Micro Grid - Riadenie zataženia siete na strane odberu

Pavol Babarík

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manage energy better

From traditional energy system towards smart grid

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Nuclear power phaseout

Distributed generation

Global warming / CO_2 reduction targets
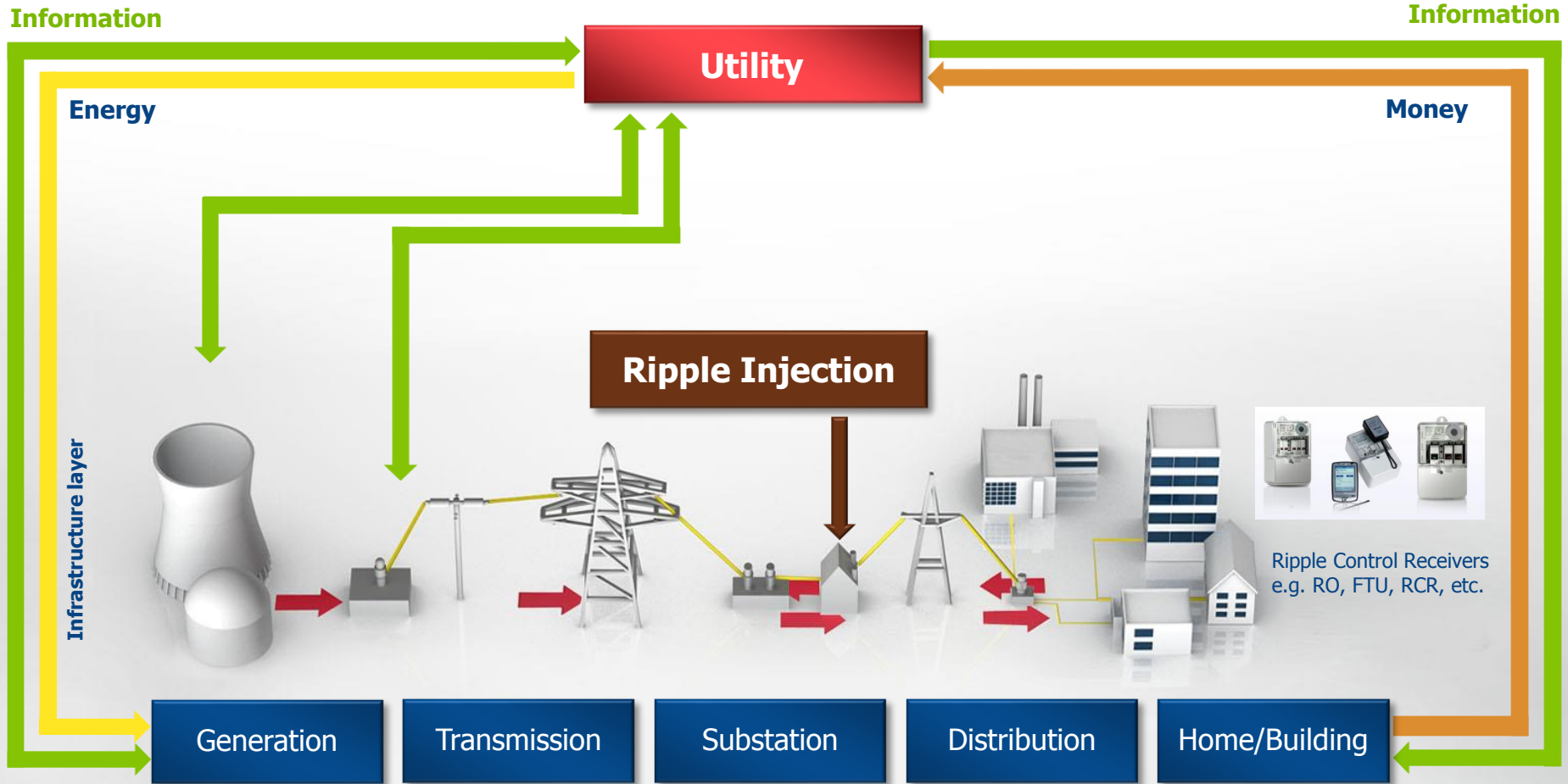
Aging infrastructure
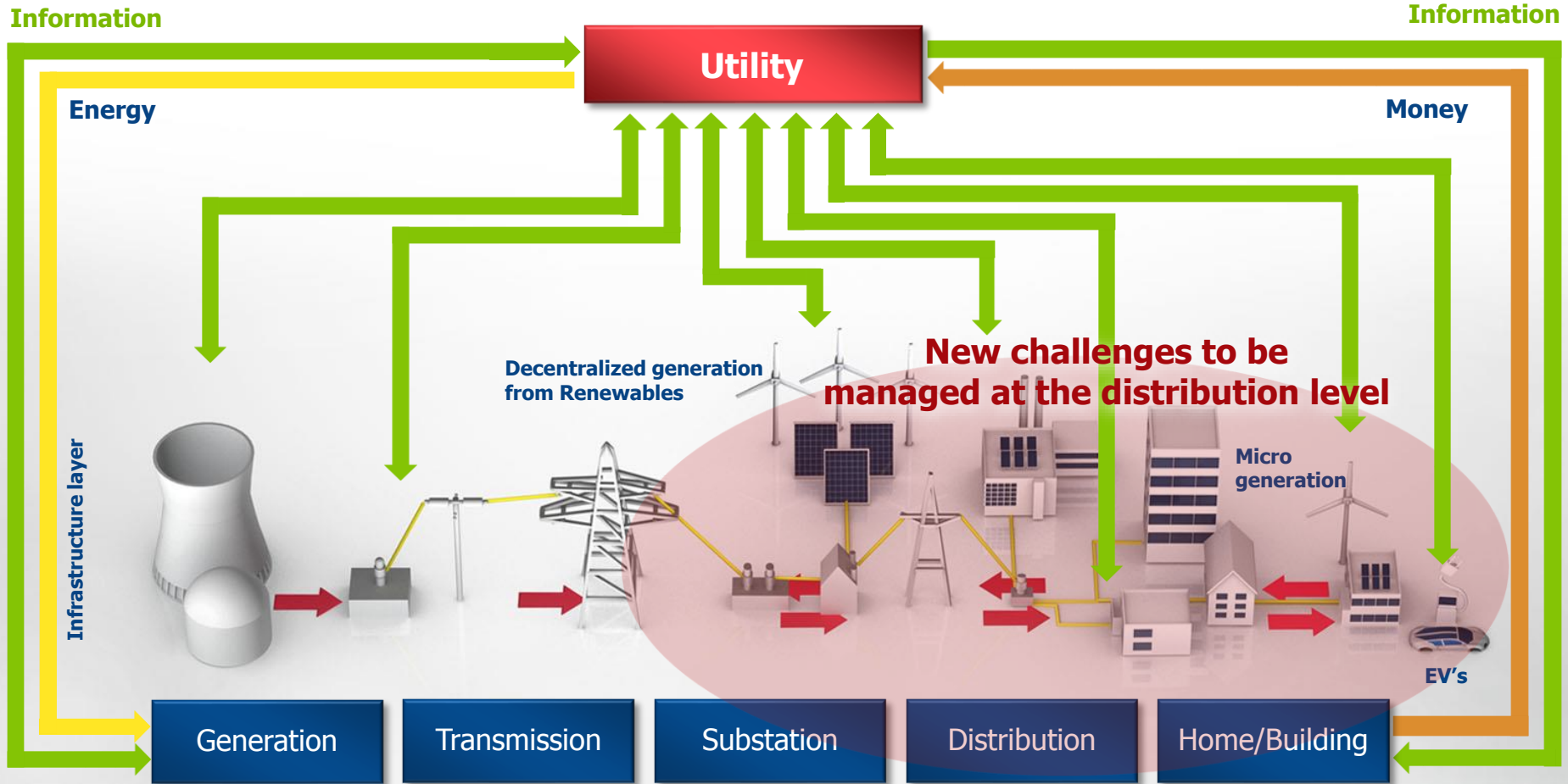
New consumer needs

Market liberalization

Regulatory mandate

- Lack of energy (reliability)

- Load objects have to be switched according to actual energy supply (allocation)

- Reduction of energy consumption in general

- Limited transmission / distribution capacity

- New services and business models

- Dynamic consumer tariffs

The traditional energy system…

Ripple Control Receivers
e.g. RO, FTU, RCR, etc.

