



TAC Meeting

12 October 2021

Antitrust Policy Notice

Linux Foundation meetings involve participation by industry competitors, and it is the intention of the Linux Foundation to conduct all of its activities in accordance with applicable antitrust and competition laws. It is therefore extremely important that attendees adhere to meeting agendas, and be aware of, and not participate in, any activities that are prohibited under applicable US state, federal or foreign antitrust and competition laws.

Examples of types of actions that are prohibited at Linux Foundation meetings and in connection with Linux Foundation activities are described in the Linux Foundation Antitrust Policy available at <http://www.linuxfoundation.org/antitrust-policy>. If you have questions about these matters, please contact your company counsel, or if you are a member of the Linux Foundation, feel free to contact Andrew Updegrove of the firm of Gesmer Updegrove LLP, which provides legal counsel to the Linux Foundation.

TAC Voting Members

New members in **bold**

Full Name	Account Name	Appointed By
Boris DOLLEY	RTE (Reseau de Transport dElectricite)	Vote of TSC Committee - OperatorFabric
Anne Tilloy	RTE (Reseau de Transport dElectricite)	Vote of TSC Committee - PowSyBl
Carmen Best	Recurve	Vote of TSC Committee - OpenEEmeter
Arjan Stam	Alliander	Membership Entitlement
Jonas van den Bogaard	Alliander	Vote of TSC Committee - GXF
Benoît Jeanson	RTE (Reseau de Transport dElectricite)	Membership Entitlement
Antonello Monti	RWTH Aachen University	Vote of TSC Committee - SOGNO

LF Energy Hosted Project Leads

Changes in **bold**

Project	Project Lead(s)
PowSyBl	Anne Tilloy, RTE
OperatorFabric	Boris Dolley, RTE
OpenEEmeter	Carmen Best, Recurve
GXF	Jonas van den Bogaard, Alliander
SOGNO	Antonello Monti, RWTH Aachen University
EM2	none
CoMPAS	Frederic Fouseret, RTE
FledgePOWER	Akli Rahmoun, RTE
Hyphae	Kotaro Jinushi, Sony ESL
openLEADR	Lonneke Driessen & Stan Janssen, OpenADR
SEAPATH	Eloi Bail, Savoir-faire Linux
Grid Capacity Map	none
Shapeshifter	Jelle Wijnja, Alliander

Agenda

Opening (5 Minutes)

- **Summary of last TAC meeting & Updates from the Board Meeting**
- **Upcoming community meetings of interest**
- **Landscape updates**

TAC Business (80 Minutes)

- EVerest project proposal
- GXF annual review
- Green Energy DataHub project proposal
- OpenEEMeter/EM2 annual review

Closing and next meeting (5 Minutes)

Summary of last TAC meeting

- Meeting notes and deck at

[https://wiki.lfenergy.org/display/HOME/Technical+Advisory+Council#
TechnicalAdvisoryCouncil-MeetingMinutes](https://wiki.lfenergy.org/display/HOME/Technical+Advisory+Council#TechnicalAdvisoryCouncil-MeetingMinutes)

Updates from the Board

Upcoming community meetings of interest

- If interested in participating in Security WG meetings, please joining the mailing list at <https://lists.lfenergy.org/g/security>
- CI/CD working group meeting - plan for next Tuesday, October 19th, 2021 at 8:00 am US Pacific Time/11:00 am US Eastern Time/ 5:00pm CET.
 - Details of work so far at
<https://wiki.lfenergy.org/pages/viewpage.action?pageId=18311586>
 - Mailing list at <https://lists.lfenergy.org/g/cicd> with meeting invites.
- Please share others!

Landscape now with more project info!

We are using the LF Energy Landscape to showcase more project information:

- Mailing List/Slack Channel
- LFX Insights
- SBOM
- Wiki
- TSC Meeting Notes
- Calendar
- Contribution Guidelines



Crunchbase	more... total: 52	crunchbase.com/organization/lf-energy
LinkedIn		linkedin.com/company/lf-energy
Twitter	@LFE_Foundation	Latest Tweet this week
First Commit	5 years ago	Latest Commit 3 weeks ago
Contributors	35	Headcount 1-10
Headquarters	San Francisco, California	
Mailing List		https://lists.lfenergy.org/g/sogno-discussion
Slack Channel		#sogno
LFX Insights		https://insights.lfx.linuxfoundation.org/projects/lfenergy%2Fsogno
Wiki Page		https://wiki.lfenergy.org/display/HOME/SOGNO
SBOM		https://github.com/lfsclanning/spdx-lfenergy/tree/main/sogno
TSC Meeting Notes		https://github.com/sogno-platform/tsc/tree/master/tsc/meetings
Calendar		https://lists.lfenergy.org/g/sogno-tsc/calendar
Contribution Guidelines		https://github.com/sogno-platform/tsc/blob/master/CONTRIBUTING.md

ACTION: Project leads please review your entry and ensure it is accurate; issue PR for any changes needed.

Agenda

Opening (5 Minutes)

- Summary of last TAC meeting & Updates from the Board Meeting
- Upcoming community meetings of interest
- Landscape updates

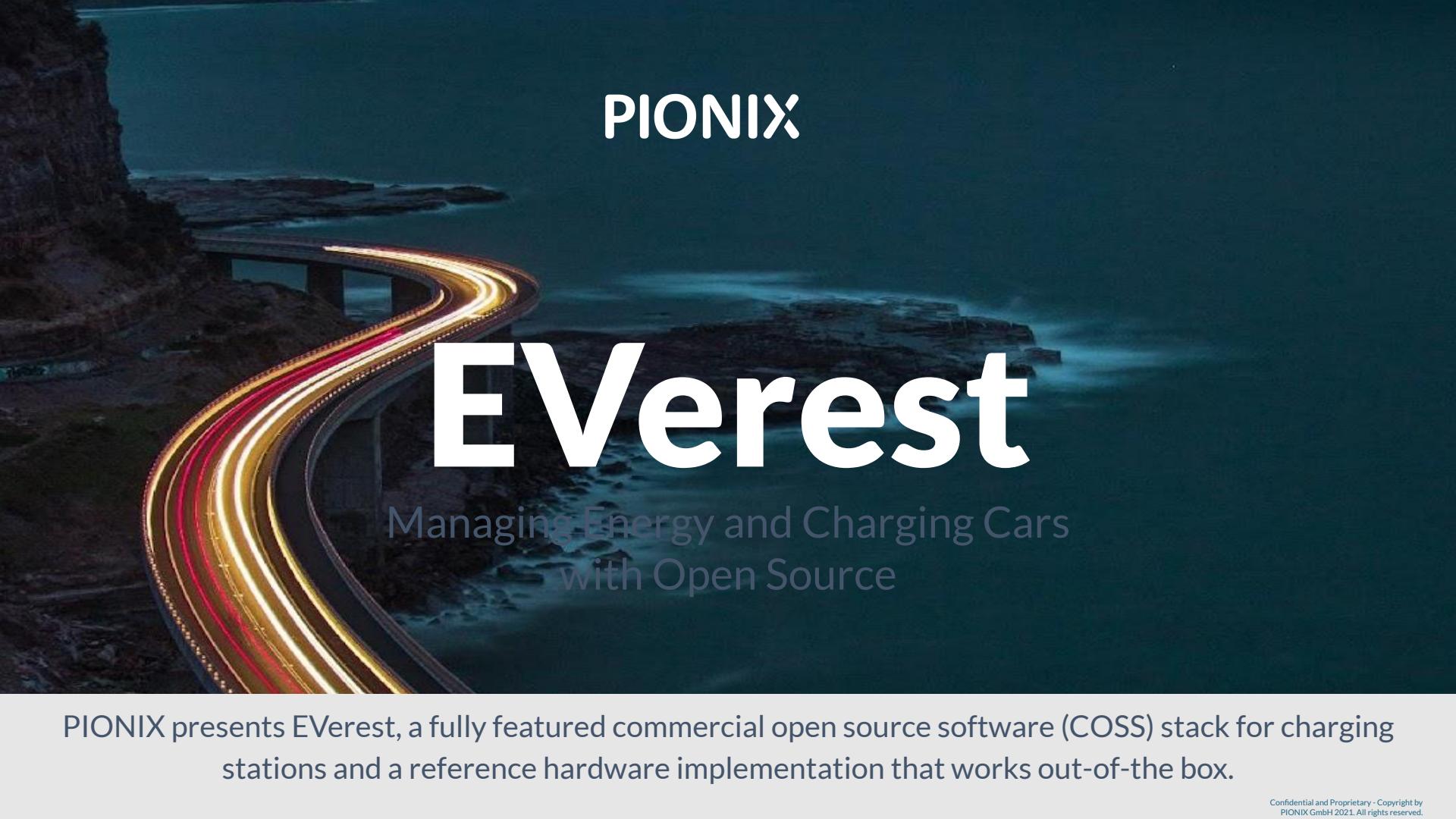
TAC Business (80 Minutes)

- **EVerest project proposal**
- **GXF annual review**
- **Green Energy DataHub project proposal**
- **OpenEEMeter/EM2 annual review**

Closing and next meeting (5 Minutes)

EVerest project proposal



The background of the slide features a coastal road at night, with the headlights and streetlights creating long, glowing streaks of light that curve along the road. The road leads towards a bright horizon over a dark, choppy sea under a dark, cloudy sky.

