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Local flexibility markets: refined roles for TSOs and DSOs

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LOCAL MARKETS: CONGESTION MANAGEMENT, FLEXIBILITY AND LOCAL PRICE SIGNALS

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Never assume the transmission grid is just a minor market optimisation parameter ...



Outline

1. Why and Who?
2. How?
3. What now?

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Today's and tomorrow's challenges require a refined role for TSOs and DSOs.

Today:

- Increase in intermittent renewable generation
- Lack of infrastructure development
- Increase of unscheduled flows, redispatch, transformer overload, loop flows, and voltage maintenance
- Increase of corresponding costs of congestion management and balancing.

Tomorrow:

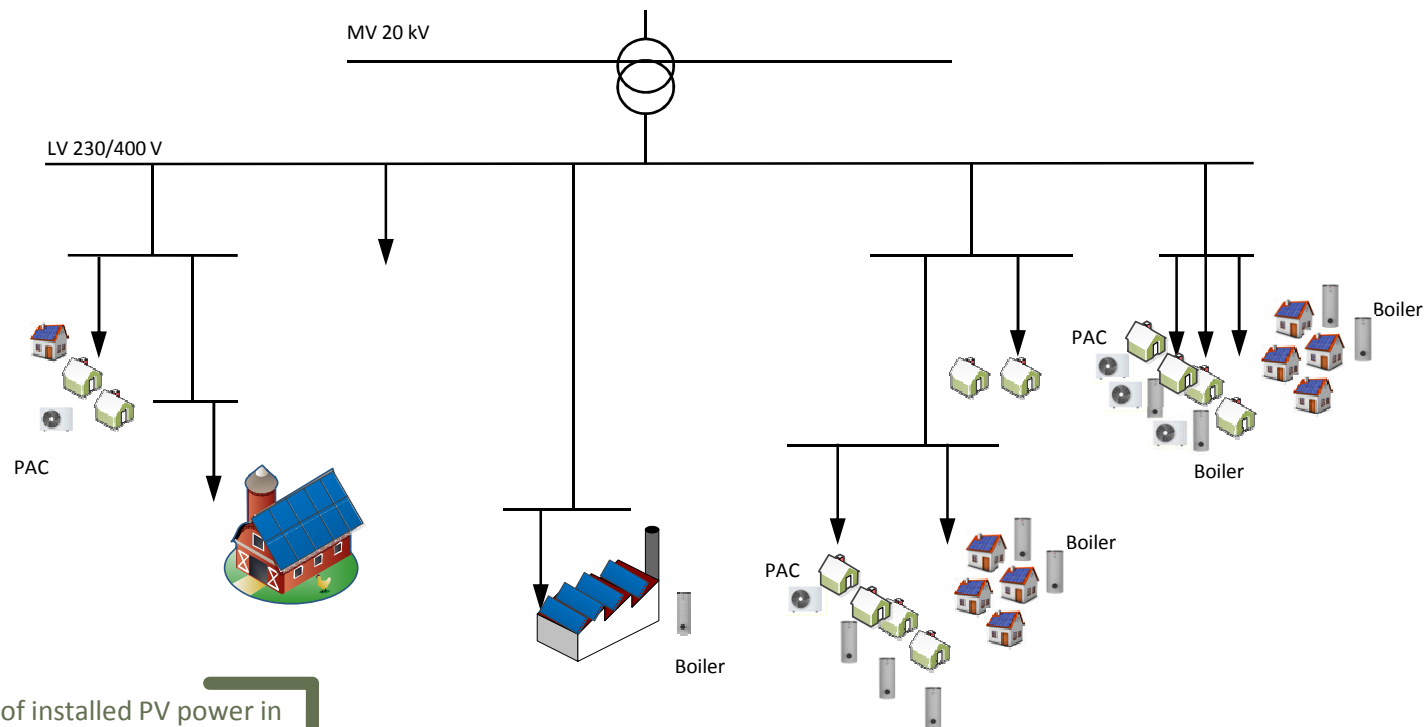
- Further increase in intermittent renewable generation
- Completion of 3rd package: implementation of SOGL et al.
- Implementation of CEP ("70%")
- Decrease in baseload generation in the CE synchronous area.

