FlexMeasures Technical Steering Committee

March 31st 2022

Agenda

- What is FlexMeasures?

- Review latest release: version 0.9.0

- Review roadmap & planning for version 0.10.0

- What kind of people are using FlexMeasures?

- Q&A

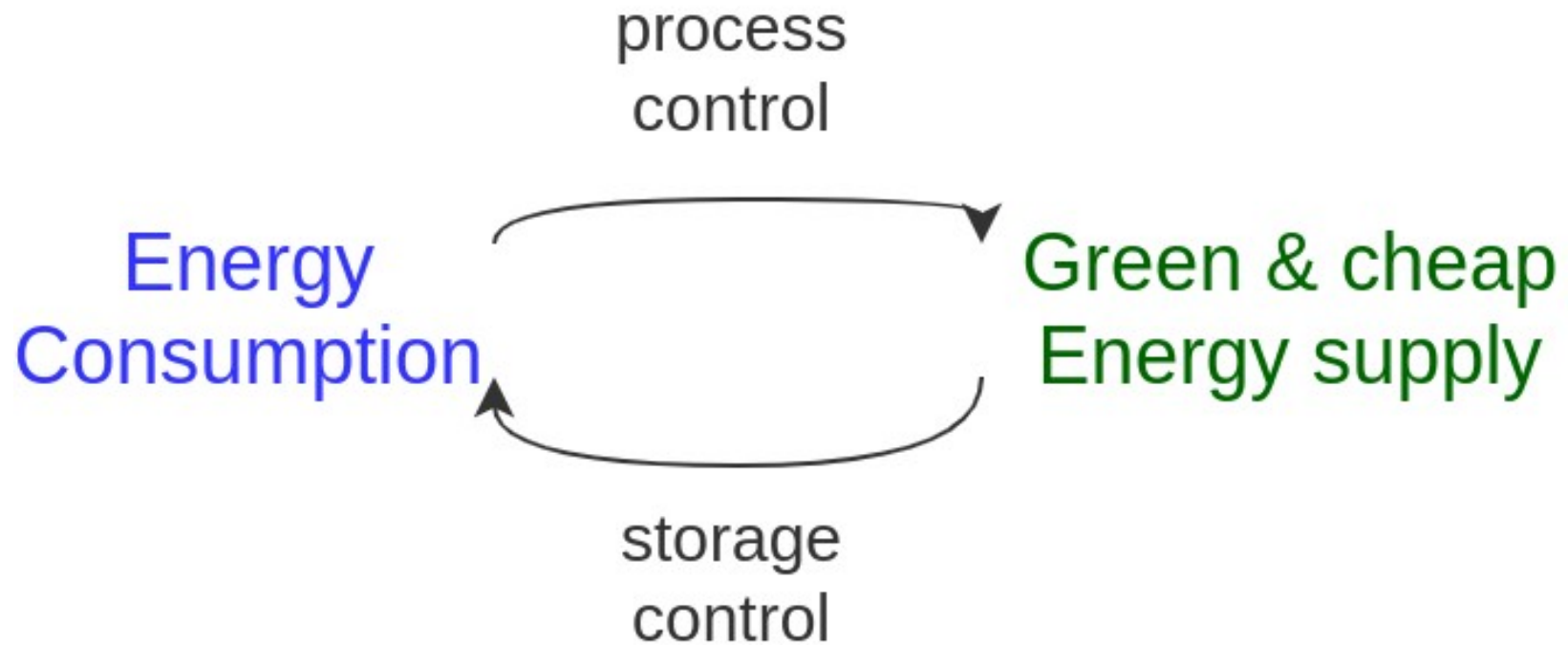# Agenda

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FlexMeasures

FlexMeasures is the intelligent & developer-friendly EMS to support real-time energy flexibility apps, rapidly and scalable.

Go green in daily operations, stay in control.

The big picture

How does FlexMeasures add value?

