TABLE I. Ranking of the most affected concession areas in terms of the generated electricity from DG in (TWh) for the year 2030.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Alternative 0 | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 | Alternative 5 | OL |
| AES Eletropaulo | 5.26 | 3.94 | 3.64 | 3.30 | 2.81 | 2.48 | 4.05 |
| CPFL Paulista | 6.10 | 4.98 | 4.72 | 4.42 | 3.97 | 3.66 | 5.45 |
| CEMIG-D | 8.39 | 7.28 | 7.02 | 6.72 | 6.27 | 5.95 | 7.90 |
| LIGHT | 5.81 | 4.83 | 4.60 | 4.32 | 3.92 | 3.63 | 4.97 |
| COPEL-DIS | 4.27 | 3.39 | 3.19 | 2.96 | 2.63 | 2.40 | 3.65 |
| ENEL RJ | 3.76 | 3.12 | 2.96 | 2.77 | 2.50 | 2.30 | 3.39 |
| COELBA | 2.65 | 2.05 | 1.92 | 1.77 | 1.56 | 1.42 | 2.33 |
| CELESC-DIS | 2.95 | 2.35 | 2.22 | 2.06 | 1.83 | 1.68 | 2.47 |
| ELEKTRO | 3.21 | 2.61 | 2.47 | 2.31 | 2.07 | 1.90 | 2.85 |
| RGE SUL | 3.35 | 2.81 | 2.69 | 2.55 | 2.35 | 2.22 | 3.13 |
| ENEL CE | 2.03 | 1.64 | 1.55 | 1.45 | 1.31 | 1.21 | 1.83 |
| CELPE | 1.69 | 1.32 | 1.24 | 1.15 | 1.02 | 0.93 | 1.51 |
| ENERGISA MT | 2.24 | 1.95 | 1.89 | 1.81 | 1.70 | 1.62 | 2.15 |
| EDP ES | 1.35 | 1.08 | 1.02 | 0.95 | 0.85 | 0.78 | 1.17 |
| CEMAR | 0.93 | 0.71 | 0.67 | 0.62 | 0.55 | 0.50 | 0.84 |
| ENERGISA MS | 1.41 | 1.21 | 1.16 | 1.10 | 1.02 | 0.96 | 1.33 |
| COSERN | 0.72 | 0.60 | 0.57 | 0.55 | 0.50 | 0.48 | 0.70 |
| ENERGISA PB | 0.58 | 0.48 | 0.46 | 0.43 | 0.40 | 0.37 | 0.54 |
| ENERGISA SE | 0.43 | 0.33 | 0.31 | 0.29 | 0.25 | 0.23 | 0.37 |
| ENERGISA TO | 0.49 | 0.40 | 0.38 | 0.36 | 0.32 | 0.30 | 0.45 |
| ENERGISA MG | 0.32 | 0.27 | 0.26 | 0.25 | 0.23 | 0.22 | 0.30 |
| ELFSM | 0.10 | 0.08 | 0.08 | 0.07 | 0.06 | 0.06 | 0.09 |
| ENERGISA NF | 0.07 | 0.06 | 0.06 | 0.05 | 0.05 | 0.04 | 0.06 |
| ENERGISA BO | 0.08 | 0.06 | 0.06 | 0.06 | 0.05 | 0.05 | 0.07 |
| SULGIPE | 0.06 | 0.05 | 0.05 | 0.05 | 0.04 | 0.04 | 0.05 |
| COCEL | 0.05 | 0.04 | 0.04 | 0.04 | 0.03 | 0.03 | 0.05 |
| COPERALIANÇA | 0.05 | 0.04 | 0.04 | 0.04 | 0.04 | 0.03 | 0.05 |
| ELETROCAR | 0.05 | 0.04 | 0.04 | 0.04 | 0.03 | 0.03 | 0.04 |
| DEMEI | 0.03 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 |
| UHENPAL | 0.03 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 |
| HIDROPAN | 0.03 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| MUX ENERGIA | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| FORCEL | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| EFLUL | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| EFLJC | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |

TABLE II. Ranking of the most affected concession areas in terms of the generated electricity from DG in (%) for the year 2030.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 | Alternative 5 | OL |
| AES Eletropaulo | 74.80% | 69.20% | 62.60% | 53.40% | 47.10% | 76.90% |
| CEMAR | 77.00% | 72.10% | 66.60% | 59.00% | 53.90% | 91.00% |
| ENERGISA SE | 77.30% | 72.30% | 66.70% | 58.80% | 53.40% | 86.20% |
| COELBA | 77.40% | 72.40% | 66.80% | 59.00% | 53.70% | 87.80% |
| CELPE | 77.90% | 73.10% | 67.60% | 60.10% | 55.10% | 89.00% |
| COPEL-DIS | 79.40% | 74.70% | 69.30% | 61.60% | 56.20% | 85.50% |
| CELESC-DIS | 79.70% | 75.20% | 69.80% | 62.20% | 57.00% | 83.90% |
| EDP ES | 79.90% | 75.40% | 70.10% | 62.70% | 57.50% | 87.00% |
| ENERGISA NF | 80.30% | 75.70% | 70.30% | 62.40% | 56.80% | 83.90% |
| ENEL CE | 80.70% | 76.50% | 71.50% | 64.50% | 59.70% | 90.60% |
| ELFSM | 80.70% | 76.40% | 71.40% | 64.30% | 59.40% | 89.60% |
| ELEKTRO | 81.40% | 77.10% | 72.00% | 64.60% | 59.40% | 88.80% |
| DEMEI | 81.80% | 77.60% | 72.80% | 65.90% | 61.10% | 88.50% |
| CPFL Paulista | 81.80% | 77.50% | 72.50% | 65.20% | 60.00% | 89.50% |
| ENERGISA TO | 81.80% | 77.70% | 72.90% | 66.20% | 61.50% | 91.90% |
| ENERGISA PB | 82.20% | 78.30% | 73.90% | 67.70% | 63.60% | 92.40% |
| COCEL | 82.60% | 78.60% | 73.80% | 67.00% | 62.10% | 89.70% |
| ENEL RJ | 82.90% | 78.80% | 73.80% | 66.40% | 61.10% | 90.10% |
| SULGIPE | 83.00% | 79.20% | 74.70% | 68.30% | 63.80% | 87.10% |
| LIGHT | 83.10% | 79.10% | 74.40% | 67.50% | 62.50% | 85.50% |
| MUX ENERGIA | 83.20% | 79.30% | 74.80% | 68.30% | 63.80% | 90.10% |
| ENERGISA BO | 83.50% | 79.90% | 75.80% | 70.00% | 66.20% | 92.90% |
| COSERN | 83.60% | 80.10% | 76.00% | 70.30% | 66.50% | 97.40% |
| COPERALIANÇA | 83.90% | 80.20% | 75.80% | 69.40% | 64.80% | 87.60% |
| RGE SUL | 84.10% | 80.50% | 76.30% | 70.30% | 66.20% | 93.50% |
| ENERGISA MG | 84.80% | 81.30% | 77.20% | 71.20% | 67.00% | 93.40% |
| ENERGISA MS | 85.40% | 82.00% | 78.00% | 72.20% | 68.10% | 94.00% |
| EFLJC | 85.60% | 82.20% | 78.20% | 72.40% | 68.30% | 91.50% |
| FORCEL | 86.50% | 83.40% | 79.70% | 74.30% | 70.40% | 94.80% |
| CEMIG-D | 86.80% | 83.70% | 80.00% | 74.70% | 70.90% | 94.20% |
| HIDROPAN | 86.90% | 83.80% | 80.20% | 74.80% | 71.00% | 93.50% |
| ELETROCAR | 87.20% | 84.20% | 80.70% | 75.60% | 72.00% | 93.40% |
| ENERGISA MT | 87.30% | 84.30% | 80.90% | 75.90% | 72.40% | 96.30% |
| UHENPAL | 87.30% | 84.30% | 80.70% | 75.30% | 71.50% | 90.90% |
| EFLUL | 87.90% | 85.10% | 81.80% | 76.90% | 73.40% | 92.90% |