Possible solutions

- "Hardware" solution: build additional lines and other infrastructure to strengthen the network
- "Software" solution:
 - intelligent local markets for flexibility
 - integrate old and new sources of flexibility
 - solve congestion and balancing challenges at the most efficient level: TSO, DSO and right at their interface.
- **Growing role of DSOs in the energy system**
- **"One-system approach": TSOs and DSOs share responsibilities and need to find solutions.**

Congestion management at Romande Energie 2019?

Hardly any problem!



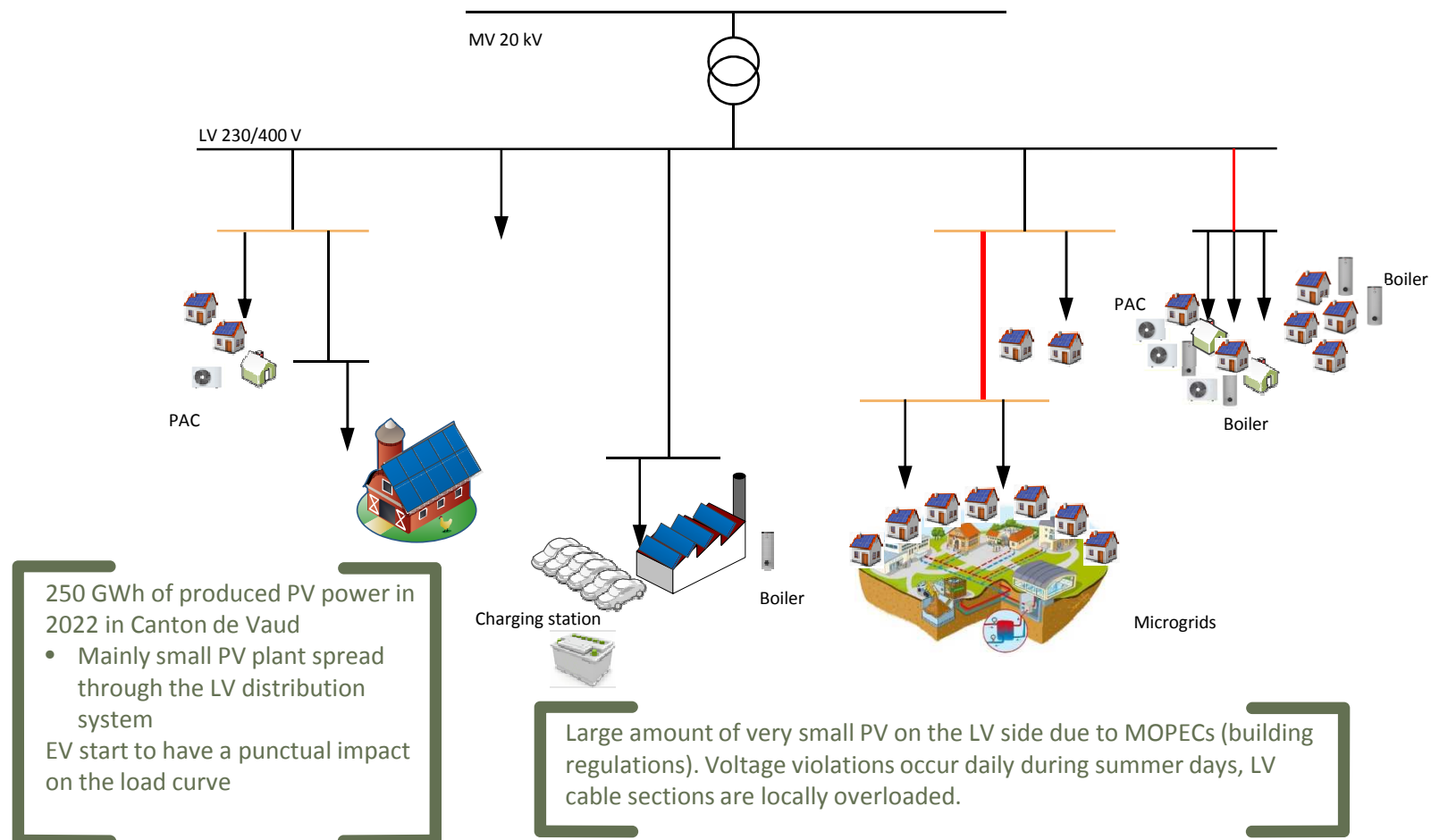
100 MWp of installed PV power in 2017

- Mainly large PV plant directly connected to MV system
- Both MV and LV system are still oversized