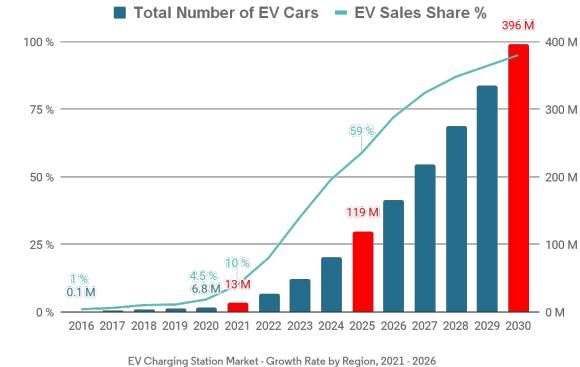
PIONIX

EVerest

Managing Energy and Charging Cars
with Open Source

PIONIX presents EVerest, a fully featured commercial open source software (COSS) stack for charging stations and a reference hardware implementation that works out-of-the box.

>Soon All Global Annually Sold 75 Mio. Cars Will Be Electric... ...and for Every Car ~1.2 Chargers Are Needed

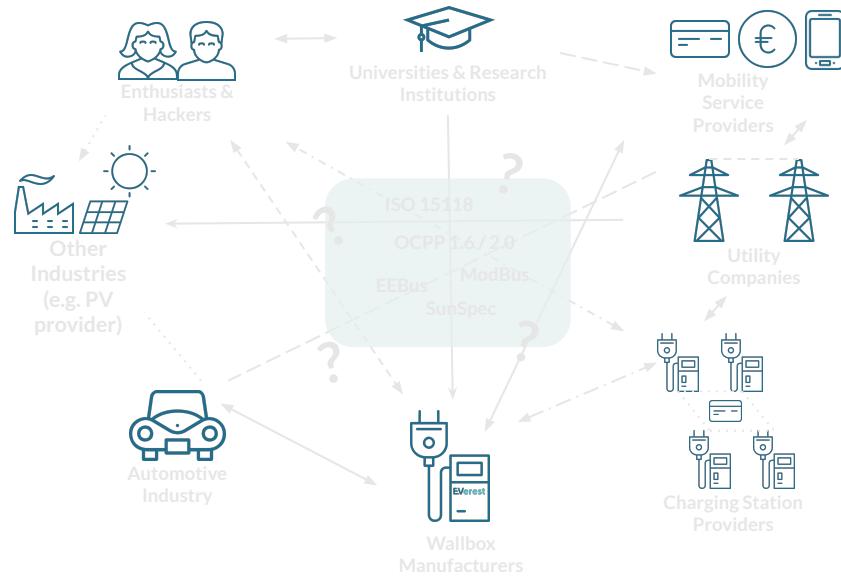




No De-facto standards and too many links:

- **High Fault-Rate**
- **Expensive & slow development**
- **Complex mechanisms to proliferate innovations**
- **Market fragmentation**

Customers and Industry suffering



>We Empower The Ecosystem With a Community & Services

Charging Station Providers



- Future proof through SW update path
- Reliable through broad testing by community
- Easy extensibility & customization through open source

Wallbox Manufacturers



- Focus on USP features & reduce Time2Market
- Avoid integration problems and decrease costs
- Avoid vendor lock-in

Automotive Industry



- Tests new models on unified ecosystem
- Easy & fast roll-out of new features
- Single point to demand/push infrastructure innovations

Utility Companies



- SW for bidirectional dynamic charging
- Single entry point for edge control & innovation

Mobility Service Providers



- Can build new services on top of widely adopted solution
- Fast rollout to existing network

Universities & Research Institutions

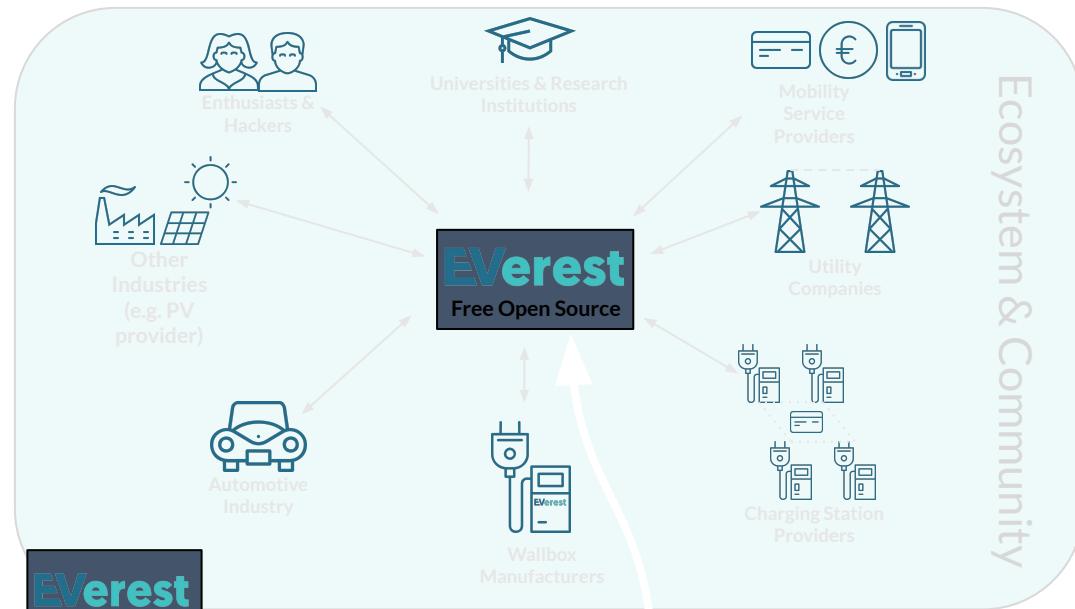


- Researched features can be easily adopted for mass market
- Technology base layer for research

Other Industries



- HW Independent
- No vendor lock-in
- Access to technology base layer



Pionix Updates & Integration Services

Payment for upgrades, updates, support and integration

PIONIX

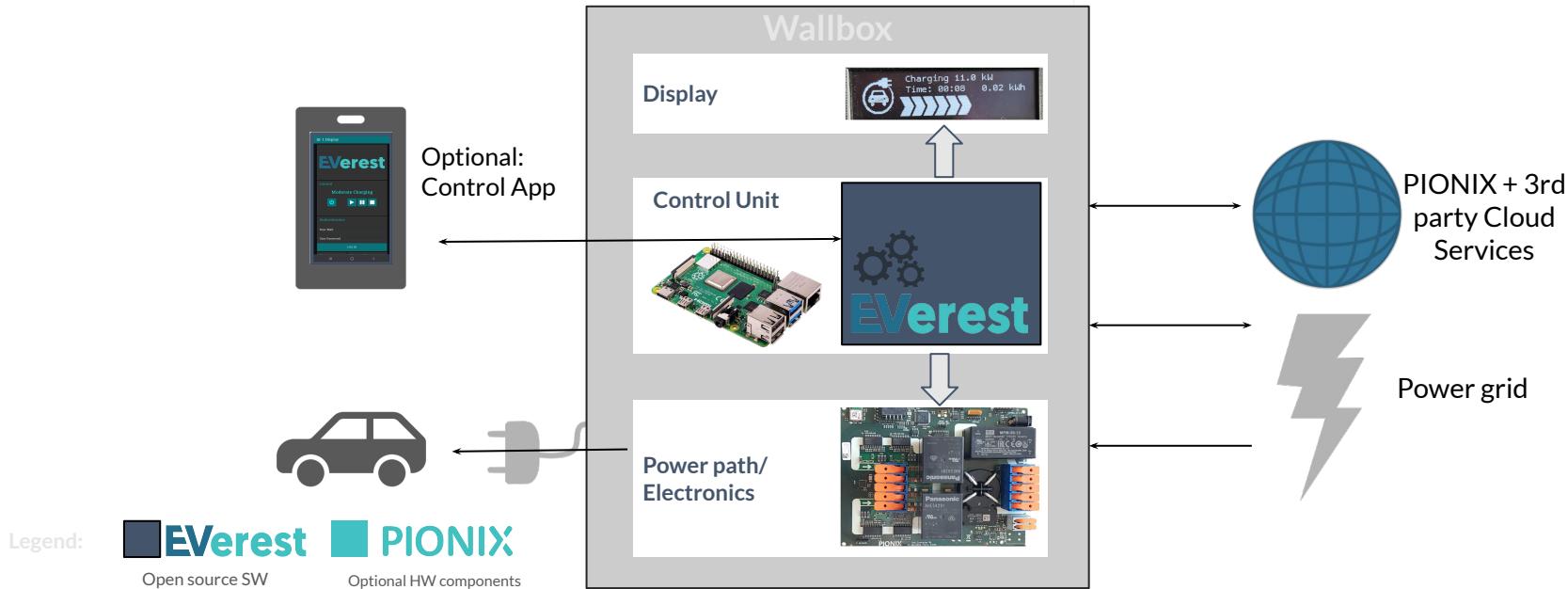
Initializing & Coordinating
Community

PIONIX Hardware

Payment per unit sold and setup fee

>How EVerest Works

EVerest runs on charging stations and wallboxes and connects them to the world, building an ecosystem



>Competition - Filling the Gap

	EVerest	 openWB die modulare Wallbox  OpenEVSE	 BENDER  PHOENIX CONTACT  ABB	 V2G [®] CLARITY
Agile, Innovative, Extendable	++	++	--	 no community: GPL + commercial dual Licence
Commercial Features	++	e.g. GPL Licence	++	++

Why us? - The only fully featured **open source e-mobility solution** that addresses the needs of **every player** in the e-mobility world.

