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Design Changes to Better Integrate Demand Side Management and Flexibility into Electricity Markets

Arthur Janssen, Head of Market Development & Design
Lausanne, 10th September 2015

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01 **Current Market Challenges**

02 **Potential for Flexibility**

03 **Developing Markets for Flexibility**

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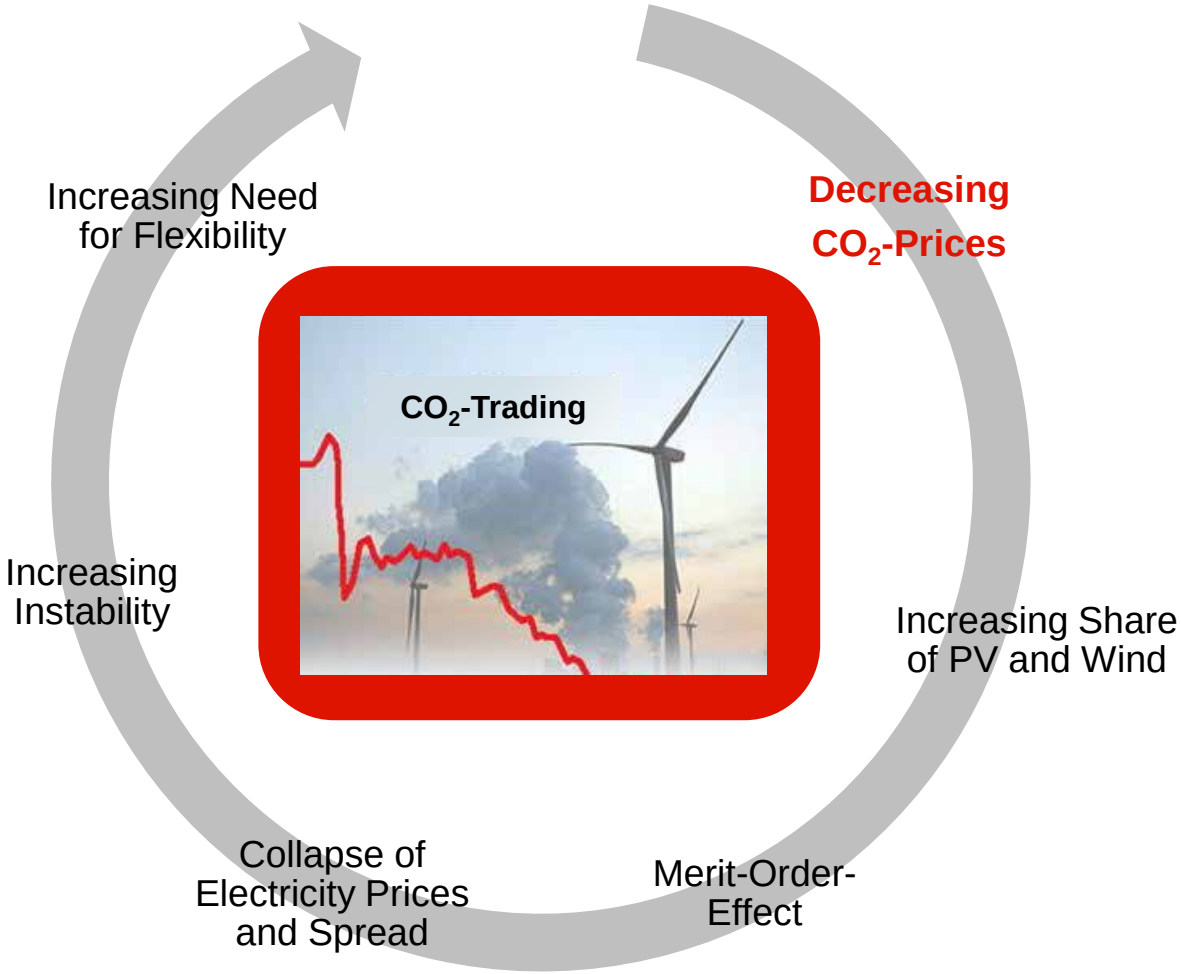
Present Developments have a Deep Impact on the Swiss Electricity Market