...has to adopt to new challenges.

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Information

Information

Utility

Energy

Money

Infrastructure layer

Decentralized generation from Renewables

New challenges to be managed at the distribution level

Micro generation

EV's

| Generation	Transmission	Substation	Distribution	Home/Building

Distributed Generation / Distribution & Substation Automation / Dynamic Load Management / Dynamic Tariffs / Local Load Controller (Micro Generation) / EV's / New Energy Services / Personal Energy Mgmt
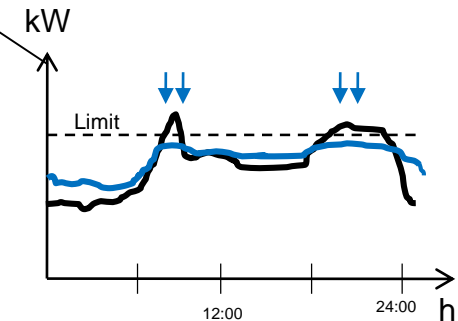
AMM + 3rd Generation Load Management

Micro Grid Controller (FPS Micro)

Existing Ripple and 3rd Generation LM technology

Gridstream AIM

FPS LM

Network Control Center

HV

MV

LV

FPS Micro — DC

FPS Micro — DC

FPS Micro — DC
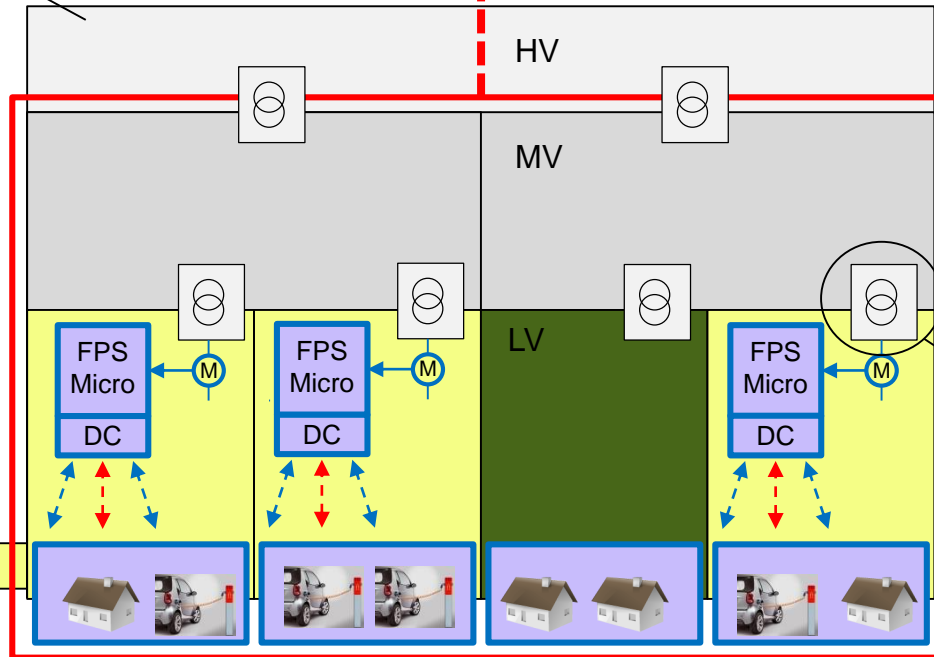
New:

Local closed loop load controller

kW

Limit

12:00   24:00   h
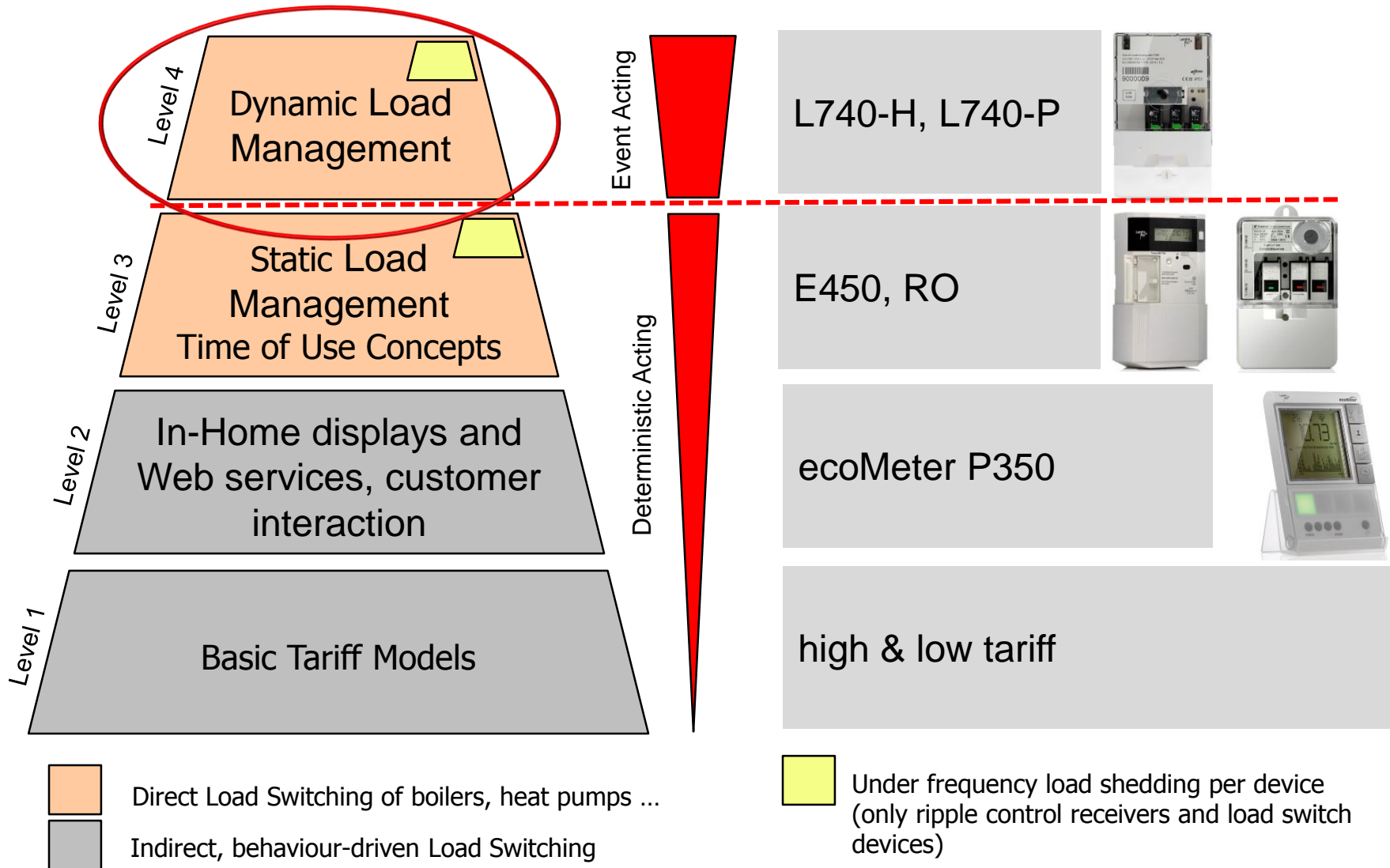
o E-mobility will increase peak loads dramatically