>The Founders



Cornelius Claussen (*1982)

Dipl. Physicist

"I feel at home with the whole range of technology. I love exploring new technologies, thinking them through in detail and revolutionizing traditional solutions using unconventional deep-tech approaches"

Develops: Technical Architecture & Development

Founder: Pionier-Manufaktur, MAVinci, OpenTek

<https://www.linkedin.com/in/cornelius-claussen-b910b4164/>



Dr. Marco Möller (*1982)

Dr. Physics, BSc Informatic, Electronics

"I am a networker through and through and I connect people, ideas, technologies and business. I love to understand things and connections from the ground up and I am never satisfied with off-the-peg knowledge. Living First Principle Thinking in a real way makes me happy."

Boosts: Technical Strategy & Networking

Founder: VetVise, Pionier-Manufaktur, MAVinci, MacroLAB

<https://www.linkedin.com/in/marco-m%C3%BCller-049a1724/>



2016 sold
drone startup to



Johanna Claussen (*1985)

MSc. Physik

"Success is made from the scratch - Loss as well! To combine creativity and innovation fascinates me, channeling those in strategic approaches the right way is what makes the difference."

Responsible: Product & Company Strategy

Founder: Pionier-Manufaktur, MAVinci



<https://www.linkedin.com/in/benjamin-mosler-38b8a7b9/>

Benjamin Mosler (*1989)

Electrical engineer, Business economist, MBA

"Evolve promising ideas into scalable business cases is my passion. I believe that challenging the status quo is the key to identify and realize creative solutions that could be a game changer."

Controls: Business Development & Operations

Founder: Pionier-Manufaktur, Mosler Consulting



<https://www.linkedin.com/in/prof-dr-falko-tappen-09542932/>

Prof. Falko Tappen (*1977)

Prof. Hochschule Worms (Tax)

"I support the team in all questions related to financing, taxes and law. In doing so, I draw on my extensive legal and tax law experience in major international law firms. In this way, optimal arrangements for any entrepreneurial initiative can be implemented from the very beginning."

Navigates: Legal & Finance

Founder: Pionier-Manufaktur, TCS Treuhand Steuerberatungsges.

>Meet Our Team

Managing Directors of PIONIX



Cornelius Claussen
Graduate in Physics



Marco Möller
PhD in Physics
BSc Computer Science



Benjamin Mosler
Electrical engineer
Business economist, MBA



Johanna Claussen
MSc. Physics



Kai-Uwe



Thilo



Leonardo



Tim



Anton



Andreas



Julian

Currently Hiring:

- Devs
- Sales
- Biz Dev
- Marketing



Backoffice



external

Our Advisors:

NEXT MOBILITY LABS

THE COMPANY BUILDER



Felix Wagner
Managing Partner



Armin Bieser
Managing Partner



Romina Reuther
Venture Architect



Dr. Peter Mertens
Former CTO Audi



Thomas Andrae
Serial Founder



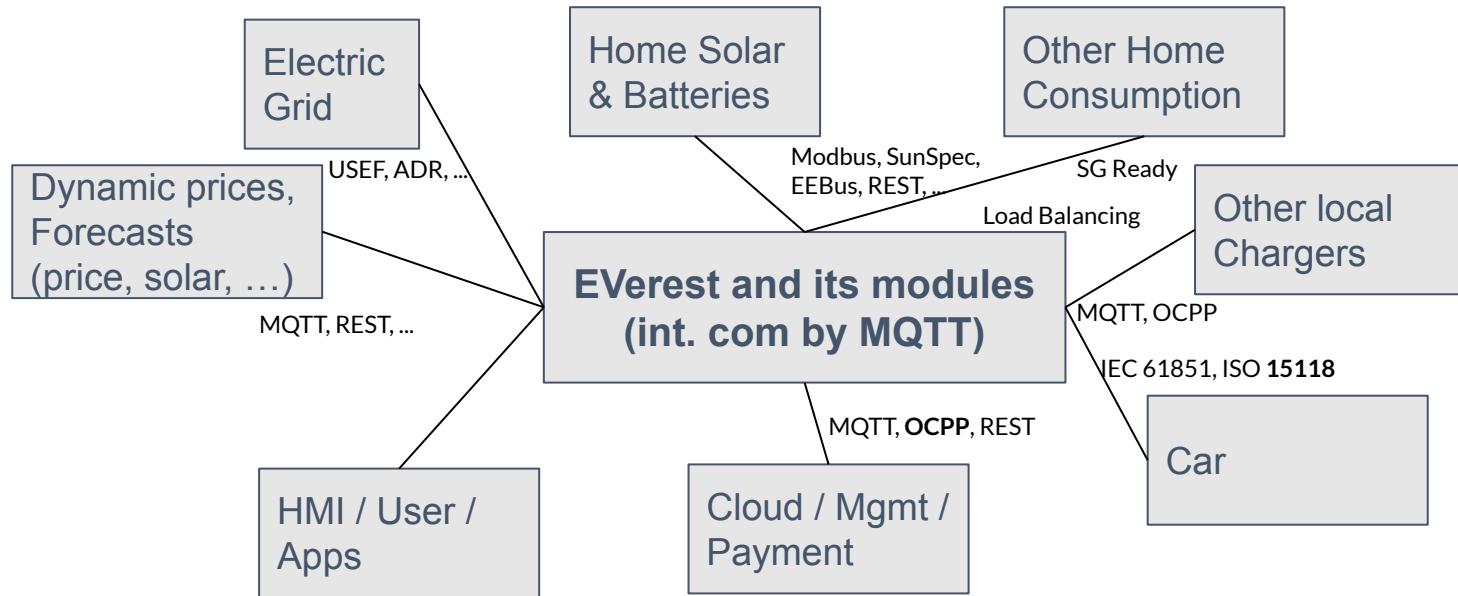
Klaus Entenmann
Former CEO
Daimler Financial Services AG

⇒ Focus on VC driven: fast growth and sustaining open source adoption phase

EVerest Tech

taken from: Nauta Capital, VC company <https://nautacapital.com/open-source-is-eating-europe/>

>EVerest Connects Multiple Energy-Services



EVerest Classes

Framework:

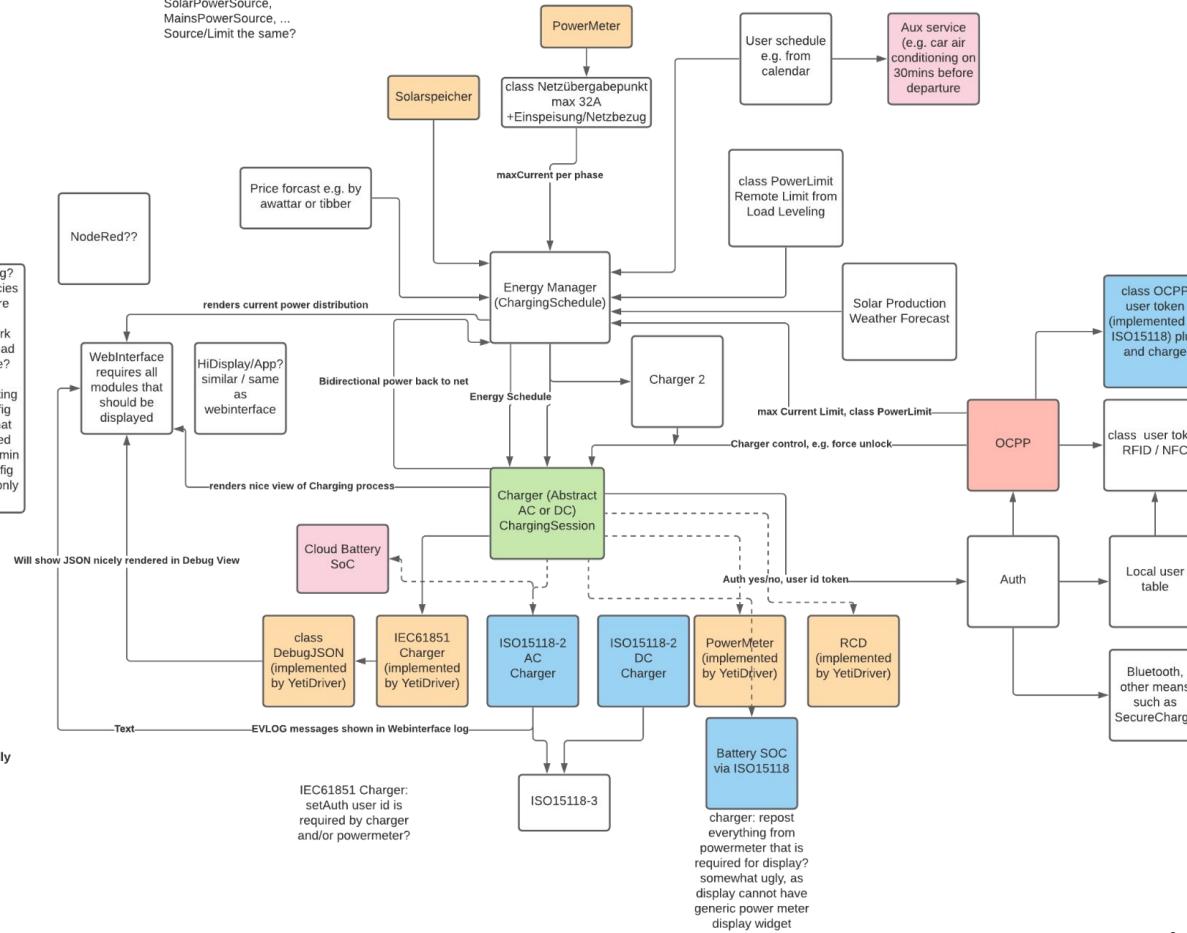
- Requires 1...N of one class, e.g. N powersources, loop over required modules somehow. Maybe also a requires all of certain class (e.g. debugview requires all debugJSON objects)
- config overlays: manufacturer default values in config.json, but user editable overrides in separate file editable by webinterface
- modules subfolder e.g.
- modules/ChargingDrivers/AC/Yeti
- requirement of base class / but specify implementation class in config.json
- enums?
- find out if optional requirement is met?

