 |
| DWASHUSE | -0.506404 | -0.506404 | -0.418285 |
| LGTIN4TO8 | -0.205201 | -0.205201 | -0.035122 |
| **DRYRUSE** | 0.217632 | 0.217632 | 0.370136 |
| **TVONWD3** | 0.256369 | 0.256369 | 0.170003 |

| **Cluster 3** | Corr. avec KWH | Corr. avec BTUEL | Corr. avec DOLLAREL |
| --- | --- | --- | --- |
| MONPOOL | NaN | NaN | NaN |
| **DWASHUSE** | 0.440338 | 0.440338 | 0.314431 |
| LGTIN4TO8 | 0.059444 | 0.059444 | 0.004922 |
| **DRYRUSE** | 0.356455 | 0.356455 | 0.255704 |
| **TVONWD3** | NaN | NaN | NaN |

| **Cluster 4** | Corr. avec KWH | Corr. avec BTUEL | Corr. avec DOLLAREL |
| --- | --- | --- | --- |
| MONPOOL | -0.341816 | -0.341816 | -0.130061 |
| DWASHUSE | -0.890895 | -0.890895 | -0.793758 |
| **LGTIN4TO8** | 0.306503 | 0.306503 | 0.234116 |
| DRYRUSE | -0.071984 | -0.071984 | 0.057578 |
| **TVONWD3** | 0.231568 | 0.231568 | 0.225745 |

| **Cluster 5** | Corr. avec KWH | Corr. avec BTUEL | Corr. avec DOLLAREL |
| --- | --- | --- | --- |
| MONPOOL | NaN | NaN | NaN |
| **DWASHUSE** | 0.337892 | 0.337892 | 0.302547 |
| LGTIN4TO8 | -0.724432 | -0.724432 | -0.676033 |
| DRYRUSE | -0.073167 | -0.073167 | -0.082887 |
| **TVONWD3** | 0.558877 | 0.558877 | 0.501396 |

|  | Recommandation | Remarques |
| --- | --- | --- |
| Cluster 0 | Réduire l’utilisation de tout | 91.7% des ménages  N’a pas de piscine |
| Cluster 1 | Réduire l’utilisation de tout, surtout la piscine | - |
| Cluster 2 | Réduire l’utilisation de la piscine | 5 ménages seulement  Très forte corrélation avec la piscine (chauffée?) |
| Cluster 3 | Réduire l’utilisation de la 3e TV et de l’électroménager | 37 ménages seulement  La 3e TV est constamment allumée |
| Cluster 4 | Réduire l’utilisation des lumières et de la 3e TV | 8 ménages seulement |
| Cluster 5 | Réduire l’utilisation de la 3e TV et du lave-linge | 8 ménages seulement  N’utilise pas de lave-linge |

BROUILLON

|  | **Moy KWH** | **Moy BTUEL** | **Moy DOLLAREL** | **Classement Energivore** |
| --- | --- | --- | --- | --- |
| **Cluster 0** | 14173.538261 | 48360.112612 | 1792.719976 | 2 |
| **Cluster 1** | 12329.468049 | 42068.145231 | 1589.475122 | 3 |
| **Cluster 2** | 7614.514961 | 25980.725182 | 1146.629784 | 6 |
| **Cluster 3** | 7712.185241 | 26313.975969 | 1069.457969 | 5 |
| **Cluster 4** | 14590.218526 | 49781.825524 | 1818.063939 | 1 |
| **Cluster 5** | 9582.847031 | 32696.673455 | 1260.804506 | 4 |

Classement énergétique :

| **Num** | **Features** | **Corr avec KWH** | **Corr avec BTUEL** | **Corr avec DOLLAREL** |
| --- | --- | --- | --- | --- |
| 1 | DRYRUSE | 0.356319 | 0.356319 | 0.325130 |
| 2 | WASHLOAD | 0.355810 | 0.355810 | 0.327177 |
| 3 | MONPOOL | 0.321479 | 0.321479 | 0.307733 |
| 4 | OUTGRILL | 0.272181 | 0.272181 | 0.263227 |
| 5 | TVONWE3 | 0.266745 | 0.266745 | 0.251690 |
| 6 | DWASHUSE | 0.266180 | 0.266180 | 0.250399 |
| 7 | TVONWD3 | 0.264112 | 0.264112 | 0.250692 |
| 8 | GARGCOOL | 0.251543 | 0.251543 | 0.210152 |
| 9 | ATTCCOOL | 0.250104 | 0.250104 | 0.214451 |
| 10 | TVONWE2 | 0.237155 | 0.237155 | 0.216173 |
| 11 | USECFAN | 0.235822 | 0.235822 | 0.175665 |
| 12 | WASHTEMP | 0.229414 | 0.229414 | 0.204835 |
| 13 | TVONWD2 | 0.224518 | 0.224518 | 0.206843 |
| 14 | ATTCHEAT | 0.218561 | 0.218561 | 0.189696 |
| 15 | GARGHEAT | 0.214332 | 0.214332 | 0.187554 |
| 16 | LGTIN4TO8 | 0.208819 | 0.208819 | 0.198753 |
| 17 | OVENUSE | 0.199932 | 0.199932 | 0.190397 |
| 18 | LGTIN1TO4 | 0.196866 | 0.196866 | 0.180485 |
| 19 | LGTOUTNITE | 0.196423 | 0.196423 | 0.159134 |
| 20 | MONTUB | 0.190012 | 0.190012 | 0.182378 |
| 21 | DWCYCLE | 0.179510 | 0.179510 | 0.160081 |
| 22 | LGTINMORE8 | 0.174344 | 0.174344 | 0.162534 |
| 23 | COOKTOPUSE | 0.161490 | 0.161490 | 0.148355 |
| 24 | LGTOUTLED | 0.157657 | 0.157657 | 0.128442 |
| 25 | TEMPHOMEAC | 0.156032 | 0.156032 | 0.106419 |
| 26 | TEMPNITEAC | 0.156032 | 0.156032 | 0.105453 |
| 27 | LGTOUTANY | 0.152228 | 0.152228 | 0.122538 |

