**Additional file 1. Descriptive statistics of the emission inventories of South Korea in the winter of 2015 by Si-Do**

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| --- | --- | --- | --- | --- | --- |
|  |  | Mean | Standard Deviation | Maximum | Minimum |
| **Gangwon** |  |  |  |  |
| Population density (persons/km2) | 154  | 210  | 780  | 20  |
| No. of car registrations (1,000 cars) | 29  | 32  | 115  | 7  |
| No. of car accidents | 433  | 564  | 2,130  | 63  |
| Industrial power usage (Kwh/km2) | 515,194  | 969,898  | 4,210,673  | 62,905  |
| Generation of electricity (Kwh) | 321,680,104  | 350,275,408  | 743,904,051  | 931,815  |
| **Gyeonggi** |  |  |  |  |
| Population density (persons/km2) | 3,350  | 3,887  | 16,011  | 67  |
| No. of car registrations (1,000 cars) | 127  | 101  | 385  | 14  |
| No. of car accidents | 1,922  | 1,468  | 5,368  | 195  |
| Industrial power usage (Kwh/km2) | 5,236,038  | 4,768,221  | 20,886,088  | 239,149  |
| Generation of electricity (Kwh) | 783,566,592  | 938,710,907  | 3,640,390,874  | 809  |
| **Gyeongsangnam-do** |  |  |  |  |
| Population density (persons/km2) | 343  | 403  | 1,438  | 45  |
| No. of car registrations (1,000 cars) | 68  | 106  | 445  | 8  |
| No. of car accidents | 621  | 706  | 2,649  | 70  |
| Industrial power usage (Kwh/km2) | 967,411  | 1,072,010  | 3,816,241  | 101,110  |
| Generation of electricity (Kwh) | 1,685,195,716  | 3,362,147,555  | 8,410,216,856  | 294,545  |
| **Gyeongsangbuk-do** |  |  |  |  |
| Population density (persons/km2) | 158  | 183  | 683  | 22  |
| No. of car registrations (1,000 cars) | 41  | 50  | 195  | 3  |
| No. of car accidents | 518  | 748  | 2,675  | 2  |
| Industrial power usage (Kwh/km2) | 671,639  | 973,430  | 3,957,286  | 41,955  |
| Generation of electricity (Kwh) | 259,306,110  | 359,989,531  | 879,936,246  | 387,141  |
| **Gwangju** |  |  |  |  |
| Population density (persons/km2) | 3,530  | 1,876  | 6,495  | 1,782  |
| No. of car registrations (1,000 cars) | 99  | 49  | 144  | 29  |
| No. of car accidents | 1,905  | 921  | 2,687  | 706  |
| Industrial power usage (Kwh/km2) | 4,785,460  | 2,283,228  | 8,696,985  | 3,115,424  |
| Generation of electricity (Kwh) | 75,823,488  | 106,475,325  | 151,112,912  | 534,063  |
| **Daegu** |  |  |  |  |
| Population density (persons/km2) | 6,935  | 4,349  | 12,165  | 433  |
| No. of car registrations (1,000 cars) | 113  | 63  | 211  | 48  |
| No. of car accidents | 1,803  | 912  | 3,377  | 750  |
| Industrial power usage (Kwh/km2) | 10,926,853  | 8,842,318  | 27,200,607  | 1,991,244  |
| Generation of electricity (Kwh) | 250,355,735  | 370,725,176  | 677,565,669  | 13,173,015  |
| **Daejeon** |  |  |  |  |
| Population density (persons/km2) | 3,197  | 1,486  | 5,195  | 1,796  |
| No. of car registrations (1,000 cars) | 104  | 45  | 168  | 68  |
| No. of car accidents | 1,664  | 691  | 2,827  | 1,137  |
| Industrial power usage (Kwh/km2) | 5,200,984  | 3,118,515  | 10,326,815  | 1,905,112  |
| Generation of electricity (Kwh) | 49,737,809  | 23,781,555  | 66,553,907  | 32,921,710  |
| **Busan** |  |  |  |  |
| Population density (persons/km2) | 9,688  | 5,438  | 17,488  | 439  |
| No. of car registrations (1,000 cars) | 63  | 34  | 135  | 13  |
| No. of car accidents | 989  | 434  | 1,782  | 320  |
| Industrial power usage (Kwh/km2) | 12,829,340  | 8,606,504  | 39,607,215  | 1,297,260  |
| Generation of electricity (Kwh) | 418,688,738  | 811,210,300  | 1,635,183,928  | 93  |
| **Seoul** |  |  |  |  |