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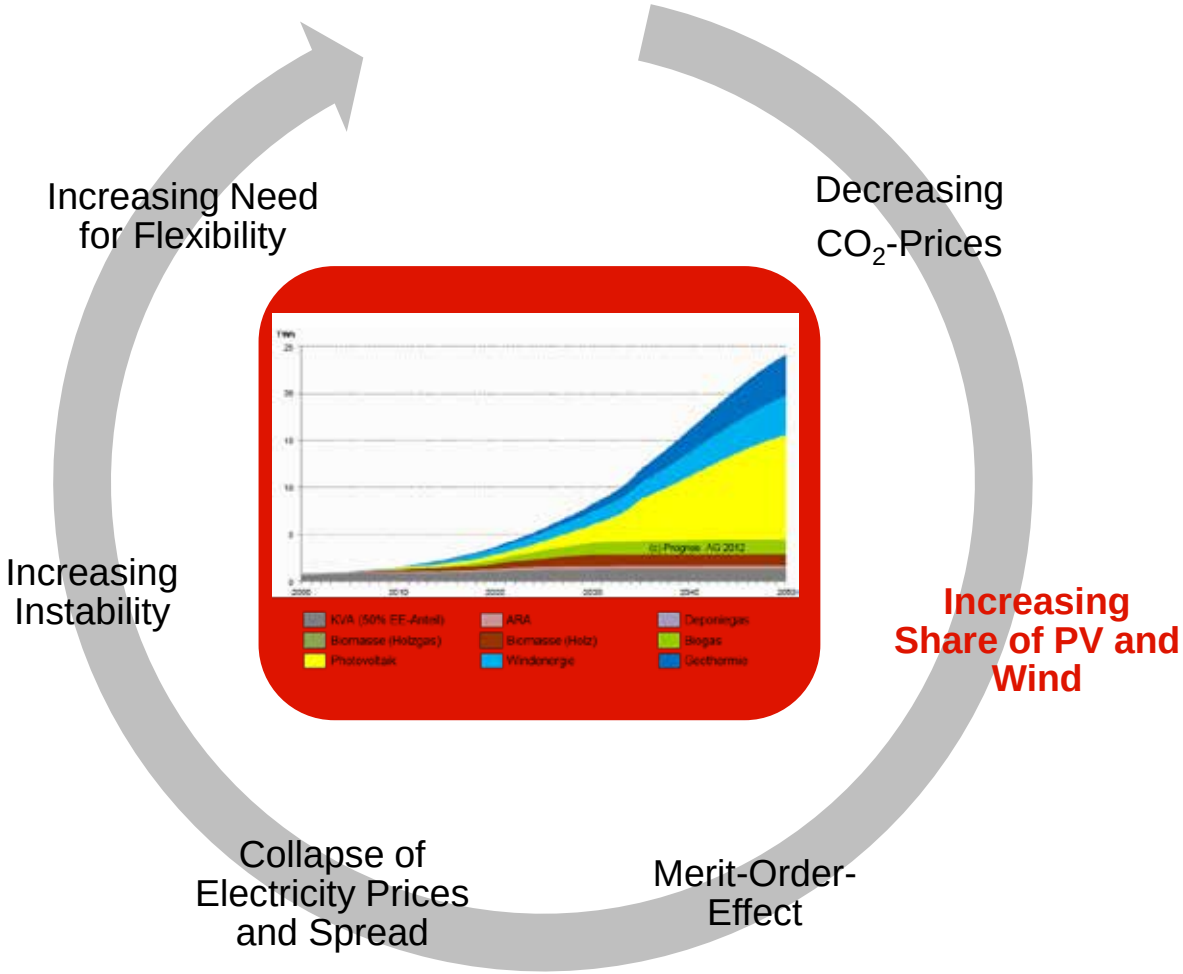