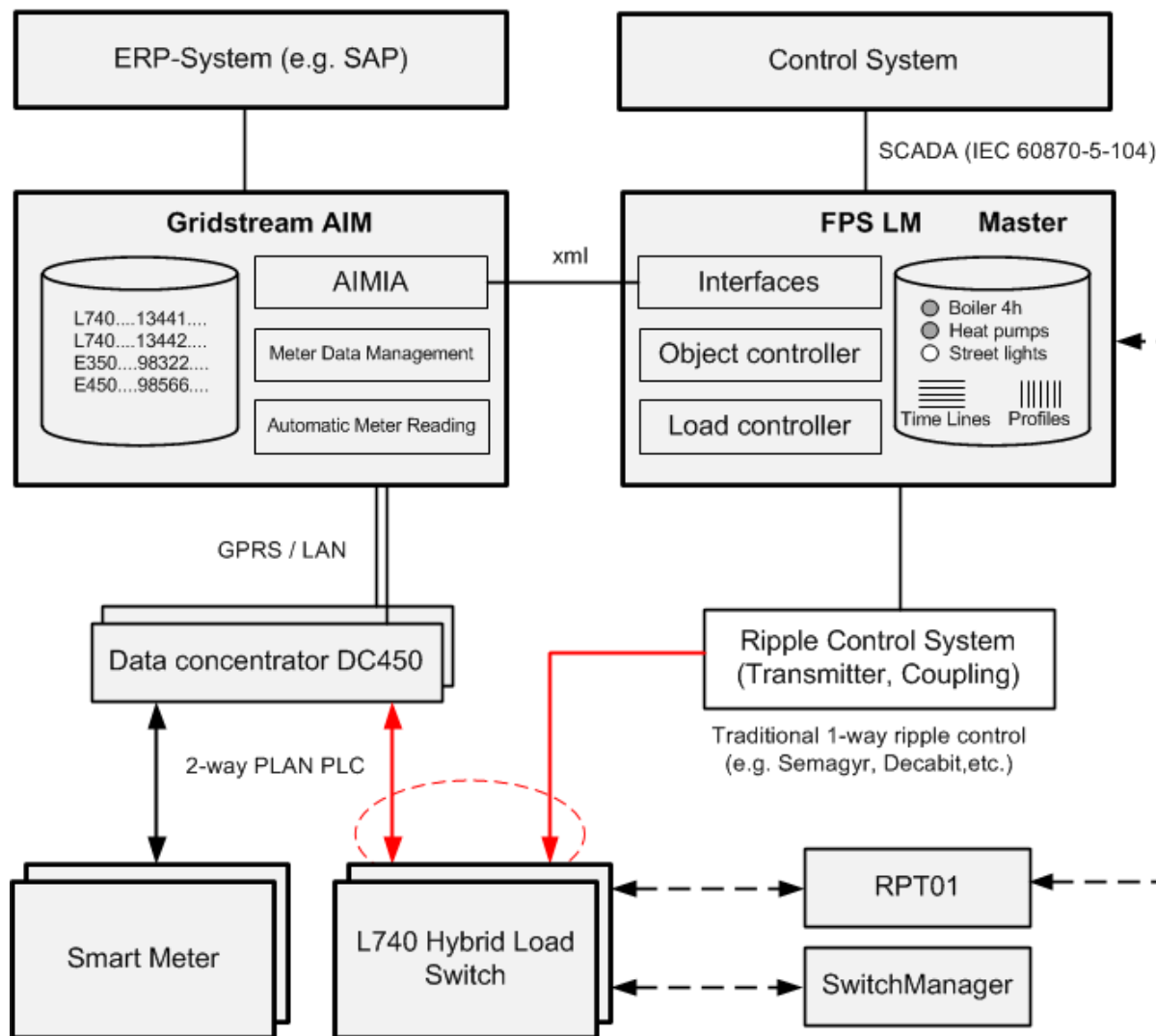o No replacement of existing infrastructure due to Local Dynamic Load Management