Or: separate classes for
SolarPowerSource,
MainsPowerSource, ...
Source/Limit the same?

Config options:
1) only in config.json:
Manufacturer of Wallbox / port of
Everest to HW
2) settings for
Electrician / Installation
of Wallbox to the
House
3) user settings:
End user will edit them
from time to time as
they wish

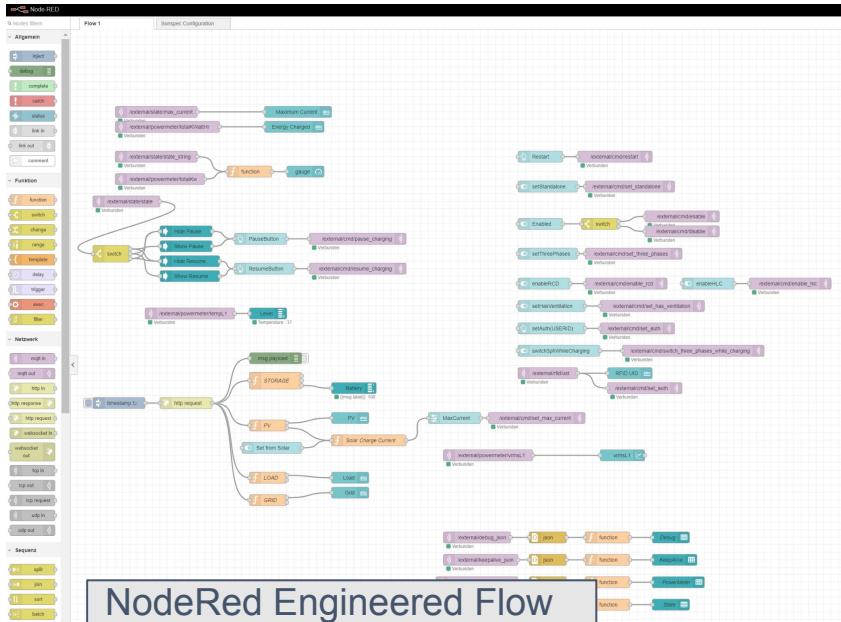
WebConfig?
dependencies
to that are
loaded.
Framework
thing instead
of module?
Allows setting
of all config
options that
are marked
User or Admin
or so. config
json level only
in file?

work in progress
As of 2021-09-29
Confidential / for Pionix internal use only

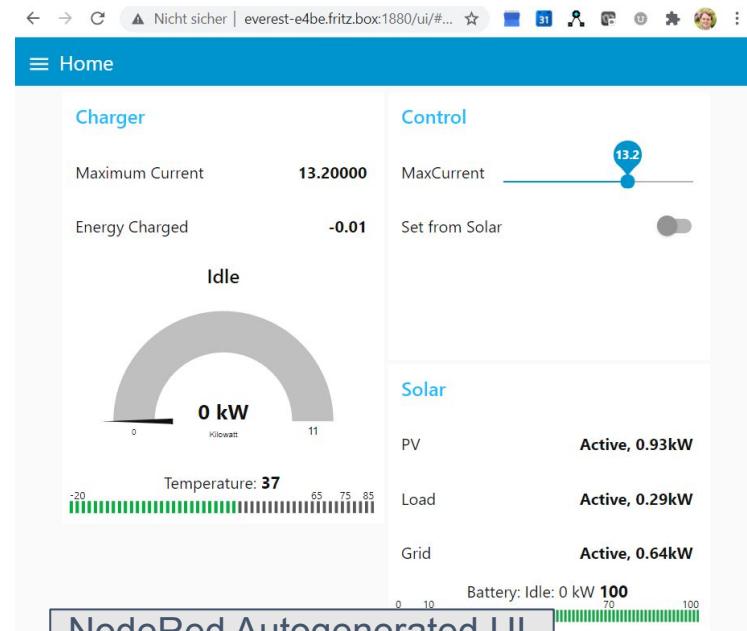


MQTT Based

- Own very flexible module configuration framework
 - **Quick prototyping** via Node Red:



NodeRed Engineered Flow

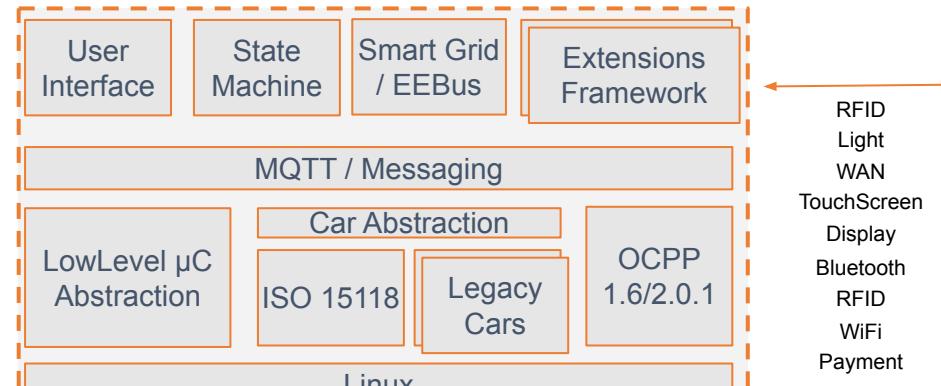


NodeRed Autogenerated UI

Overall Architecture

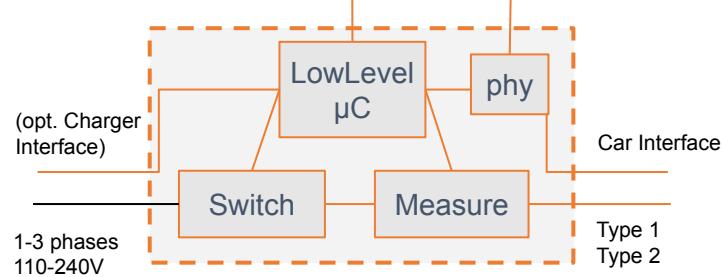
High level Board:

- Complete Open Source Solution (MIT licence)
- Excessively **extensible** & modifiable
- SW also runs on standard HW (e.g. Raspberry Pi) alternatively to Pionix High level Board



Low level Board:

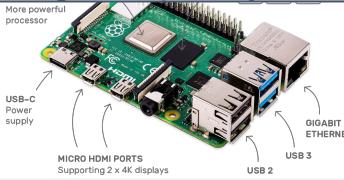
- proprietary code
- commercial Pionix HW
- Certified



>“/dev/box”: Commercial Dev-Kit

- Goal: Marketing for Starting a Developer Community
- Shipping EU+North America ~Q2 2022
- Via crowdfunding platforms Kickstarter / Indiegogo
- Supported by external crowdfunding marketing specialists
- Split into 4 PCBs
 - Energy Board (could act as standalone not so smart charger)
 - Compute Board (Raspberry Pi 4 + ...)
 - 1-2 x Display (compatible with metering law)
 - RFID Antenna