Rapid rise of very small PV on the LV side due to MOPECs (building regulations) but without endangering the distribution system. Grid reinforcement is still the solution.

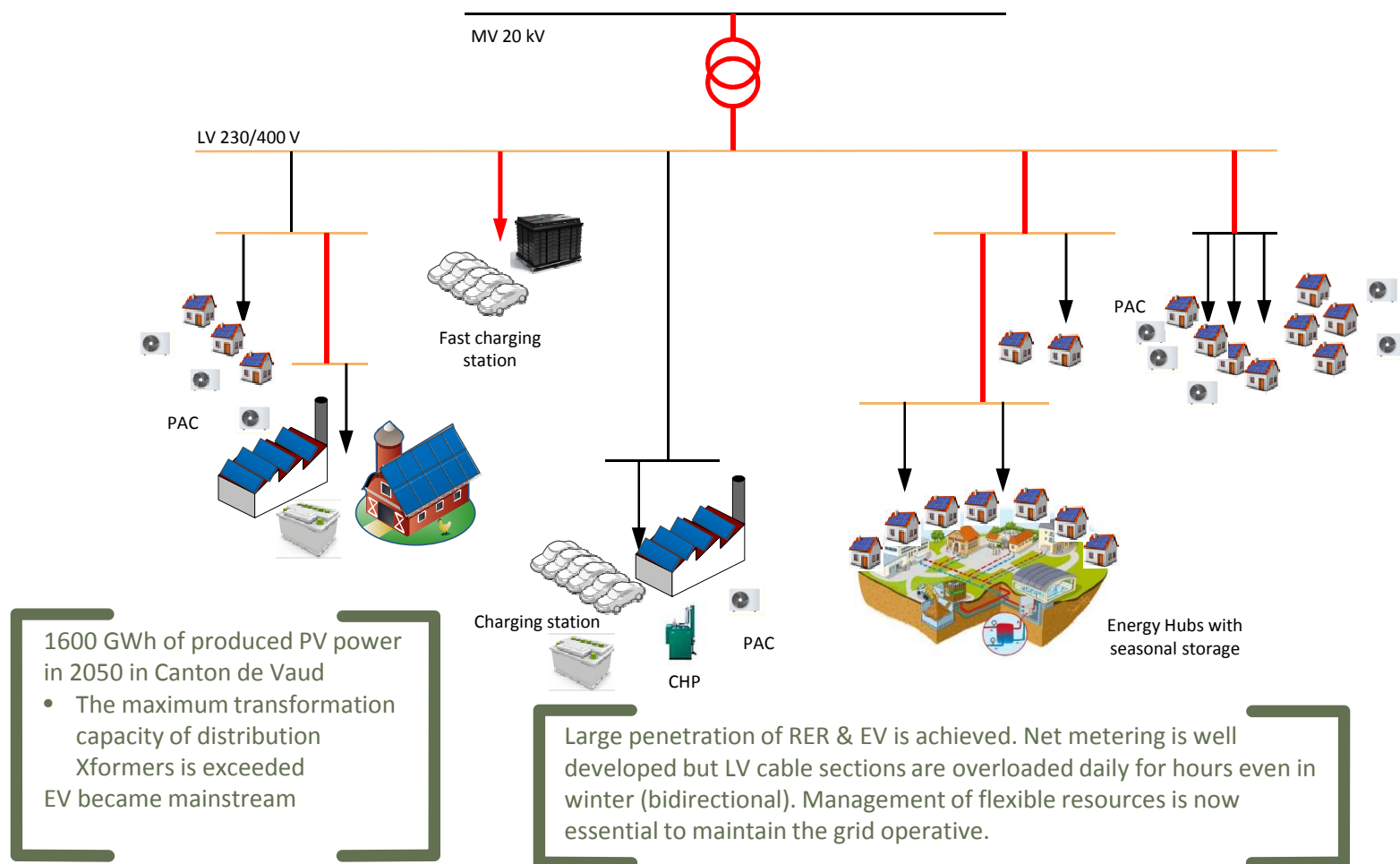
Congestion management at Romande Energie 2022?

