TAC Meeting

12 October 2021

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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

LF ENERGY

The Power of Together

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

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

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

more...   total: ⊙ ★52

Crunchbase	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/lfscanning/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

LF Energy Early Adoption   LF Project

Open Source Software   License Mozilla Public License

CII Best Practices 25%

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- **Green Energy DataHub project proposal**
- **OpenEEMeter/EM2 annual review**
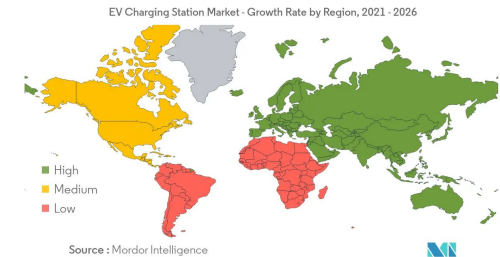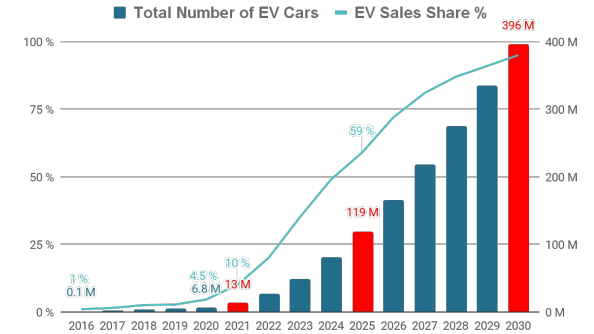
Closing and next meeting (5 Minutes)

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

■ Total Number of EV Cars ━ EV Sales Share %

EV Charging Station Market - Growth Rate by Region, 2021 - 2026

■ High
■ Medium
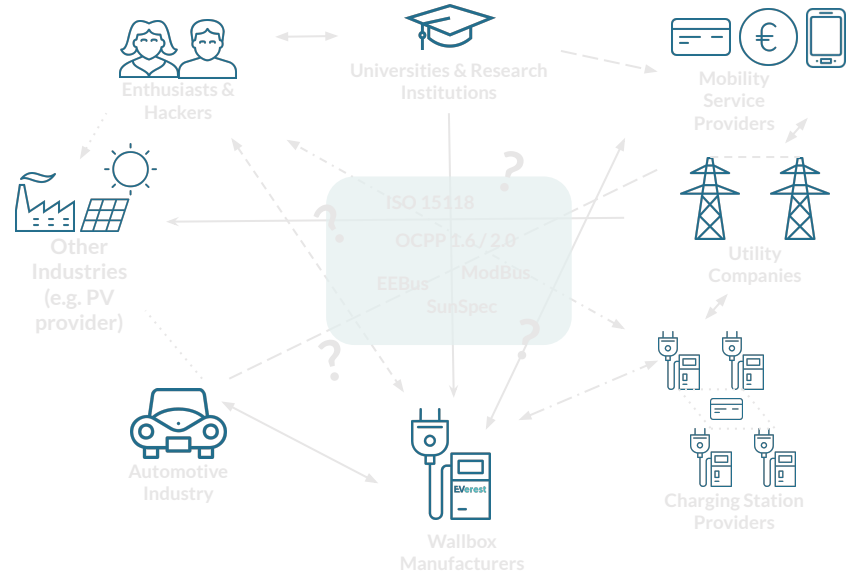■ Low

Source : Mordor Intelligence

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

Enthusiasts & Hackers

Universities & Research Institutions

Mobility Service Providers

Other Industries (e.g. PV provider)

ISO 15118
OCPP 1.6 / 2.0
ModBus
EEBus
SunSpec

Utility Companies

Automotive Industry

Wallbox Manufacturers

EVerest

Charging Station Providers

›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
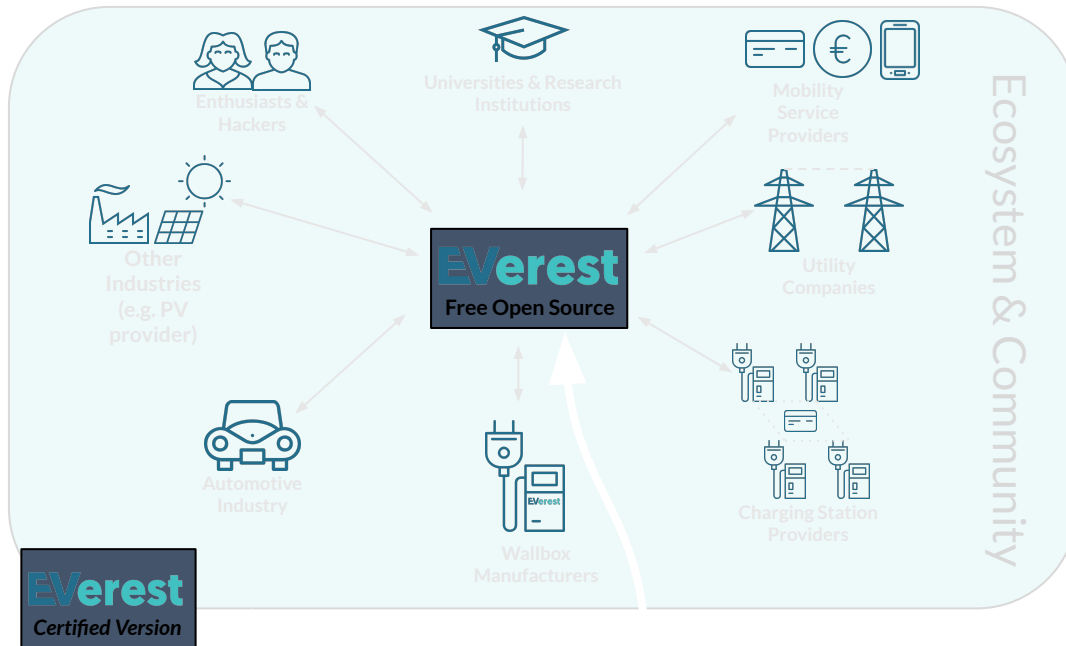
Universities & Research Institutions
- Researched features can be easily adopted for mass market
- Technology base layer for research

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

Enthusiasts & Hackers

Universities & Research Institutions

Mobility Service Providers

Other Industries (e.g. PV provider)