TABLE III. Ranking of the most affected concession areas in terms of the PEI in (MBRL) for the year 2030.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Alternative 0 | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 | Alternative 5 | OL |
| CEMIG-D | 1890.2 | 1274.3 | 1144.8 | 997.4 | 794.4 | 658.0 | 1668.8 |
| CPFL Paulista | 1646.4 | 1108.1 | 996.2 | 869.9 | 697.7 | 583.6 | 1375.6 |
| ENEL RJ | 1171.4 | 809.6 | 733.3 | 646.5 | 527.0 | 446.9 | 978.2 |
| COPEL-DIS | 877.8 | 541.5 | 473.6 | 397.9 | 296.7 | 231.1 | 691.9 |
| RGE SUL | 783.5 | 459.6 | 393.4 | 319.0 | 218.5 | 152.5 | 682.0 |
| COELBA | 740.8 | 453.1 | 396.2 | 333.3 | 250.3 | 197.1 | 608.4 |
| ENERGISA MT | 658.7 | 387.1 | 330.4 | 266.1 | 178.1 | 119.4 | 596.9 |
| ELEKTRO | 810.0 | 545.3 | 490.4 | 428.4 | 344.0 | 288.2 | 671.7 |
| LIGHT | 894.7 | 644.1 | 591.7 | 532.2 | 450.6 | 396.1 | 710.0 |
| AES Eletropaulo | 649.8 | 419.2 | 373.5 | 323.0 | 256.5 | 214.0 | 457.6 |
| CELESC-DIS | 487.4 | 317.4 | 282.9 | 244.3 | 192.4 | 158.4 | 380.7 |
| ENEL CE | 387.4 | 241.1 | 211.5 | 178.6 | 134.4 | 105.7 | 327.9 |
| CELPE | 329.2 | 194.5 | 168.0 | 138.9 | 100.7 | 76.2 | 273.2 |
| EDP ES | 327.8 | 214.7 | 191.7 | 165.9 | 131.3 | 108.7 | 266.9 |
| ENERGISA MS | 313.9 | 202.2 | 178.9 | 152.5 | 116.3 | 92.1 | 275.9 |
| CEMAR | 175.9 | 94.5 | 78.7 | 61.4 | 38.9 | 24.8 | 148.7 |
| COSERN | 167.7 | 94.1 | 79.4 | 62.9 | 41.0 | 26.8 | 158.1 |
| ENERGISA PB | 121.6 | 69.4 | 59.0 | 47.5 | 32.1 | 22.1 | 104.5 |
| ENERGISA TO | 112.9 | 65.8 | 56.3 | 45.7 | 31.4 | 22.2 | 96.0 |
| ENERGISA SE | 85.6 | 52.0 | 45.4 | 38.1 | 28.5 | 22.3 | 68.5 |
| ENERGISA MG | 83.8 | 51.9 | 45.3 | 37.9 | 27.7 | 21.0 | 72.7 |
| ELFSM | 26.3 | 16.2 | 14.2 | 12.0 | 8.9 | 7.0 | 21.8 |
| ENERGISA BO | 13.1 | 7.6 | 6.6 | 5.3 | 3.7 | 2.6 | 11.3 |
| ENERGISA NF | 16.3 | 11.0 | 9.9 | 8.7 | 7.0 | 5.9 | 12.6 |
| COCEL | 15.2 | 10.7 | 9.8 | 8.8 | 7.3 | 6.4 | 12.8 |
| ELETROCAR | 9.9 | 6.2 | 5.4 | 4.5 | 3.3 | 2.5 | 8.6 |
| SULGIPE | 9.4 | 6.8 | 6.3 | 5.7 | 4.9 | 4.3 | 7.7 |
| HIDROPAN | 6.9 | 4.5 | 4.0 | 3.4 | 2.7 | 2.1 | 6.0 |
| COPERALIANÇA | 7.9 | 5.7 | 5.3 | 4.8 | 4.1 | 3.6 | 6.5 |
| DEMEI | 5.4 | 3.4 | 3.0 | 2.6 | 1.9 | 1.5 | 4.5 |
| UHENPAL | 4.6 | 3.4 | 3.1 | 2.8 | 2.3 | 2.1 | 3.9 |
| MUX ENERGIA | 3.4 | 2.3 | 2.1 | 1.8 | 1.5 | 1.3 | 2.9 |
| FORCEL | 3.4 | 2.3 | 2.0 | 1.8 | 1.4 | 1.2 | 3.0 |
| EFLUL | 3.8 | 2.7 | 2.5 | 2.2 | 1.9 | 1.6 | 3.3 |
| EFLJC | 1.4 | 1.0 | 0.9 | 0.9 | 0.7 | 0.7 | 1.2 |

TABLE IV. Ranking of the most affected concession areas in terms of the REGULATED TARIFF in (MBRL/TWh) for the year 2030.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Alternative 0 | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 | Alternative 5 | OL |