Trouble starts ...



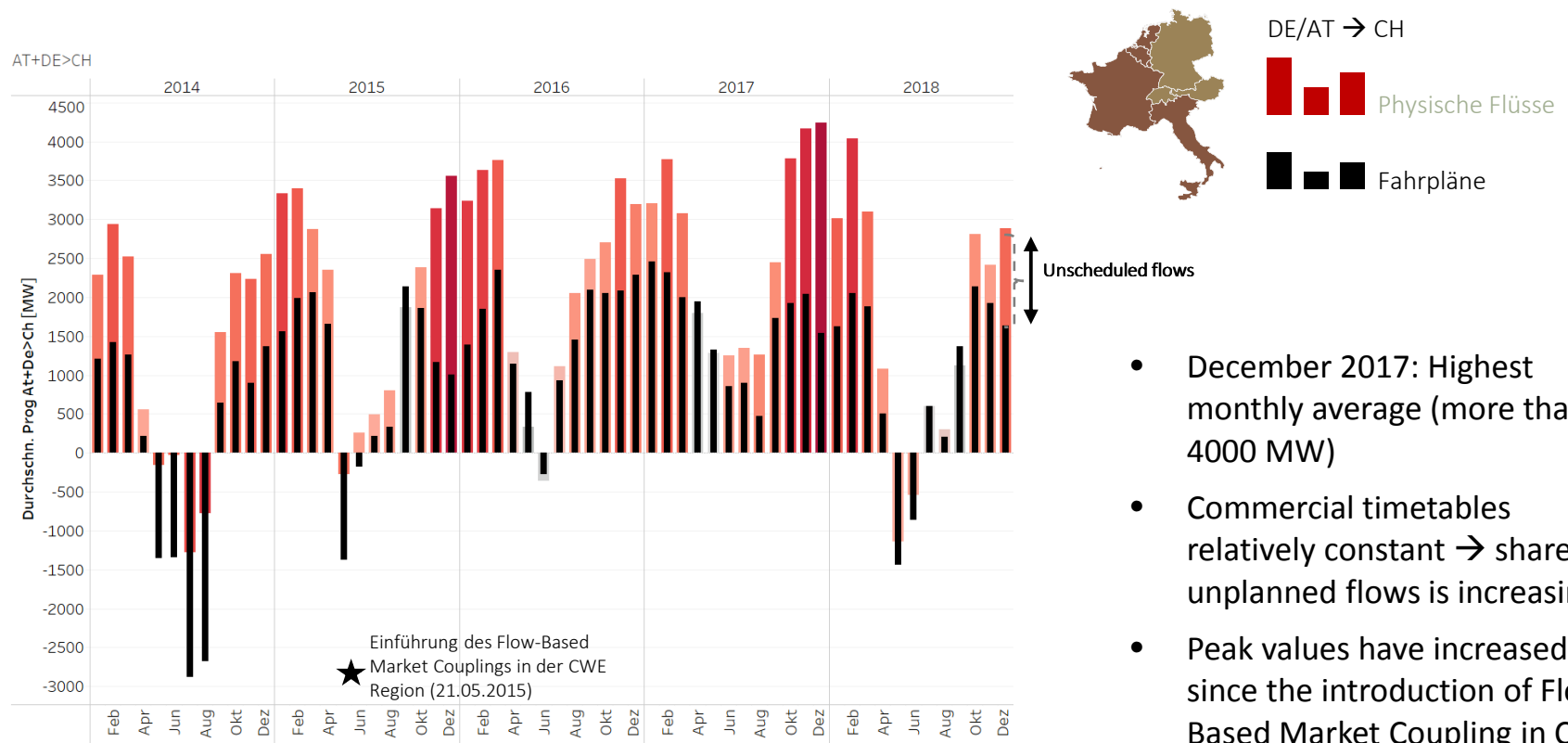
Congestion management at Romande Energie 2050?

