

# Dynamic Load Management



3D-LM by Landis+Gyr



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Severin Fischer, Head of Product Management

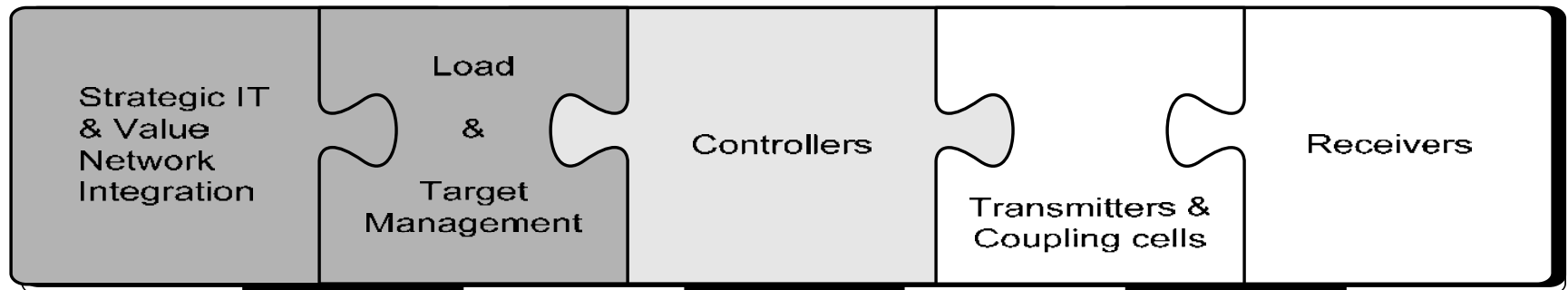
Business Unit Load Management, Landis+Gyr AG, Fehraltorf/Zug

# Ripple Control

Broadcast on medium voltage network (11, 22, 33 up to 66kV) on low frequencies (150-300Hz) crossing transformers.

Fastest response time 6.6 seconds.

Landis+Gyr and Enermet sold more than 14 million receivers during the last 60 years! With over 3'000 systems installed in over 30 countries, BU-LM is a well experienced and reliable partner for utilities throughout the world.



Landis+Gyr+

# Long Wave - Radio Control

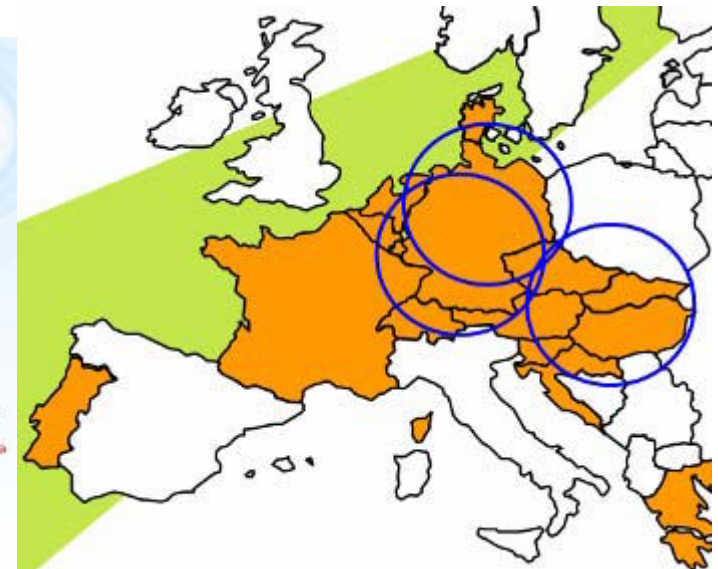
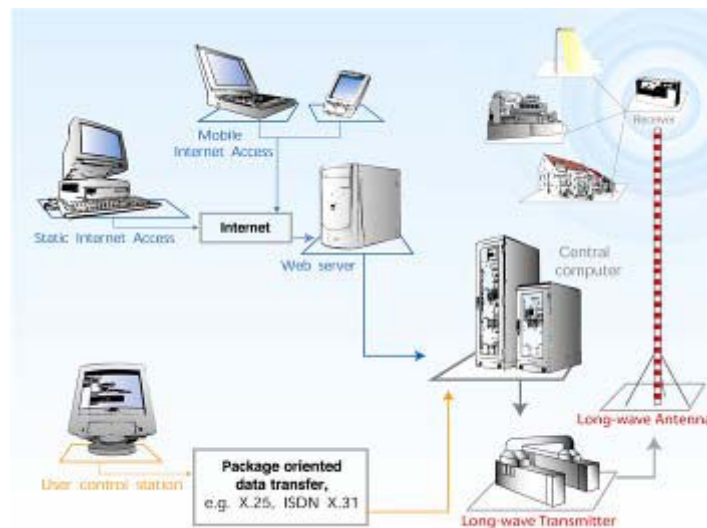
Broadcast on Long - Wave Radio (120-140kHz) reaching receivers in a radius of about 400km around the transmitter.