| Population density (persons/km2) | 17,488  | 4,922  | 27,938  | 6,565  |
| No. of car registrations (1,000 cars) | 102  | 43  | 216  | 40  |
| No. of car accidents | 1,853  | 966  | 5,357  | 924  |
| Industrial power usage (Kwh/km2) | 21,671,186  | 10,949,174  | 64,266,833  | 10,374,840  |
| Generation of electricity (Kwh) | 64,219,113  | 75,423,176  | 214,286,649  | 9,144,784  |
| **Sejong\*** |  |  |  |  |
| Population density (persons/km2) | 336  |  |  |  |
| No. of car registrations (1,000 cars) | 76  |  |  |  |
| No. of car accidents | 442  |  |  |  |
| Industrial power usage (Kwh/km2) | 1,504,342  |  |  |  |
| Generation of electricity (Kwh) | 961,785,140  |  |  |  |
| **Ulsan** |  |  |  |  |
| Population density (persons/km2) | 3,520  | 2,642  | 6,453  | 283  |
| No. of car registrations (1,000 cars) | 87  | 27  | 129  | 56  |
| No. of car accidents | 1,265  | 635  | 2,379  | 777  |
| Industrial power usage (Kwh/km2) | 15,185,233  | 20,226,782  | 50,762,907  | 3,506,212  |
| Generation of electricity (Kwh) | 1,171,684,461  | 1,656,984,126  | 2,343,349,172  | 19,749  |
| **Incheon** |  |  |  |  |
| Population density (persons/km2) | 7,226  | 6,251  | 17,404  | 120  |
| No. of car registrations (1,000 cars) | 111  | 81  | 218  | 7  |
| No. of car accidents | 1,377  | 1,031  | 2,992  | 36  |
| Industrial power usage (Kwh/km2) | 22,558,961  | 38,484,176  | 129,655,373  | 321,547  |
| Generation of electricity (Kwh) | 2,618,968,317  | 4,348,064,881  | 10,673,238,998  | 2,335,911  |
| **Jeollanam-do** |  |  |  |  |
| Population density (persons/km2) | 342  | 967  | 4,636  | 56  |
| No. of car registrations (1,000 cars) | 28  | 26  | 93  | 8  |
| No. of car accidents | 370  | 437  | 1,618  | 67  |
| Industrial power usage (Kwh/km2) | 939,140  | 1,783,925  | 6,826,105  | 105,923  |
| Generation of electricity (Kwh) | 493,341,122  | 872,120,186  | 2,269,070,235  | 85,946  |
| **Jeollabuk-do** |  |  |  |  |
| Population density (persons/km2) | 392  | 828  | 3,177  | 34  |
| No. of car registrations (1,000 cars) | 44  | 63  | 236  | 6  |
| No. of car accidents | 654  | 991  | 3,680  | 59  |
| Industrial power usage (Kwh/km2) | 1,089,304  | 1,852,809  | 5,605,791  | 69,170  |
| Generation of electricity (Kwh) | 340,641,252  | 717,428,665  | 1,623,422,362  | 3,855  |
| **Jeju** |  |  |  |  |
| Population density (persons/km2) | 320  | 196  | 459  | 182  |
| No. of car registrations (1,000 cars) | 170  | 161  | 283  | 56  |
| No. of car accidents | 1,529  | 1,165  | 2,353  | 705  |
| Industrial power usage (Kwh/km2) | 653,288  | 115,697  | 735,098  | 571,478  |
| Generation of electricity (Kwh) | 208,498,096  | 196,723,344  | 347,602,506  | 69,393,685  |
| **Chungcheongnam-do** |  |  |  |  |
| Population density (persons/km2) | 271  | 248  | 941  | 67  |
| No. of car registrations (1,000 cars) | 48  | 54  | 219  | 9  |
| No. of car accidents | 712  | 976  | 3,968  | 120  |
| Industrial power usage (Kwh/km2) | 1,415,522  | 1,657,252  | 5,702,552  | 177,613  |
| Generation of electricity (Kwh) | 4,650,437,284  | 4,869,350,166  | 10,015,674,187  | 1,309,273  |
| **Chungcheongbuk-do** |  |  |  |  |
| Population density (persons/km2) | 211  | 249  | 884  | 40  |
| No. of car registrations (1,000 cars) | 50  | 84  | 295  | 9  |
| No. of car accidents | 658  | 1,033  | 3,632  | 110  |
| Industrial power usage (Kwh/km2) | 879,706  | 870,538  | 2,955,151  | 146,522  |
| Generation of electricity (Kwh) | 54,871,913  | 42,752,636  | 85,102,592  | 24,641,234  |
| \*Sejong has no si-goon-gu division.  |