High level: e.g. Raspberry Pi

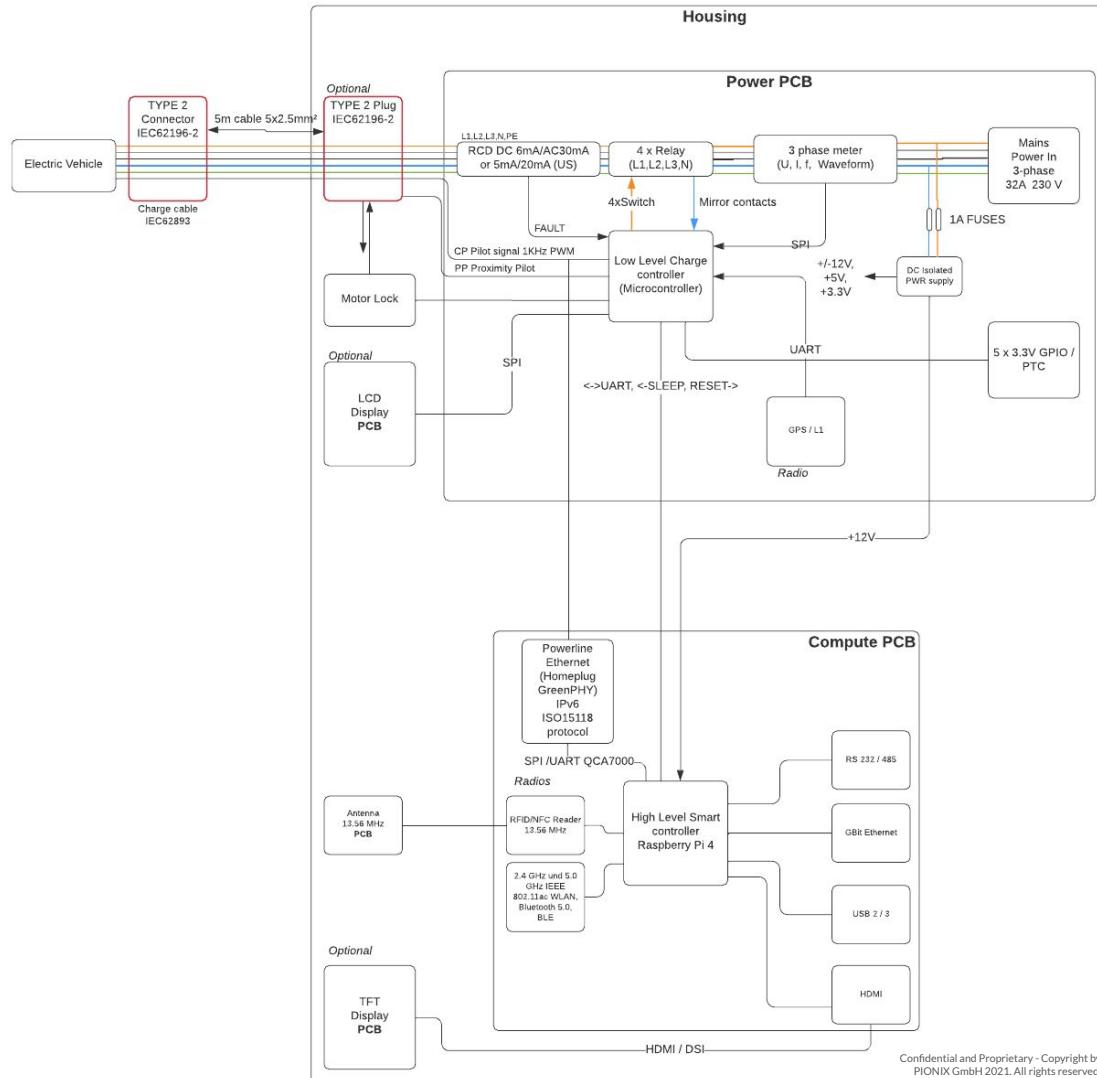


Low level: e.g. Custom Pionix

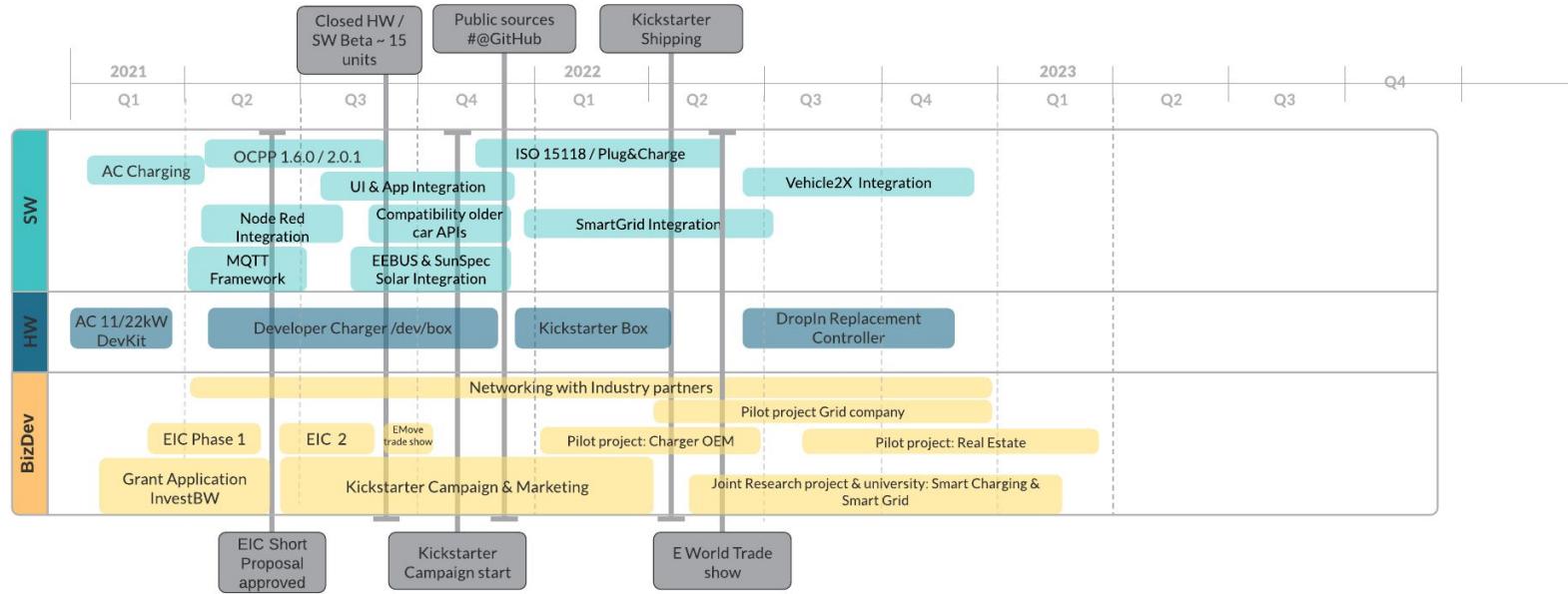


Block Diagram

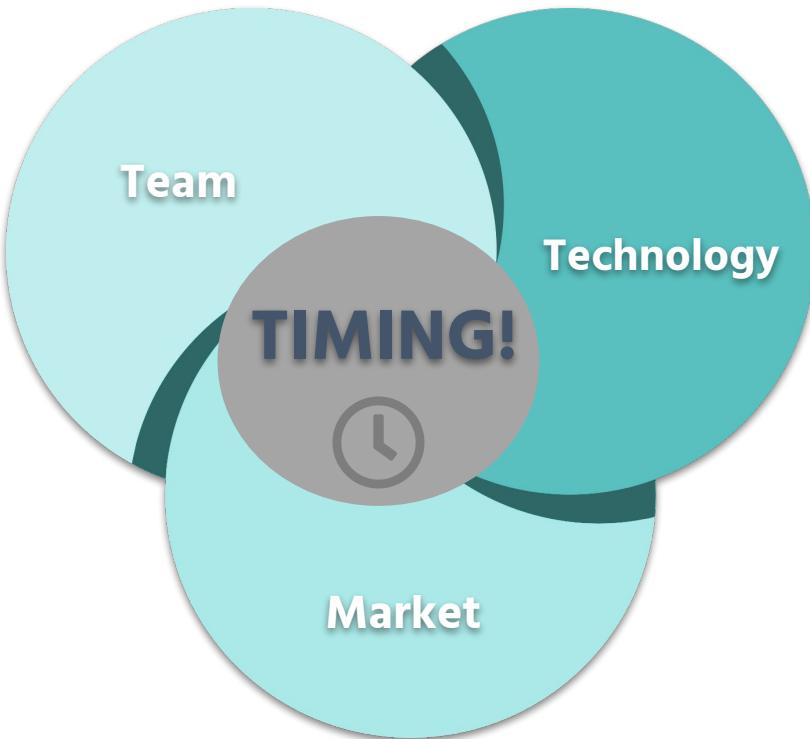
Community Development
Platform “/dev/box” V2



>Timeline



>The Time is Right - One Main Reason for Success



Currently: Industry focussing on **closed source** solutions with many **downsides**

- Huge **growing market demand** for seamless integrated and available technology base layer
- In **many industries** proprietary **software stacks** are **phased out** into a commercially maintained **community open source base**.

With our joint **team experience**, we are spot on to **start this technology transition**

>EVerest is Depending on This Open Source Projects

Project name	Website	Use	License
nlohmann_json	json.nlohmann.me	JSON parsing	MIT
nlohmann_json_schema_validator	github.com/pboettch/json-schema-validator	JSON schema validation	MIT
pal_sigslot	github.com/palacaze/sigslot	Signal capabilities for C++	MIT
MQTT-C	liambindle.ca/MQTT-C	mqtt handling	MIT
date	github.com/HowardHinnant/date	date handling	MIT
Qualcomm Atheros Open Powerline Toolkit	github.com/qca/open-plc-utils	low-level powerline communication	Clear BSD
Boost	www.boost.org	various helper libraries for C++	Boost Software License
RISE V2G	github.com/SwitchEV/RISE-V2G	communication with ISO15118	MIT
Node-Addon-Api	github.com/nodejs/node-addon-api	binding library for node.js	MIT
Node-RED	nodered.org	interface for testing and evaluation	Apache License 2.0
WebSocket++	github.com/zaphoyd/websocketpp	websocket handling	3-Clause BSD
Sqlite3	www.sqlite.org	data persistence	Public Domain

⇒ EVerest is planned to be released under “Apache 2.0”
(but flexible to change to e.g. MIT or BSD)

>Everest Implementing these Standards

Standard / Protocol name	Reference	Use	Terms & Conditions	Status
MODBUS RTU / TCP	www.modbus.org	Communication with solar and other relevant devices	open	implemented
SUNSPEC	www.sunspec.org	Communication with solar and other relevant devices	open	implemented
ISO15118-X	www.iso.org	Vehicle to grid communication interface	doc:closed / implement: ?	preliminary implementation
OCPP 1.6 / 2.0.1	https://www.openchargealliance.org/protocols/ocpp-201/	Chargepoint to cloud communication (admin + payment)	open	in implementation
EEBus	https://www.eebus.org/	Local Energy management	open	implementation research
awattar API	https://www.awattar.de/services/api	Energy Pricing API		implemented
tibber API	https://developer.tibber.com/	Energy Pricing API		implemented
forecast.solar	https://doc.forecast.solar/doku.php	Solar PV forecasting		implemented
MQTT	https://mqtt.org/	IoT communication protocol	open	implemented
ADR	https://www.openadr.org/	flexible grid load mgmt	open	planned
USEF	https://www.usef.energy/	flexible grid load mgmt		planned

› Let's boost
EVerest and LF Energy
together



Marco Möller
CEO / Co-Founder
mm@pionix.de
+49 173 2051706

PIONIX

Pionix GmbH, Am Mühlgarten 8, 76669 Bad Schönenborn, Germany

PIONIX

Appendix

Open-Source in Commercial Business Models

taken from: Nauta Capital, VC company <https://nautacapital.com/open-source-is-eating-europe/>