Goal:
With Local Dynamic Load Management, customer does not need to replace transformer(s)!
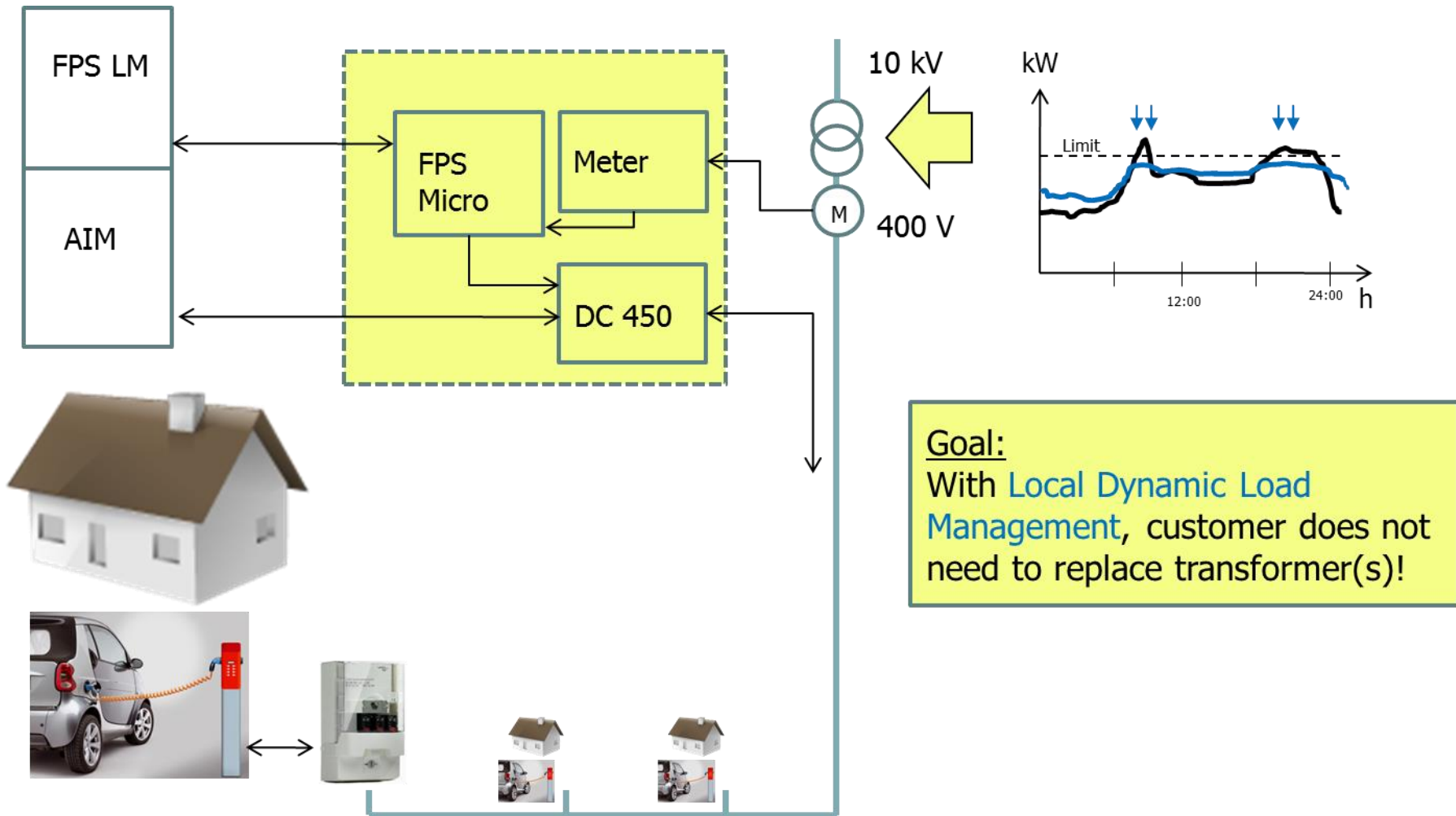
Load Control: Level Of Grid Engagement

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Pyramid Level		Device
Level 4	Dynamic Load Management	L740-H, L740-P
Level 3	Static Load Management — Time of Use Concepts	E450, RO
Level 2	In-Home displays and Web services, customer interaction	ecoMeter P350
Level 1	Basic Tariff Models	high & low tariff