EVerest Free Open Source

Utility Companies

Automotive Industry

Wallbox Manufacturers

Charging Station Providers

Ecosystem & Community

EVerest Certified Version

Pionix Updates & Integration Services
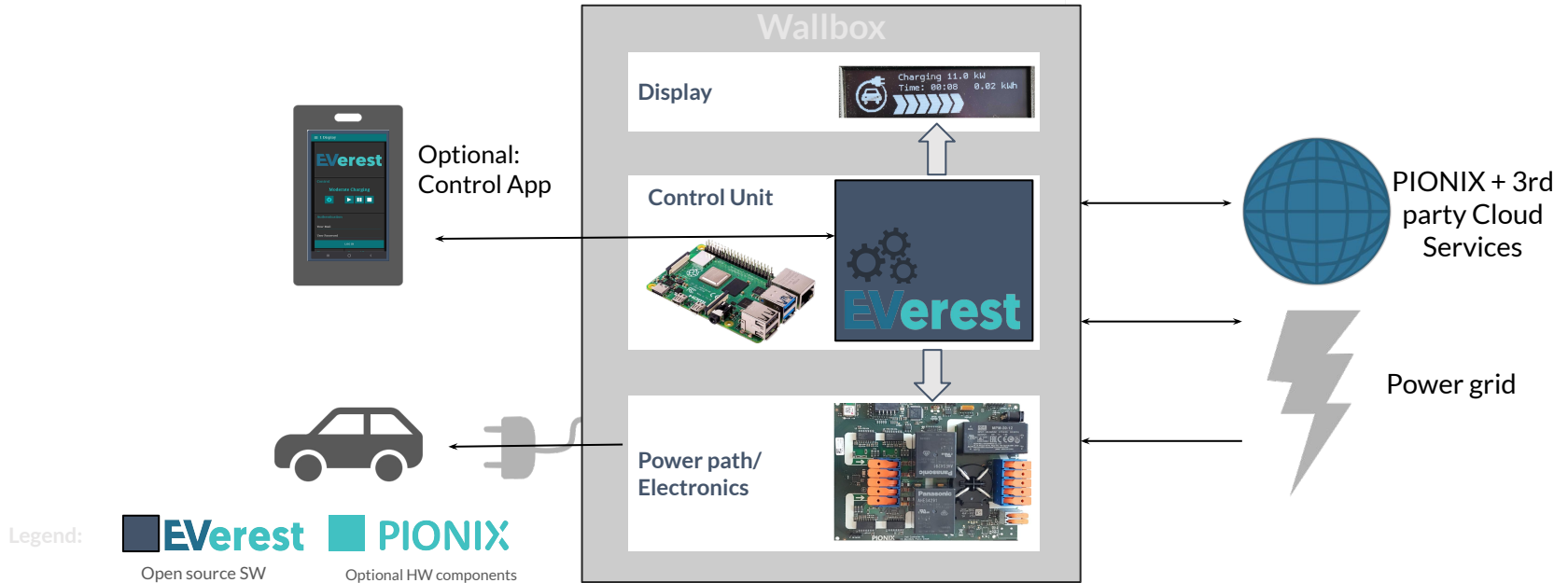
Payment for upgrades, updates, support and integration

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 Typical open source	BENDER ABB PHOENIX CONTACT Typical commercial	V2G CLARITY
Agile, Innovative, Extendable	++	++	- -	O 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

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

MAVINCI

2016 sold drone startup to

intel.

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

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

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

Our Advisors:

NE>T MOBILITY LABS
THE COMPANY BUILDER

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

Falko Tappen
Prof. Tax law

Felix Wagner
Managing Partner

Armin Bieser
Managing Partner

Romina Reuther
Venture Architect

Kai-Uwe

Thilo

Leonardo

Tim

Backoffice

external

Dr. Peter Mertens
Former CTO Audi

Thomas Andrae
Serial Founder

Klaus Entenmann
Former CEO
Daimler Financial
Services AG

Anton

Andreas

Julian

Currently
Hiring:
● Devs
● Sales
● Biz Dev
● Marketing

⇒ 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

Electric Grid

Home Solar & Batteries

Other Home Consumption

Dynamic prices, Forecasts (price, solar, …)

USEF, ADR, …

Modbus, SunSpec, EEBus, REST, …

SG Ready

Load Balancing

Other local Chargers

EVerest and its modules (int. com by MQTT)