No way without efficient use of flexibility.



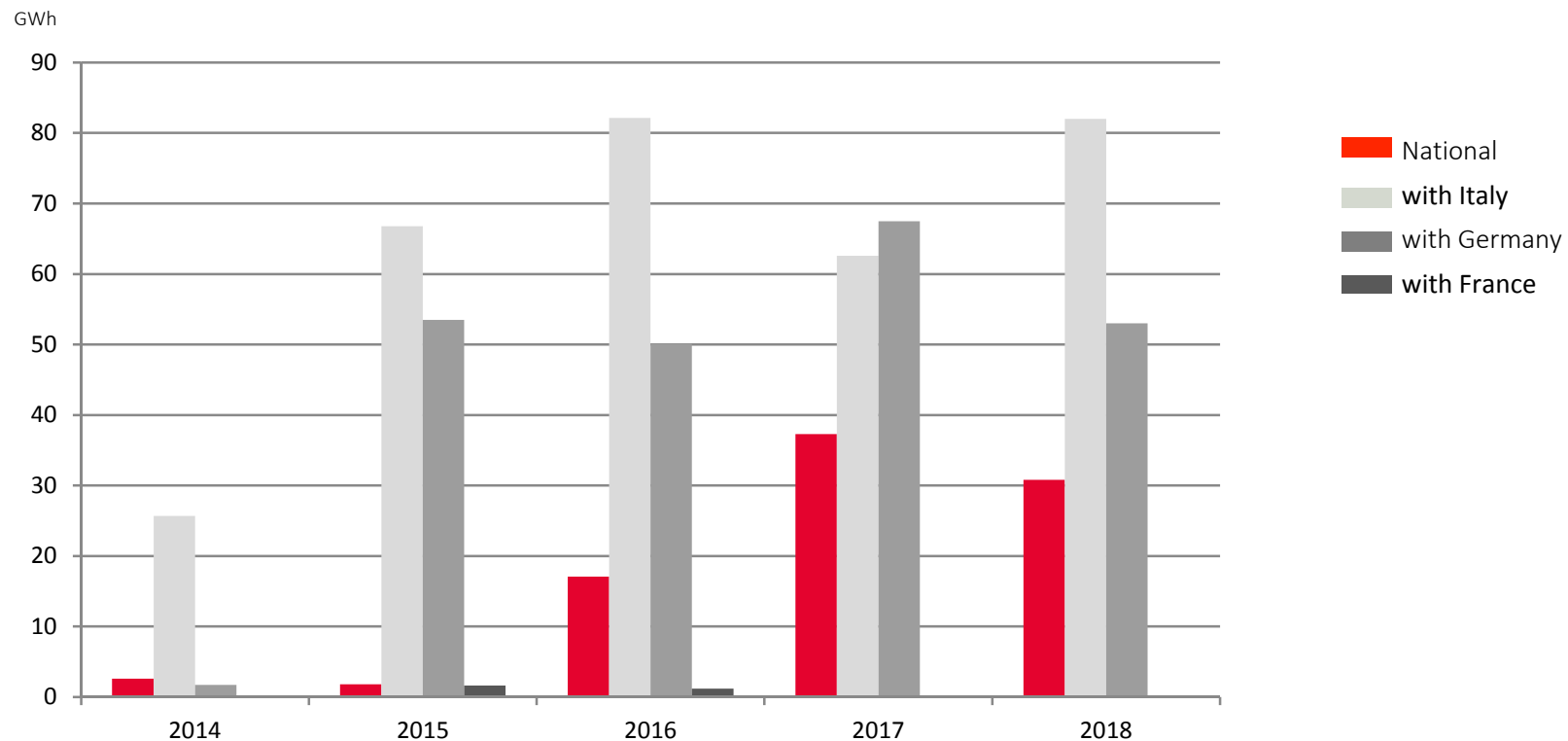
Go-live of CWE FBMC: severe impact on relation between planned and real physical flows.