Event Acting

Deterministic Acting

Legend:
- Direct Load Switching of boilers, heat pumps …
- Indirect, behaviour-driven Load Switching
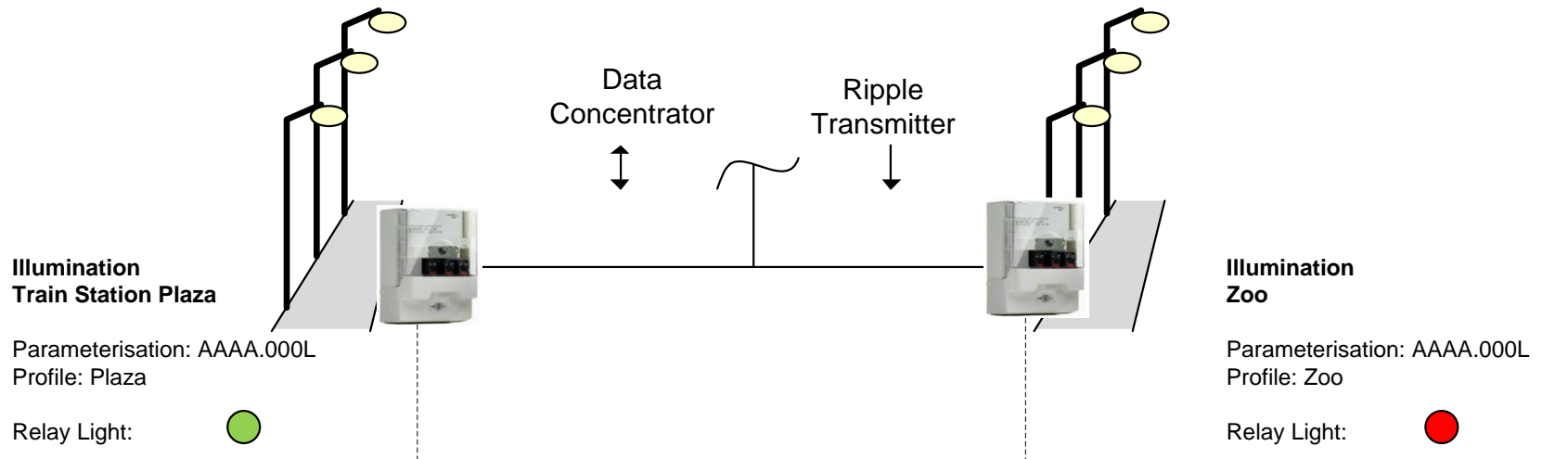- Under frequency load shedding per device (only ripple control receivers and load switch devices)

3rd Generation LM in Gridstream Solutions

L7XX: Modern 2-way PLAN PLC **AND** traditional 1-way ripple control communication within ONE system

Data Concentrator

Ripple Transmitter

**Illumination
Train Station Plaza**

Parameterisation: AAAA.000L
Profile: Plaza

Relay Light:

**Illumination
Zoo**

Parameterisation: AAAA.000L
Profile: Zoo

Relay Light:

Load Object	State DC	DC	Time Line	Profile Plaza
Light, City Zurich		33	On, 18:00, Mo- Su	x
		33	Off, 06:00, Mo- Su	x
		33	~~On, 04:00, Mo- Su~~	-
		33	~~Off, 24:00, Mo- Su~~	-

Load Object	State DC	DC	Time Line	Profile Zoo
Light, City Zurich		33	On, 18:00, Mo- Su	x
		33	Off, 06:00, Mo- Su	x
		33	On, 04:00, Mo- Su	x
		33	Off, 24:00, Mo- Su	x

Zoo (OFF)	Zoo (ON)	Zoo (OFF)	Zoo (ON)

Train Station Plaza (ON)	Train Station Plaza (OFF)	Train Station Plaza (ON)

00:00　　　　04:00　06:00　　　　　　　12:00　　　　　　18:00　　　　24:00

Load Manager FPS-LM

+FPS-LM is based on an industrial PC running Linux OS

+DCF77 timer (long wave time signal, 77.5 kHz)

  −Optional with GPS

+Input and Output Interfaces

+etc.