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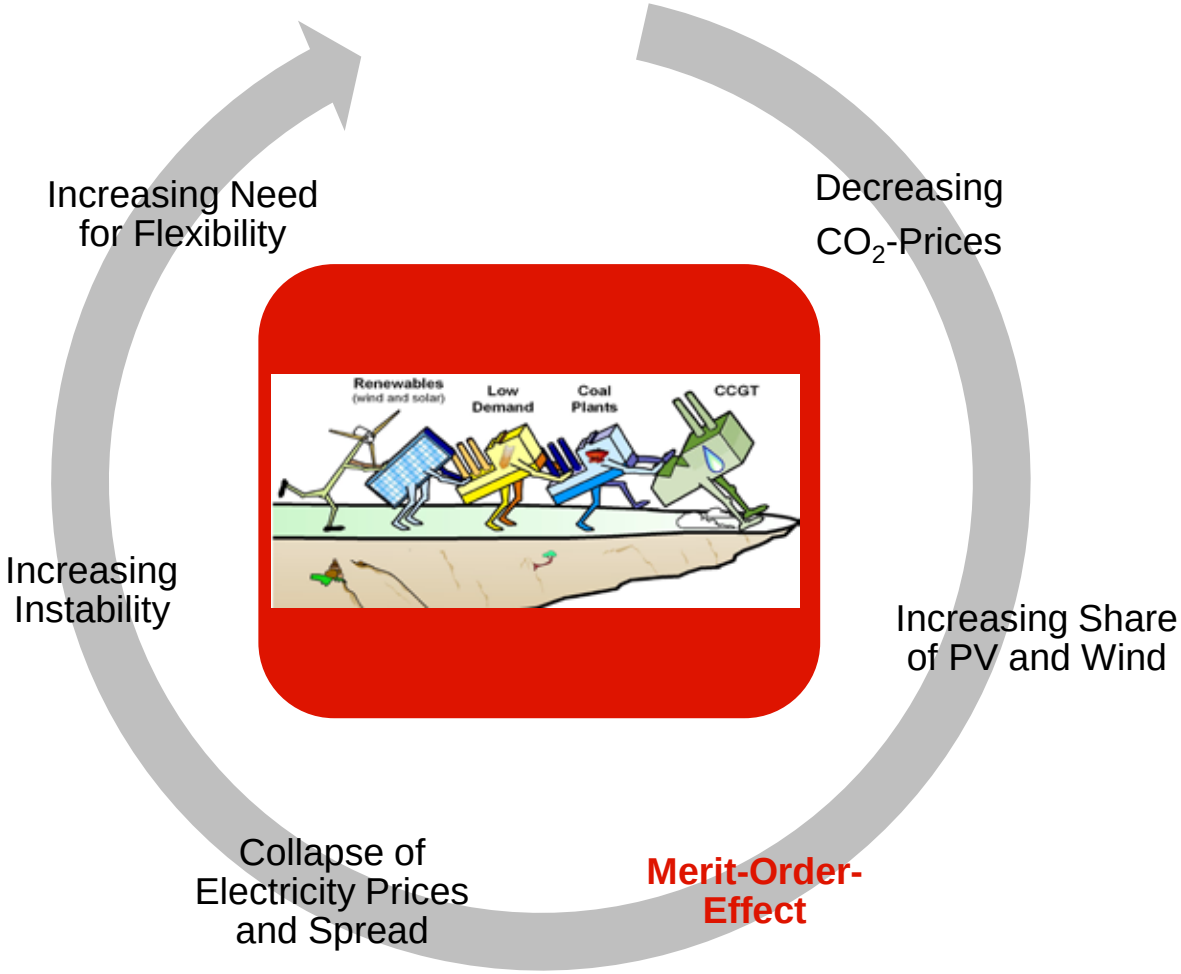