MQTT, REST, …

MQTT, OCPP

IEC 61851, ISO **15118**

HMI / User / Apps

MQTT, **OCPP**, REST

Cloud / Mgmt / Payment

Car
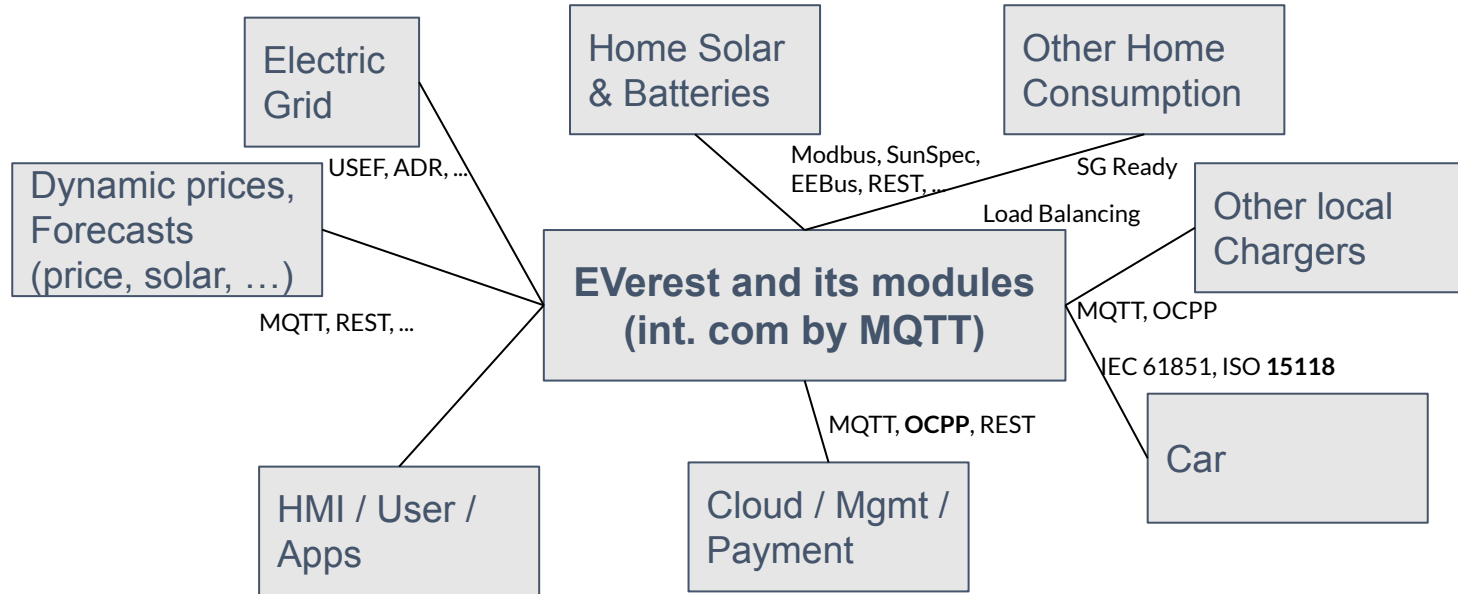
EVerest Classes

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 seperate file editable by webinterface
- modules subfolder e.g.
- modules/ChargingDrivers/AC/Yeti
- requirement of base class / but specify implementation class in config.json
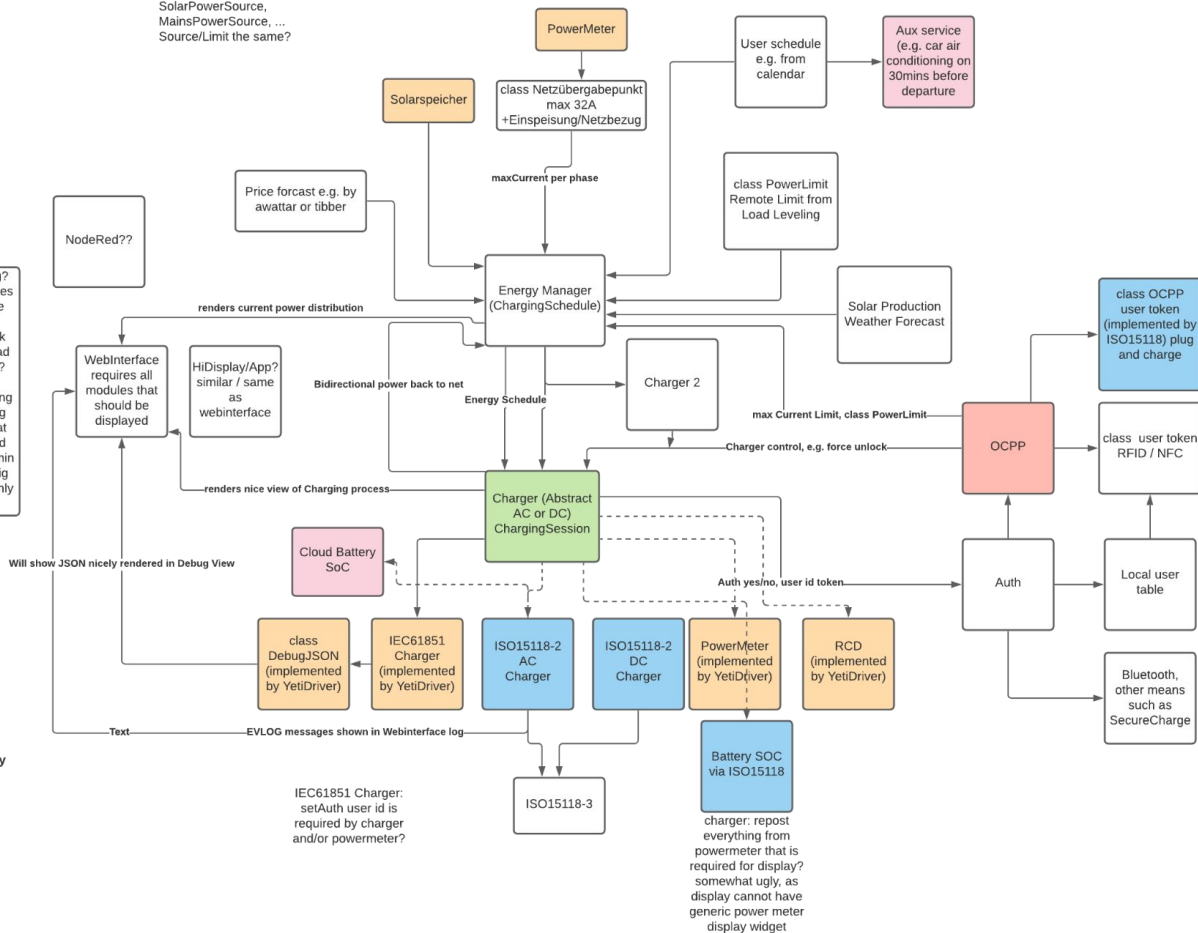- enums?
- find out if optional requirement is met?

Or: seperate 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?

NodeRed??

PowerMeter

Solarspeicher

class Netzübergabepunkt max 32A +Einspeisung/Netzbezug

Price forcast e.g. by awattar or tibber

User schedule e.g. from calendar

Aux service (e.g. car air conditioning on 30mins before departure

class PowerLimit Remote Limit from Load Leveling

maxCurrent per phase

Energy Manager (ChargingSchedule)

Solar Production Weather Forecast

class OCPP user token (implemented by ISO15118) plug and charge

renders current power distribution

WebInterface requires all modules that should be displayed

HiDisplay/App? similar / same as webinterface

Bidirectional power back to net

Charger 2

Energy Schedule

max Current Limit, class PowerLimit

OCPP

class user token RFID / NFC

renders nice view of Charging process

Charger (Abstract AC or DC) ChargingSession

Charger control, e.g. force unlock

Cloud Battery SoC

Will show JSON nicely rendered in Debug View

Auth yes/no, user id token

Auth

Local user table

class DebugJSON (implemented by YetiDriver)

IEC61851 Charger (implemented by YetiDriver)

ISO15118-2 AC Charger

ISO15118-2 DC Charger

PowerMeter (implemented by YetiDriver)

RCD (implemented by YetiDriver)

Bluetooth, other means such as SecureCharge

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

Text

EVLOG messages shown in Webinterface log

Battery SOC via ISO15118

ISO15118-3

IEC61851 Charger: setAuth user id is required by charger and/or powermeter?

