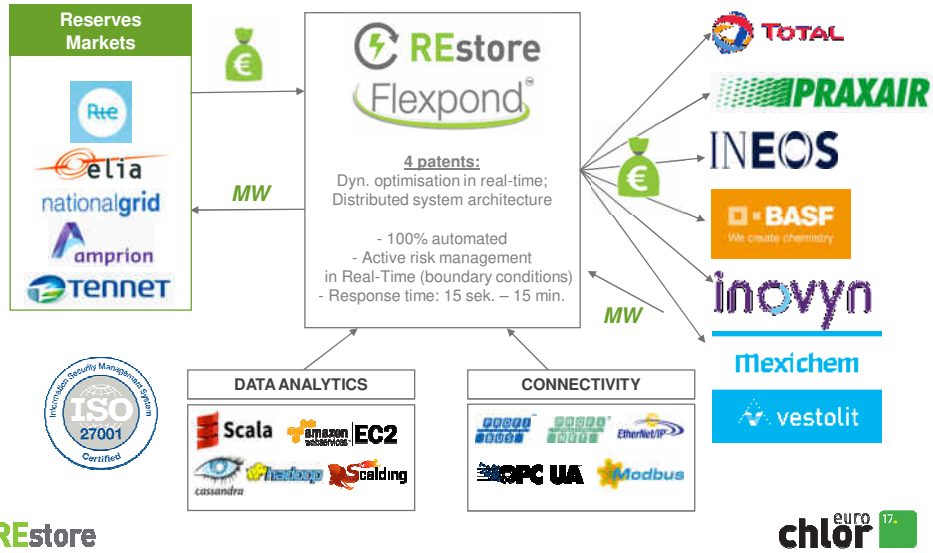




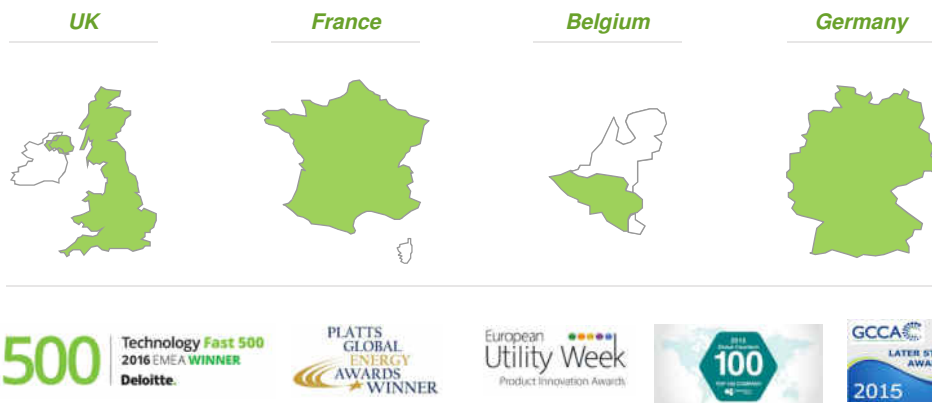
Agenda

- 1 Introduction: REstore and market for flexibility
- 2 What's in it for me?
- 3 The REstore Solution

REstore makes aggregated flexible power from industrial consumers available to TSOs and already has more than 1.7 GW flex. load under management



In Europe, Asia and US price awarded energy-technology company, active as a trusted partner in the European/UK energy market



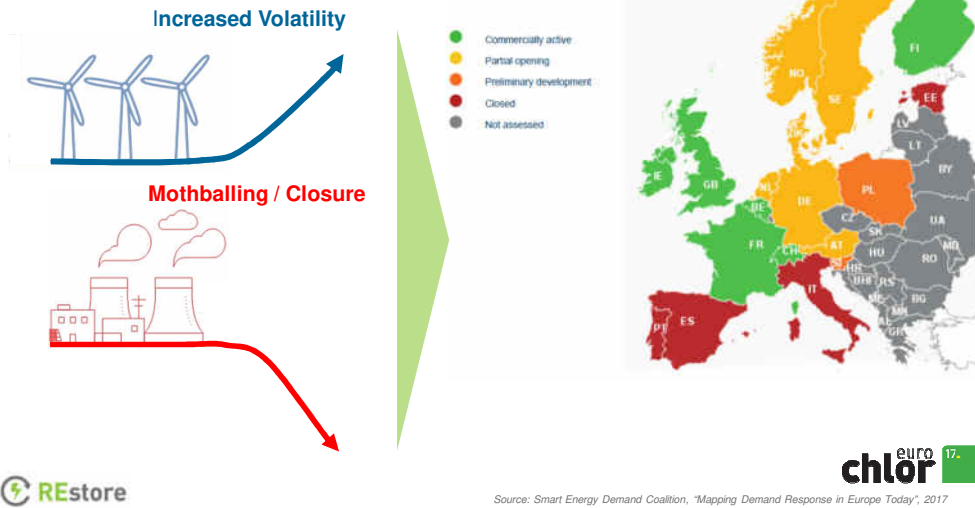
REstore

chlor 17

Increasing Demand Response markets in Europe driven by 2 fundamental trends
→ Flexible power is valuable!

