TAC Meeting

31 May 2022

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Agenda

Opening (25 Minutes)

- **Landscape updates**
- **TAC Sponsors for projects**
- **Summary of last TAC meeting & Updates from the Board Meeting**

TAC Business (60 Minutes)

- LFX Security Presentation
- LF Architecture Model
- GPX Presentation
- JDF Transition for Standards and Specifications

Closing and Next Meeting (5 Minutes)

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
Jonas van den Bogaard	**Alliander**	**Membership Entitlement**
Maarten Mulder	**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
Art Pope	Google	Membership Entitlement

LF Energy Hosted Project and Working Group Leads

Changes in **bold**

Project	Project Lead(s)
PowSyBl	Anne Tilloy, RTE
OperatorFabric	Boris Dolley, RTE
OpenEEmeter	Carmen Best, Recurve
GXF	**Maarten Mulder, Alliander**
SOGNO	Antonello Monti, RWTH Aachen University
CoMPAS	Frederic Fouseret, RTE & Sander Jansen, Alliander (TAC Representative)
FledgePOWER	Akli Rahmoun, RTE
Hyphae	Asimenia Korompili, RWTH Aachen University
openLEADR	Lonneke Driessen & Stan Janssen, OpenADR
SEAPATH	Eloi Bail, Savoir-faire Linux
Grid Capacity Map	Per Lysemose Hansen, Energinet
Shapeshifter	Jelle Wijnja, Alliander
OpenSTEF	Frank Kreuwel, Alliander
EVerest	Marco Möller, PIONIX
OpenGEH	Martin F. Hansen, Energinet
FlexMeasures	Nicolas Höning, Seita Energy Flexibility B.V.
OCPP Cloud Connector	Rebecca Wolkoff, Chargenet
Full Architecture WG (FAWG)	Benoît Jeanson, RTE
Carbon Data Specification Consortium (CDSC)	TBD

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%

TAC Sponsors for projects

As part of the benefit for LF Energy projects, the TAC has a sponsor for each project.

"Appointment of an existing TAC member by the TAC that will act as a sponsor of the project and provide recommendations regarding governance best practices."

ASK: Volunteer to be a TAC sponsor for a project

Project	Current Level	TAC Sponsor
CoMPAS	Incubation	
Carbon Data Specification Consortium	Standards	
EVerest	Incubation	
FledgePOWER	Incubation	Benoît Jeanson
FlexMeasures	Incubation	
Full Architecture Working Group (FAWG)	Working Group	
Grid Capacity Map	Incubation	
GXF	Early Adoption	Jonas van den Bogaard
Hyphae	Incubation	Antonello Monti
OpenEEmeter	Incubation	Carmen Best
OpenGEH	Incubation	
OpenLEADR	Incubation	
OpenSTEF	Incubation	Jonas van den Bogaard
OperatorFabric	Early Adoption	Boris Dolley
PowSyBl	Early Adoption	Anne Tilloy
SEAPATH	Incubation	Benoît Jeanson
Shapeshifter	Incubation	Jonas van den Bogaard
SOGNO	Early Adoption	Antonello Monti

LF ENERGY

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

Agenda

Opening (25 Minutes)

- Landscape updates
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TAC Business (60 Minutes)

- **LFX Security Presentation**
- **LF Architecture Model**
- **GPX Presentation**
- **JDF Transition for Standards and Specifications**

Closing and Next Meeting (5 Minutes)

LFX Security Presentation

LF Architecture Model Presentation

A functional reference architecture to accelerate open-source development of power system applications

LF Energy FAWG Meeting

25 April 2022

Sean Crimmins, EPRI

Laura Crowley, EPRI

Jonas van den Bogaard, Alliander

Benoit Jeanson, RTE

Agenda

- Motivation for building a reference architecture
- ArchiMate primer
- Model demo:
  - Metamodel
  - Generic reference architecture
  - LF Energy projects views:
    - OpenSTEF
    - SOGNO
    - PowSyBl
  - Collaborative modelling with Archi and GitHub
- Feedback and next steps

EPRI

Benefits of the reference architecture for open-source development & LF Energy

- Engage stakeholders in LF Energy's open-source projects
  - Communicates the purpose and scope of an LF Energy projects
- Facilitate systems integration
  - Communicates the data objects that are exchanged between software
- Facilitate interoperability
  - Data exchange standards
- Create alignment within the LF Energy open-source community
  - Identifies gaps and overlaps in the portfolio of projects
- Allow utilities to align/compare their strategic development with the LF energy portfolio

EPRI

What is a Reference Architecture

- A few definitions:

"A reference architecture … provides a template solution for an architecture for a particular domain. It also provides a common vocabulary with which to discuss implementations " Wikipedia

"Reference Architectures are standardized architectures that provide a frame of reference for a vertical domain or sector. Reference models or architectures provide a common vocabulary, reusable designs, and industry best practices. " LeanIX

- More than just software
  - Business Architectures
  - Business Practices
  - Application
  - Technology

EPRI

What is a Functional Reference Architecture

A reference architecture:

- Defines the functions and data required to implement a capability independent of applications and technology
- Provides a vocabulary and definitions that enable:
  - Planning and roadmapping in terms of functional components without committing to a particular application
  - Requirements analysis while delaying design, deployment and purchasing decisions
  - Analysis of possible implementation options and a modularization of complex application suites.
  - Identification of <u>data exchanges between application components</u> and the corresponding standards.

EPRI

ArchiMate primer

- The ArchiMate framework separates the Business layer from the Application layer[1].

- An Application Function represents automated behavior that can be performed by an application component.

- A data object represents data structured for automated processing.

- A data object can be accessed by an application function.

[1] https://pubs.opengroup.org/architecture/archimate3-doc/chap09.html

Access (read/write)

Business Function → Business Object

Archimate Business Layer

Access (read/write)

Application Function → Data Object
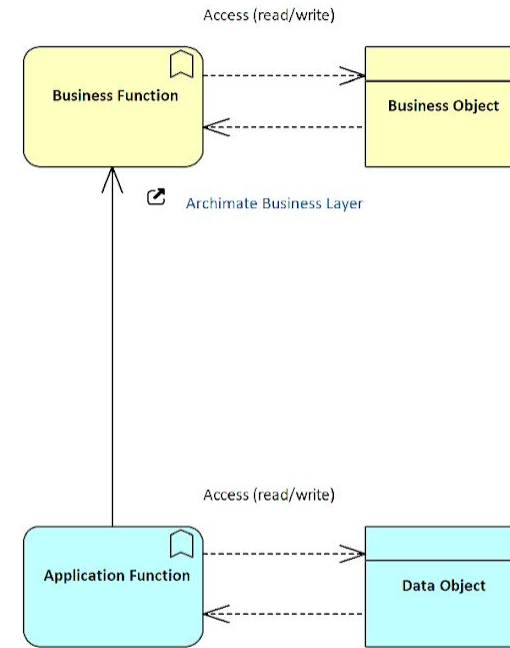
ArchiMate is framework that is implemented in the Enterprise Architect software.

