Digital transformation
A disruptive approach of the power system ?

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RTE, the French Transmission System Operator

Transmission grid owner

- 100000 km transmission line (63KV to 400kV) join local level to European level
- 2800 Substations
- 22000 km optical fibers
- 48 interconnectors

Transmission grid operator

- 8 control centers
- Founder member of CORESO coordination center
- Homemade software (adequacy, integrated study chain from development to operation, …)

Market design

- Market coupling at European scale with flow-based method
- Market based capacity mechanism
- Most advanced market design for demand side management in Europe (SEDC* source)

** SEDC: Smart Energy Demand Coalition*

Perspectives for power system in France

Global demand expected to be stable, energy exchange through transmission grid in reduction

- Transmission grid role in the power system is moving
- Tariff doesn't reflect this change
- Grid planning in a system in transition is a real challenge

Strong development of renewable

- Location of REN is the driver for grid development
- Grid planning and generation planning are de-correlated
- High volatility of the power flows in the grid

How to conciliate three territory scales

- Decentralization of the decision making for energy policy
- Energy Union: a big challenge for Europe
- What role for the state?

Inflation of players number

- Multiplication by1000: tomorrow several millions
- New behavior : environmental commitment
- Global optimization is becoming a myth

What do you think about the future of the Grid ?

Combination of power and digital a key feature for:

- Performance and resiliency
- Economical efficiency
- Reactivity in a power system in transition

Our ambition: to transform our substations in both electrical and digital nodes

- All substations connected through a private high speed data network (INUIT Project)
- Substations will become a node for low rate network for IOT (on line monitoring)
- Advanced features based on « Smart Substation Pilot »

New components using electrochemical, power electrics and numeric

- Virtual power line concept (alternative to new lines)
- Frequency control in power system without inertia
- New concept in market design for RES integration

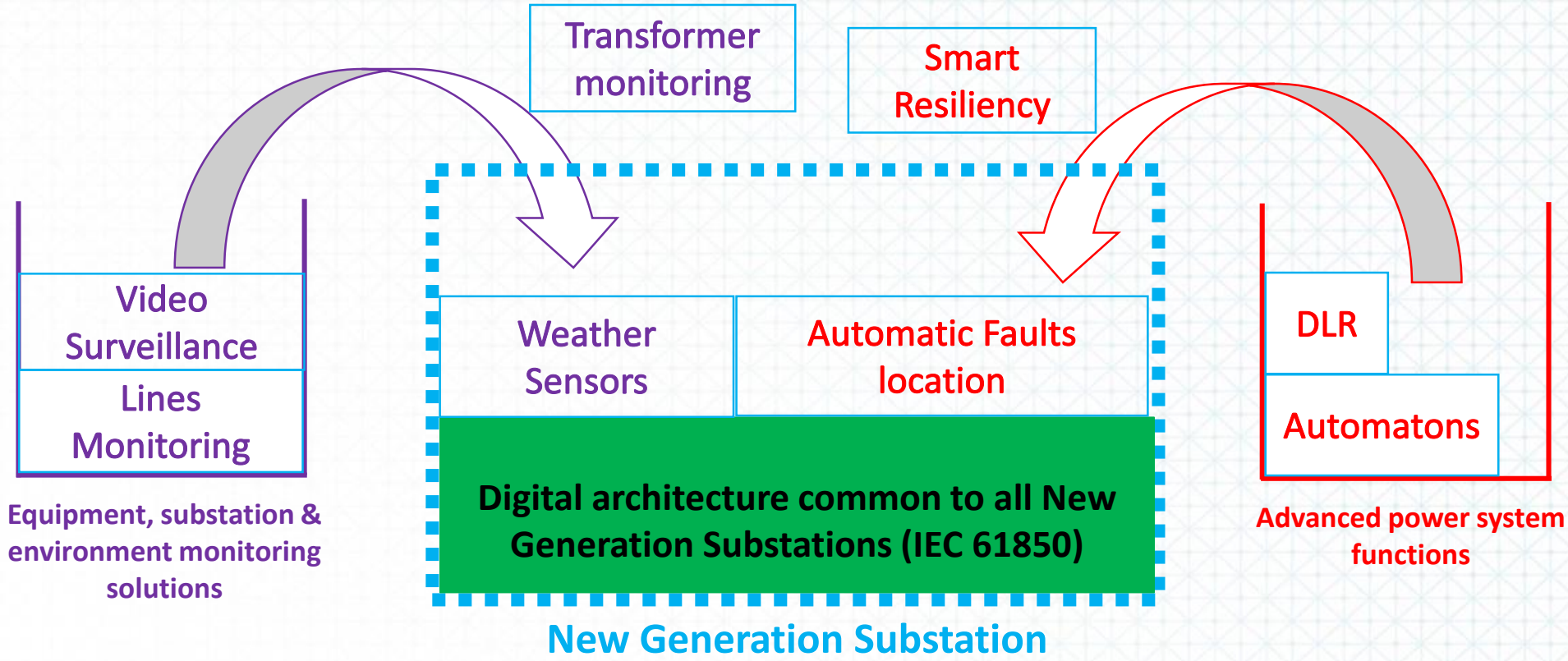
New solutions to manage and value the data

- Real time data platform, highly secured, to exchange services with third parties
- Optimization for grid planning using geo-localized flexibility
- New models for innovative asset management methods (MONA project with COSMO)
- High performance calculation for new risk models in grid operation

New Generation Substation : industrial tailor–made

New Generation Substation will be adapted to the specific needs of the deployment area,

These “industrial tailor made” substations are based on the multi-systems interoperability allowed by the latest digital technologies,



Thank you for your attention