Main growth drivers: Volatility & Mothballing

Growing DR markets in Europe



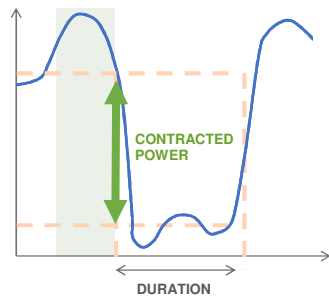
Agenda

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**REstore-Technology covers most reserves programs of the TSOs,
→ Focus to primary reserve: lowest impact, highest remuneration**

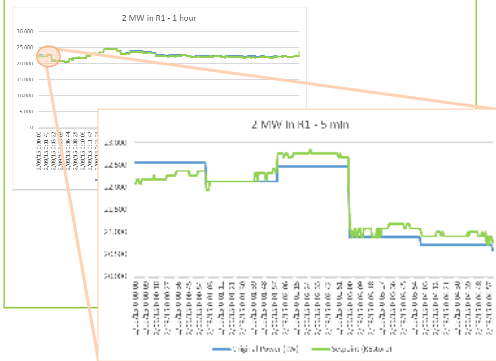
TERTIARY RESERVE

- Activation time: 15mn to 2h (depending on market)
- Duration: 15mn up to 4h
- Nb of activation: 0 to 5 per year
- Activated power: 100% of contracted power
- Availability revenue: ~ 10k€/MW/year gross



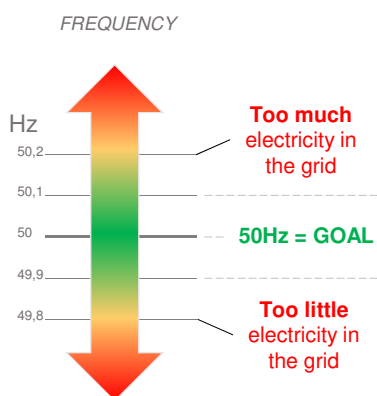
PRIMARY RESERVE (200 mHz)

- Activation time: 30s
- Duration: ~ 1mn
- Nb of activation: continuous
- Activated power: 30% to 60% of contracted power
- Availability revenue: ~ 130k€/MW/year gross

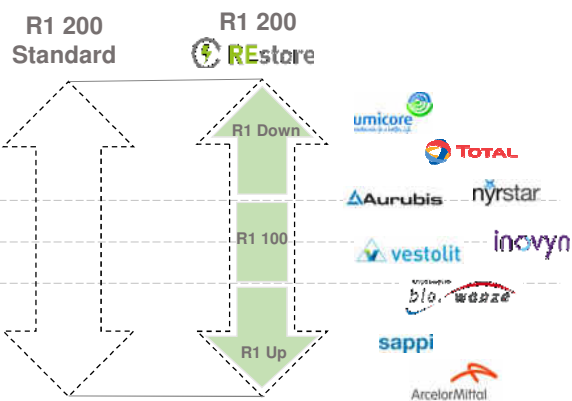


REstore's is the only player delivering a multi-site, multi-band portfolio in R1, managed in real-time, patented, allowing a much higher revenue for chlorine plants.

Frequency variation across Europe



REstore offers synthetic R1-200



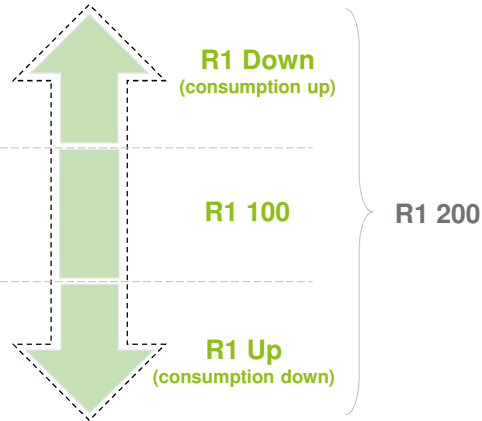
Requirements for the process (primary control) :
→ short activations requiring low buffer capacity



how long: ~ 13 sec. (max. 5 min)
how often: ~ 35 times/year
how much: ~ 30 % of contract load in practice
revenue: ~ 40k€/MW/year gross

how long: activation in **average: 1 min.**
how often: continuously in both directions
how much: ~ 60 % of contract load in practice
revenue: ~ 180k€/MW/year gross

how long: ~ 20 sec. (max. 2,5 min)
how often: ~ 90 times/year
how much: ~ 50 % of contract load in practice
revenue: ~ 40k€/MW/year gross



* : basis of this analysis: 2015



Simulation study: modulation of the power of a membrane possible up to 20 % of nominal power within the given boundary conditions of delta pressure +/- 3 mbar