The system is operated by the utility owned service provider EFR and serves customers in Germany, Hungary, Czech, Slovakia and parts of other countries.

Fastest response time 2-10 seconds. More than 600k receivers installed.

Landis+Gyr is the main supplier of receivers.

South Africa is the next target market.



## LW - Radio reception area example for Moskau

This may be implemented within 12 month on an existing transmission tower.



# Benefits of Load Management

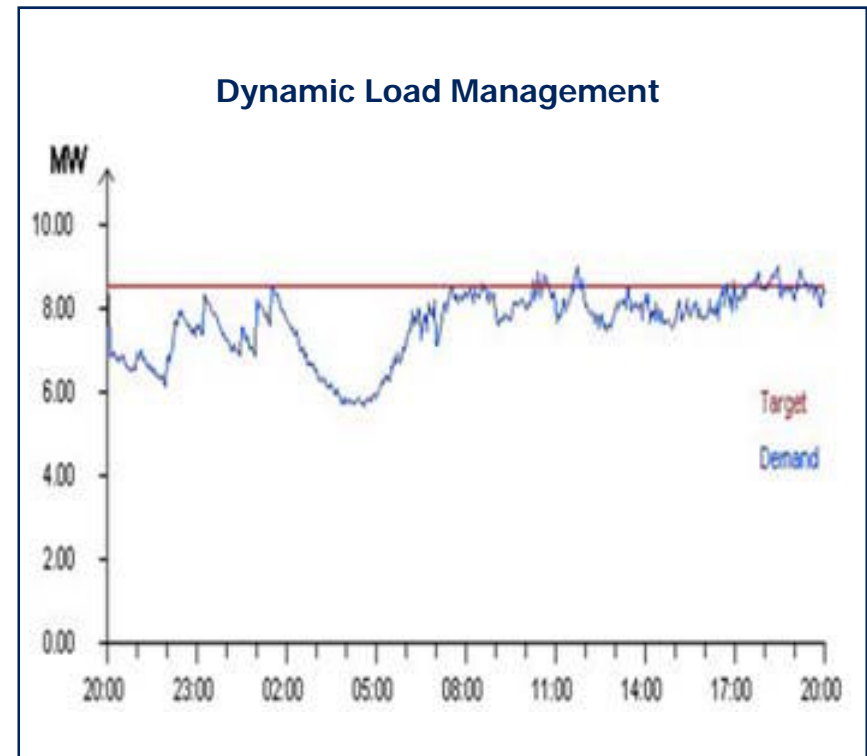
Manage capacity investments

Manage quality of supply during supply constraints and disturbances

Bid load into the reserves market (demand market participation)