charger: repost everything from powermeter that is required for display? somewhat ugly, as display cannot have generic power meter display widget
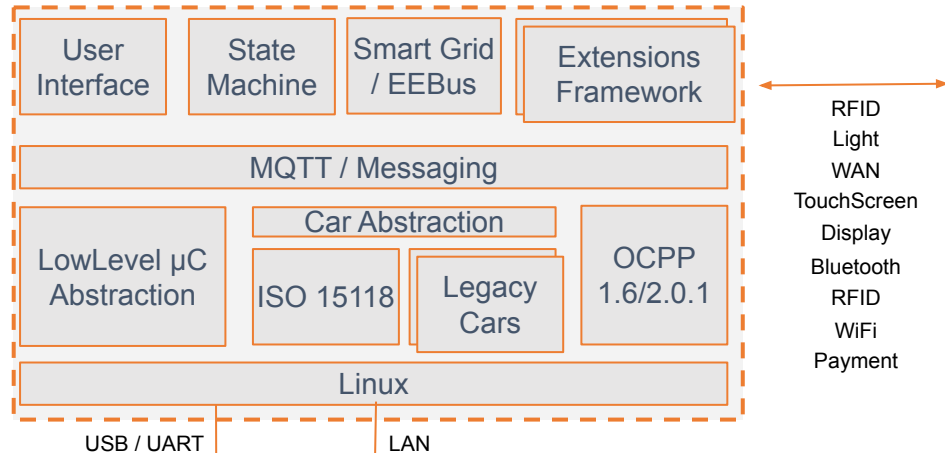
MQTT Based

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

NodeRed Engineered Flow
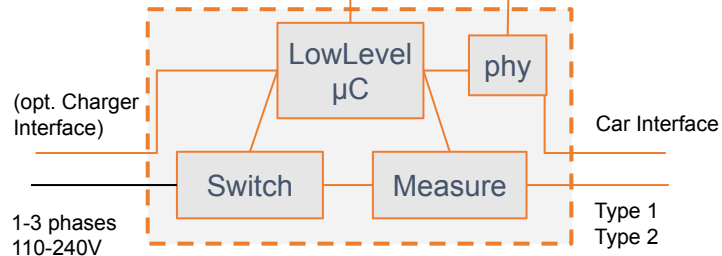

NodeRed Autogenerated UI
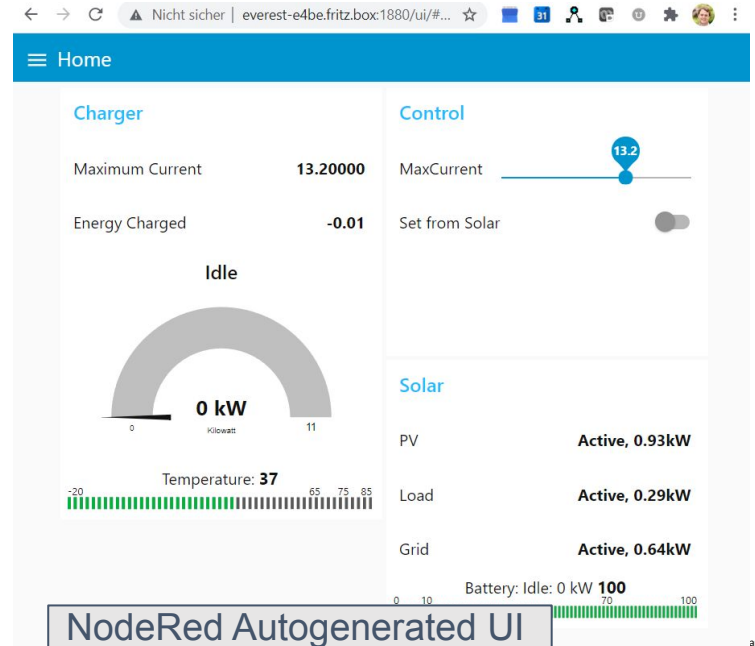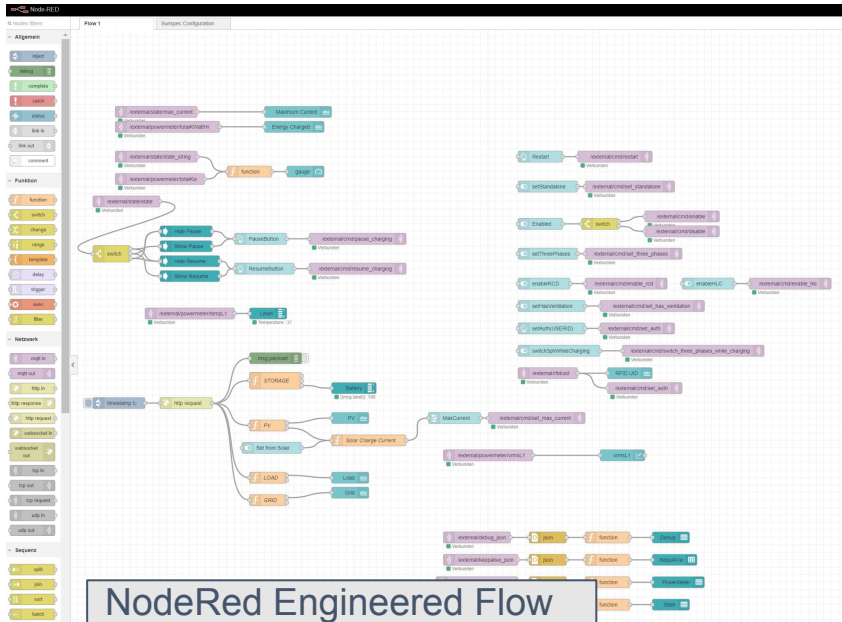
Overall Architecture

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

User Interface	State Machine	Smart Grid / EEBus	Extensions Framework

RFID
Light
WAN
TouchScreen
Display
Bluetooth
RFID
WiFi
Payment

MQTT / Messaging

Car Abstraction

LowLevel µC Abstraction	ISO 15118	Legacy Cars	OCPP 1.6/2.0.1

Linux

USB / UART   LAN

Low level Board:

- proprietary code
- comercial Pionix HW
- Certified

LowLevel µC

phy

(opt. Charger Interface)

