

GLOBAL SOLAR ATLAS

BY WORLD BANK GROUP

Fortaleza

-03.738824°, -038.554848°

Rua Francisca Rangel, Fortaleza, Ceará, Brazil

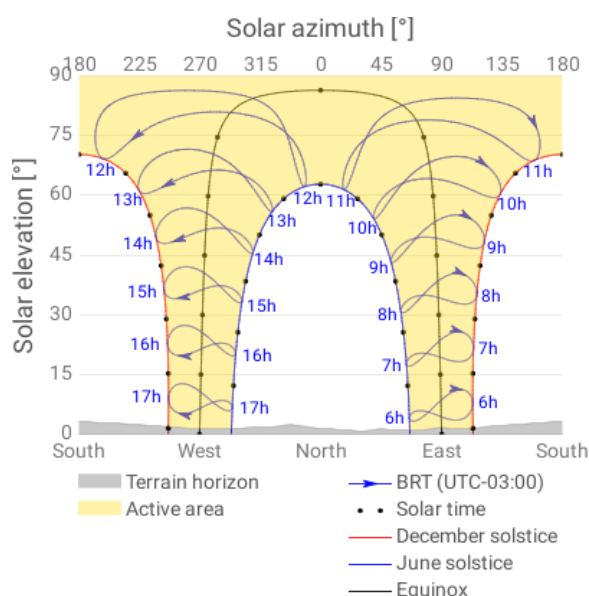
Time zone: UTC-03, America/Fortaleza [BRT]

🕒 Report generated: 2 Mar 2023

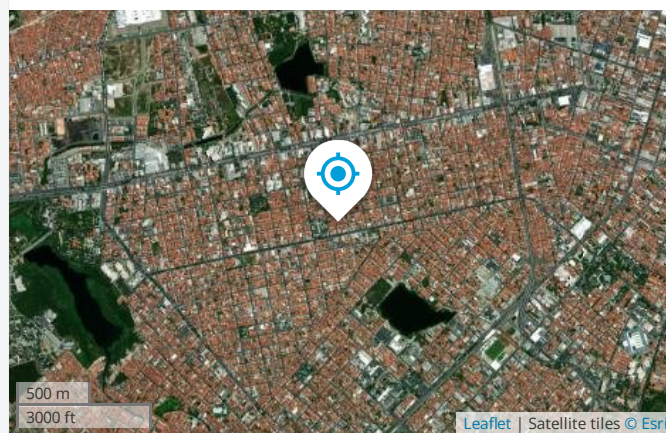
SITE INFO

| Map data | | Per year | |
|--|----------------|----------|--------------------|
| Specific photovoltaic power output | PVOUT specific | 1734.4 | kWh/kWp |
| Direct normal irradiation | DNI | 1972.7 | kWh/m ² |
| Global horizontal irradiation | GHI | 2197.4 | kWh/m ² |
| Diffuse horizontal irradiation | DIF | 778.5 | kWh/m ² |
| Global tilted irradiation at optimum angle | GTI opta | 2204.6 | kWh/m ² |
| Optimum tilt of PV modules | OPTA | 6 / 0 | ° |
| Air temperature | TEMP | 27.0 | °C |
| Terrain elevation | ELE | 20 | m |

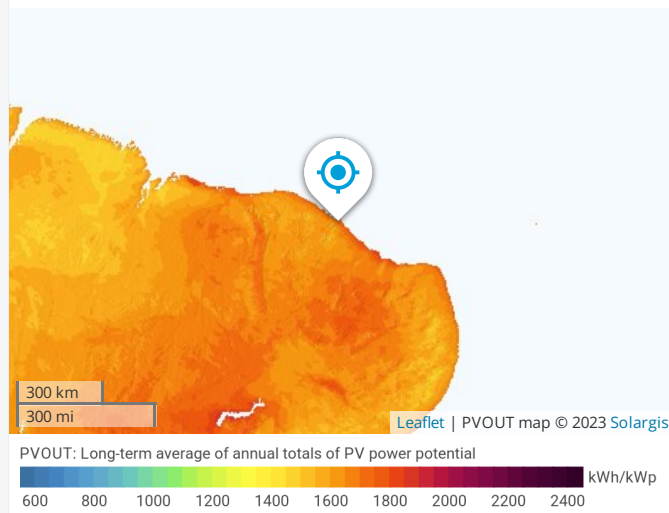
Horizon and sunpath



Map



PVOUT map



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PV ELECTRICITY AND SOLAR RADIATION

Annual averages

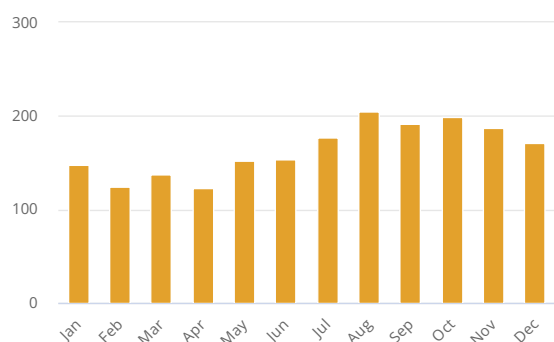
Direct normal irradiation

1969.8

kWh/m² per year

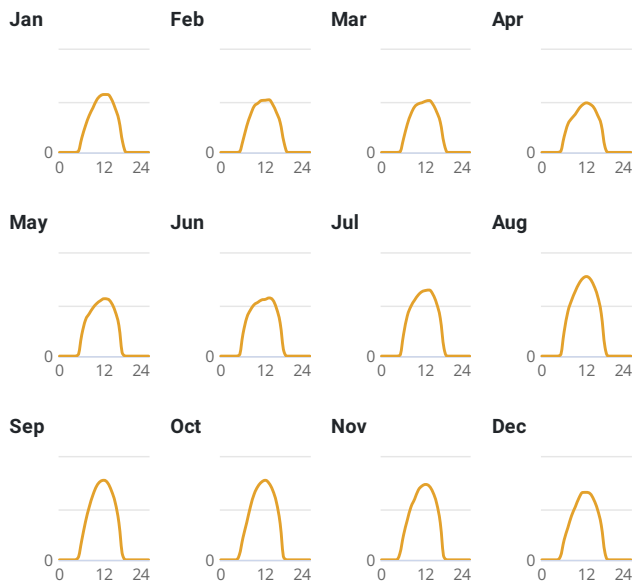
Monthly averages

Direct normal irradiation



Average hourly profiles

Direct normal irradiation [Wh/m²]