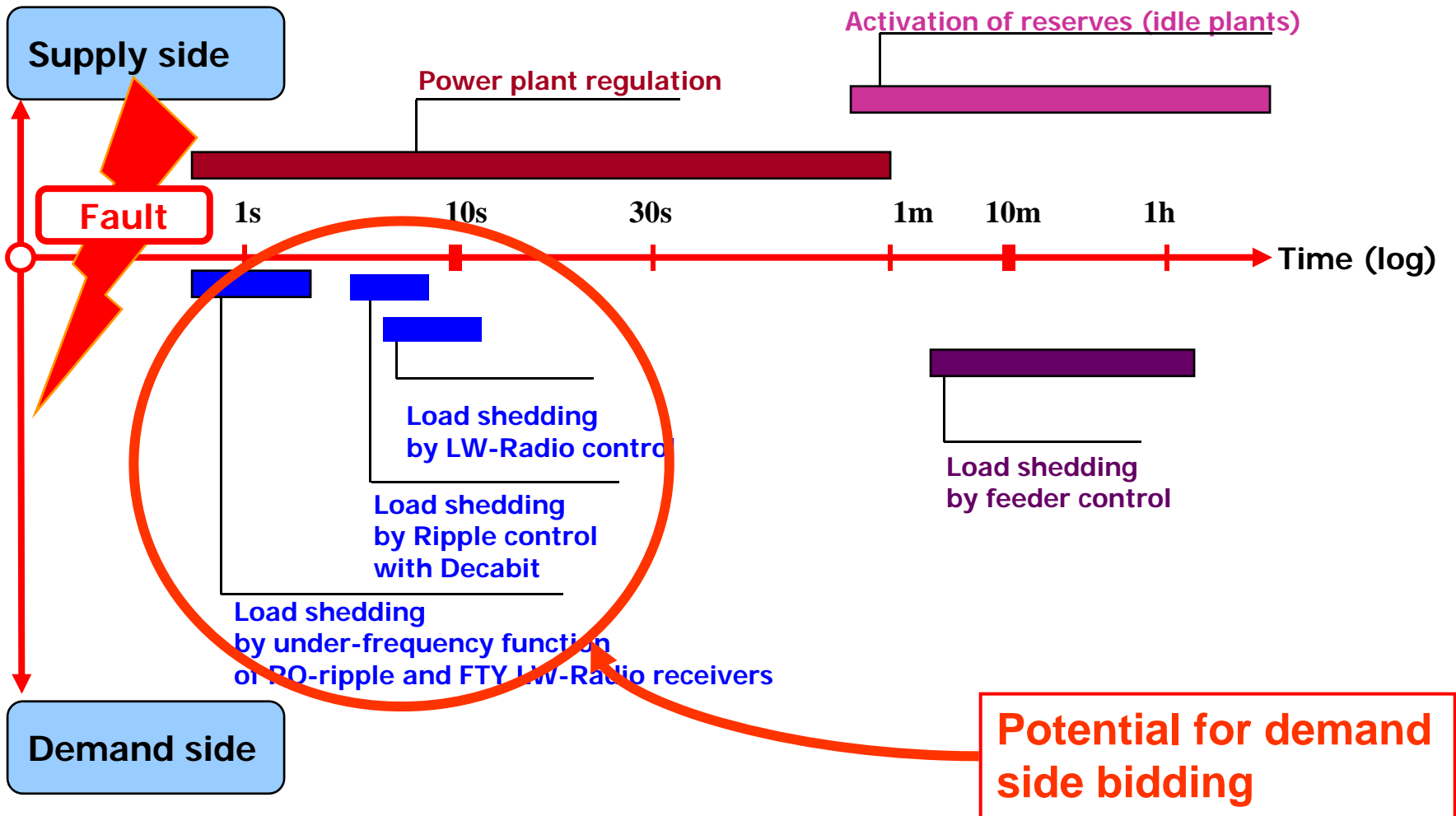
Minimise transmission charges (by distribution companies)