Car Interface

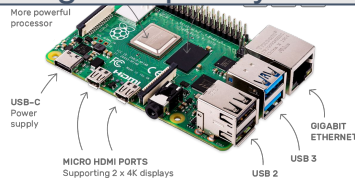Switch   Measure

1-3 phases
110-240V

Type 1
Type 2

❯"/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)
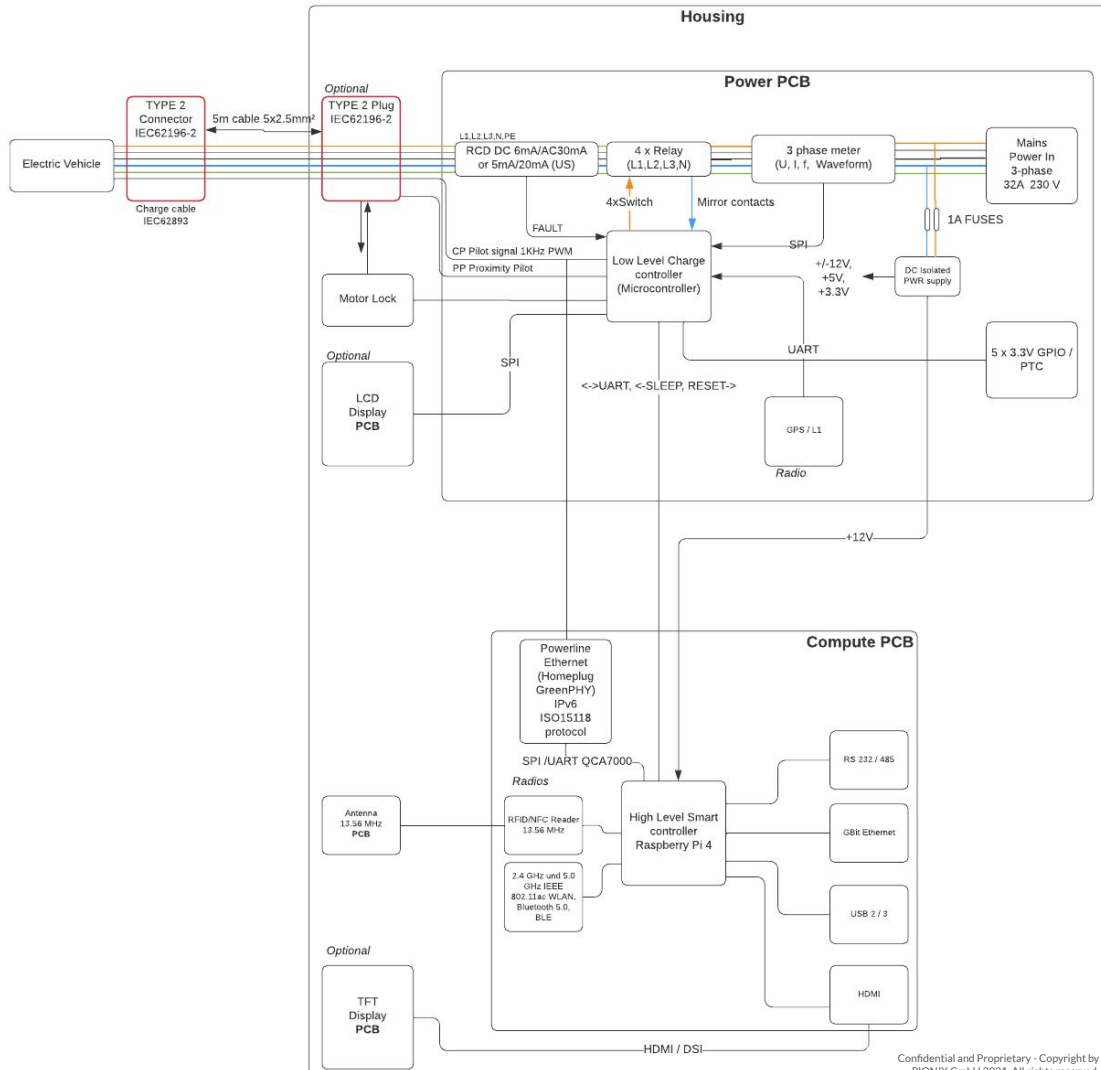 - RFID Antenna