- Real-time data intelligence & integration

- Uncertainty models

- App building

Open Energy Flexibility Services

Intelligence plugins (open apps)

Implicit Flex Services

Self-balancing

kW_{max} control

ToU Optimization (EUR)

ToU Optimization (CO_2)

Explicit Flex Services

Asset Pooling

Baseline Qualification

Wholesale Bidding

Balancing Optimization

Advanced models

Custom Forecasting

Multi-commodity Optimization

Reinforcement Learning

Process Analytics

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FlexMeasures (open FlexEMS)

UI

CLI

Problems —

Solutions —

— Data

— Schedules

API

Control & Job Queueing

DB

Energy Forecasting and Flex Optimization (basic models)
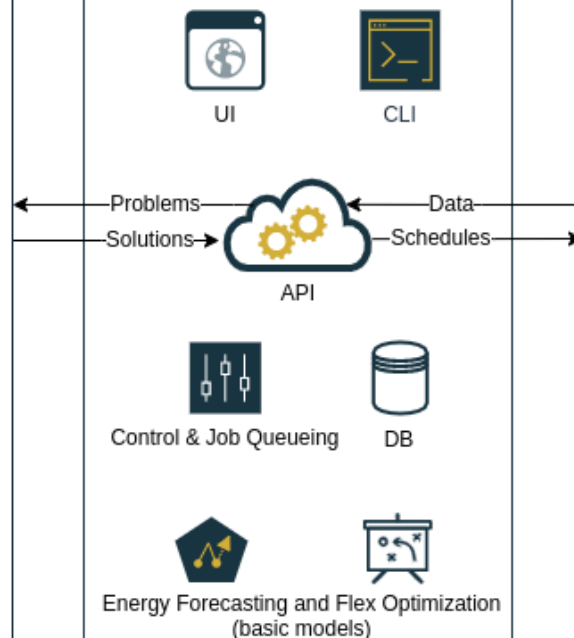
Data plugins (open APIs)

Prosumer integrations

IoT Sensors

Actuators

Market integrations

Constraint Management

Adequacy

Wholesale

Balancing

Other integrations

OpenWeather
Weather Data

entsoe
Grid & Emissions Data

Example cases

Use case: SteerOnCO$_2$ at Rijnland Water Board

We help water board Rijnland to only run their centrifuges for sludge dehydration when the CO$_2$ footprint in the grid is low.

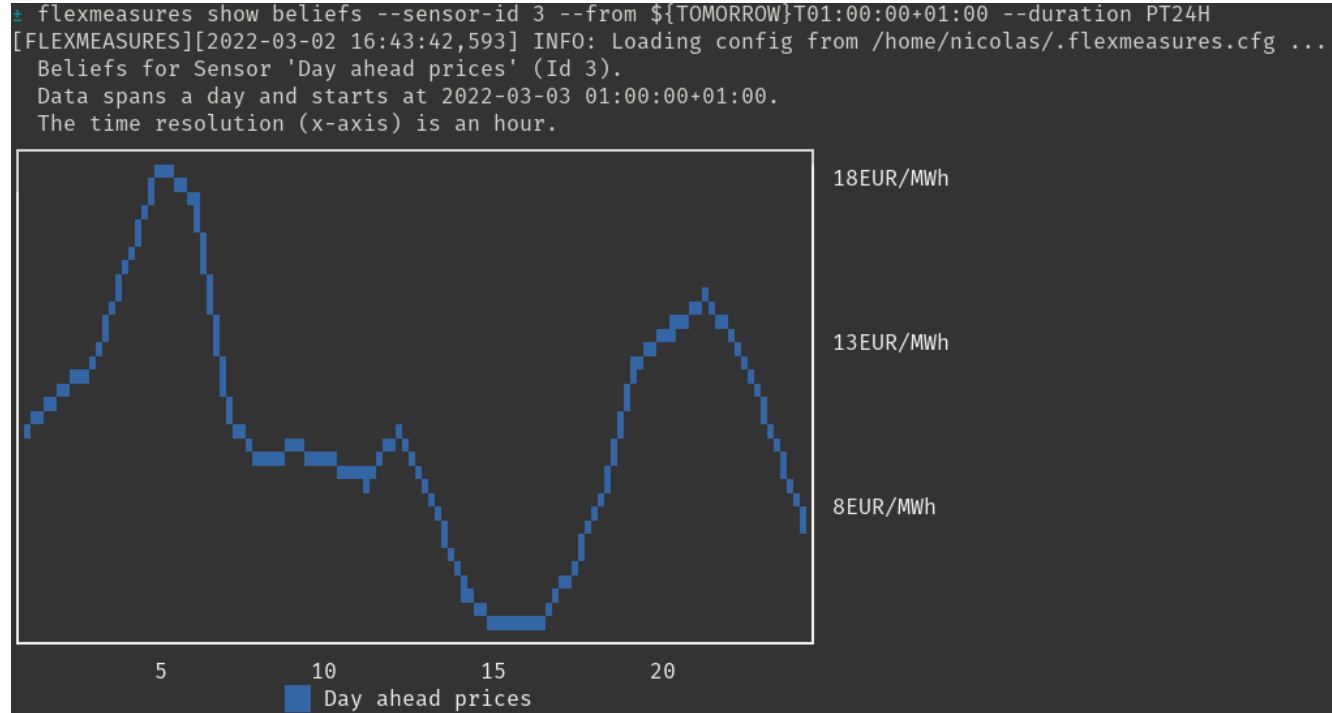
Use case: SteerOnPrice & SteerOnSolar at V2G@Home