EPRI

Reading the reference architecture

A small example of SCADA and State Estimation

Application functions
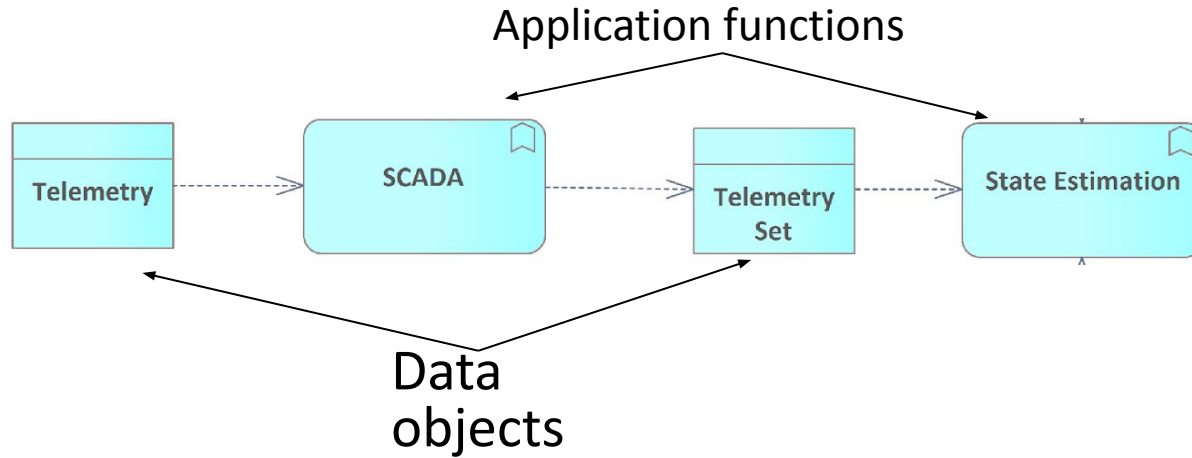
Data
objects

- SCADA and State Estimation are application functions.

- Telemetry is a data object and is an input to the SCADA application function.

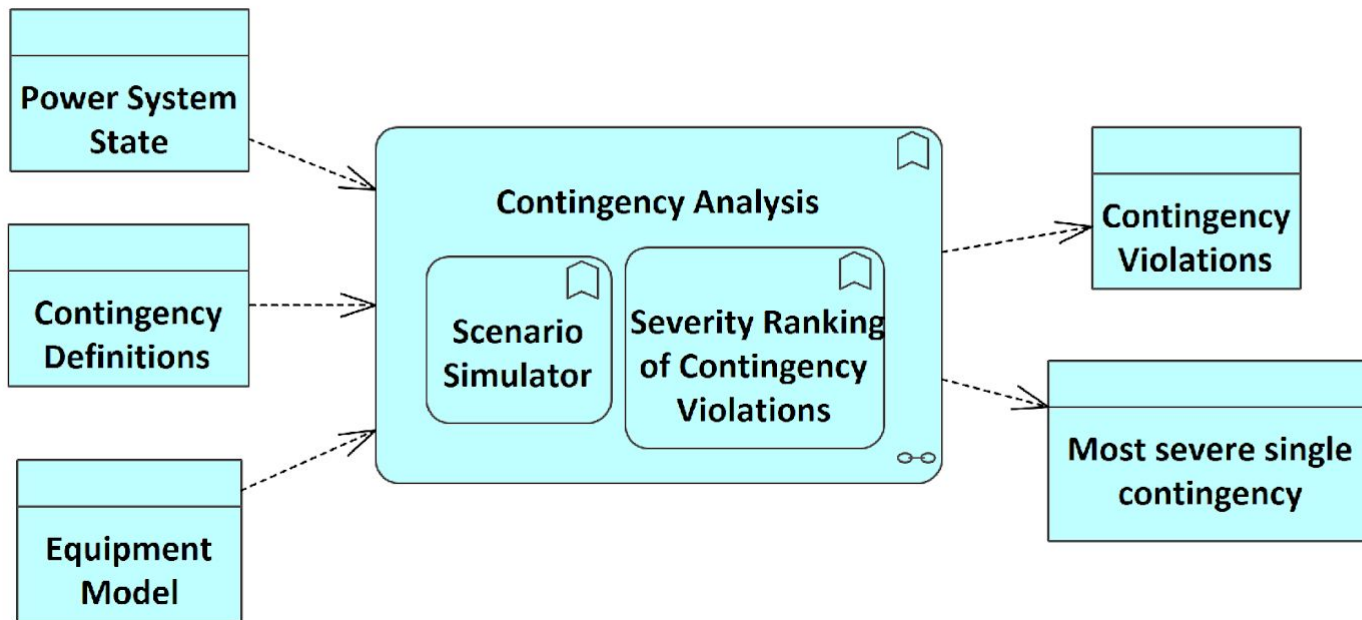- The Telemetry Set is an output of the SCADA application function.

EPRI

High Level overview of the reference architecture

Data Exchange Standards

EPRI
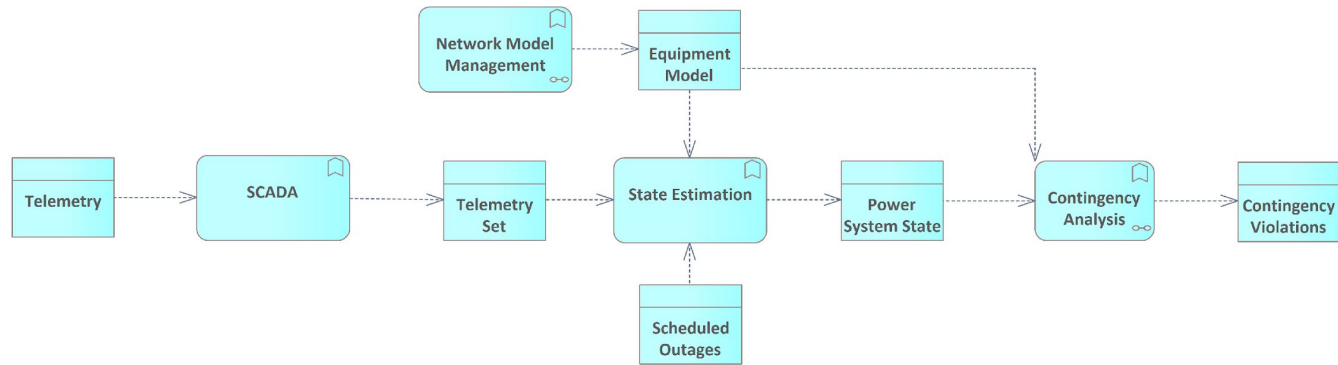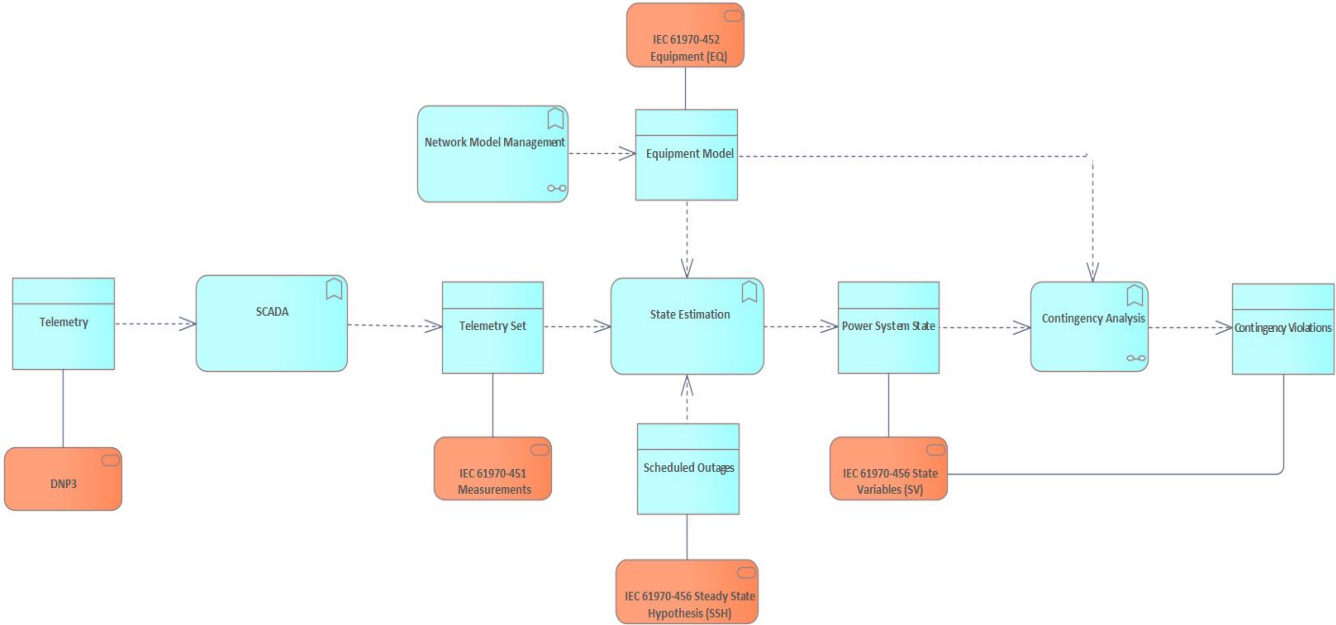
Contingency Analysis – a closer look

Model demo

- Metamodel

- Generic reference architecture

- LF Energy projects views:

  - OpenSTEF

  - SOGNO

  - PowSyBl

- Collaborative modelling with Archi and GitHub

All models are licenced under Creative Commons Attribution 4.0 International License

EPRI

Feedback and next Steps

▪Do you think lfenergyfunctionalarchitecture useful for LFEnergy and its members?