UTC-03

Average hourly profiles

Direct normal irradiation [Wh/m²]

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---------|------|------|------|------|------|------|------|------|------|------|------|------|
| 0 - 1 | | | | | | | | | | | | |
| 1 - 2 | | | | | | | | | | | | |
| 2 - 3 | | | | | | | | | | | | |
| 3 - 4 | | | | | | | | | | | | |
| 4 - 5 | | | | | | | | | | | | |
| 5 - 6 | 8 | 4 | 5 | 8 | 12 | 10 | 8 | 10 | 20 | 47 | 61 | 33 |
| 6 - 7 | 140 | 118 | 133 | 152 | 209 | 219 | 211 | 237 | 191 | 218 | 241 | 193 |
| 7 - 8 | 260 | 257 | 272 | 274 | 352 | 374 | 390 | 432 | 371 | 364 | 385 | 312 |
| 8 - 9 | 360 | 365 | 374 | 330 | 413 | 450 | 486 | 544 | 514 | 519 | 514 | 430 |
| 9 - 10 | 434 | 450 | 445 | 372 | 470 | 502 | 546 | 632 | 632 | 642 | 592 | 516 |
| 10 - 11 | 510 | 480 | 474 | 427 | 512 | 525 | 597 | 708 | 720 | 716 | 680 | 604 |
| 11 - 12 | 552 | 507 | 485 | 465 | 540 | 548 | 629 | 758 | 765 | 759 | 720 | 657 |
| 12 - 13 | 565 | 509 | 500 | 483 | 560 | 554 | 641 | 776 | 776 | 776 | 736 | 659 |
| 13 - 14 | 564 | 514 | 506 | 470 | 556 | 568 | 645 | 754 | 749 | 747 | 719 | 646 |
| 14 - 15 | 519 | 467 | 468 | 437 | 518 | 549 | 601 | 689 | 673 | 678 | 658 | 586 |
| 15 - 16 | 430 | 389 | 395 | 364 | 436 | 467 | 512 | 586 | 559 | 560 | 551 | 489 |
| 16 - 17 | 315 | 292 | 294 | 270 | 298 | 323 | 368 | 414 | 361 | 353 | 358 | 338 |
| 17 - 18 | 100 | 102 | 90 | 54 | 22 | 46 | 76 | 87 | 45 | 20 | 26 | 68 |
| 18 - 19 | | | | | | | | | | | | |
| 19 - 20 | | | | | | | | | | | | |
| 20 - 21 | | | | | | | | | | | | |
| 21 - 22 | | | | | | | | | | | | |
| 22 - 23 | | | | | | | | | | | | |
| 23 - 24 | | | | | | | | | | | | |
| Sum | 4758 | 4453 | 4441 | 4108 | 4898 | 5134 | 5710 | 6628 | 6376 | 6399 | 6241 | 5531 |

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GLOSSARY

| Acronym | Full name | Unit | Type of use |
|----------------|--|--|--|
| DIF | Diffuse horizontal irradiation | kWh/m ² , MJ/m ² | Average yearly, monthly or daily sum of diffuse horizontal irradiation (© 2021 Solargis) |
| DNI | Direct normal irradiation | kWh/m ² , MJ/m ² | Average yearly, monthly or daily sum of direct normal irradiation (© 2021 Solargis) |
| ELE | Terrain elevation | m, ft | Elevation of terrain surface above/below sea level, processed and integrated from SRTM-3 data and related data products (SRTM v4.1 © 2004 - 2021, CGIAR-CSI) |
| GHI | Global horizontal irradiation | kWh/m ² , MJ/m ² | Average annual, monthly or daily sum of global horizontal irradiation (© 2021 Solargis) |
| GTI | Global tilted irradiation | kWh/m ² , MJ/m ² | Average annual, monthly or daily sum of global tilted irradiation (© 2021 Solargis) |
| GTI_opta | Global tilted irradiation at optimum angle | kWh/m ² , MJ/m ² | Average annual, monthly or daily sum of global tilted irradiation for PV modules fix-mounted at optimum angle (© 2021 Solargis) |
| OPTA | Optimum tilt of PV modules | ° | Optimum tilt of fix-mounted PV modules facing towards Equator set for maximizing GTI input (© 2021 Solargis) |
| PVOUT_total | Total photovoltaic power output | kWh, MWh, GWh | Yearly and monthly average values of photovoltaic electricity (AC) delivered by the total installed capacity of a PV system (© 2021 Solargis) |
| PVOUT_specific | Specific photovoltaic power output | kWh/kWp | Yearly and monthly average values of photovoltaic electricity (AC) delivered by a PV system and normalized to 1 kWp of installed capacity (© 2021 Solargis) |
| TEMP | Air temperature | °C, °F | Average yearly, monthly and daily air temperature at 2 m above ground. Calculated from outputs of ERA5 model (© 2021 ECMWF, post-processed by Solargis) |

ABOUT

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