

Agreflex

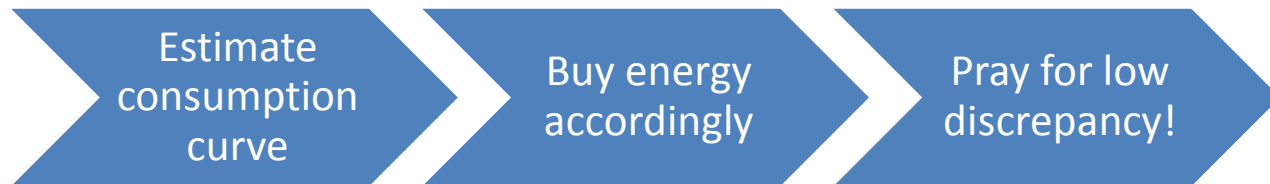
Projet HES-SO - EOS Holding

Kick off meeting

Lausanne, le 14 novembre 2013

Current Process for Power Management

Business



Grid Operation

Distribution systems :

Congestion risk -> Grid upgrade

No real-time process (besides protection)

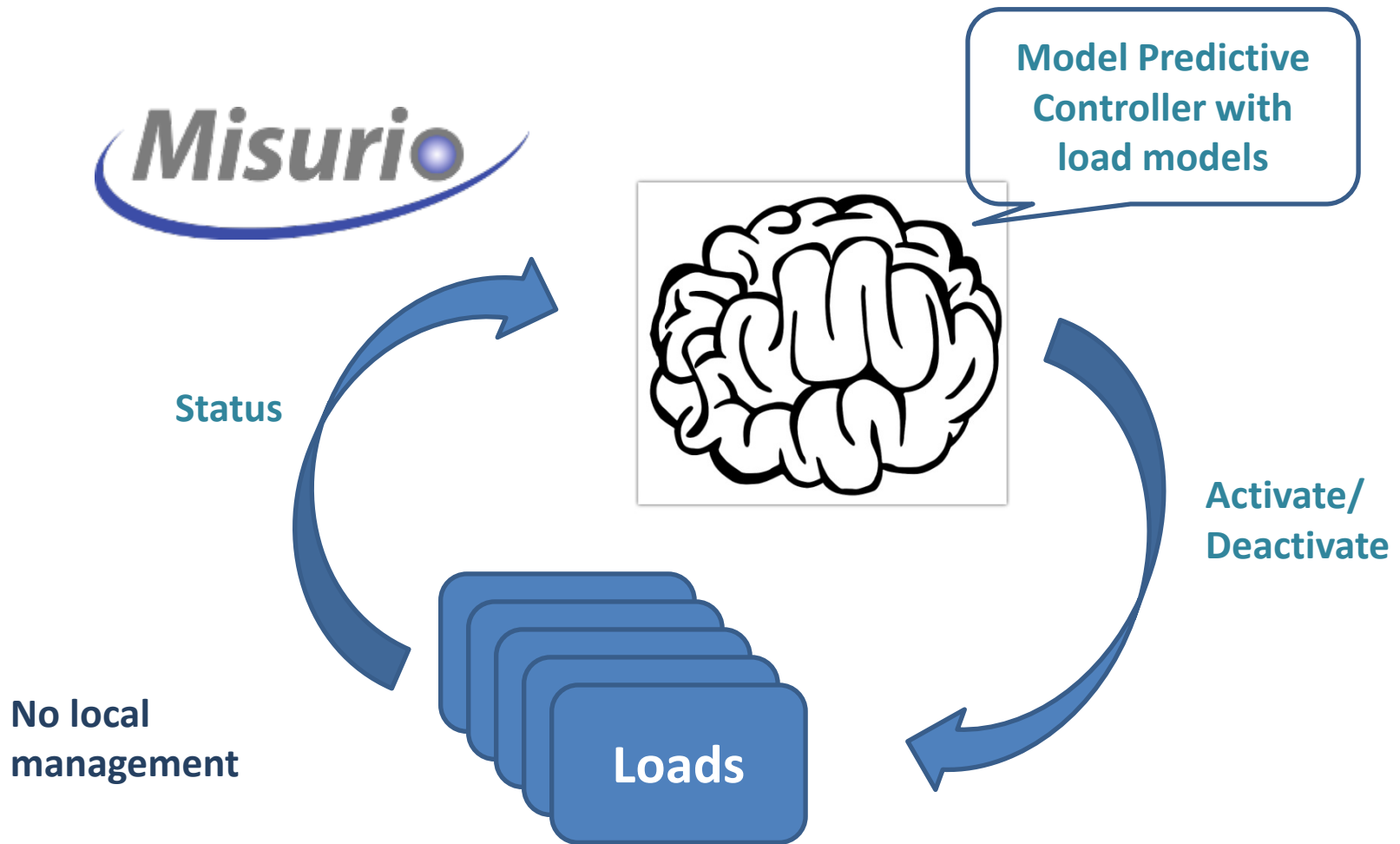
Transport systems:

« Power routing » in meshed transgrid

Redispatching

Disconnection of regions

“Brain”-based Approach





Target as precisely as possible!

Correct in real time if necessary!

