

# Microgrid OS

Monitoring and Steering assets on the microgrid

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# Microgrid OS Evaluation

OS	Cost (money)	Interoperability	long term relationship	Deployment Readiness	Quality	Features
<a href="#">NewSunRoad Stellar</a>						
<a href="#">Remot by Innovex</a>						
<a href="#">Inhemeter</a>						
<a href="#">GxF by LF Energy</a>						
<a href="#">MicroPower Manager</a>						
<a href="#">Hyphae by LF Energy</a>						
<a href="#">OpenEMS</a>						
<a href="#">Sunalyzer</a>						

## New Sun Road Stellar

Stellar seems to have all the capabilities we want from their website but Michael (CTO) confirms that he is not sure that the meters are using are supported 100%. They can likely monitor usage data but may not be able to remote on/off. It is proprietary.

## Remot by Innovex

The Innovex team has not been responsive to our email requests for more information about this. Also, their website seems to be frequently down.

## Inhemeter

We were not about to get a demo or even an order for meters out of this company. Their meters are known to be good quality but I think they are not interested in working with us because we are a small new company.

## GxF by LF energy

This project is actually a macrogrid OS that currently still being open sourced. A number of key components like the GUI for smart metering is not yet open sourced. It is worth watching because it has potential to run for a microgrid because it has smart metering and public lighting capabilities.

## MicroPowerManager

This one looks very promising. Open source and field tested. I think it's ripe for us to take to production and prove it out. It also has an associated battery management capability which makes this community seem like a good fit for NFE.

## Hyphae by LF Energy

I think Hyphae has a bold vision for an autonomous microgrid. It currently only has peer to peer battery power interchange capabilities and no metering. Also not yet field tested but has some simulation capabilities.

# GxF Platform Evaluation

## Overview

GxF is an opensource platform (set of capabilities; metering, public lighting) for distribution of power on a grid. It is currently being used by and was donated to the open source community by a Dutch utility company called Alliander.

## Links

Here's some useful links from my discovery work on GxF

- [Understanding it's capabilities](#)
- [Official docs](#)
- [Video Overview](#)
- [GxF on M1 Mac](#)
- [Microgrid Management Software](#)

## Next Steps

Continue deployment to digital ocean VM

- Start by reviewing all [these packages](#) and understanding which ones you want to deploy or explore whether it makes more sense to rebuild the latest release and deploy packages from that.
- To run the GXF (Grid eXchange Fabric) platform, you generally need only a subset of the packages published in the OSGP GitHub organization—specifically, those that are direct dependencies for the platform's core services and adapters.
- GXF is a modular system, and the required packages depend on your deployment goals. Commonly, the following package types are used:
- Core Platform Packages - These include the main server components, messaging infrastructure, shared libraries, and authentication modules.
  - Protocol Adapters - Depending on your use case, you'll need the adapters that communicate with your field devices (e.g., OSLP, DLMS, IEC61850).
  - Domain and WS Adapters - These provide domain-specific logic and web service endpoints (e.g., smart metering, microgrids, public lighting).
  - Shared Utilities - Supporting packages shared between multiple modules.

Steps to Determine Required Packages

- Review the GxP Deployment Documentation: The official [GxP deployment guide](https://github.com/OSGP/open-smart-grid-platformdocumentation) lists the core components and adapters you need to deploy for a standard platform.
- Match Packages to Components: Identify which packages correspond to those components (e.g., "osgp-adapter-domain-smart-metering", "osgp-adapter-ws-publiclighting", etc.).

Focus on Smart metering Use Case: One of the maintainers tells the application's current design allows you to deploy only the smart metering components, along with some core GxP components. You'll need the following components for smart metering:

- core GxP components:
  - osgp-adapter-domain-admin
  - osgp-adapter-domain-core
  - osgp-adapter-ws-admin
  - osgp-adapter-ws-core
  - osgp-core
  - osgp-logging
- Smart metering specific components
  - osgp-adapter-domain-smartmetering
  - osgp-adapter-ws-smartmetering
  - osgp-protocol-adapter-dlms
  - osgp-throttling-service
  - osgp-secret-management
- Smart metering simulator
  - osgp-simulator-dlms-triggered
  - dlms-device-simulator-starter

These components do not contain any user interface but provide a SOAP interface for communication with the GxP platform. The user interface is currently not part of the open-source implementation.

- We could set up RESTful APIs and build a GUI we can use and contribute back to the community or we can also try to build a UI from the SOAP API available. Open to either, I don't know how much we can do with API only if we don't have a GUI.

## Historical Context

From Sander (Maintainer). I recommend you join the [project mailing list](#), introduce yourself (I already did) and use it to ask questions along the way.. I have found it very useful and Sander is very helpful in responding there.

“ We are currently in the process of creating an open-source containerized solution for deploying and testing GxP. With this solution it will be possible to run GxP locally in k3d - a lightweight wrapper to run k3s (a minimal Kubernetes distribution) in docker - and to run automated tests using cucumber. For this you

will need at least 32 GB of RAM, 64 GB is preferable. The solution can be found here: <https://github.com/OSGP/gxf-gitops>. Container images can be found in [https://github.com/orgs/OSGP/packages?repo\\_name=open-smart-grid-platform](https://github.com/orgs/OSGP/packages?repo_name=open-smart-grid-platform). Currently the gxf-gitops repository only contains the charts to deploy and test our flexible public lighting solution. The deployment of our smart metering solution is still work in progress.

As a side note, I would like to mention that the current smart metering implementation is specifically tailored to the Dutch market, so it would probably need several changes to make it operable outside of the Netherlands.

In the past we also used to have a distinct microgrids solution available, but as it was no longer used, we removed it from our codebase. However, the old microgrids components can still be found in the GitHub history:

- <https://github.com/OSGP/open-smart-grid-platform/tree/release-5.28.0/osgp/platform/osgp-adapter-domain-microgrids>
- <https://github.com/OSGP/open-smart-grid-platform/tree/release-5.28.0/osgp/platform/osgp-adapter-ws-microgrids>
- <https://github.com/OSGP/open-smart-grid-platform/tree/release-5.28.0/osgp/protocol-adapter-iec61850>
- <https://github.com/OSGP/open-smart-grid-platform/tree/release-5.28.0/integration-tests/cucumber-tests-platform-microgrids>

but they will require some serious dusting off to make them usable again.

# Microgrid Design with OpenSolar

We have an OpenSolar NFE account, reach out to [aaron.tushabe@nearlyfreeenergy.com](mailto:aaron.tushabe@nearlyfreeenergy.com) for an invite.

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# Target Architecture