Minimise spot market price exposure



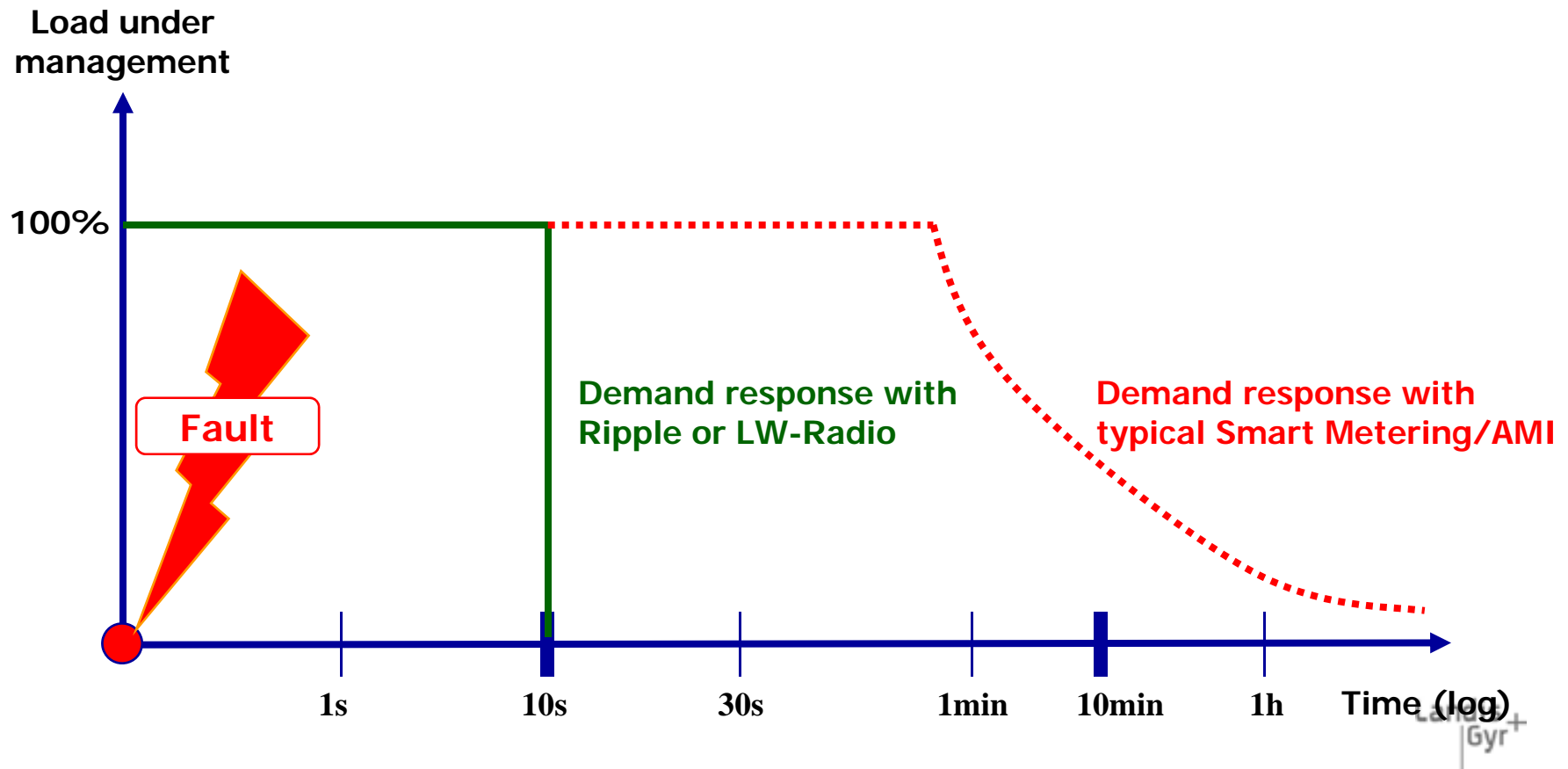
... by just switching **residential load** such as boilers, heating, air conditioning, pool pumps, washing machines, dryers etc.

# Reaction time for Load Shedding



# Reaction time for Load Shedding

Smart Metering /AMI has the aim to communicate with electricity meters to collect data, manage tariffs and manage load on a predefined schedule.





## 3D Load-Management

The Enermet **3D Load-Management Algorithm** calculates the switching decisions in real time. The Controller is typically installed in the substation managing 10-15 load groups.

The algorithm includes the modelling of different load types and has proven the reliability during the last 15 years.

**Dynamic** – adaptive closed loop control down to 1% accuracy

**Direct** – switching performed simultaneously within seconds

**Democratic** – all load groups are treated equally

**Under frequency detection** is done with Ripple and LW-Radio receivers on 45-50 Hz programmable level and 0,2 - 5 seconds programmable reaction time. The Off-time is free programmable and may have a random time.