Missile TOW
Source wikipedia

Target!

Cost-based Approach

What's the relation between cost curve and load curve?

Determine and transmit cost curve

Estimate consumption according to cost curve

Possibly dependant on location

Business driven?
Grid operation driven? Combined?

How long in advance?
Can costs be overwritten?
Prices vs. costs

Manage process locally to minimise cost

Correct!

Reserve-based Approach

Do we need this phase?

Determine positive & negative reserve needs

Make agreements accordingly

Activate reserve if/when needed

Business driven?
Grid operation driven?
Combined?

Reserve = (Power/Energy, Duration, Min. period)
Baseline for evaluation?
Contract and pricing model?

Calculate reserve capability

Keep due reserve

Local control

Activate reserve

WP1

Evaluation du potentiel de charges flexibles

“Energiewende” requires storage -> Qualify and quantify storage needs
Load management is equivalent to storage -> Qualify and quantify load management
potential contribution to storage needs

WP2

Modélisation des charges flexibles

Provide simple models for loads and grids

Buildings and electrical vehicles : Simple generic models with parameters

Large consumers: Models for some individual loads (based on WP5 measurement results)

Grids: Simple model of multi voltage level transport/distribution grids

Overview of a generic model for building heating

Time step: 1 minute

Local demand
response
control

Scope of WP2

Heating system
model

Weather
model

Building
envelope
model

User behaviour
model

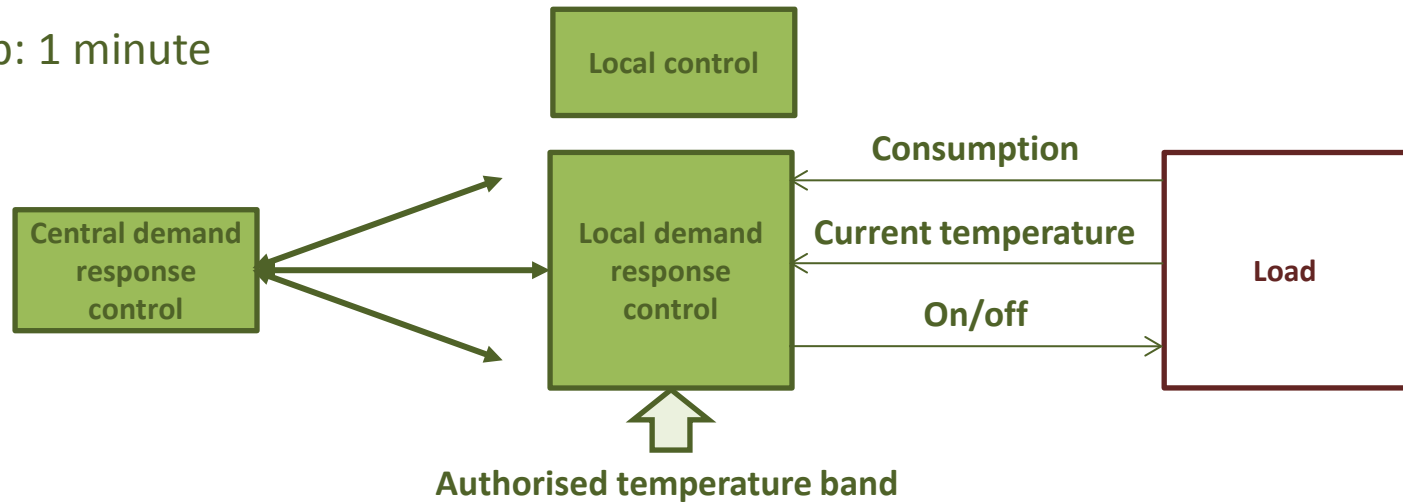
WP3

Elaboration et simulation d'algorithmes d'agrégation

Develop a load management simulation environment Loads models are taken over from WP2

Prototype the coast-based approach and the reserve based approach

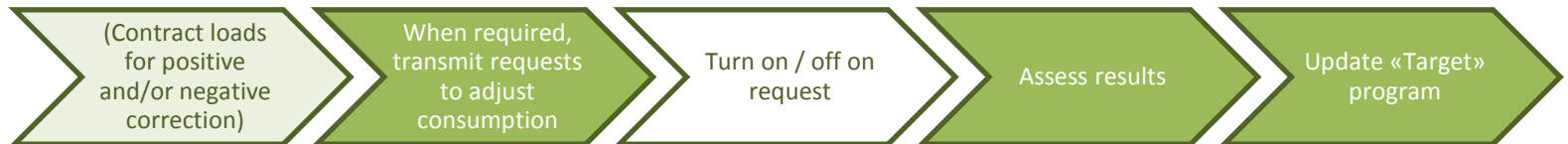
Time step: 1 minute



«Target»



«Correct»



Conception d'une architecture de déploiement

WP4

Context: denuclearised and defossilised electricity world

Define the "upstream" interface according to DSOs' and energy suppliers future expected needs

Sketch a technical architectures (included "downstream" interface)

Point potential problems on law & regulation, estimate value

Mesures sur site et tests

WP5

Validate by measurement the model for a building heating and hot tap water
Perform measurements to derive the model for a large consumer