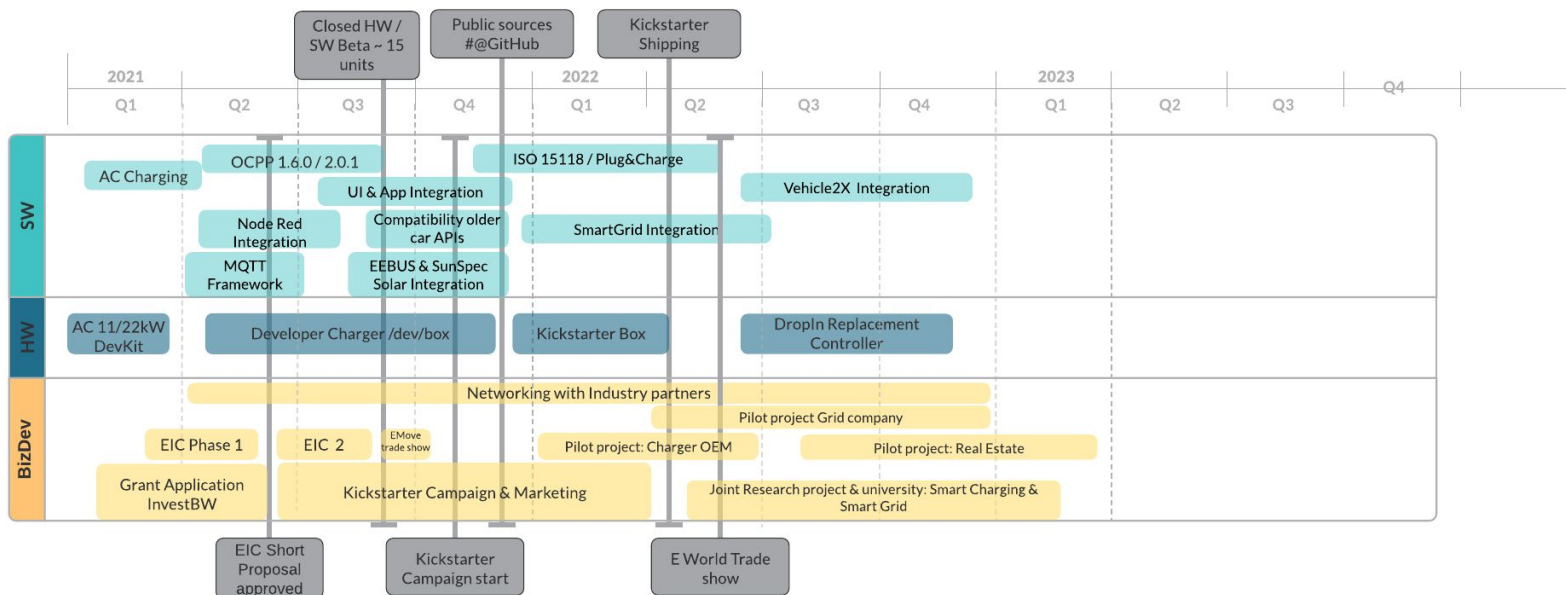High level: e.g. Raspberry Pi

More powerful processor

USB-C Power supply

MICRO HDMI PORTS
Supporting 2 x 4K displays

GIGABIT ETHERNET

USB 3

USB 2

Low level: e.g. Custom Pionix

Block Diagram

Community Development Platform "/dev/box" V2

>Timeline

		2021				2022				2023			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

SW
- AC Charging
- OCPP 1.6.0 / 2.0.1
- ISO 15118 / Plug&Charge
- UI & App Integration
- Vehicle2X Integration
- Node Red Integration
- Compatibility older car APIs
- SmartGrid Integration
- MQTT Framework
- EEBUS & SunSpec Solar Integration

HW
- AC 11/22kW DevKit
- Developer Charger /dev/box
- Kickstarter Box
- DropIn Replacement Controller

BizDev
- Networking with Industry partners
- Pilot project Grid company
- EIC Phase 1
- EIC 2
- EMove trade show
- Pilot project: Charger OEM
- Pilot project: Real Estate
- Grant Application InvestBW
- Kickstarter Campaign & Marketing
- Joint Research project & university: Smart Charging & Smart Grid

Milestones:
- Closed HW / SW Beta ~ 15 units
- Public sources #@GitHub
- Kickstarter Shipping
- EIC Short Proposal approved
- Kickstarter Campaign start
- E World Trade show

The Time is Right - One Main Reason for Success

Team

Technology

TIMING!
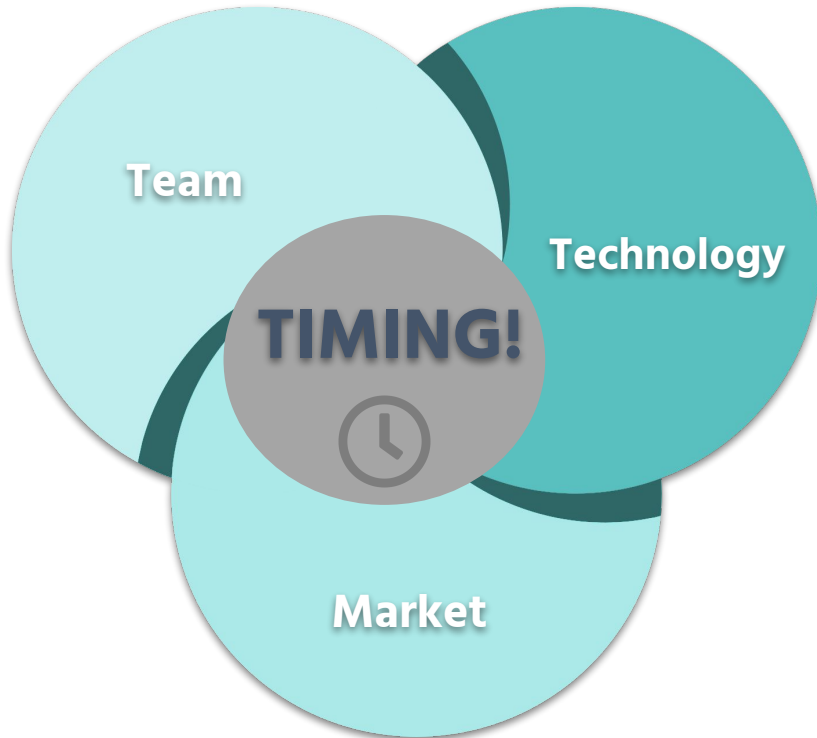
Market

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 Schönborn, 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

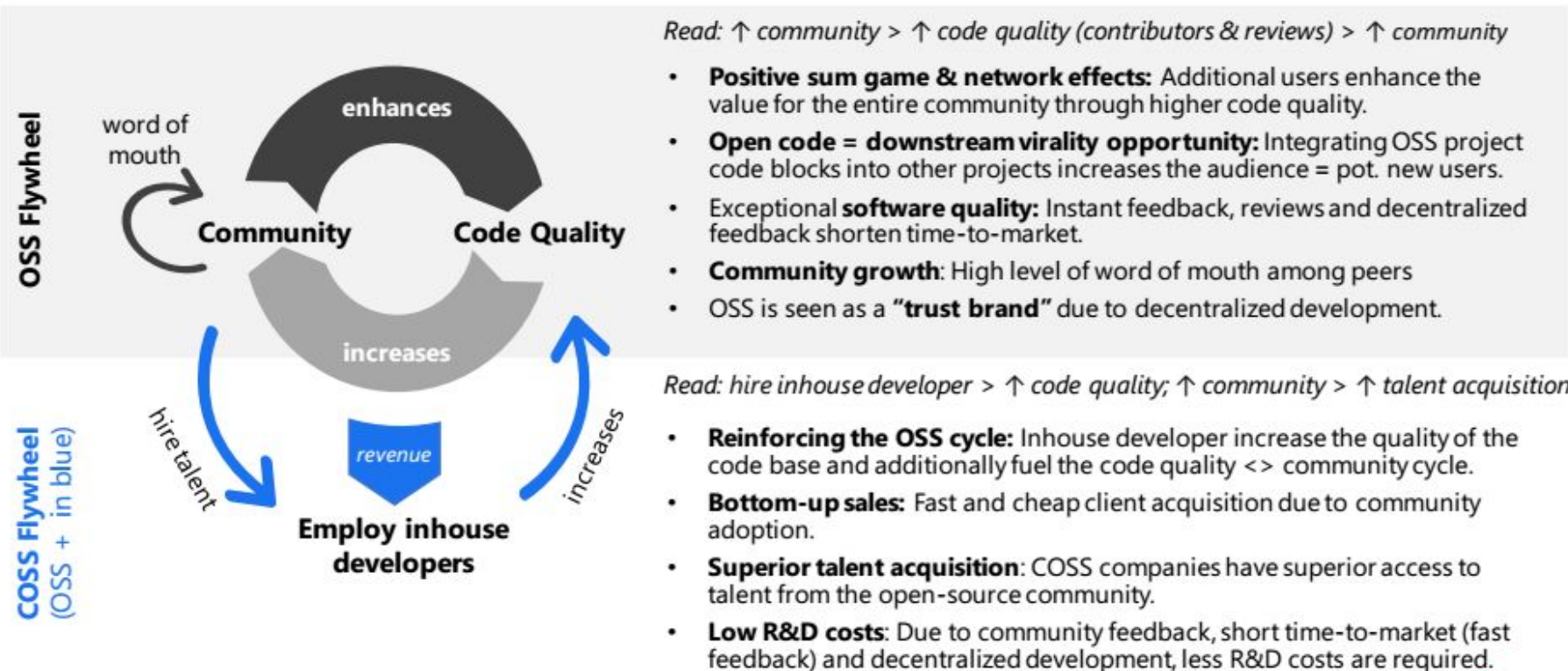**Dual license: GPL + commercial**
- ❌ Community contributions would become GPL code again, can't be licenced commercially
  ⇒ Will be avoided by companies
- ❌ No community involvement possible ⇒ GPL contributions would not be commercially licenced

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

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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.