We optimize (dis)charging of Nissan Leaf cars with Wallbox chargers to save costs and use solar power, with zero user interaction needed.
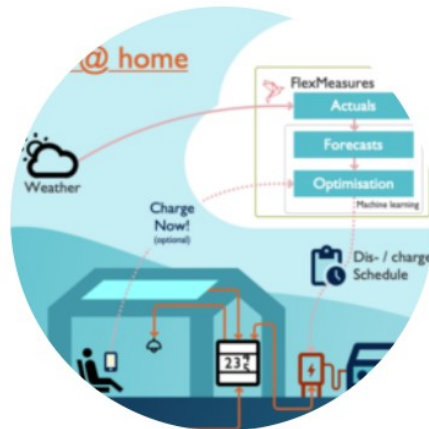
New release: v0.9.0

- CLI commands

- Toy tutorial

- Unit conversion

- API v3

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```
# setup an account with a user, a battery (Id 2) and a market (Id 3)
$ flexmeasures add toy-account --kind battery
# load prices to optimise the schedule against
$ flexmeasures add beliefs --sensor-id 3 --source toy-user prices-tomorrow.csv
# make the schedule
$ flexmeasures add schedule --sensor-id 2 --optimization-context-id 3 \
    --start ${TOMORROW}T07:00+01:00 --duration PT12H \
    --soc-at-start 50% --roundtrip-efficiency 90%
```

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API v3

Resource	Operation	Description
Asset	GET /api/v3_0/assets	Download asset list
	POST /api/v3_0/assets	Create a new asset
	DELETE /api/v3_0/assets/(id)	Delete an asset
	GET /api/v3_0/assets/(id)	Get an asset
	PATCH /api/v3_0/assets/(id)	Update an asset
Data	GET /api/v3_0/sensors/data	Download sensor data
	POST /api/v3_0/sensors/data	Upload sensor data
Schedule	GET /api/v3_0/sensors/(id)/schedules/(uuid)	Download schedule from the platform
	POST /api/v3_0/sensors/(id)/schedules/trigger	Trigger scheduling job
Sensor	GET /api/v3_0/sensors	Download sensor list
User	GET /api/v3_0/users	Download user list
	GET /api/v3_0/users/(id)	Get a user
	PATCH /api/v3_0/users/(id)	Patch data for an existing user
	PATCH /api/v3_0/users/(id)/password-reset	Password reset

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v0.10.0?

- API

- Data model deprecations

- Smarter monitoring

- ?

Roadmap ideas

- Annotations

- Customisable algorithms

- Market support?

- Dockerization?

Who is using FlexMeasures?

- Users

- Hosters

- Plugin developers

- Core developers

Q&A

What are you working on?

What is unclear?

Resources – do get in touch!

- https://github.com/FlexMeasures/flexmeasures/

- https://www.flexmeasures.io

- https://lists.lfenergy.org/g/flexmeasures

- https://twitter.com/flexmeasures

- LF Energy Slack: #flexmeasures

FlexMeasures

Our new data model

LatestTaskRun
+name : String
+datetime : DateTime
+status : Boolean

DataSource
+id : Integer
+name : String
+type : String
+user_id : Integer
+model : String
+version : String

User
+id : Integer
+email : String
+username : String
+password : String
+last_login_at : DateTime
+login_count : Integer
+active : Boolean
+fs_uniquifier : String
+timezone : String
+account_id : Integer

Role
+id : Integer
+name : String
+description : String

Account
+id : Integer
+name : String

AccountRole
+id : Integer
+name : String
+description : String

GenericAsset
+id : Integer
+name : String
+latitude : Float
+longitude : Float
+generic_asset_type_id : Integer
+account_id : Integer

GenericAssetType
+id : Integer
+name : String
+description : String

Sensor
+id : Integer
+name : String
+unit : String
+timezone : String
+event_resolution : Interval
+knowledge_horizon_fnc : String
+knowledge_horizon_par : JSON
+generic_asset_id : Integer

TimedBelief
+event_start : DateTime
+belief_horizon : Interval
+cumulative_probability : Float
+event_value : Float
+sensor_id : Integer
+source_id : Integer