▪Who wants to be involved?

▪What are the most critical domains?

▪Extend the reference architecture to demonstrate technical services (e.g., messaging, gateway, ESB)

▪Present at the TAC

modelled 3 LFEnergy projects; PowSyBl, SOGNO

GitHub: https://github.com/lfenergyarchitecturemodel
Slack: https://lfenergy.slack.com/archives/C03A1U5APPA

EPRI
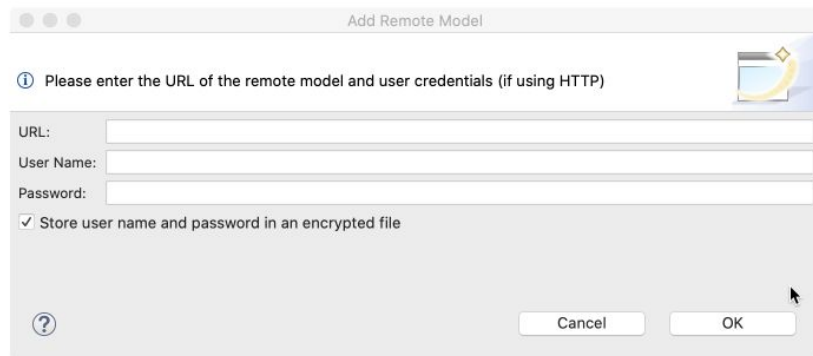
Appendix A: LF Energy Architecture Model installation

Installation

The use the LF Energy Archimate models you need Archi.

Step-by-step guide for Archi

1. Download and install the archi software. This can be downloaded from the following location https://www.archimatetool.com/.
2. Download the following Archi plugin "coArchi – Model Collaboration for Archi" (https://www.archimatetool.com/plugins/#coArchi) to share and version the created models.
3. It is necessary to create a Personal Access Token. (https://github.com/archimatetool/archi-modelrepository-plugin/wiki/Refresh-and-Publish) Creating a personal token is described in this link. https://docs.github.com/en/enterprise/2.15/user/articles/creating-a-personal-access-token-for-the-command-line
4. Open Archi and via the menu option → Collaboration → Import Remote Model to Workplace
5. Fill in the archimate model I https://github.com/lfenergyarchitecturemodel/xxx.git, your username and the personal access token.

Add Remote Model		
ⓘ Please enter the URL of the remote model and user credentials (if using HTTP)		
URL:		
User Name:		
Password:		
☑ Store user name and password in an encrypted file		
?	Cancel	OK

6. The model is cloned from github and shown in archi. The following steps may still be required to get the model under 'Models': Collaboration → Toggle Collaboration Workspace: The Collaboration Workspace opens on the right side of the screen. The project is visible. Double click on the model: The model is added under 'Models' on the left side of the screen and can be edited.

EPRI

Appendix B: LF Energy Architecture Metamodel

Business Function
A business function represents a collection of business behavior based on a chosen set of criteria (typically required business resources and/or competencies), closely aligned to an organization, but not necessarily explicitly governed by the organization.

Just like a business process, a business function also describes internal behavior performed by a business role. However, while a business process groups behavior based on a sequence or flow of activities that is needed to realize a product or service, a business function typically groups behavior based on required business resources, skills, competencies, knowledge, etc.

There is a potential many-to-many relation between business processes and business functions. Complex processes in general involve activities that offer various functions. In this sense, a business process forms a string of business functions. In general, a business function delivers added value from a business point of view. Organizational units or applications may coincide with business functions due to their specific grouping of business activities.

A business function may be triggered by, or trigger, any other business behavior element (business event, business process, business function, or business interaction). A business function may access business objects. A business function may realize one or more business services and may be served by business, application, or technology services. A business role may be assigned to a business function. The name of a business function should clearly indicate a well-defined behavior. Examples are customer management, claims administration, member services, recycling, or payment processing

Application Function
An application function represents automated behavior that can be performed by an application component.

An application function describes the internal behavior of an application component. If this behavior is exposed externally, this is done through one or more services. An application function abstracts from the way it is implemented. Only the necessary behavior is specified.

An application function may realize one or more application services. Application services of other application functions and technology services may serve an application function. An application function may access data objects. An application component may be assigned to an application function (which means that the application component performs the application function). The name of an application function should preferably be a verb ending with "-ing"; e.g., "accounting".

Application Component
An application component represents an encapsulation of application functionality aligned to implementation structure, which is modular and replaceable.

An application component is a self-contained unit. As such, it is independently deployable, re-usable, and replaceable. An application component performs one or more application functions. It encapsulates its behavior and data, exposes services, and makes them available through interfaces. Cooperating application components are connected via application collaborations.

An application component may be assigned to one or more application functions. An application component has one or more application interfaces, which expose its functionality. Application interfaces of other application components may serve an application component. The name of an application component should preferably be a noun.

Definition of Relationships

- Realization: Represents that an entity plays a critical role in the creation, achievement, sustenance, or operation of a more abstract entity.
- Access: Represents the ability of behavior and active structure elements to observe or act upon passive structure elements.
- Composition: Represents that an element consists of one or more other concepts.
- Association: An association relationship represents an unspecified relationship, or one that is not represented by another ArchiMate relationship.
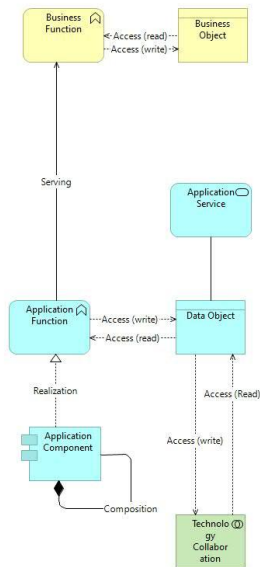
Business Object
A business object represents a concept used within a particular business domain.

As explained in Section 3.6, the ArchiMate language in general focuses on the modeling of types, not instances, since this is the most relevant at the Enterprise Architecture level of description. Hence a business object typically models an object type (cf. a UML class) of which multiple instances may exist in operations. Only occasionally, business objects represent actual instances of information produced and consumed by behavior elements such as business processes. This is in particular the case for singleton types; i.e., types that have only one instance.

A wide variety of types of business objects can be defined. Business objects are passive in the sense that they do not trigger or perform processes. A business object could be used to represent information assets that are relevant from a business point of view and can be realized by data objects.

Application Services
According to the ArchiMate 3.0 specification, an application service represents an explicitly defined exposed application behavior.
In this reference architecture, we have used application services to model "data exchange standards" i.e., to specify the data exchange standard used to exchange a given data object. For example, IEC 61970-452 is the standard for exchanging Equipment Models and therefore is associated with the corresponding object in the model.

Data Object
A data object represents data structured for automated processing.

A data object should be a self-contained piece of information with a clear meaning to the business, not just to the application level. Typical examples of data objects are a customer record, a client database, or an insurance claim.

As explained in Section 3.6, the ArchiMate language in general focuses on the modeling of types, not instances, since this is the most relevant at the Enterprise Architecture level of description. Hence a data object typically models an object type (cf. a UML class) of which multiple instances may exist in operational applications. An important exception is when a data object is used to model a data collection such as a database, of which only one instance exists.