>IP Strategy

- Collaboration across industry currently happens by **standardization** committees
⇒ **slow & buggy**
- **Collaboration** on the actual product would also provide standardization ⇒ **fast**
- Collaboration only flies with **open source**
- Important: Proper licencing!
- **Scaling & disseminating only by protecting less!**

Licence Option:

Commercial Licence:

 No community building

GPL only:

 All derived work by our clients would need to be published
⇒ Highly avoided in commercial usage

Dual license: GPL + commercial

 Community contributions would become GPL code again, can't be licenced commercially
⇒ Will be avoided by companies

 No community involvement possible ⇒ GPL contributions would not be commercially licenced

MIT / BSD (entirely, or only for core components):

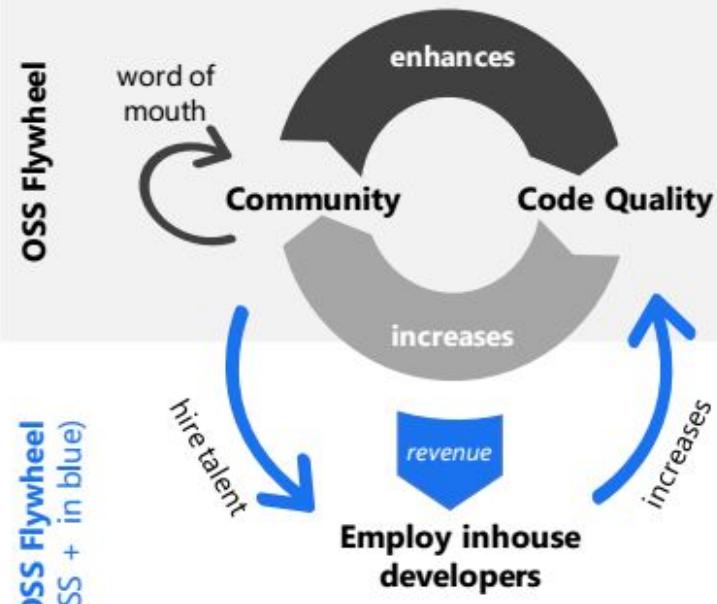
 Community could contribute

 No limitation to commercial usage

 No *direct* protection of Pionix IP
⇒ mitigate by being core of community

The OSS & COSS Flywheel: enabling exceptional business models

Interconnected COSS & OSS flywheels can power exponential, capital-efficient adoption rates and growth



Read: ↑ community > ↑ code quality (contributors & reviews) > ↑ community

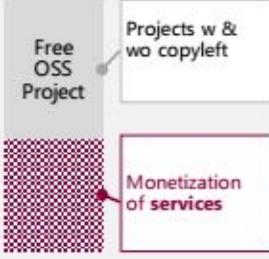
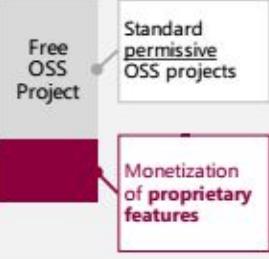
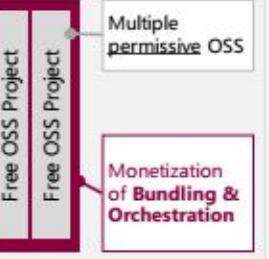
- **Positive sum game & network effects:** Additional users enhance the value for the entire community through higher code quality.
- **Open code = downstream virality opportunity:** Integrating OSS project code blocks into other projects increases the audience = pot. new users.
- Exceptional **software quality:** Instant feedback, reviews and decentralized feedback shorten time-to-market.
- **Community growth:** High level of word of mouth among peers
- OSS is seen as a "**trust brand**" due to decentralized development.

Read: hire inhouse developer > ↑ code quality; ↑ community > ↑ talent acquisition

- **Reinforcing the OSS cycle:** Inhouse developer increase the quality of the code base and additionally fuel the code quality <> community cycle.
- **Bottom-up sales:** Fast and cheap client acquisition due to community adoption.
- **Superior talent acquisition:** COSS companies have superior access to talent from the open-source community.
- **Low R&D costs:** Due to community feedback, short time-to-market (fast feedback) and decentralized development, less R&D costs are required.

Monetization strategy for the commercialization of OSS

Five different, yet often combined options to successfully commercialize Open Source

	Services	Open Core	Multi-Licensing	
Free OSS vs. paid:	<p>Free OSS Project</p> <p>Projects w & wo copyleft</p>  <p>Monetization of services</p>	<p>Free OSS Project</p> <p>Standard permissive OSS projects</p>  <p>Monetization of proprietary features</p>	<p>Free OSS Project</p> <p>Standard permissive OSS projects</p>  <p>Monetization of Hosting / SaaS</p>	<p>Multiple permissive OSS</p>  <p>Monetization of Bundling & Orchestration</p>
Description	Services incl. SLA, support etc. (can be recurring)	Various degrees of free OSS vs. proprietary	Hosting-as-a-service	Combination of multi-vendor OSS projects
Challenges	Scalability problems Potential conflict of support vs. code quality	Dual focus needed for: <ul style="list-style-type: none">- Product-market fit- Code basis Deciding which features to include in free core	Risk of "forking" from cloud providers if offered without additional lock-in (see elastic search)	Defensibility, if layer of orchestration is too small
Examples (of the primary revenue source)	       	   	   	   



>PIONIX Will Fix The Ecosystem

EVerest is the software that powers charging stations and wallboxes and offers a unified base layer

It is:

- A Open Source Software Stack
- Targeting Commercial Applications
- Fully Featured
- Extendable & Customizable
- Setting De-Facto Standards
- Running on Most Hardware
- Fast & Innovative
- Empowering Stakeholders
- Developed and Maintained by PIONIX and a Growing Community



EVerest is NOT:

- Another Wallbox
- A Charging Provider
- A Payment Service
- A Cloud Service
- Vendor-Dependent
- Costly
- Proprietary



Transformed Many Industries

Industry focussing on **closed source** solutions with many **downsides**.



Proprietary Solution
everyone develops on his own, many downsides

Huge growing market demand for seamless integrated and available technology base layer.



Standardization
everyone develops the same, but align how

In many industries proprietary software stacks are phased out into a commercial **open source** software (COSS) community



EVerest
We will be the driver of this disruption in the EV industry

Shortens development • Reviewed by many developers • Distributed community testing
Avoids vendor lock in • Utilization of external contributions • Saves up to 55% costs

>Market Opportunity

Global warming is driving market growth

Growing environmental concerns and rising demand for sustainable transportation

Global infrastructure



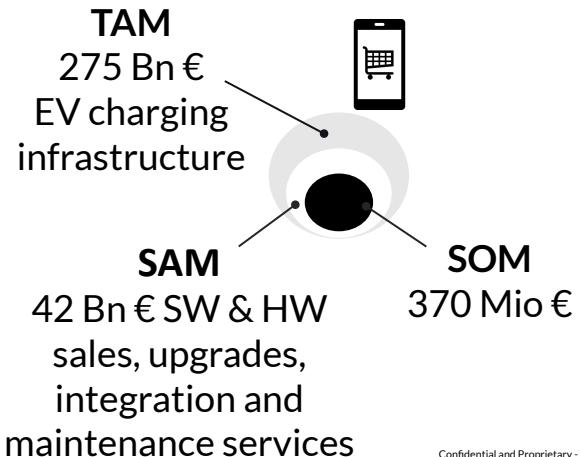
400 M cars
480 M EV charging
points by 2030

Global electric vehicle charging station market



113.2 B € by 2027
46.6% CAGR

Markets by 2030



GXF annual review



LF Energy TAC meeting 2021:

Grid eXchange Fabric Annual review



Maarten Mulder, Robert Tusveld – Alliander – 12 october 2021

alliander

Grid eXchange Fabric



Brief Description:

Grid eXchange Fabric (GXF) is a software platform that enables hardware monitoring and control in the public space. GXF provides several functions out of the box and provides scalability & high availability, high security, a generic design, and no vendor lock-in. GXF is currently deployed in several public use cases, including microgrids, smart metering, public lighting, and distribution automation..

Current stage: Early Adoption and we are not aiming for the Graduated stage for this review.

Contributed by:

Alliander

TSC Chairperson:

Robert Tusveld <Robert.Tusveld@alliander.com>

TSC Members and Affiliations:

Maarten Mulder - Product Owner

Robert Tusveld - Lead Architect - Chairman

Paul Houtman - Lead Architect

Kevin Smeets - Maintainer

LF Energy TAC member – Jonas van den Bogaard (a.i.)

Key links



Github: <https://github.com/OSGP>

Website: <https://www.lfenergy.org/projects/gxf/>

Wiki: <https://wiki.lfenergy.org/display/HOME/Grid+eXchange+Fabric+-+GXF>

Technical documentation: <https://grid-exchange-fabric.gitbook.io/gxf/>

Webinar: <https://www.youtube.com/watch?v=zH9CdMH0tUM>

Mailing lists: [GXF-general](#)

CII Badge URL: <https://bestpractices.coreinfrastructure.org/en/projects/4104>

Agenda

- Current activities
- Assessment
- Roadmap
- Feedback on its experience as an LF Energy project

alliander

 **GRID EXCHANGE FABRIC**



Current activities

include releases, adoption, and committer/contribution growth and diversity



- Releases for Public Lighting

- Light metering
- Connection with corporate API
- CMDB connection via Kafka

Releases for Low Voltage Measurements

- MQTT adaptor implementation South
- Kafka adaptor North
- Dockerization of GXF
- Openshift implementation

Releases for Smart Meter Head End

- Development DLMS protocol adapter
- Stabilizing GXF

Grid Exchange Fabric (GXF)

Grid eXchange Fabric (GXF) is a software platform that enables hardware monitoring and control in the public space. GXF provides several functions out of the box and provides scalability & high availability, high security, a generic design, and no vendor lock-in. GXF is currently deployed in several public use cases, including microgrids, smart metering, public lighting, and distribution automation.