Monthly average timetables / flows at the border DE /AT → CH (MW)



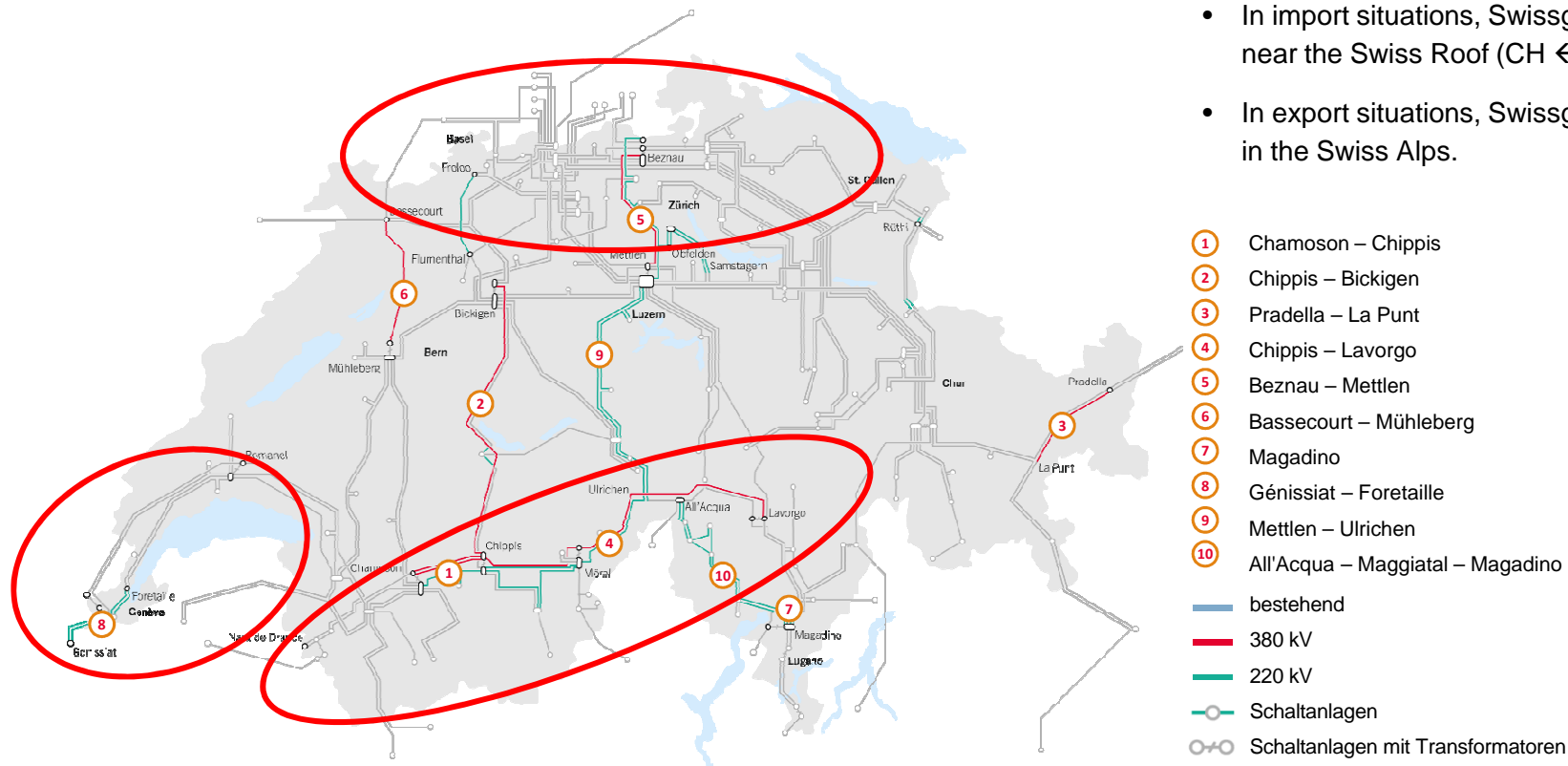
- December 2017: Highest monthly average (more than 4000 MW)
- Commercial timetables relatively constant → share of unplanned flows is increasing
- Peak values have increased since the introduction of Flow-Based Market Coupling in CWE.