### 11 clusters

Cluster 0 :

Electroménager : utilise beaucoup le lave-linge et sèche-linge

Light : laisse le plus de lumière allumée longtemps la nuit

Cluster 1 :

Heat : Ne chauffe jamais le garage

Light : n’allume jamais de lumière la nuit

Cluster 2 :

Electroménager : utilise peu le lave-linge mais lave toujours les vêtements à chaud, utilise peu le sèche-linge

Heat : Pas de clim dans le garage

Cluster 3 :

Light : allume toujours la lumière la nuit mais surtout en LED

Cluster 4 :

Light : n’allume jamais de lumière la nuit

Cluster 5 :

Electroménager : utilise peu le sèche-linge

Heat : n’a pas de climatiseur

Cluster 6 :

Heat : ne chauffe jamais le garage

Light : allume toujours la lumière la nuit mais beaucoup en LED

Cluster 7 :

Heat : n’a pas de climatiseur

Cluster 8 :

TV : regarde énormément les TV

Cluster 9 :

Cuisine : utilise beaucoup la cuisine (cuisinière et four)

Cluster 10 :

Pool : utilise beaucoup la piscine

|  | **Moy KWH** | **Moy BTUEL** | **Moy DOLLAREL** | **Classement Energivore** |
| --- | --- | --- | --- | --- |
| **Cluster 0** | 16091.984657 | 54905.852102 | 2006.247431 | 2 |
| **Cluster 1** | 9252.465413 | 31569.411966 | 1251.347920 | 9 |
| **Cluster 2** | 5767.219099 | 19677.751306 | 865.809765 | 10 |
| **Cluster 3** | 11767.257789 | 40149.883302 | 1484.448695 | 5 |
| **Cluster 4** | 10758.212675 | 36707.021957 | 1388.204126 | 7 |
| **Cluster 5** | 5757.957785 | 19646.152224 | 908.813005 | 11 |
| **Cluster 6** | 10784.780834 | 36797.671528 | 1398.845058 | 6 |
| **Cluster 7** | 9325.527998 | 31818.701608 | 1353.384650 | 8 |
| **Cluster 8** | 13852.489388 | 47264.693817 | 1759.733817 | 4 |
| **Cluster 9** | 14328.916865 | 48890.264378 | 1802.946670 | 3 |
| **Cluster 10** | 19997.383198 | 68231.071521 | 2500.342503 | 1 |

# V5

Méthode 1

| **Num** | **Feature** | **Description** | **Importance** |
| --- | --- | --- | --- |
| 1 | STATE\_FIPS |  | 0.020160 |
| 2 | REGIONC\_x0\_NORTHEAST |  | 0.019742 |
| 3 | DBT1 |  | 0.019461 |
| 4 | REGIONC\_x0\_SOUTH |  | 0.018971 |
| 5 | DIVISION\_x0\_Pacific |  | 0.015334 |
| 6 | SOLAR |  | 0.011249 |
| 7 | DIVISION\_x0\_New England |  | 0.007451 |
| 8 | TOTCSQFT |  | 0.006438 |
| 9 | SQFTEST |  | 0.004689 |
| 10 | HDD65 |  | 0.004166 |
| 11 | DBT99 |  | 0.003824 |
| 12 | state\_name\_x0\_Pennsylvania |  | 0.003404 |
| 13 | CDD65 |  | 0.003274 |
| 14 | state\_name\_x0\_California |  | 0.003243 |
| 15 | GWT |  | 0.003144 |
| 16 | TOTHSQFT |  | 0.003113 |
| 17 | REGIONC\_x0\_MIDWEST |  | 0.003080 |
| 18 | TOTSQFT\_EN |  | 0.002886 |
| 19 | state\_name\_x0\_Michigan |  | 0.002691 |
| 20 | HDD30YR\_PUB |  | 0.002541 |
| 21 | CDD30YR\_PUB |  | 0.002520 |
| 22 | DOEID |  | 0.001867 |
| 23 | HHAGE |  | 0.001617 |
| 24 | MONPOOL |  | 0.001462 |
| 25 | ELWATER |  | 0.001435 |

Méthode 2 : Catégories

| **Catégories** | **Nombre de features** |
| --- | --- |
| Behavioral Characteristics | 40 |
| Geography | 113 |
| Weather | 2 |
| Household Characteristics | 4 |
| Home Characteristics | 27 |
| Appliances | 25 |
| Electronics | 20 |
| Space Heating | 8 |
| Air Conditioning | 9 |
| Thermostat | 0 |
| Water Heating | 3 |
| Lighting | 1 |
| Energy Bills | 3 |
| Energy Assistance | 4 |
| **Total** | 240 |

Méthode 3 : Information Gain

| **Catégories** | **Nombre de features** |
| --- | --- |
| Behavioral Characteristics | 34 |
| Geography | 22 |
| Weather | 4 |
| Household Characteristics | 4 |
| Home Characteristics | 15 |
| Appliances | 22 |
| Electronics | 23 |
| Space Heating | 8 |
| Air Conditioning | 8 |
| Thermostat | 6 |
| Water Heating | 2 |
| Lighting | 7 |
| Energy Bills | 9 |
| Energy Assistance | 7 |
| **Total** | 143 |

## 