22.97K
Commits



11
Repositories

946.79K
Lines Of Code

10.65K
Pull Requests / Changesets

1.47K
Builds

3
Emails

No Data
Earned Media Mentions

2.03K
Total Issues

No Data
Messages

No Data
Documents

No Data
Registry

- The project is in control of issue
- Stable contributors
- Continuous flow of commits

Alliander Use-cases



20.000 devices in production

200.000 devices
and scaling up to
6.000.000 meters

250 devices in a
new DA chain via
MQTT

Public Lighting



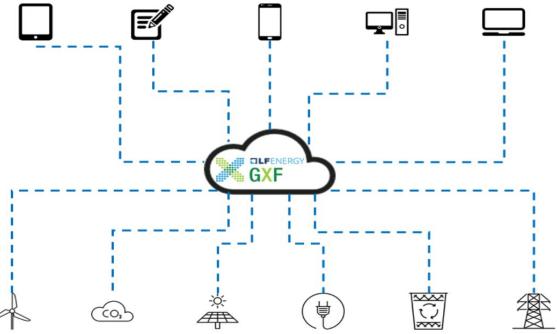
Smart Metering



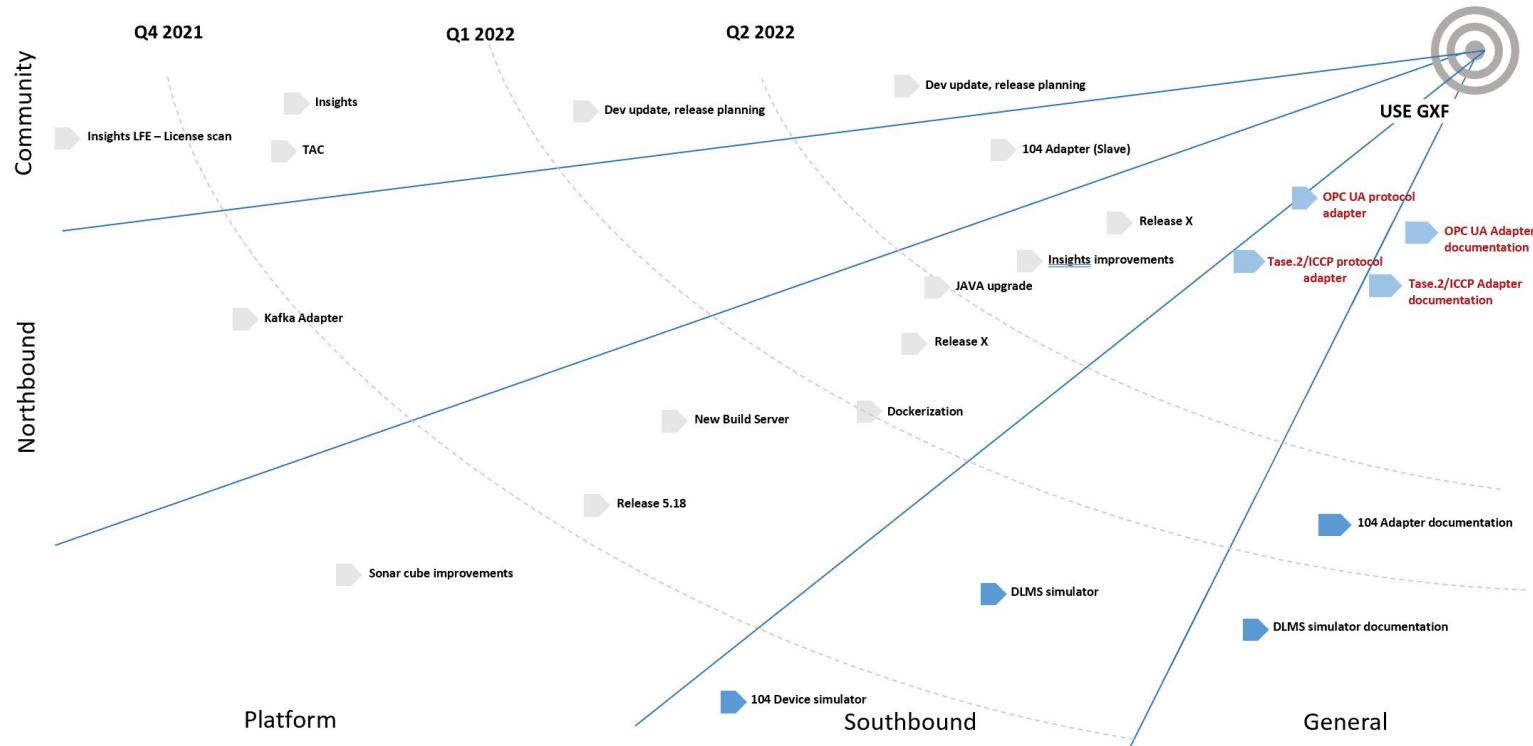
Low Voltage Measurements



Overview



Roadmap GXF



Assessment

Graduated stage



Current stage: Early Adoption and we are not aiming for the Graduated stage for now.

To graduate to Graduated status, a project must meet the Early Adoption stage criteria plus:

Have a defined governing body of at least 5 or more members (owners and core maintainers), of which no more than 1/3 is affiliated with the same employer. In the case there are 5 governing members, 2 may be from the same employer.

Our TSC currently has 4 voting members: Robert Tusveld - Architect – Chairman, Paul Houtman - Lead Architect, Kevin Smeets – Maintainer, LF Energy TAC member – Jonas van den Bogaard (a.i.)

Have fulfilled or are on track to complete the growth plan defined in the Early Adoption stage proposal.

No, we have to formally define a growth plan.

Have a healthy number of contributions or committers from at least three organizations, with any single organization not composing more than 50% of the contributions or committers. Committers must be identified within the project in a COMMITTERS file.

We have commits from some external contributors, but Alliander still makes up over 90 % of the contributions. No COMMITTERS file.

Have a public list of project adopters for at least the primary repo (e.g., ADOPTERS.md or logos on the project website).

Yes, see: <https://wiki.lfenergy.org/display/HOME/GXF+Usage+in+Real-World+Applications>

Achievement of the Core Infrastructure Initiative Best Practices badge at the Gold level.

Badge at Passing level

Feedback on its experience as an LF Energy project



Discussions

- Internal discussion about availability of resources and time for LFE activities
- Possibility to have cooperation with the DSO in the Netherlands through LFE
- Closed source applications at Alliander

Positive feedback

- Insights dashboards
- LFE wiki
- Support for the project

License Scan report

Project: lfenergy
Subproject: gxf
Snapshot on: 2021-09-24 (show repos)

Key findings:

Finding #1
Priority: **High**
This repo contains one or more other files with compiled binary / object code. We would strongly recommend pulling in dependencies at build-time rather than distributing them in the source repos. Or, if they contain the project's own compiled binary / object code, we would not recommend distributing them within the source code repo itself, and instead configuring to compile it at build time.
[153 files](#) (show files)

Finding #2
Priority: **High**
This README file refers to jDLMS, a project licensed under GPLv3. Is any jDLMS code incorporated into the repo? Even if jDLMS exists separately, we may need to discuss code in the repo which interfaces with jDLMS.
[2 files](#) (show files)

Finding #3
Priority: **Medium**
This file indicates that it is under the OpenSSL license, which includes an "advertising clause" requirement. Is it possible to remove these from the repo?
[2 files](#) (show files)

Questions

Thank you for your interest in the Grid eXchange Fabric



Green Energy DataHub project proposal



GREEN ENERGY HUB





WHY?

GREEN ENERGY FOR A BETTER WORLD



WE SEE AN OPPORTUNITY TO ACCELERATE
INNOVATION, QUALITY AND PACE OF DEVELOPMENT
THROUGH OPEN COLLABORATIONS

- . BY SETTING ENERGY DATA FREE WE CAN SUPPORT THE GREEN TRANSITION GLOBALLY
- . AN OPEN SOURCE DATAHUB CAN CONTRIBUTE TO SOLVE THE GREEN TRANSITION



WHAT?

. A PLATFORM TO SUPPORT THE MARKET
DRIVEN PROCESSES

. A TOOL FOR SHARING ENERGY DATA

CORE UTILITIES WE NEED TO SOLVE IN THE DANISH MARKET



Meter Data Management



Metering Point Management



Consumer Management



Business Process



Market Roles



Charges

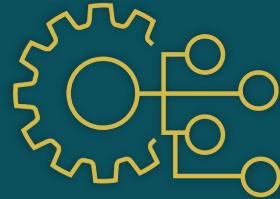
Billing & Settlement

Data Access



SUPPORTING MARKET PROCESSES BASED ON THE COMING CIM-STANDARD

- . ALL INTERNAL AND EXTERNAL MESSAGES ARE BASED ON THE CIM HARMONIZED ROLE MODEL
- . PROCESSES ARE BASED ON CIM USE CASES LIKE: RequestMoveIn, RequestMoveOut



HOW?