Redispatch has become the new normal mode of operation (also) in Switzerland.



- Strong increase in national redispatch
- Especially in summer: high domestic production, various maintenance work on lines, high transit flows through Switzerland
- Redispatch is no longer an emergency measure, but becomes the rule.

Swissgrid's Strategic Grid 2025: Congestion remains an issue, likely to increase.



- In import situations, Swissgrid has congestion near the Swiss Roof (CH ↔ FR-DE-AT)
- In export situations, Swissgrid has congestion in the Swiss Alps.

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The Implementation of a market-based flexibility platform follows three main objectives.

Transparent market mechanism

- **Clear and transparent market rules** for actors
 - Asset Certification by the System Operators
 - Verification of physical impact
 - Strict Compliance
- **Addition to existing wholesale markets** to solve specific local issues.

Development of distributed flexibility

- **Unveil and unlock the potential of distributed flexibility**
 - Provide transparent locational flexibility prices
 - Foster development of distributed flexibility (
- **Short-term activation mechanism of long-term local flexibility contracts**

Coordination between Parties

- **Clear guidelines and communication protocols**
- **EPEX SPOT neutral and objective third party**
 - efficiently run the platform
 - adapt to current System Operator processes
 - ensure compatibility with the current European markets

The main design follows four basic requirements.

Simple but specific rules

- The design can serve several purposes: **congestion management, balancing, ...**
- The design must be simple and tailor-made to System Operators needs
- The design must be smart and adaptable to several regions / countries

Open design

- The future design should be open to foster innovation and adaptability
- ➔ Design open to requirements formulated by the system operators (products, processes, etc.)

Voluntary

- Local flexibility markets: complementary to existing structures (Wholesale markets, TSO arrangements, ...)
- No obligation to sell inherent to the local flexibility market (but LT contracts are possible)
 - The system operators have no obligation to use the Local Flexibility Markets

Regulation friendly

- Regulatory changes are needed, but can be complementary to existing markets:
- Give sufficient incentives to network operators to use alternative to grid expansion
 - Ability for DSOs to use the market

- ➔ Avoid a centralized top-down approach at European level:
 - ➔ Locks the market in a (central) “one size fits all” model
 - ➔ Little scope for innovation and adaptability.