| ENEL RJ | 1124.6 | 992.5 | 971.9 | 951.0 | 926.4 | 912.5 | 1021.8 |
| EFLUL | 1272.3 | 1188.5 | 1173.9 | 1158.3 | 1138.7 | 1126.7 | 1215.8 |
| FORCEL | 980.8 | 915.7 | 904.5 | 892.6 | 877.8 | 868.7 | 945.8 |
| HIDROPAN | 948.7 | 884.3 | 873.2 | 861.7 | 847.3 | 838.7 | 911.4 |
| UHENPAL | 788.3 | 726.4 | 715.8 | 704.6 | 690.6 | 682.1 | 737.9 |
| ENERGISA MT | 1016.5 | 957.6 | 947.2 | 936.1 | 922.1 | 913.5 | 995.3 |
| CPFL Paulista | 811.0 | 754.2 | 745.0 | 735.4 | 724.1 | 717.5 | 769.8 |
| CEMIG-D | 822.8 | 768.3 | 758.8 | 748.7 | 736.0 | 728.2 | 792.3 |
| ELEKTRO | 783.0 | 731.6 | 723.3 | 714.8 | 704.7 | 699.0 | 744.5 |
| ENERGISA MS | 771.4 | 720.3 | 711.5 | 702.3 | 690.9 | 684.0 | 744.1 |
| COCEL | 873.8 | 823.2 | 814.7 | 805.8 | 794.9 | 788.5 | 834.4 |
| ELETROCAR | 837.3 | 786.9 | 778.1 | 768.7 | 756.8 | 749.5 | 809.8 |
| EFLJC | 811.7 | 761.6 | 752.9 | 743.8 | 732.4 | 725.6 | 771.8 |
| ENERGISA NF | 900.6 | 851.1 | 843.2 | 835.1 | 825.7 | 820.5 | 856.2 |
| ENERGISA MG | 862.8 | 813.9 | 805.4 | 796.5 | 785.5 | 778.9 | 836.5 |
| LIGHT | 733.5 | 692.9 | 685.9 | 678.7 | 669.9 | 664.8 | 695.8 |
| ENERGISA TO | 764.3 | 727.9 | 721.7 | 715.2 | 707.3 | 702.6 | 744.5 |
| COPEL-DIS | 757.9 | 722.5 | 716.6 | 710.6 | 703.6 | 699.5 | 730.7 |
| RGE SUL | 751.8 | 717.8 | 711.9 | 705.8 | 698.3 | 693.8 | 736.0 |
| COPERALIANÇA | 636.2 | 602.3 | 596.5 | 590.4 | 582.9 | 578.5 | 606.5 |
| DEMEI | 734.7 | 701.4 | 695.8 | 690.0 | 683.0 | 678.9 | 712.6 |
| MUX ENERGIA | 678.3 | 646.8 | 641.5 | 635.9 | 629.1 | 625.1 | 656.0 |
| EDP ES | 753.8 | 722.7 | 717.6 | 712.2 | 705.8 | 702.2 | 730.5 |
| ELFSM | 751.0 | 720.4 | 715.2 | 709.9 | 703.4 | 699.6 | 731.5 |
| SULGIPE | 683.3 | 658.6 | 654.3 | 649.6 | 643.8 | 640.2 | 662.2 |
| CELESC-DIS | 676.9 | 653.8 | 649.9 | 645.9 | 641.1 | 638.4 | 657.5 |
| AES Eletropaulo | 664.1 | 641.4 | 637.8 | 634.2 | 630.1 | 628.0 | 642.3 |
| COELBA | 738.3 | 716.0 | 712.3 | 708.5 | 704.0 | 701.4 | 723.8 |
| ENEL CE | 597.0 | 575.7 | 572.2 | 568.5 | 564.1 | 561.6 | 584.0 |
| ENERGISA SE | 628.4 | 609.3 | 606.1 | 602.8 | 599.0 | 596.7 | 614.9 |
| COSERN | 694.6 | 676.2 | 672.9 | 669.5 | 665.2 | 662.6 | 691.0 |
| ENERGISA PB | 674.9 | 657.0 | 653.9 | 650.7 | 646.6 | 644.2 | 666.6 |
| CEMAR | 621.5 | 603.8 | 600.9 | 598.0 | 594.5 | 592.6 | 612.5 |
| ENERGISA BO | 632.0 | 617.3 | 614.7 | 611.9 | 608.4 | 606.2 | 625.2 |
| CELPE | 577.3 | 563.2 | 560.8 | 558.5 | 555.6 | 554.1 | 568.9 |