A CLOUD BASED PLATFORM THAT SUPPORTS SMALL AND LARGE MARKETS

MICRO SERVICE LANDSCAPE

AZURE

THE MOST IMPORTANT MICRO SERVICES



EVENT DRIVEN DESIGN

COMBINED DATASET
FOR ANALYSIS AND
DATA SHARING:
**SETTING DATA
FREE**

METERING

POINTS

PROCESS
MANAGEMENT
FOR CREATING
AND UPDATING
METER
INFORMATION

MARKET ROLES

SUPPLIER AND
CUSTOMER
INFORMATION
ON METERS:
. MOVE IN/OUT
. CHANGE SUPPLIER

CHARGES

HANDLING:
. FEES
. SUBSCRIPTIONS
. PRICES

TIMESERIES

RETRIEVAL OF
TIMESERIES IN 5
MINUTES
RESOLUTION
FOR 38 MIO.
METERS

AGGREGATIONS

CALCULATES
AGGREGATED
VALUES FOR
BILLING AND
CONSUMPTION

THE BASIC MICRO SERVICES

EVENT DRIVEN DESIGN



METERING

POINTS

PROCESS
MANAGEMENT
FOR CREATING
AND UPDATING
METER
INFORMATION

MARKET ROLES

SUPPLIER AND
CUSTOMER
INFORMATION
ON METERS:
. MOVE IN/OUT
. CHANGE SUPPLIER

TIMESERIES

RETRIEVAL OF
TIMESERIES IN 5
MINUTES
RESOLUTION
FOR 38 MIO.
METERS

COMBINED DATASET
FOR ANALYSIS AND
DATA SHARING:
**SETTING DATA
FREE**

DESIGN GOALS

- AZURE IS OUR PLATFORM (FOR NOW)

. BUILD FOR THE CLOUD WITH CLOUD SERVERLESS SERVICES

- . LESS MAINTENANCE WORK WITH SERVER PATCHING AND UPDATES
- . NO NEED FOR MONITORING AND UPDATING HARDWARE
- . EASY TO SCALE WITH THE INCREASING AMOUNT OF DATA

. CRITERIA FOR SELECTING SERVICES

- . OPEN SOURCE IS PREFERRED
- . MUST BE SERVERLESS
- . POSSIBILITY TO USE OTHER CLOUD VENDORS

QUESTIONS?

OpenEEMeter/EM2 annual review





TAC Annual Review
OpenEEmeter

OPENEEMETER Status

The current activity of the project, including releases, adoption, and committer/contribution growth and diversity.

- Releases: 2.10.11, 3.0.0, and 3.1.0 = Bug fixes and adaptations of the methods for example:
 - Update `fit_temperature_bins` to potentially take an `occupancy_lookup` in order to fit different temperature bins for occupied/unoccupied modes. *This changes the args passed to `eemeter.create_caltrack_hourly_segmented_design_matrices`, where it now requires a set of bins for occupied and unoccupied temperatures separately.*
 - Update CalTRACK hourly model formula to use different bins for occupied and unoccupied mode.
- Most Committers and Contributors are still from Recurve team.
- Adoption of method + code base grown across U.S. utilities; and companies reliant on calculations for performance payment. (see next slide)



OPENEEMETER is the foundation for Demand Flexibility Performance Transactions

Utility Demand Flexibility Buyers



Demand Flexibility Providers

R&C BioPower BioPower Increase your building's profitability with a modern heating and cooling system.	BRIGHT POWER Bright Power Bright Power is the premier provider of energy and water management services.	CARBON LIGHTHOUSE Carbon Lighthouse Cut Energy at a Portfolio. Save on your building at a time doesn't cut it.	CH Energy CH Energy CH Energy is an expert in providing a turnkey energy solution.	CLEAResult CLEAResult We make energy efficiency smarter, faster, and more accessible for everyone.	OhmConnect OhmConnect Use energy when it's cleaned and earn rewards for saving when it's dirty.
Conectric IoT Conectric IoT Operational Asset Risk Management.	DIVIDEND Dividend Finance A smarter, faster way to finance home improvements and commercial upgrades.	ecobee ecobee A smart home technology helping customers maintain comfort and cost savings.	EcoGreen Solutions EcoGreen Solutions We help companies save energy and cut costs.	Ecology Action Ecology Action Ecology Action is creating a thriving environment and low-carbon economy.	PACKETIZED ENERGY Packetized Energy Packetized energy makes electricity better.
edgeWise ENERGY edgeWise Energy Helping property owners to improve their energy sustainability, and profit.	ELECTRUM Electrum Electrum provides a home insulation concierge marketplace.	elation Home Energy Solutions elation Home Energy Solutions We are on a mission to Elevate the Home Energy Experience.	ECO Energy Conservation Options (ECO) Energy Conservation Options (ECO) Independent, woman-owned & trade-licensed firm offering Gx energy management	ERI Energy Resource Management Energy Resource Management Developing Sustainability through Energy Efficiency	Sealed Sealed Stress-free home upgrades? We Sealed. They're not just a pretty.
ev energy evenergy A wireless platform that connects to Pvs and EVSEs to deliver load flexibility.	EVERWATT EverWatt Stop wasting money on old lighting.	FlexCharging FlexCharging Electric Vehicles are here. Save money AND carbon emissions. It's that easy.	Genie Energy Solutions Genie Energy Solutions Genie is democratizing the energy audit sector.	GROUSE ASSOCIATES Grouse Associates Grouse Associates Experts in reducing embedded energy in your HVAC system.	swell Swell Energy Swell Energy is an energy and smart grid solutions provider.
Helio Helio Helio is a leading residential and commercial energy services provider in NY	HomeWorks Energy HomeWorks Energy We simplify energy consumption & drive home energy efficiency challenges.	JouleSmart Joule Smart Joule Smart will save you time, money, and give you peace-of-mind.	Leap Leap Leap is a marketplace for grid services to help balance the grid.	NRMA National Resource Management If your business relies on refrigeration systems, NRMA has a way to help you.	voltus Voltus Better Energy. More Cash.

OPENEEMETER Status

Assessment of whether the project is fulfilling the requirements for the project to remain at its current stage, or be considered for a different stage

- Have an open and documented technical governance, ✓
- Complete and approve the Technical Charter and agree to transfer any relevant trademarks to The Linux Foundation or its affiliate, LF Projects, LLC, and to assist in filing for any relevant unregistered ones. ✓
- Have achieved and maintained a Core Infrastructure Initiative [Best Practices Badge](#) at the 'Passing' level.
- Have had a successful license scan with any critical issues remedied. ✓
- Have a defined project mission and scope ✓
- An overview of the project's architecture and features defined. ✓
- A project roadmap defined, which should address the following questions. ✓
- Community and contributor growth assessment
 - The current number of contributors and committers (28), and the number of different organizations (2-3)
 - Demonstrate a sustained flow of commits / merged contributions ✓
 - A credible plan for developing a thriving user community, in particular expanding the number of committers and contributors? [-]
 - Outline of the plan for the project to complete the requirements for Adopted Stage [-]
- Receive the affirmative majority vote of the TAC. [Purpose of Today's Meeting]

OPENEEMETER Status

Feedback on its experience as an LF Energy project, including benefits from being an LF Energy project and areas that the TAC and LFE staff can better support the project.

- **Experience as an LF Energy project has been positive.**
 - Provides reference point of "acceptance" for the market
 - Provides access point for the industry from a trusted source
 - Policy positioning for open-source transparency
- **Key Benefits are both for the project but also for the company**
 - Branding
 - Nudging
 - Community with other projects
- **TAC / LFE Staff can support with considering transition, and promoting new model**
 - OpenEEmeter standing alone just doesn't do much
 - Scattered governance for multiple open-source methods and code
 - Bringing it under a single umbrella will help but still questions about how methods and code can best co-habitate in an LFE project

OPENEEMETER Friends & Family

Feedback



open-source,
scalable

standard for demand
quality calculations

Scalable to every meter on the grid

→ **Automated** from smart meter data to
settlement-quality transaction

Project Review Cycle

Project	Current Level	Initially Accepted	Last Review Date	Next Review Date
OpenEEmeter	Incubation	June 4, 2019		October 12, 2021
EM42	Early Adoption	June 4, 2019		October 12, 2021
GXF	Early Adoption	February 4, 2020		October 12, 2021
SEAPATH	Incubation	October 6, 2020		November 2, 2021
OpenLEADR	Incubation	September 15, 2020		November 23, 2021
Hyphae	Incubation	December 8, 2020		December 14, 2021
FledgePOWER	Incubation	February 11, 2021		February 15, 2022
SOGNO	Early Adoption	October 27, 2020	March 16, 2021	March 8, 2022
Shapeshifter	Incubation	April 6, 2021		March 29, 2022
Grid Capacity Map	Incubation	April 27, 2021		April 19, 2022
OperatorFabric	Early Adoption	April 30, 2019	July 20, 2021	July 12, 2022
CoMPAS	Incubation	May 5, 2020	June 29, 2021	July 12, 2022
PowSyBl	Early Adoption	April 30, 2019	August 31, 2021	August 23, 2022

Agenda

Opening (5 Minutes)

- Summary of last TAC meeting & Updates from the Board Meeting
- Upcoming community meetings of interest
- Landscape updates

TAC Business (80 Minutes)

- EVerest project proposal
- GXF annual review
- Green Energy DataHub project proposal
- OpenEEMeter/EM2 annual review

Closing and next meeting (5 Minutes)

Next TAC Meeting

The next meeting of the LF Energy TAC is scheduled for 2 November 2021 at 8:00 am US Pacific Time/11:00 am US Eastern Time/5:00 pm Central European Time.

Agenda will include:

- Recap of last TAC meeting/Governing Board updates
- SEAPATH annual review
- FlexMeasures project proposal



Thank you!