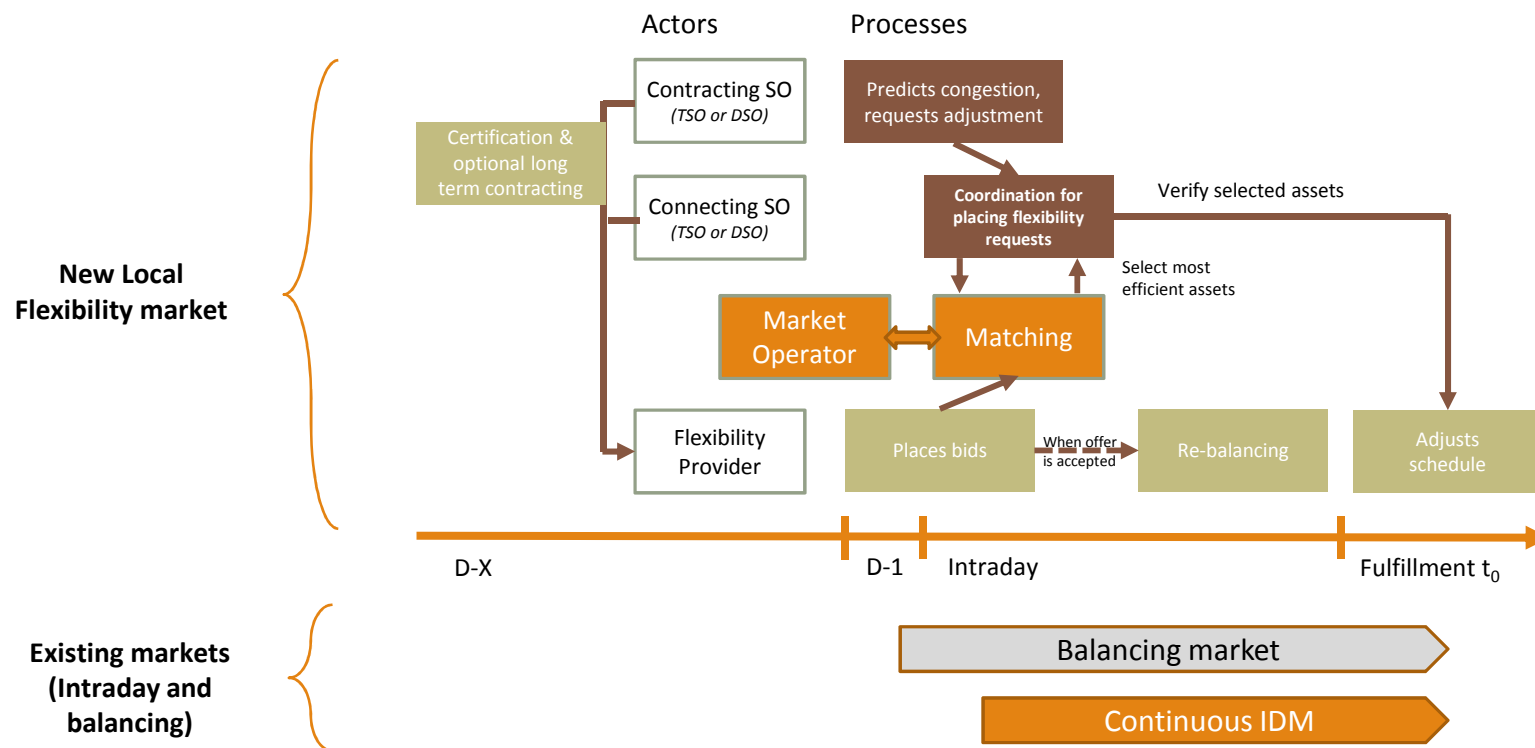
Roles and responsibilities of the project parties have to be clearly defined – governance is key.

Swissgrid	Transmission system operator: <ul style="list-style-type: none">• Participation to the market to solve/alleviate congestions• Certification of assets to allow flexibility market access• Coordination with other system operators to allow efficient flex use
Romande Energie	Distribution system operator: <ul style="list-style-type: none">• Participation to the market to solve/alleviate congestions• Certification of assets to allow flexibility market access• Coordination with other system operators to allow efficient flex use
EPEX SPOT	Neutral flexibility market operators: <ul style="list-style-type: none">• Provision of the trading systems and market operation/supervision• Coordination of the system operators and flexibility activations• Publication of relevant transparency information (prices, volumes...)
Flexibility providers	<ul style="list-style-type: none">• Provision of flexibility offers to the flexibility market based on physical injection / withdrawal capabilities• Obligation to deliver physical impact in the grid when activated.

A complementary market place relieving congestions and valuing flexibility

The flexibility providers can bid the same asset on both the Intraday market and a local market (when certified by the relevant System Operator).

The local flexibility market is complementary to the existing Intraday and the balancing markets.



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The project will deliver certain results already in the pilot phase.

- Study on expected congestion issues for 2025-2035
 - NE1 to NE5 (or 7) on Romande Energie, Groupe-e Ouest and SIL zone
- Report on a coordination process
- Specifications of local flexibility products
 - including proposed approach for zonal aggregation / disaggregation
- Cost-benefit assessment of the proposed solution
- Report on system design of a market platform
 - Including support systems include flexibility register, verification systems and coordination systems; billing and accounting procedures
- Demonstration of implementation and live operation of the systems
- Report on the potential for coordinated market-based flexibility usage.

The Partners are committed to launch and implement a pilot project.

THANK YOU FOR YOUR ATTENTION!



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