Actility

Success Story
- Utilities - Energy -

12 000 batteries in the project	3.9% Broadband customer base increase in 2016	11 million Broadband internet customers in France

ORANGE BATTERIES MANAGEMENT

Orange uses ThingPark Energy to monetize its back-up batteries

Get an ROI from passive but essential back-up resources.

Orange is one of the largest operators of mobile and internet services in Europe and Africa and a global leader in corporate telecommunication services. As a leader on its domestic French market, the Telco guarantees the Quality of Service of its network for fixed-line telephony as well as broadband internet on a 24/7 basis. To do so, Orange operates thousands of technical sites or relays distributed across the country.

The operation of these sites is very critical as they must provide a **continuous telecommunication service**. Sustained operations are guaranteed during power outages thanks to a high-capacity array of small back-up batteries installed on each site. The battery stores sufficient energy to keep the site operational for an extended period **without any external power supply**. In case of an incident, the backup system relies on a monitoring platform that Orange implemented to track the state of charge of its 10 000-site batteries.

The backup batteries are rarely used, but they represent quite an investment for Orange to ensure its high-quality network. The Telco chose Actility, flexibility aggregator and technology company, to generate a short-term ROI of the existing security system. Actility's solution ThingPark Energy connects, manages, controls and monetizes the storage capacity of Orange's fleet of batteries on the most adequate **Demand Response services** of RTE (the French Transmission System Operator of the grid) while ensuring reliable power supply of these critical operational sites.

> **We are very proud of this smart grid world premiere that contributes to the French electricity grid's stability while creating immediate and substantial ROI**
> *Hervé Mallet, Energy Director, Technical & IS Direction, Orange France*

Control distributed flexibility to generate revenues

As an aggregator, Actility offers the flexible capacity of its portfolio to the grid operator (TSO). In case of disturbance on electricity supply, the TSO can choose to activate Actility's portfolio within less than ten minutes. Actility gets paid for delivering the requested amount of energy to the grid, then distributes the gains among the flexible capacity suppliers.
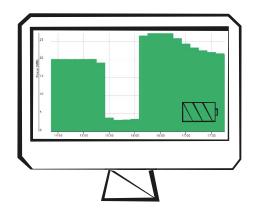
Actility's ThingPark Energy Platform leverages a high-performance algorithm to control a very large group of units – for instance, Orange's batteries – while respecting each unit's technical limits and availability.

Actility's solution for large-scale Automated DR offers multiple benefits to Orange:

• Generate revenues ROI in less than three months with minimal hardware investment

• Allow to control remotely a fleet of batteries

• Improve security of electricity supply

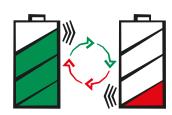• Cut CO_2 emissions with green curtailments

For the first time, a French DC-metering system allows small sites to participate in DR programs. As a result, minimal hardware investment was needed from Orange to control a first pilot group of 5,000 / 12,000 batteries.

orange™

Integrate the flexible capacities of small units

To participate in most of the DR programs, participant sites are required to offer a minimum of power. The need to aggregate those sites, **respecting their technical constraints**, is tremendous to unlock that potential power for flexibility. The DAAS (DeAggregation and Aggregation Server) is a high performance, large scale DR algorithm of ThingPark Energy, that allows very small flexible units to participate altogether in DR programs. Thanks to large number of units controlled, the DAAS matches every minute an aggregated group response profile with the requested power profile as closely as possible.

This reliable, **highly scalable solution** unlocks the potential of flexibility for various small electrical devices, like heaters, water pumps, or batteries, enabling distributed energy resources curtailments to be competitive.

Actility works together with Orange technical managers to gain insight into critical operations' constraints. Understanding the batteries' behaviour and rebound effect of the sites when plugged back to the grid is essential to manage curtailments.

> **Building on this highly profitable green curtailment, we are looking with Actility to leverage other distributed infrastructure assets within Orange to generate ROI.**
> *Hervé Mallet, Energy Director, Technical & IS Direction, Orange France*

To pilot the batteries, Actility connects the Orange monitoring system to ThingPark Energy via an on-premise proxy. Real-time data on availability and state of charge allows to successively switch on / off groups of batteries to always deliver the power required by RTE during a DR activation. Actility has transformed a passive monitoring interface into an active platform connected to grid balancing services.

The Orange batteries project implementation followed six main steps:

Data analysis ▷ Behavior learning ▷ ROI Simulation ▷ IT integration ▷ Control validation ▷ Flexibility delivery

RTE
— Global activation order →
← Aggregated load curve —

ThingPark Energy
> Fixed individual constraints
> Activation order's profile
> Rebound profile calculation
> Real-time individual technical constraints
⫸ Planning successive activation/deactivation orders

— Aggregated load curve → **Actility's monitoring interface**

Load & availability of each battery / **Activation and deactivation schedule**

Load & availability → / ← **Activation & deactivation orders**

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+5000 batteries geographically distributed on the French territory