An application function or process can operate on data objects. A data object may be communicated via interactions and used or produced by application services. A data object can be accessed by an application function, application interaction, or application service. A data object may realize a business object and may be realized by an artifact. A data object may have association, specialization, aggregation, or composition relationships with other data objects. The name of a data object should preferably be a noun.

Technology Collaboration
A technology collaboration represents an aggregate of two or more technology internal active structure elements that work together to perform collective technology behavior.
A technology collaboration specifies which nodes and/or other technology collaborations cooperate to perform some task. The collaborative behavior, including, for example, the communication pattern of these nodes, is modeled by a technology interaction. A technology collaboration typically models a logical or temporary collaboration of nodes and does not exist as a separate entity in the enterprise.
EPRI EA Note:
Useful for modeling complex infrastructure/systems at an abstract level e.g. Advanced Metering Infrastructure (AMI), SCADA, Telecommunications or the power grid.
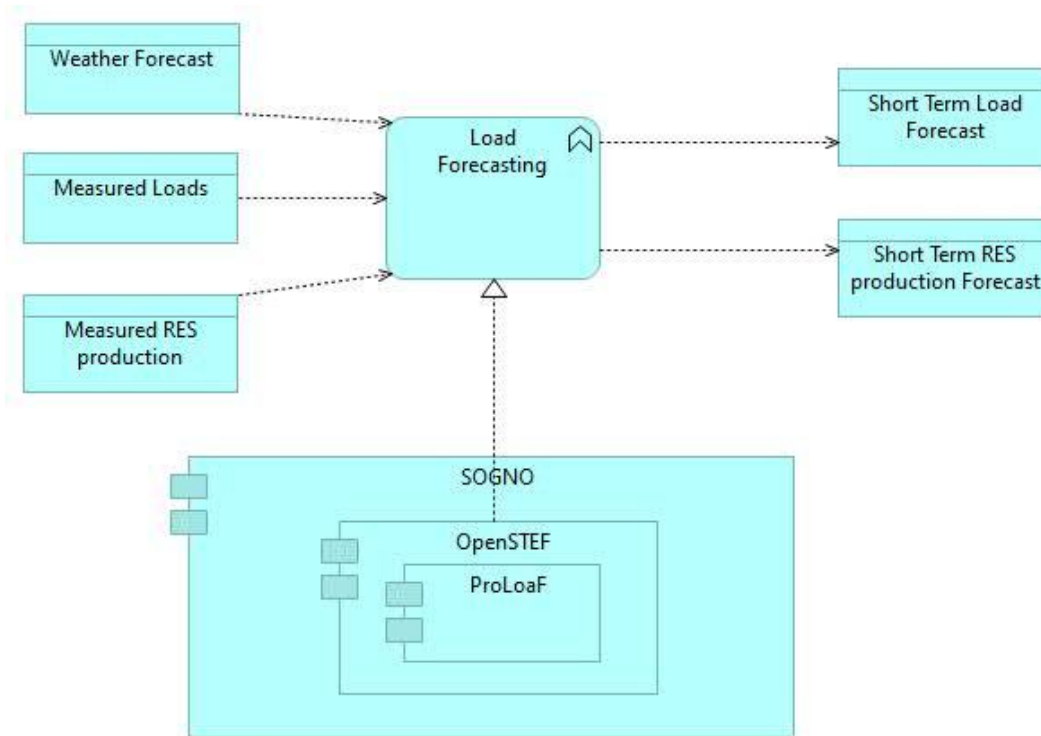
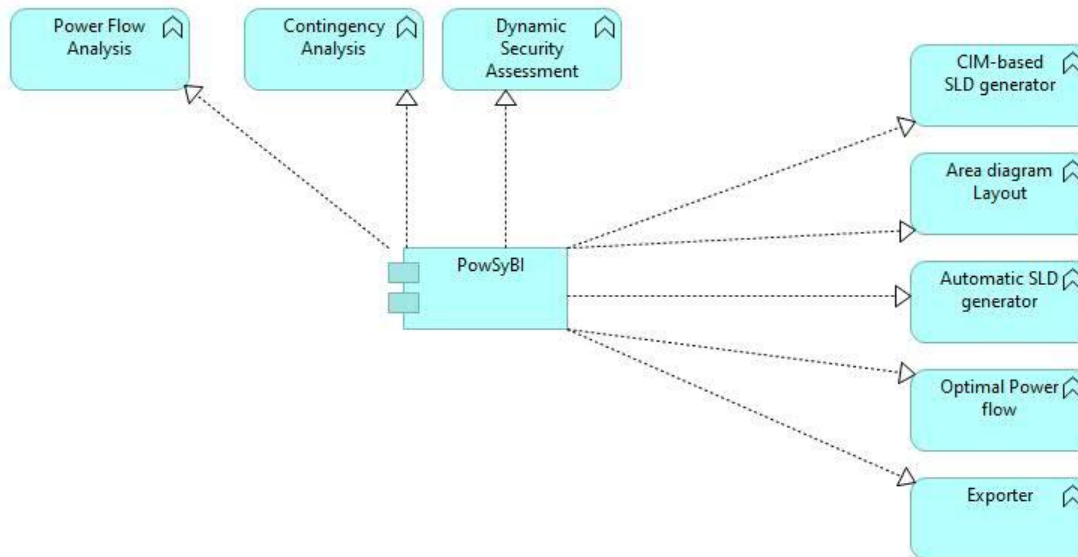# Appendix C: LF Energy Architecture Model – Generic reference architecture
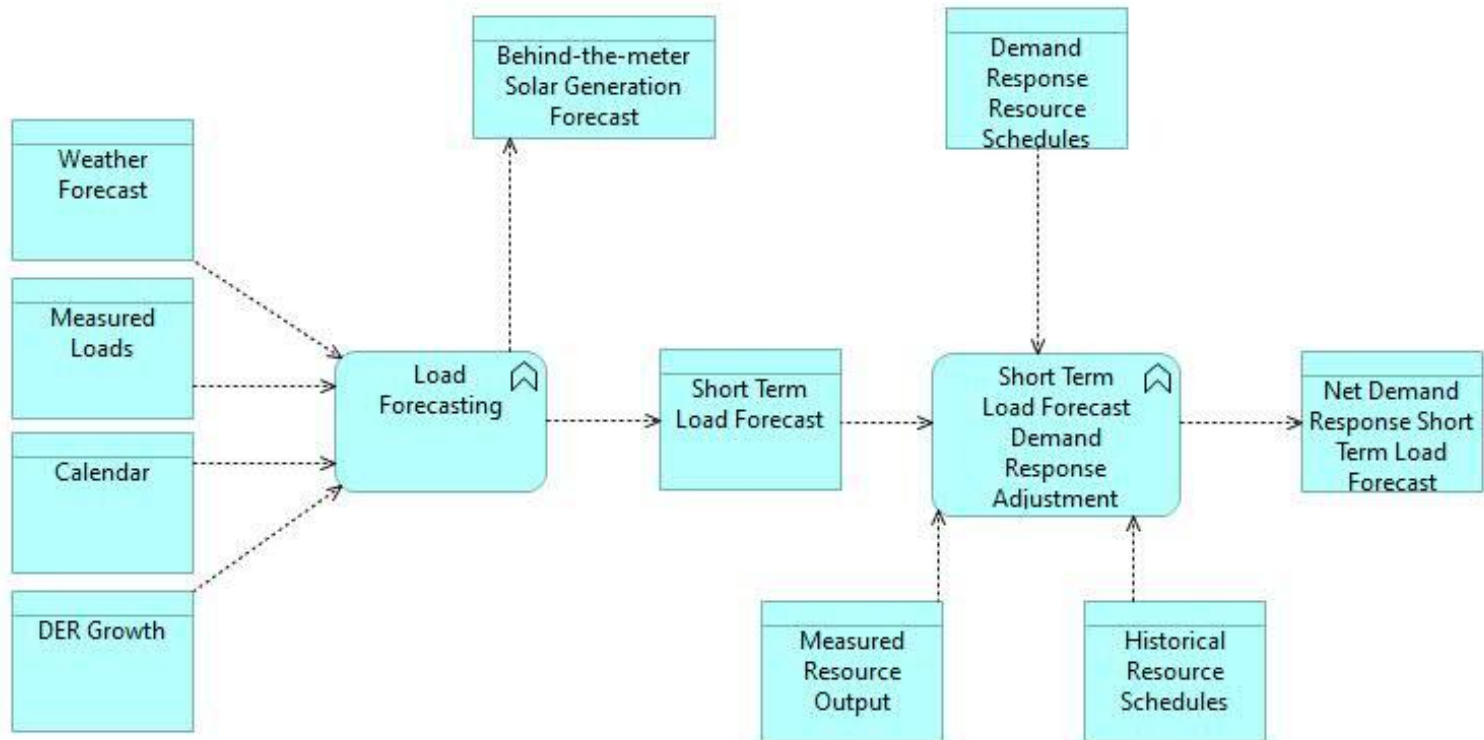
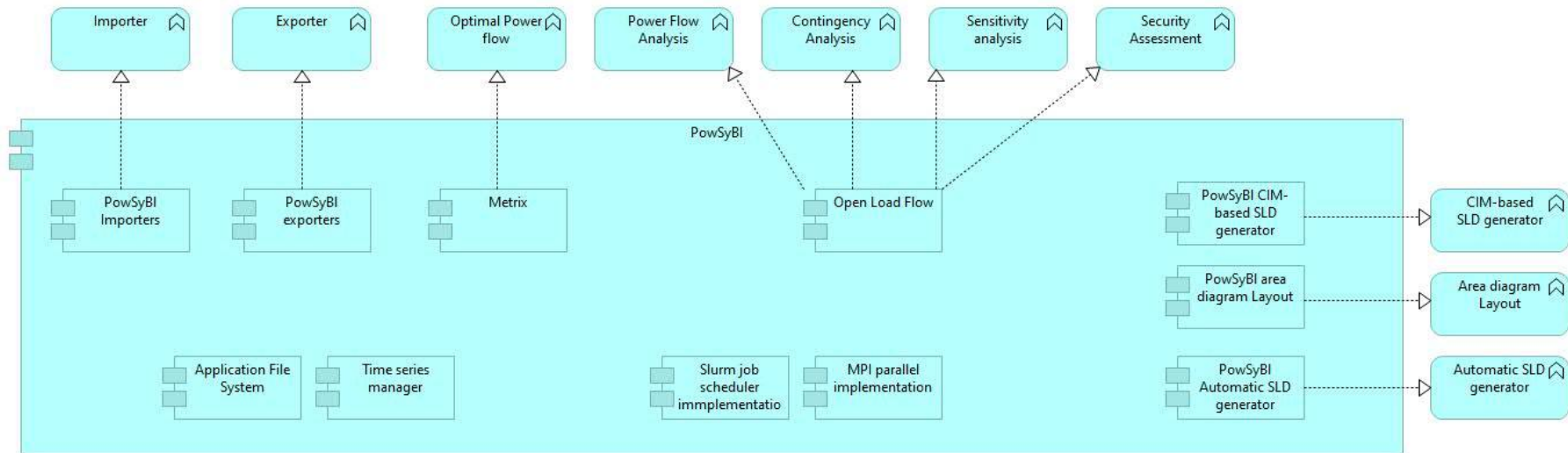# Appendix C: LF Energy Architecture Model - OpenSTEF
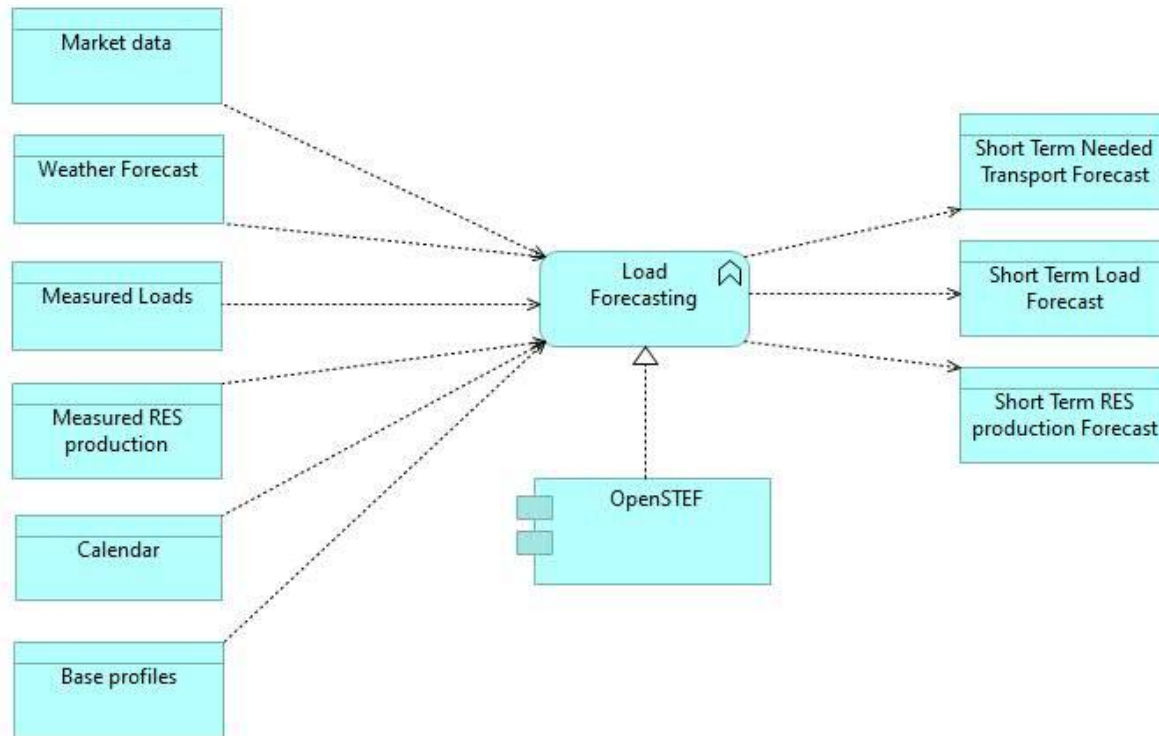
Appendix C: LF Energy Architecture Model - SOGNO