Source: Nauta analysis

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

NAUT CAPITAL

Monetization strategy for the commercialization of OSS

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

	Services	Open Core			Multi-Licensing
		Feature-based	Hosting / SaaS	Paid distribution	
Free OSS vs. paid:	Free OSS Project / Projects w & wo copyleft / Monetization of services	Free OSS Project / Standard permissive OSS projects / Monetization of proprietary features	Free OSS Project / Standard permissive OSS projects / Monetization of Hosting / SaaS	Free OSS Project / Free OSS Project / Multiple permissive OSS / Monetization of Bundling & Orchestration	OSS Project – copyleft / Proprietary Code / Copyleft license (code cannot be used for commercial purposes) / Acquisition & monetization of a copyleft-exempt license
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	Open code, commercial requires special license
Challenges	Scalability problems Potential conflict of support vs. code quality	Dual focus needed for: - 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	License In ≠ License Out Low acceptance in developer community Not pure "OSS" anymore
Examples (of the primary revenue source)	Red Hat, CHEF, SUSE, PERCONA	MuleSoft, KUBERMATIC, CLOUDERA, fastly	databricks, Acquia, Magento, GitLab	arrikto, nHOST, RANCHER, aiven	MySQL, CONFLUENT, elasticsearch, mongoDB, redis

> Models are often combined <

Naut Capital

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

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**

Powered by:
EVerest

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.**

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

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

MMS

open source project

EVerest

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

SIEMENS MENNEKES   BENDER   PHŒNIX CONTACT

OCPP 1.6 Fully Certified   Plug&Charge ISO 15118   SUNSPEC ALLIANCE   EEBUS

Proprietary Solution
everyone develops on his own, many downsides

Standardization
everyone develops the same, but align how

**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
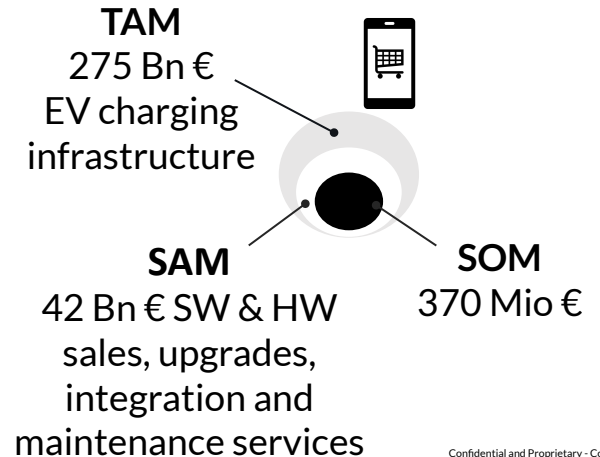
TAM
275 Bn €
EV charging
infrastructure

SAM
42 Bn € SW & HW
sales, upgrades,
integration and
maintenance services

SOM
370 Mio €

GXF annual review

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

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.

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

| 22.97K Commits | 11 Repositories |

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

GRID EXCHANGE FABRIC

Alliander Use-cases

LFENERGY
GXF

Get the code

Overview
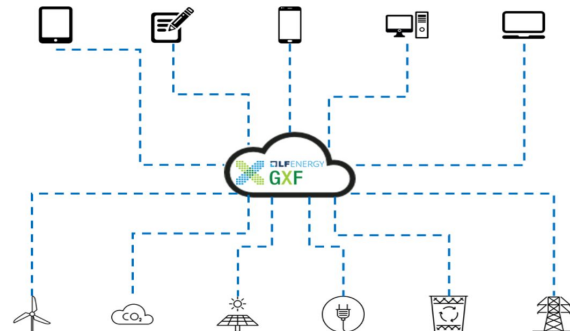
20.000 devices in production

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

Roadmap GXF

Q4 2021   Q1 2022   Q2 2022

Community

Insights LFE – License scan
Insights
TAC
Dev update, release planning
Dev update, release planning
104 Adapter (Slave)
USE GXF

OPC UA protocol adapter
OPC UA Adapter documentation

Release X
Insights improvements
Tase.2/ICCP protocol adapter
Tase.2/ICCP Adapter documentation

Northbound

Kafka Adapter
JAVA upgrade
Release X

New Build Server
Dockerization

Release 5.18

104 Adapter documentation

Sonar cube improvements

DLMS simulator

DLMS simulator documentation

104 Device simulator

Platform   **Southbound**   **General**

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 COMMITERS 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

alliander

Discussions

- Internal discussion about availability of resources and time for LFE activities

- Possibility to have cooperation with the DSO in the Netherlands trough 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)