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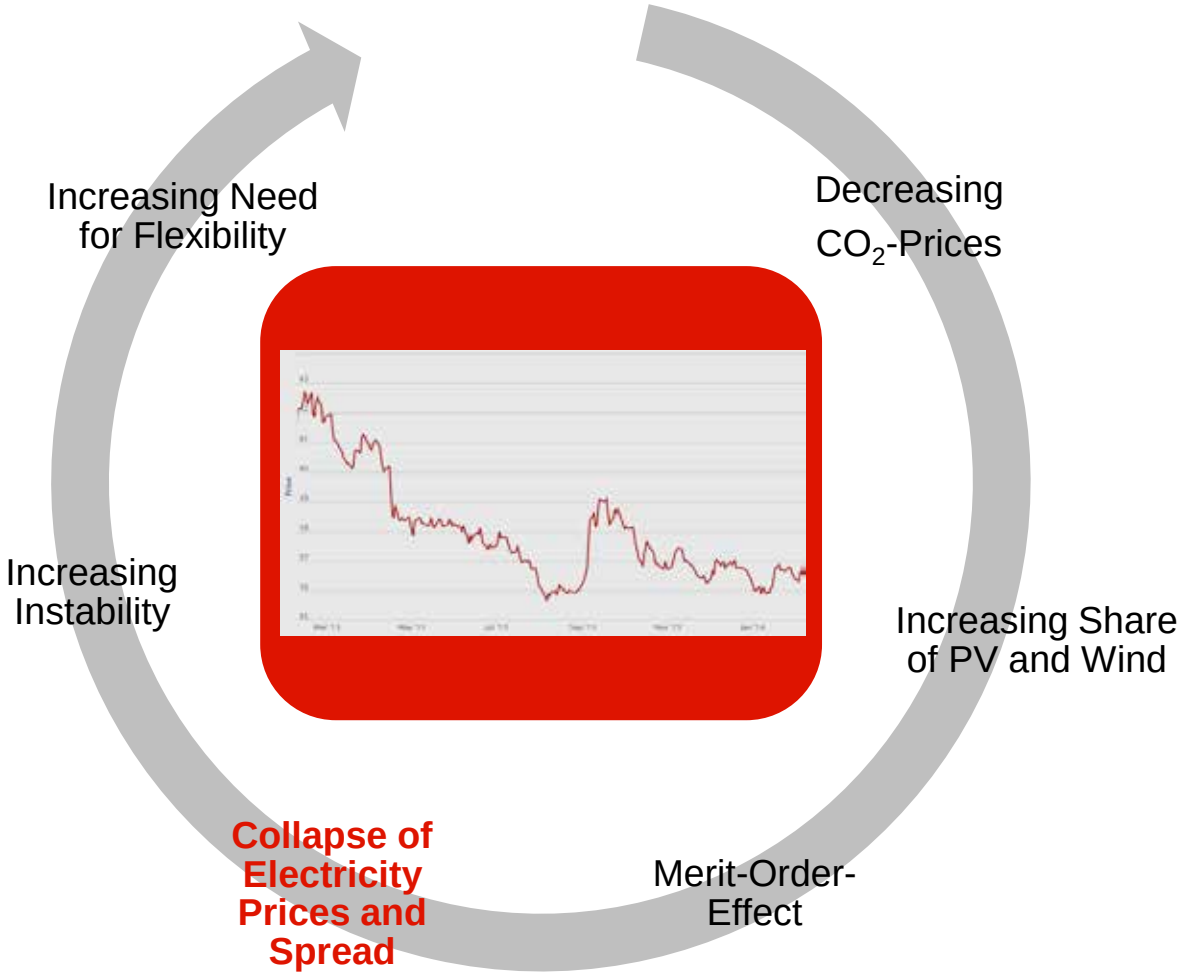

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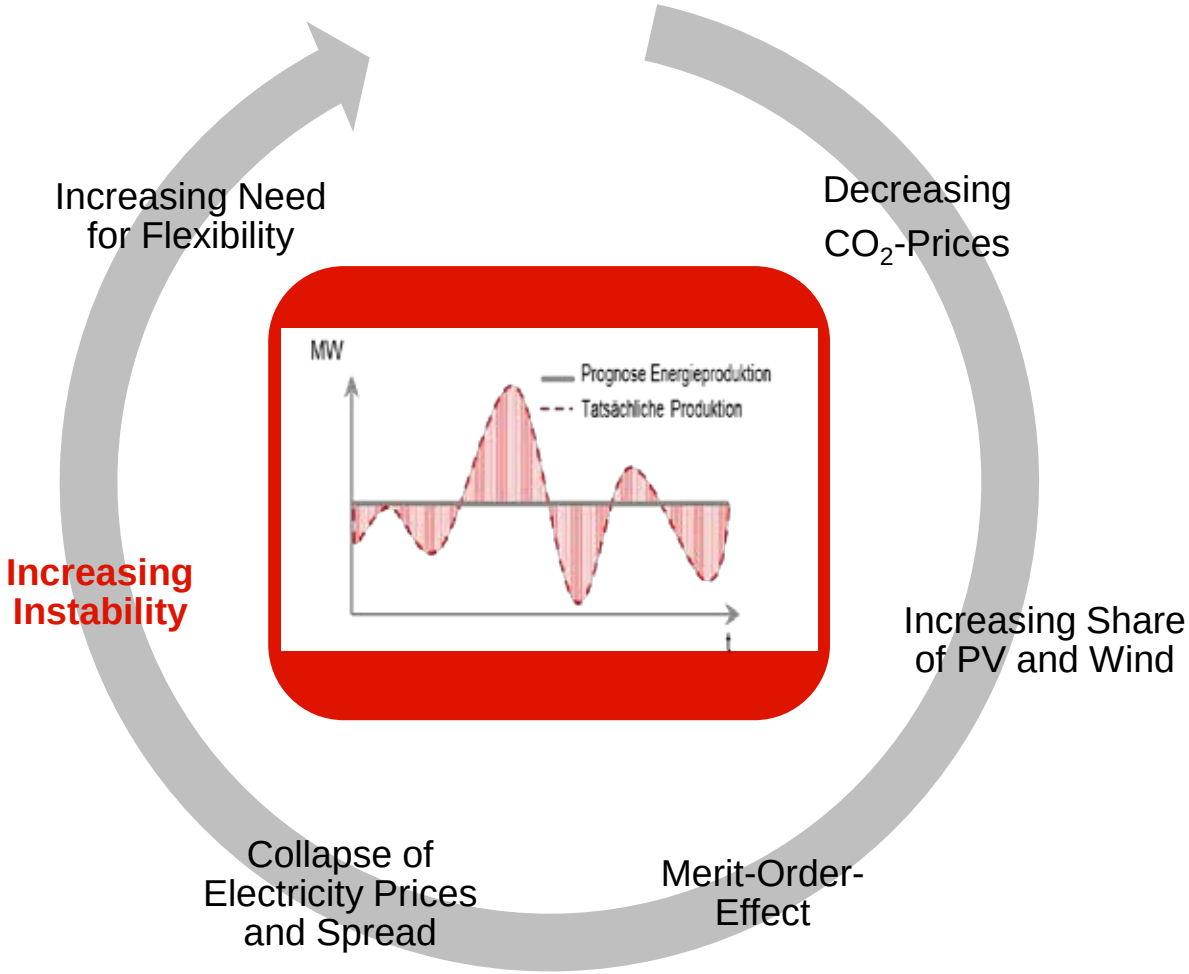