Appendix C: LF Energy Architecture Model - PowSyBI

Appendix C: LF Energy Architecture Model - PowSyBI

EPRI

ABOUT US

Founded in 1972, EPRI is the world's preeminent independent, non-profit energy research and development organization, with offices around the world. EPRI's trusted experts collaborate with more than 450 companies in 45 countries, driving innovation to ensure the public has clean, safe, reliable, affordable, and equitable access to electricity across the globe. Together, we are shaping the future of energy.

EPRI

Vision

To be a world leader in advancing science and technology solutions for a clean energy future

Mission

Advancing safe, reliable, affordable, and clean energy for society through global collaboration, science and technology innovation, and applied research.

Together…Shaping the Future of Energy™

EPRI

Together…Shaping the Future of Energy™

EPRI

GPX Presentation

Presentation May30, 2022 GPX SW+HW dev

In 3 steps

1. Information
2. Options
3. Consequences

1. Information – general 3/1

1) Groupmeter gathers (max 10) individual meters

2) Social interactive concept

3) Software open source
https://github.com/GPXenergy
Dashboard = groupmeter + individual meter

4) Hardware
GPXconnector connects via wifi meter > server

5) Server use untill end November 2022

1. Information – general 3/2

Past

GPX since 1999 in energy origin disclosure

1) In 2019 Jelle HAN/AIM set-up dashboard+HW

2) In 2020 payed improvement to present status

Future

3) GPX = non-profit, aim > GPXFoundation

4) Looking for board members

Participants

1) Are satisfied but expect development
2) Believe in promising future with this idea
3) Small troubles installing HW by different guides
4) Exiting current clamp situation between wires

2. Option – general 3/1
Ideal situation architecture
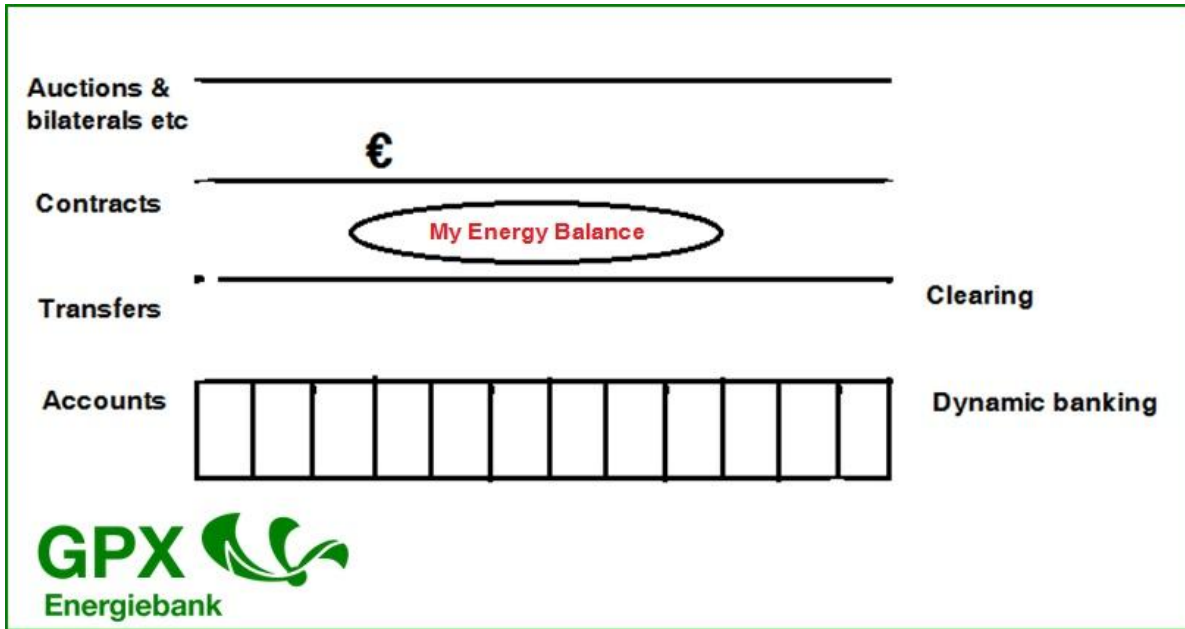
2. Option – general 3/2
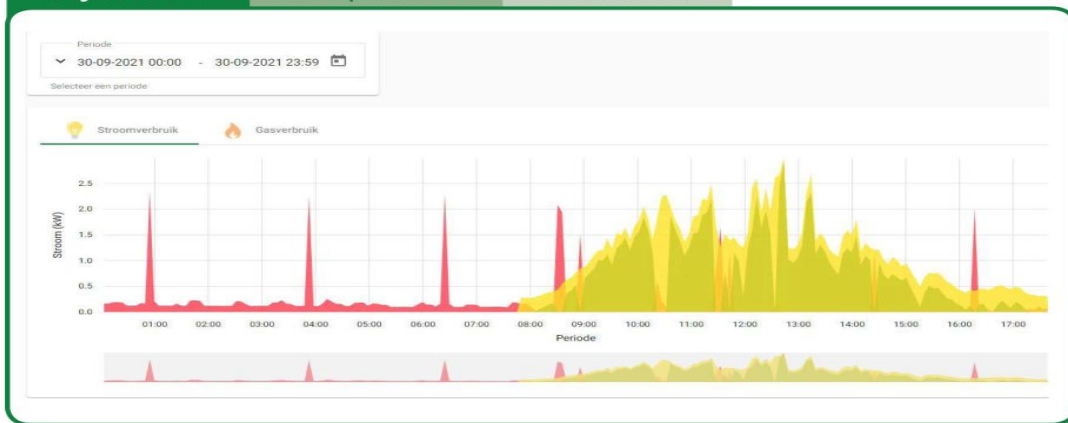
2. Option – general 3/3

1. Dashboard plus chat-functionality
2. Groupmeter with graph-functionality
3. Groups to form in clusters
4. Windpark & solarfield connecting
5. Together in energy-neutral 'experience'
6. Better hardware (no adapter)
7. GPXFoundation (open source & non-profit)

3. Consequences

- What if then else – effort & results
- SWOT – scalability to micro & macro!
- LFE (Linux) interested
- NL-AIC (Artificial Intelligence) interested
- Participants do not like surprises in GDPR
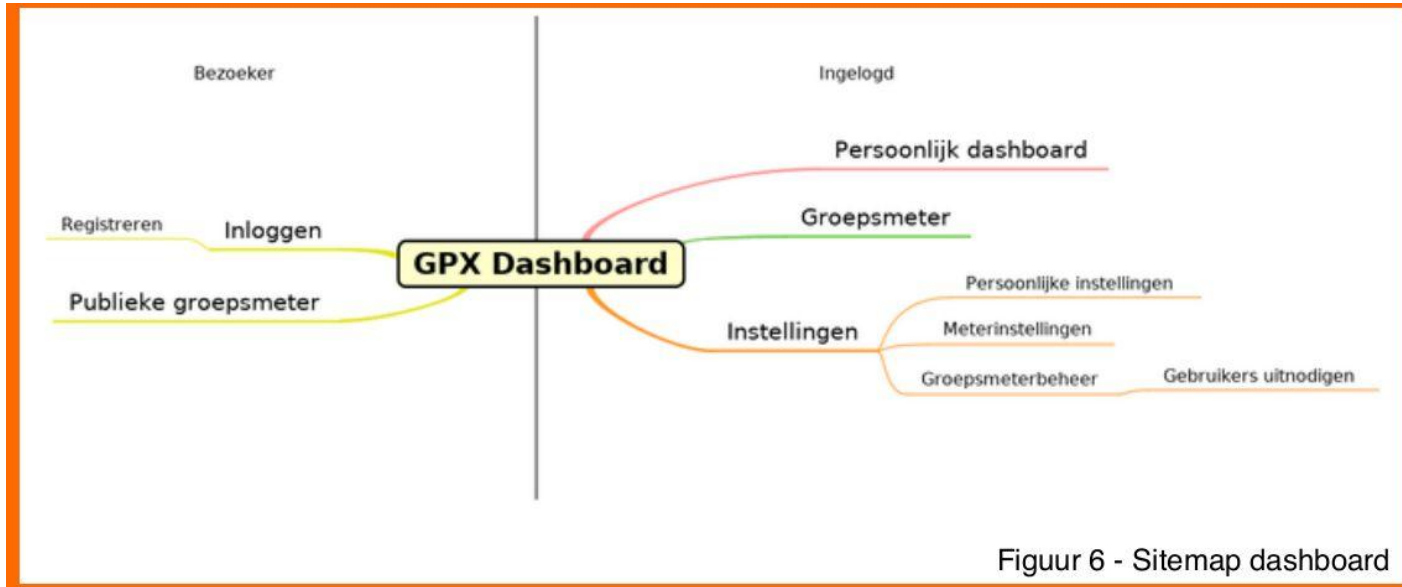- Data ownership very delicate