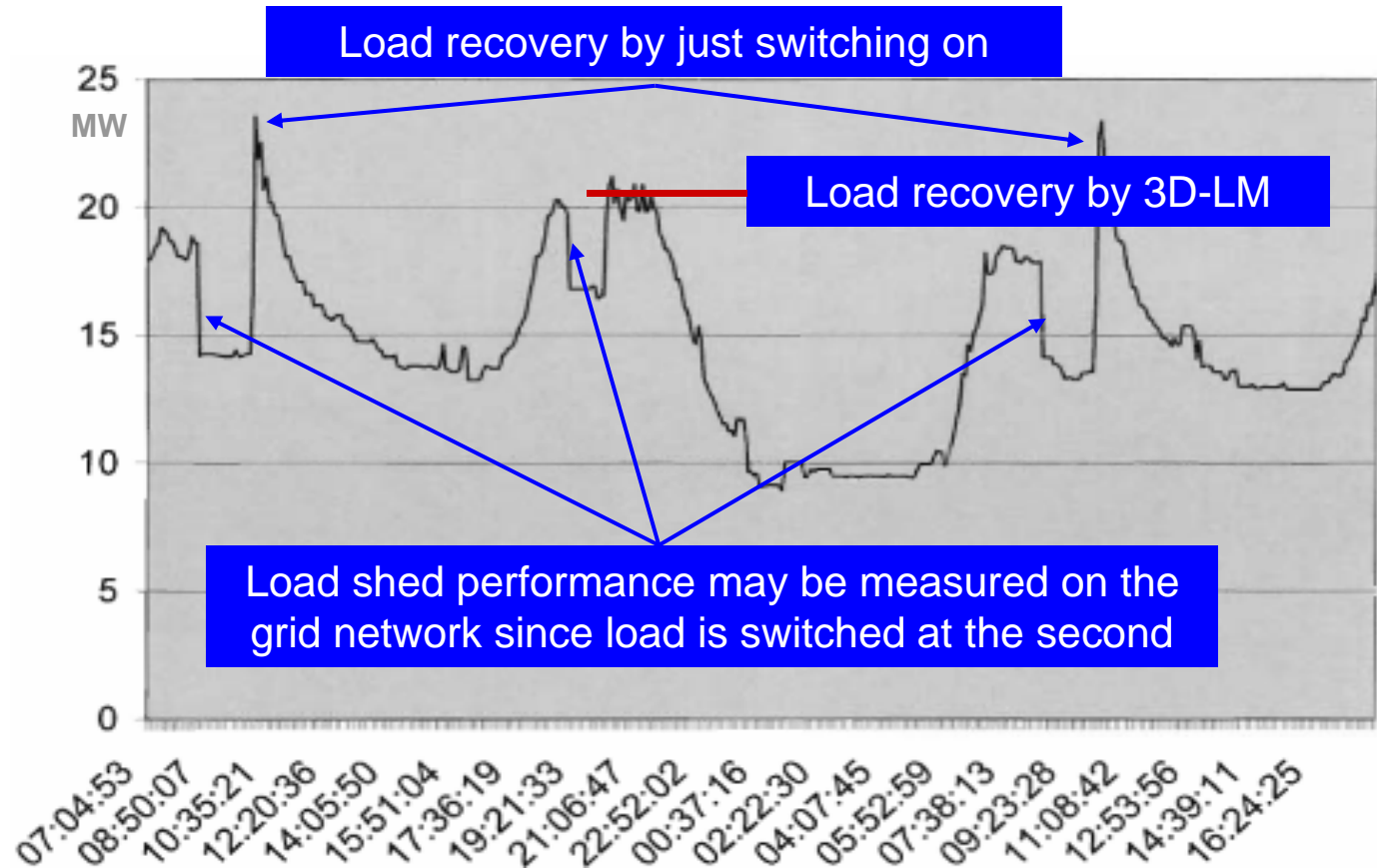
The receiver may also work as **time switch**.

# Load shedding and recovery

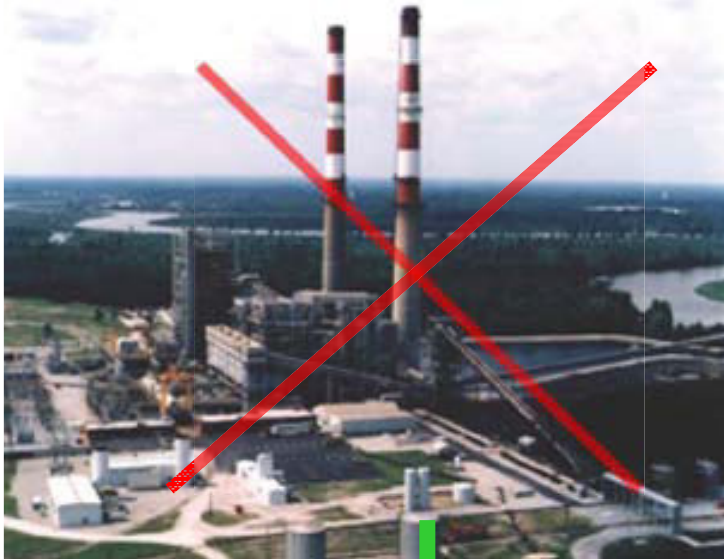
If Load Management is properly applied at large scale, an overall reduction between **7 % to 21 %** of the total peak demand can be achieved.

Typically load is shed for minutes or hours. This is the easy task but bringing the load back...

Depending on the type of Load the overshoot may be 200-400%!



# Virtual Peak Power Plant



~~1 000 MW gas fired Peak Power Plant~~

~~700 - 1 500 Mio\$~~

Virtual Peak Power by Landis+Gyr

120 Mio\$

LW-Transmitter 5 Mio\$

1 000 000 FTY243 65 Mio\$

Installation 50 Mio\$

It is cheaper to implement Demand Side Management than a power station!

This is a GREEN investment!