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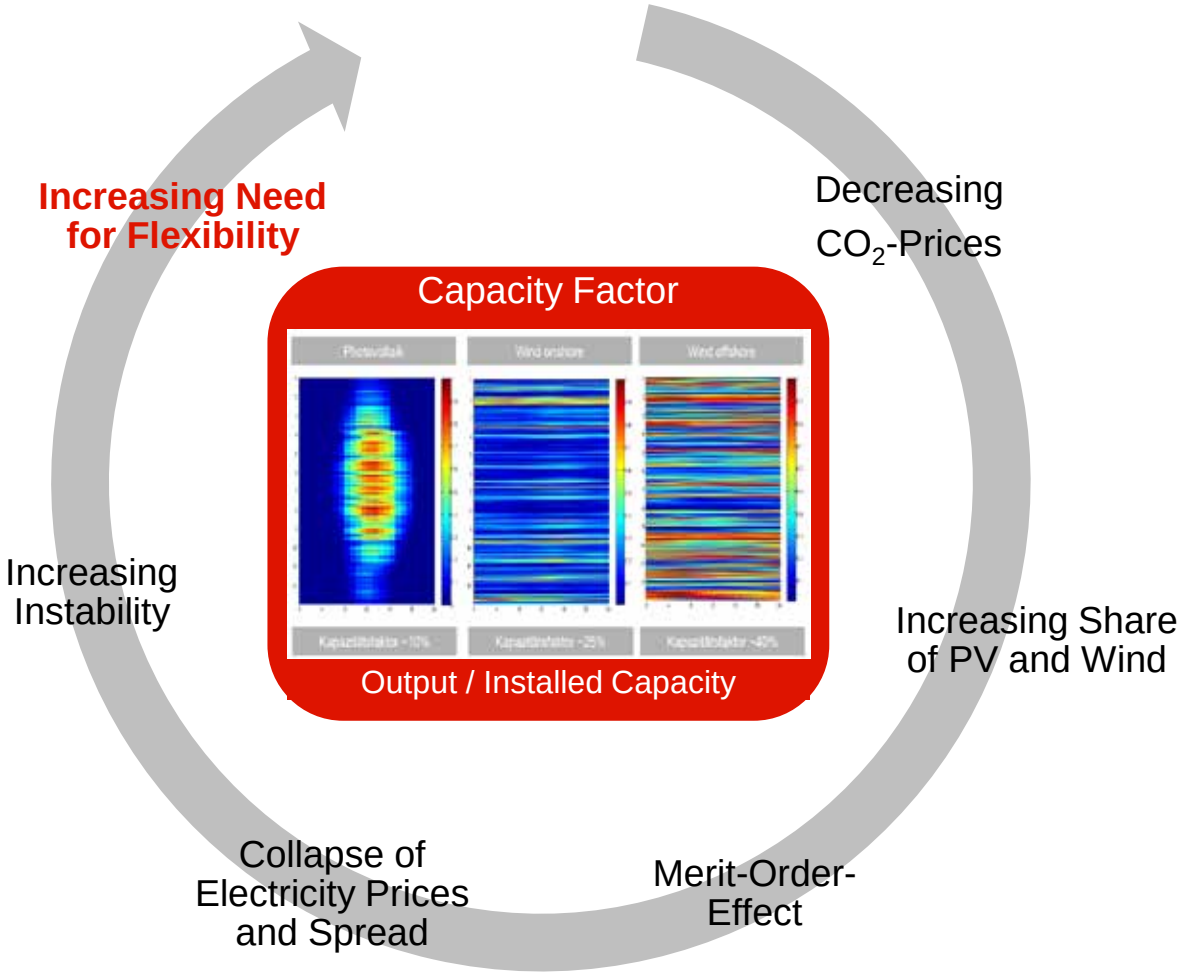