FIN

- Last page

- Financial consequences

- Way to cooperate and
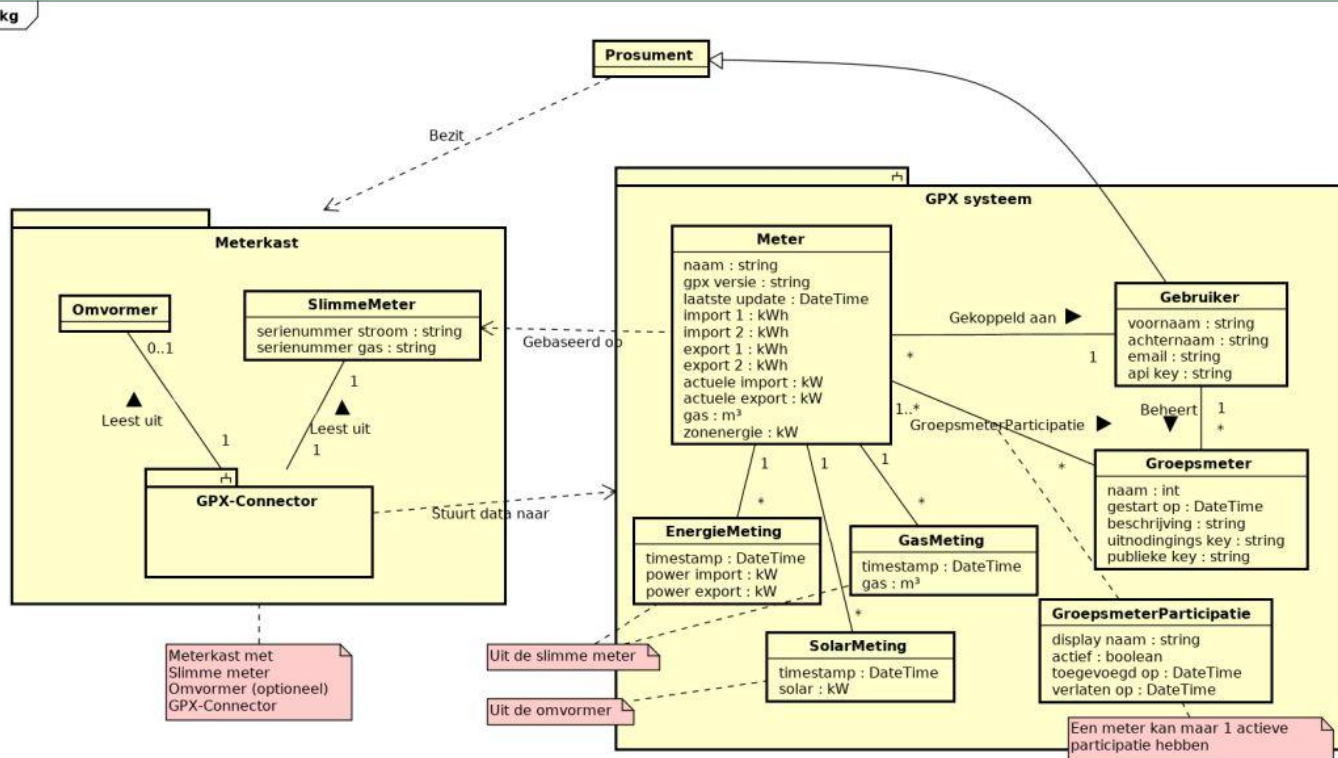
- How to move forward

Thank you.
Contact: https://www.gpx.nl/contactpagina/

Bonus slides 5/1

Figuur 6 - Sitemap dashboard

Bonus slides 5/2
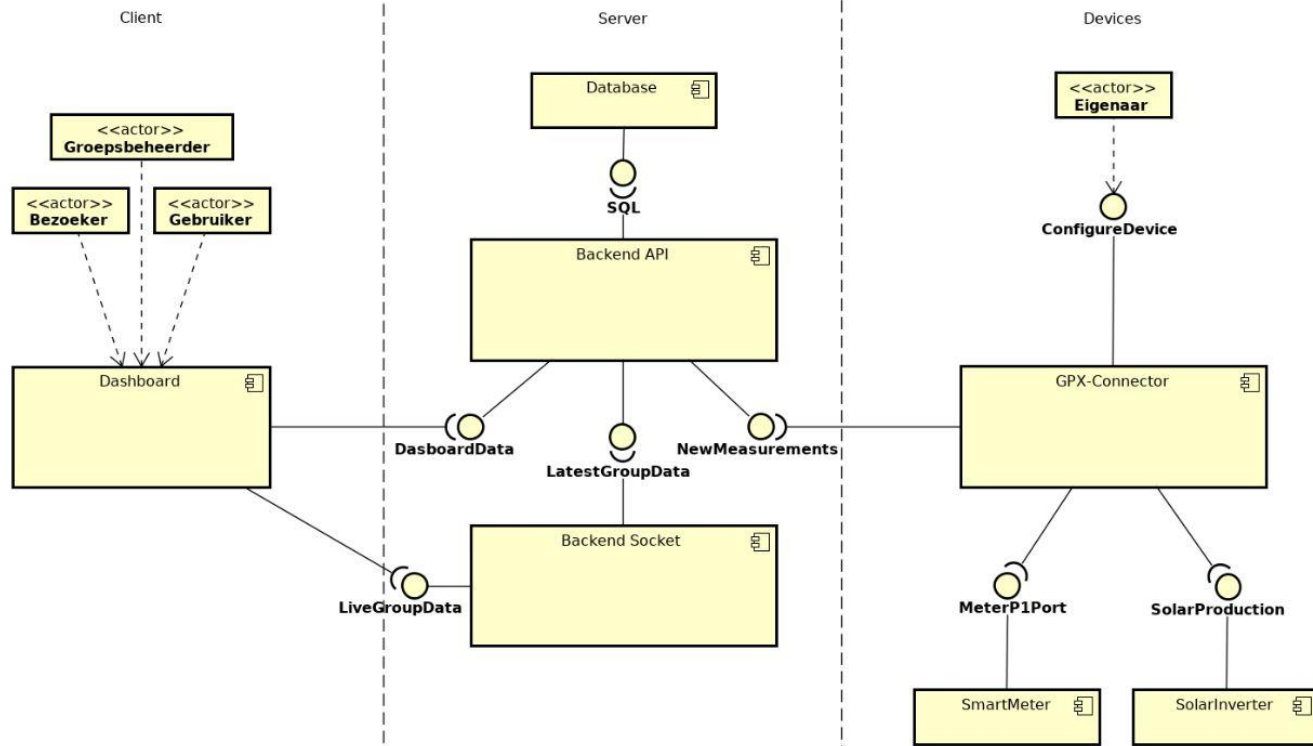
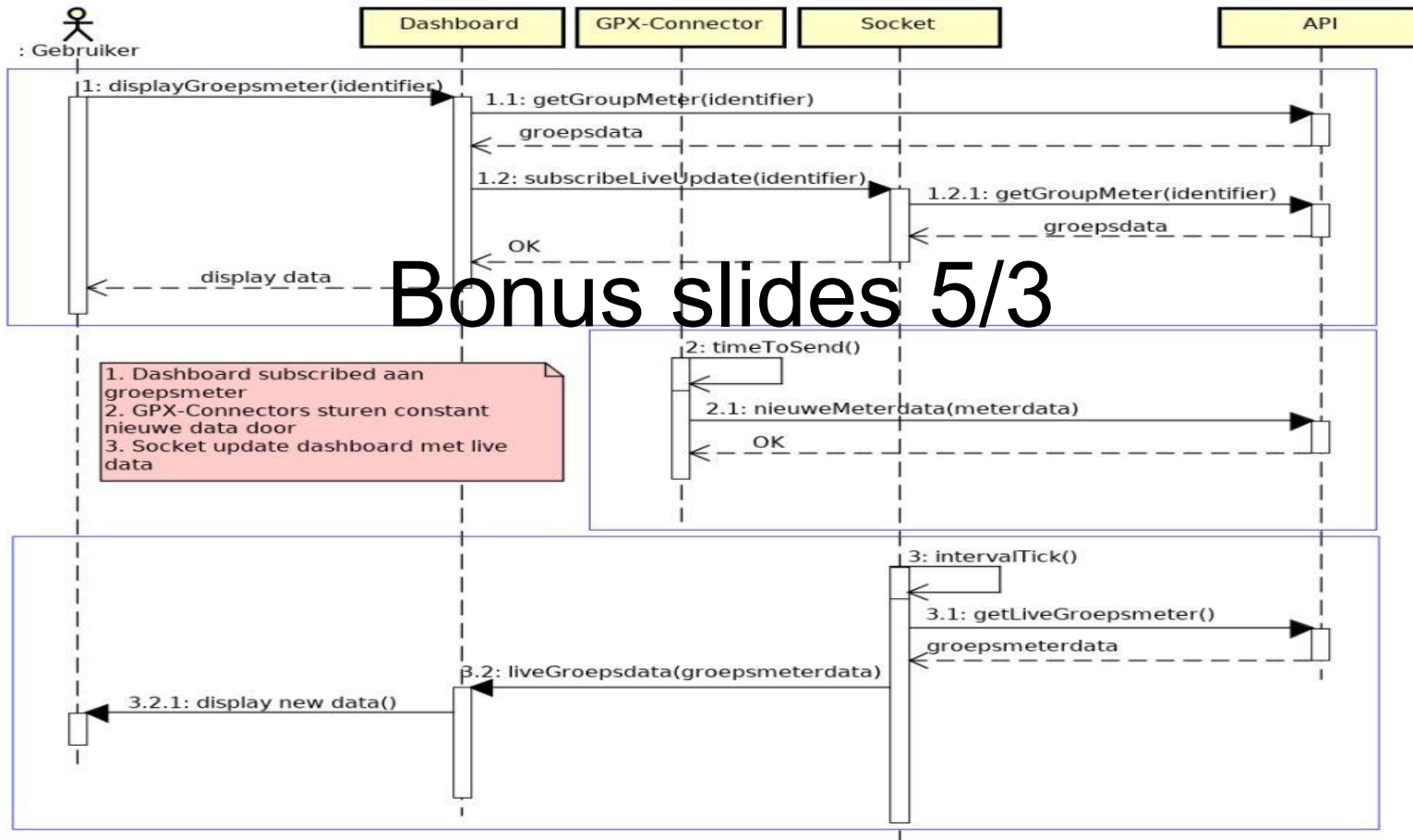# Bonus slides 5/3