N°	Description	Direction	MW t=0	MW t=30	Δ MW	Δ MW as % of nominal power	Δ Pressure excursion
1.	Modulation based on a historical frequency deviation provided by REstore	Up	24,6	27,2	2,58	10%	1,7
2.	Modulation based on a historical frequency deviation provided by REstore	Down	24,6	23,5	-1,06	-4%	-0,8
3.	Maximum tolerable modulation in order to respect the delta pressure range +3 mbar	Up					
3a	• With a proper functioning of the pressure control system		24,6	29,0	4,43	18%	3
3.b	• Without a proper functioning of the pressure control system (pressure regulation valves stay put)		24,6	25,8	1,22	5%	3
4.	Maximum tolerable modulation in order to respect the delta pressure range -3 mbar	Down					
4.a	• With a proper functioning of the pressure control system		24,6	20,4	-4,17	-17%	-3
4.b	• Without a proper functioning of the pressure control system (pressure regulation valves stay put)		24,6	23,4	-1,22	-5%	-3
5.	Continuous modulation around the baseline power level in order to respect the delta pressure range +/-3 mbar	Down & Up	24,6	29,4	4,80	20%	+/- 3



Agenda

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Overview of the Flexpond™ platform

Flextract™ works as a slave: it is the industrial consumers' proper control system that steers the activations:

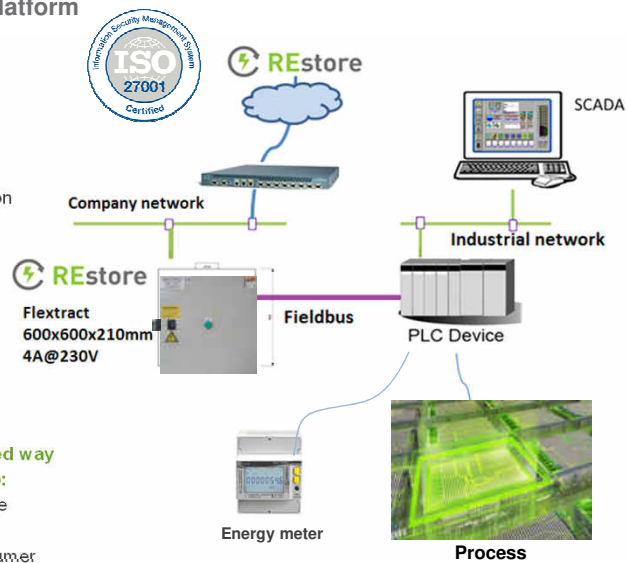
- The Flextract sends requests
- Industrial consumers' proper decision control system accepts or rejects

Flextract™ collects data:

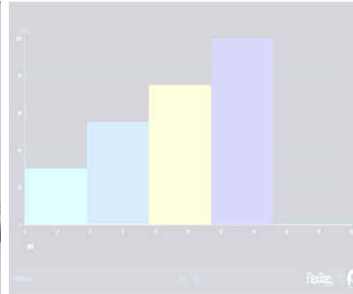
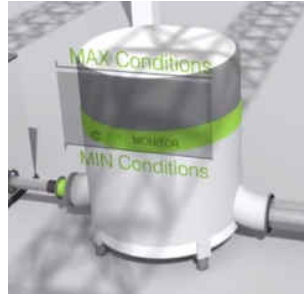
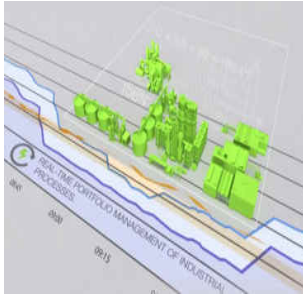
- Boundary conditions determining the availability of the process
- Power consumption of the process

Flextract™ communicates in a secured way the information to REstore in order to:

- Analyze the real time power available
- To be able to respect the boundary conditions set by the industrial consumer



Our FlexPond™ platform offers concrete benefits to C&I consumers



Real-time portfolio management

- Constant adaptation of the FlexProviders combination to maximize availability and minimize penalties

Protection of your boundary conditions

- e.g. temp. level, stock levels, current density, voltage
- **Automated** : no manual intervention
- Industrial 100% in control overrule always possible

REstore automatically runs merit orders of DSM flex:

- Software enables partial activation based on opportunity costs
- Software respects the opportunity cost for each process



Summary Primary Control for Chlorine Industry

REstore:

- KnowHow and experience with flexibility in industries, such as chlorine
- Carefully monitors boundary conditions of process (i.e. Delta p)
- Technology for “synthetic” primary control, allowing different processes to take part and profit from primary control (best paid, lowest impact)

Concrete potential for your plant (example: 50 MW):

- Symmetric, 100 mHz: ca. 2-3 MW (gross: 360 - 540 T€/a)
- Asymm., consumption down: ca. 5-10 MW (gross: 200 - 400 T€/a)
- Asymm., consumption up: depending on available headroom
- CO2 savings: 1.600 tons per MWflex. and year.





THANK YOU



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