You are here: Portfolio Info > Load Management > Ripple Control > Controllers > L+G FPS > Sales Documents

Sales Documents

Technical Documents

Approvals

CE Declarations

Sales Documentation Ripple Control Command System FPS

FLYERS	
english	german
RC Command System L+G FPS (D000030446)	RST-Kommandosystem L+G FPS (D000030447)

L740 Load Switch Device

+Secure and reliable operation with Dynamics^{3G} communication concept

  +Traditional ripple control and PLC (PLAN DLMS) combined

  +Broadcasting or direct addressing (peer-to-peer)

+ Dynamic Load Management (15min load control applications)

+ Individual and flexible remote parameterisation

  +Support of up 6 consumer profiles

+ Firmware-Upgrade per Broadcast

+ Status feedback: power failure, open-circuit load, tamper detection
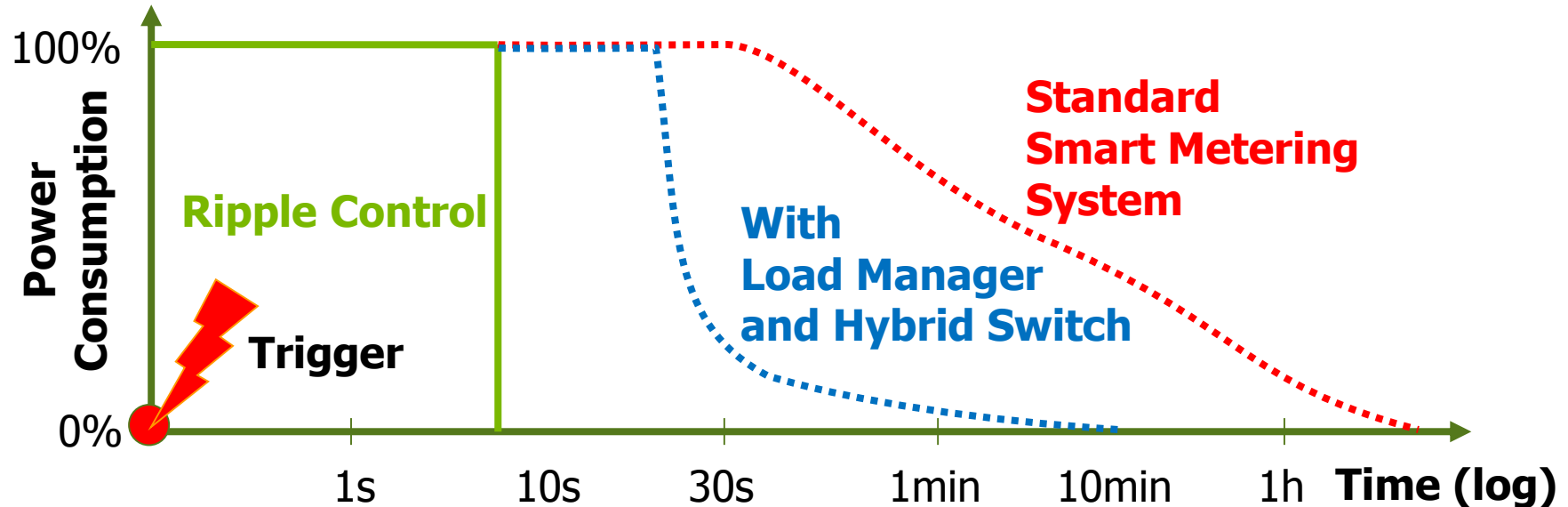
+ Repeater functionality

+ Interpreter programs

Appendix - Speed does matter!

Dynamic Load Control applications require fast response time to meet the 15' interval target value:

+ Direct commands need to be broadcasted to all Load Switches simultaneously

Example: Direct Command „Load Shedding" of an object group

Reference Project EKZ (Zurich, Switzerland)

Success Story
Die Elektrizitätswerke des Kantons Zürich (EKZ), Switzerland

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Smart Metering in Switzerland powered by Landis+Gyr

Landis+Gyr supplied its end-to-end Gridstream solution to Die Elektrizitätswerke des Kantons Zürich (EKZ), one of the first utilities to implement Smart Metering in Switzerland.

Quick facts

EKZ is one of the largest state-owned utilities in Switzerland, which accounts for ca. 10% of the overall country power supply. Nearly one million residents profit from the utility services in the canton of Zurich. The company is striving to improve its grid efficiency by delivering environmentally safe and sustainable energy solutions to the customers.

Gridstream solution description
- *1000 E350 PLC-based metering devices*
- *Gridstream MDUS software*
- *Data concentrator DC200/DC450*
- *Hybrid Load Switch L740*
- *ecoMeter*

Thank you

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