Bonus slides 5/3

Bonus slides 5/4

4. Systeemeisen System-requirements

Dit hoofdstuk beschrijft de eisen aan de opdracht, onderverdeeld in functionele en niet-functionele eisen. Hiervoor wordt FURPS gebruikt, dat staat voor: Functionality, Usability, Reliability, Performance, Supportability. De eisen zijn geprioriteerd met behulp van de MoSCoW methodiek.

Bonus slides 5/5
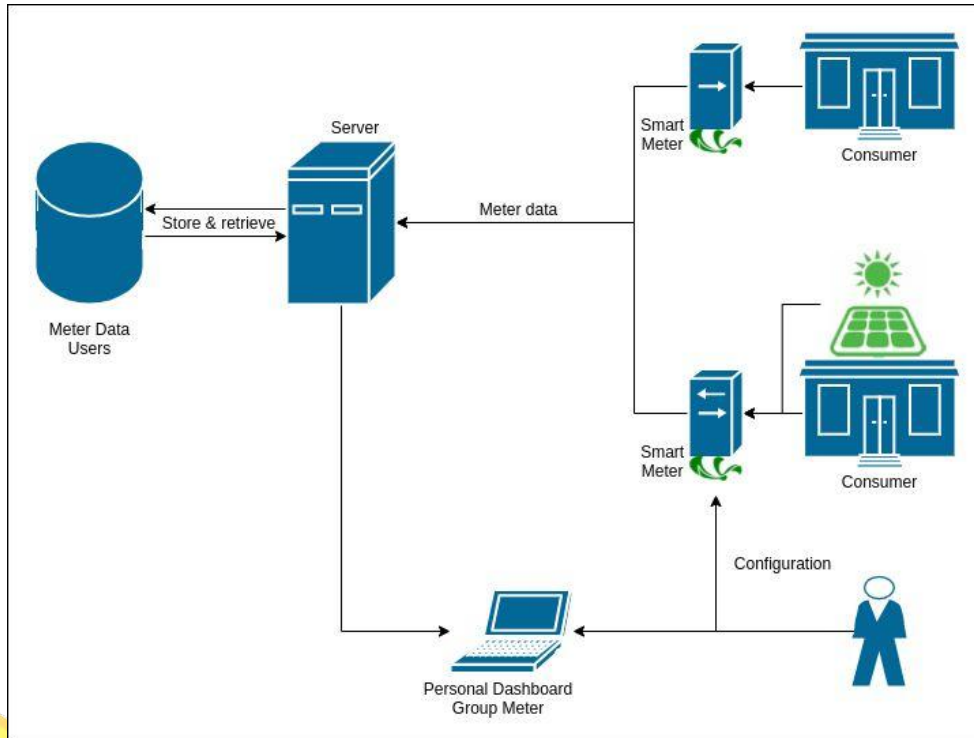
May30-2022 Egbert Bouwhuis
Contact:
https://dashboard.gpx.nl/info
https://gpx.nl
Google: groupmeter gpx
Phone NL 0031 6 20364506

JDF Transition for Standards and Specifications

Project Review Cycle

Project	Current Level	Initially Accepted	Last Review Date	Next Review Date
Grid Capacity Map	**Incubation**	**April 27, 2021**		**June 21, 2022**
OperatorFabric	*Early Adoption*	*April 30, 2019*	*July 20, 2021*	*June 21, 2022?*
CoMPAS	Incubation	May 5, 2020	June 29, 2021	July 12, 2022
PowSyBl	Early Adoption	April 30, 2019	August 31, 2021	August 23, 2022
OpenEEmeter	Incubation	June 4, 2019	October 12, 2021	September 13, 2022
OpenSTEF	Incubation	September 21, 2021		September 13, 2022
GXF	Early Adoption	February 4, 2020	October 12, 2021	October 4, 2022
OpenGEH	Incubation	October 12, 2021		October 4, 2022
OpenLEADR	Incubation	September 15, 2020	November 23, 2021	October 25, 2022
SEAPATH	Incubation	October 6, 2020	November 23, 2021	October 25, 2022
EVerest	Incubation	October 12, 2021		November 15, 2022
FlexMeasures	Incubation	November 2, 2021		November 15, 2022
Hyphae	Incubation	December 8, 2020	December 14, 2021	December 6, 2022
Full Architecture Working Group (FAWG)	Working Group		January 25, 2022	January 17, 2023
Data Architecture Working Group (DAWG)	Working Group		January 25, 2022	January 17, 2023
FledgePOWER	Incubation	February 11, 2021	February 15, 2022	February 28, 2023
SOGNO	Early Adoption	October 27, 2020	March 8, 2022	March 21, 2023
OCPP Cloud Connector	Sandbox	March 8, 2022		March 21, 2023
Shapeshifter	Incubation	April 6, 2021	April 19, 2022	April 11, 2023

LF ENERGY

The Power of Together

Agenda

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Closing and Next Meeting (5 Minutes)

The Power of Together

Next TAC Meeting

The next meeting of the LF Energy TAC is scheduled for 21 June 2022 at 8:00 am US Pacific Time/11:00 am US Eastern Time/5:00 pm Central European Time.

NOTE: New meeting invite for series titled 'LF Energy TAC meeting (2022)' from 'LF Energy (LFE) - Meetings <meetings@lfx.linuxfoundation.org>'. Register for meeting at https://zoom-lfx.platform.linuxfoundation.org/meeting/98588947265 Please remove all other meeting invites.

Agenda will include:

- Recap of last TAC meeting/Governing Board updates

LF ENERGY

Thank you!

Outreach

- TFiR videos
  - https://www.tfir.io/?s=lf+energy
- Recent press articles
  - https://www.lfenergy.org/news/media-coverage/
- We want your project news!
  - Doesn't need to be anything huge!
  - Examples of news:
    - New releases (example https://github.com/powsybl/pypowsybl/releases)
    - New features added
    - New maintainers/organizations involved
    - Upcoming plans