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| **Abstract:** |  |
| The article focuses on sizing and designing microgrids with pvlib-python and the Python programming language. Pvlib-python is a free and open-source program for simulating solar photovoltaic (PV) systems. For the design, an existing case study of an agricultural microgrid comprised of PV arrays, batteries, and a biogas-based generator in an off-grid configuration was explored. The solar resources and PV system were modeled using pvlib-python, while the rest of the microgrid was built and simulated using a custom dispatch algorithm written in Python. The study also discussed an in-depth strategy for modeling PV utilizing various data sources using the included modules and functions. A similarly specified microgrid was also modeled in Homer Pro software and the results from the designed microgrid in Python were compared. The hourly distribution of data for both tools exhibits a noticeable deviation. The daily and annual distribution of most of the parameters, on the other hand, produce comparable results. | |