LF ENERGY
GRID EXCHANGE FABRIC

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
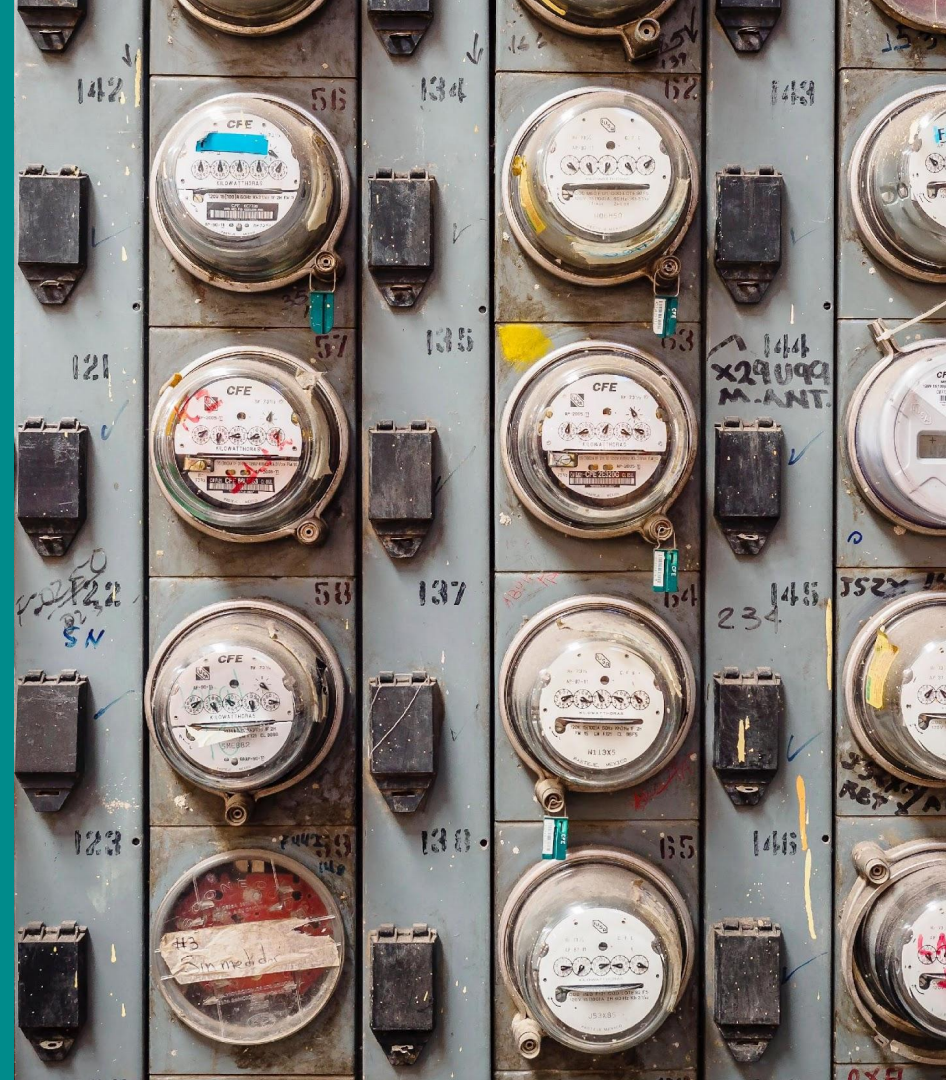
SUPPORTING MARKET PROCESSES BASED ON THE COMING CIM-STANDARD

. ALL INTERNAL AND EXTERNAL MESSAGES ARE BASED ON THE CIM HARMONIZED ROLE MODEL

. PROCESSES ARE BASED ON CIM USE CASES LIKE: RequestMovein, RequestMoveOut
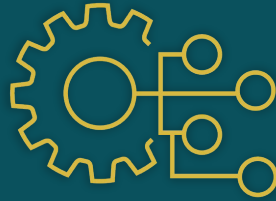
HOW?

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

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

TIMESERIES

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

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

OpenEEMeter/EM2 annual review

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

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]

LF ENERGY

The Power of Together

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
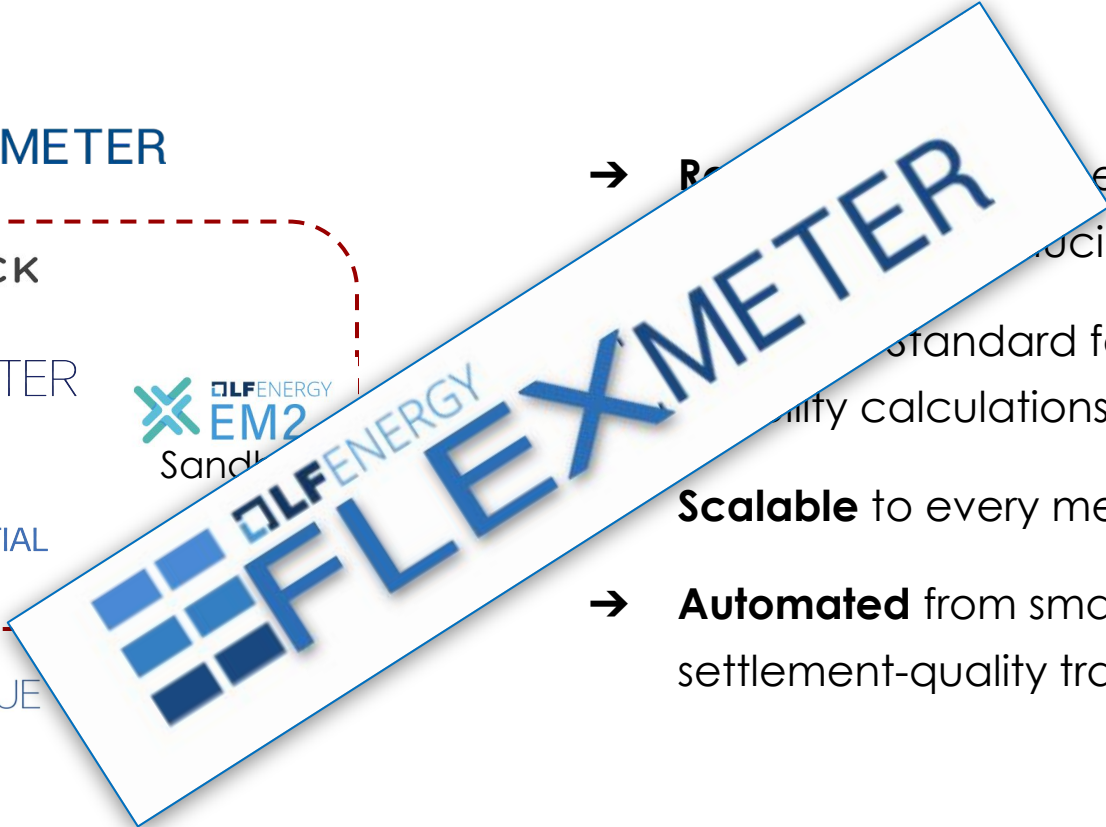
Project Review Cycle

Project	Current Level	Initially Accepted	Last Review Date	Next Review Date
~~OpenEEmeter~~	~~Incubation~~	~~June 4, 2019~~		~~October 12, 2021~~
~~EM2~~	~~Early Adoption~~	~~June 4, 2019~~		~~October 12, 2021~~
~~CXF~~	~~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

The Power of Together

LF ENERGY

Thank you!