TABLE V. Ranking of the most affected concession areas in terms of the GWP in (Mt CO2eq/year) for the year 2030.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Alternative 0 | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 | Alternative 5 | OL |
| CPFL Paulista | 0.353 | 0.410 | 0.424 | 0.439 | 0.462 | 0.478 | 0.386 |
| AES Eletropaulo | 0.355 | 0.410 | 0.423 | 0.437 | 0.457 | 0.471 | 0.406 |
| CEMIG-D | 0.504 | 0.559 | 0.572 | 0.587 | 0.609 | 0.625 | 0.529 |
| LIGHT | 0.365 | 0.410 | 0.421 | 0.434 | 0.453 | 0.466 | 0.404 |
| COPEL-DIS | 0.266 | 0.308 | 0.317 | 0.328 | 0.343 | 0.354 | 0.295 |
| ENEL RJ | 0.235 | 0.265 | 0.272 | 0.281 | 0.294 | 0.304 | 0.252 |
| ELEKTRO | 0.195 | 0.224 | 0.231 | 0.239 | 0.250 | 0.258 | 0.213 |
| COELBA | 0.163 | 0.192 | 0.198 | 0.205 | 0.215 | 0.222 | 0.178 |
| CELESC-DIS | 0.194 | 0.220 | 0.226 | 0.233 | 0.243 | 0.249 | 0.215 |
| RGE SUL | 0.211 | 0.235 | 0.241 | 0.247 | 0.257 | 0.263 | 0.221 |
| ENEL CE | 0.122 | 0.141 | 0.146 | 0.151 | 0.158 | 0.162 | 0.132 |
| CELPE | 0.105 | 0.123 | 0.127 | 0.131 | 0.137 | 0.141 | 0.114 |
| ENERGISA MT | 0.139 | 0.152 | 0.156 | 0.159 | 0.164 | 0.168 | 0.143 |
| EDP ES | 0.086 | 0.099 | 0.101 | 0.105 | 0.109 | 0.112 | 0.094 |
| ENERGISA MS | 0.084 | 0.094 | 0.097 | 0.099 | 0.104 | 0.107 | 0.088 |
| CEMAR | 0.057 | 0.067 | 0.070 | 0.072 | 0.075 | 0.078 | 0.061 |
| COSERN | 0.044 | 0.050 | 0.051 | 0.052 | 0.054 | 0.055 | 0.045 |
| ENERGISA PB | 0.036 | 0.041 | 0.042 | 0.043 | 0.045 | 0.046 | 0.038 |
| ENERGISA SE | 0.027 | 0.032 | 0.033 | 0.034 | 0.035 | 0.036 | 0.030 |
| ENERGISA TO | 0.030 | 0.034 | 0.035 | 0.036 | 0.038 | 0.039 | 0.032 |
| ENERGISA MG | 0.020 | 0.022 | 0.023 | 0.024 | 0.024 | 0.025 | 0.021 |
| ELFSM | 0.007 | 0.007 | 0.008 | 0.008 | 0.008 | 0.008 | 0.007 |
| ENERGISA BO | 0.005 | 0.005 | 0.006 | 0.006 | 0.006 | 0.006 | 0.005 |
| SULGIPE | 0.004 | 0.004 | 0.005 | 0.005 | 0.005 | 0.005 | 0.004 |
| ENERGISA NF | 0.006 | 0.006 | 0.006 | 0.006 | 0.007 | 0.007 | 0.006 |
| COCEL | 0.003 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| COPERALIANÇA | 0.003 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| ELETROCAR | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| DEMEI | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| HIDROPAN | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| UHENPAL | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| MUX ENERGIA | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| EFLUL | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| FORCEL | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| EFLJC | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |