# APPENDIX A – Development: energy production correlations for wind and solar power

Figure A‑1 – Correlation between monthly average wind speed and monthly average energy produced in the Northeast coast spot.

Table A‑1 – Capacity factor season average comparison between VWF model results, historical results from ONS, and RCP results from CORDEX data for wind farm spot in the Northeast coast region for the year 2019.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Northeast coast - historical year 2019 | | | | | |
|  | VWF model | ONS (historical) | RCP 2.6 | RCP 4.5 | RCP 8.5 |
| summer | 0.379 | 0.387 | 0.265 | 0.182 | 0.183 |
| autumn | 0.226 | 0.183 | 0.207 | 0.031 | 0.026 |
| winter | 0.595 | 0.473 | 0.776 | 0.423 | 0.544 |
| spring | 0.706 | 0.753 | 0.883 | 0.818 | 0.844 |

Figure A‑2 – Correlation between monthly average wind speed and monthly average energy produced in the Northeast onshore spot.

Table A‑2 - Capacity factor season average comparison between VWF model results, historical results from ONS, and RCP results from CORDEX data for wind farm spot in the Northeast onshore region for the year 2019.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Northeast onshore - historical year 2019 | | | | | |
|  | VWF model | ONS (historical) | RCP 2.6 | RCP 4.5 | RCP 8.5 |
| summer | 0.244 | 0.300 | 0.067 | 0.003 | 0.008 |
| autumn | 0.236 | 0.373 | 0.203 | 0.071 | 0.102 |
| winter | 0.613 | 0.670 | 0.610 | 0.614 | 0.570 |
| spring | 0.467 | 0.523 | 0.538 | 0.452 | 0.498 |

Figure A‑3 - Correlation between monthly average wind speed and monthly average energy produced in the South onshore spot.

Table A‑3 - Capacity factor season average comparison between VWF model results, historical results from ONS, and RCP results from CORDEX data for wind farm spot in the South onshore region for the year 2019

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| South onshore - historical year 2019 | | | | | |
|  | VWF model | ONS (historical) | RCP 2.6 | RCP 4.5 | RCP 8.5 |
| summer | 0.291 | 0.270 | 0.433 | 0.461 | 0.360 |
| autumn | 0.271 | 0.207 | 0.262 | 0.293 | 0.320 |
| winter | 0.287 | 0.280 | 0.316 | 0.244 | 0.267 |
| spring | 0.342 | 0.347 | 0.515 | 0.438 | 0.539 |

Figure A‑4 - Correlation between monthly average solar radiation and monthly average energy produced in the North region spot.

Table A‑4 – Capacity factor season average comparison between GSEE model results, and RCP results from CORDEX data for solar power plant spot in the North region for the year 2019.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| North - historical year 2019 | | | | | |
|  | GSEE model | ONS (historical) | RCP 2.6 | RCP 4.5 | RCP 8.5 |
| summer | 0.21 | n.a. | 0.24 | 0.24 | 0.24 |
| autumn | 0.19 | n.a. | 0.23 | 0.23 | 0.22 |
| winter | 0.23 | n.a. | 0.24 | 0.24 | 0.24 |
| spring | 0.26 | n.a. | 0.25 | 0.25 | 0.26 |

Figure A‑5 - Correlation between monthly average solar radiation and monthly average energy produced in the Northeast region spot.

Table A‑5 - Capacity factor season average comparison between GSEE model results, historical results from ONS, and RCP results from CORDEX data for solar power plant spot in the Northeast region for the year 2019.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Northeast - historical year 2019 | | | | | |
|  | GSEE model | ONS (historical) | RCP 2.6 | RCP 4.5 | RCP 8.5 |
| summer | 0.244 | 0.250 | 0.239 | 0.224 | 0.236 |
| autumn | 0.237 | 0.253 | 0.251 | 0.226 | 0.229 |
| winter | 0.296 | 0.307 | 0.264 | 0.260 | 0.265 |
| spring | 0.308 | 0.293 | 0.295 | 0.289 | 0.296 |

Figure A‑6 - Correlation between monthly average solar radiation and monthly average energy produced in the Southeast/Midwest region spot.

Table A‑6 - Capacity factor season average comparison between GSEE model results, historical results from ONS, and RCP results from CORDEX data for solar power plant spot in the Southeast/Midwest region for the year 2019.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Southeast/ Midwest - historical year 2019 | | | | | |
|  | GSEE model | ONS (historical) | RCP 2.6 | RCP 4.5 | RCP 8.5 |
| summer | 0.251 | 0.287 | 0.267 | 0.255 | 0.255 |
| autumn | 0.234 | 0.245 | 0.243 | 0.241 | 0.235 |
| winter | 0.267 | 0.255 | 0.233 | 0.234 | 0.232 |
| spring | 0.252 | 0.253 | 0.259 | 0.255 | 0.258 |

Figure A‑7 - Correlation between monthly average solar radiation and monthly average energy produced in the South region spot.

Table A‑7 - Capacity factor season average comparison between GSEE model results, and RCP results from CORDEX data for solar power plant spot in the South region for the year 2019.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| South - historical year 2019 | | | | | |
|  | GSEE model | ONS (historical) | RCP 2.6 | RCP 4.5 | RCP 8.5 |
| summer | 0.262 | n.a. | 0.269 | 0.256 | 0.256 |
| autumn | 0.198 | n.a. | 0.183 | 0.197 | 0.189 |
| winter | 0.211 | n.a. | 0.172 | 0.182 | 0.177 |
| spring | 0.251 | n.a. | 0.261 | 0.261 | 0.245 |