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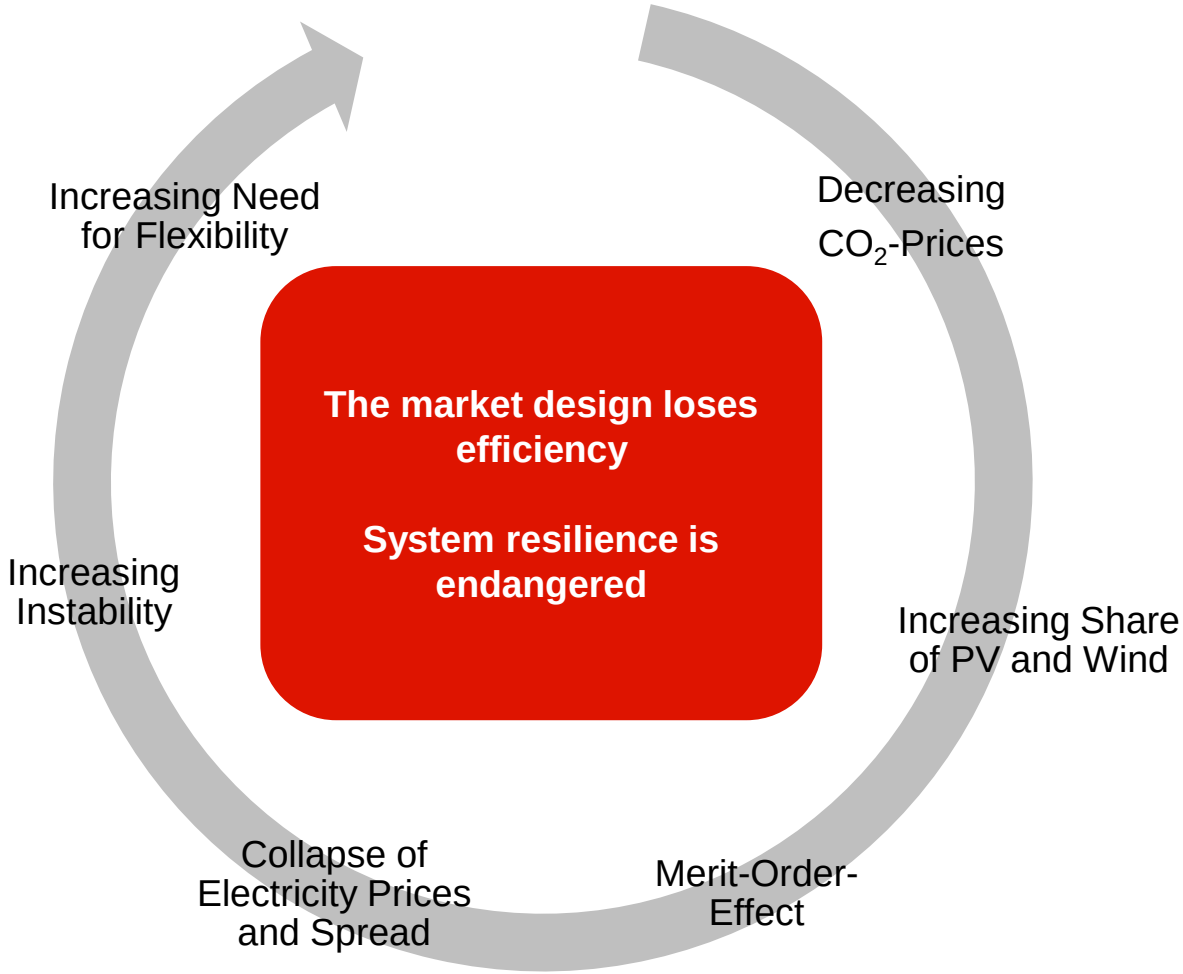

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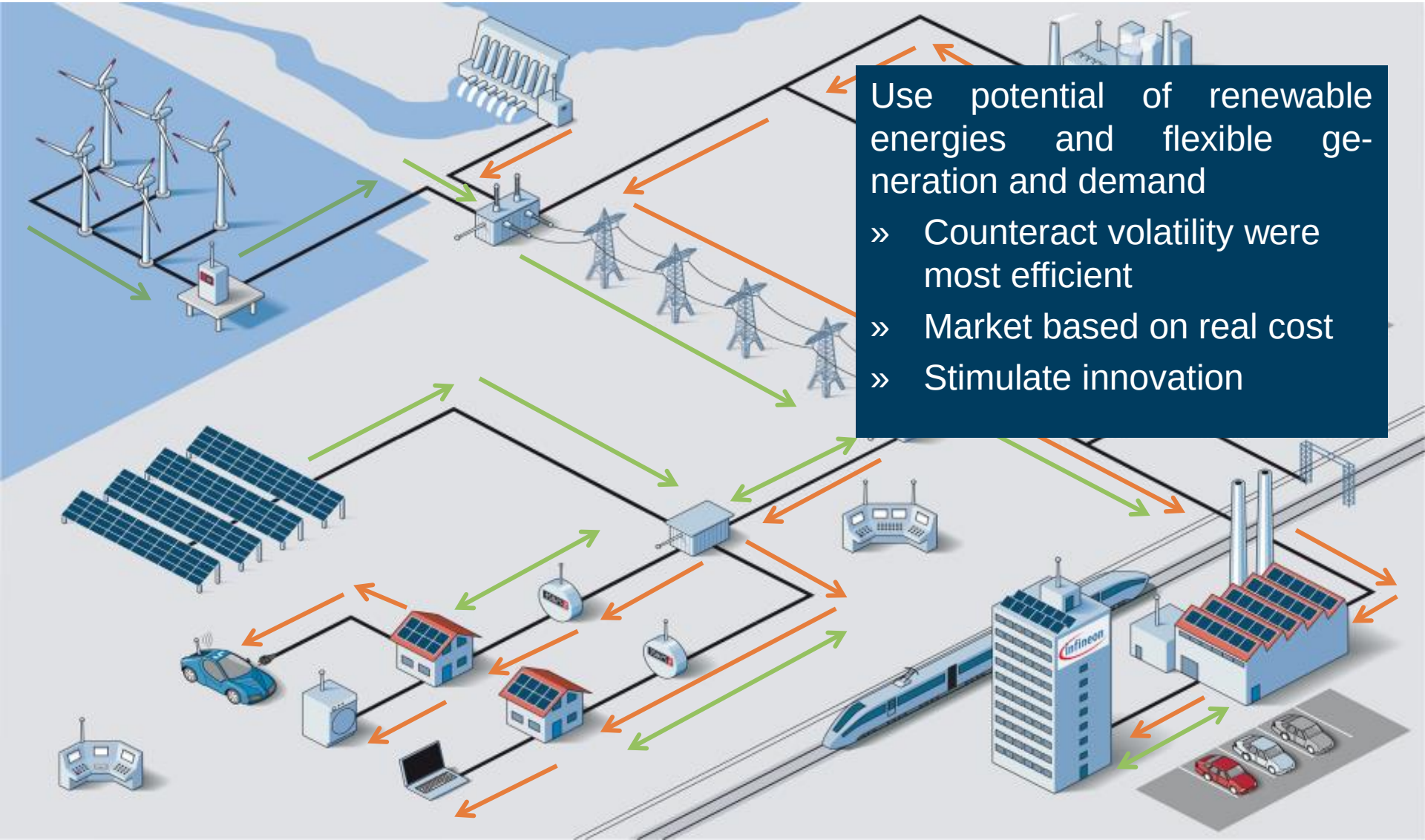
Note: A Possible Layout of Tomorrow's Electricity System



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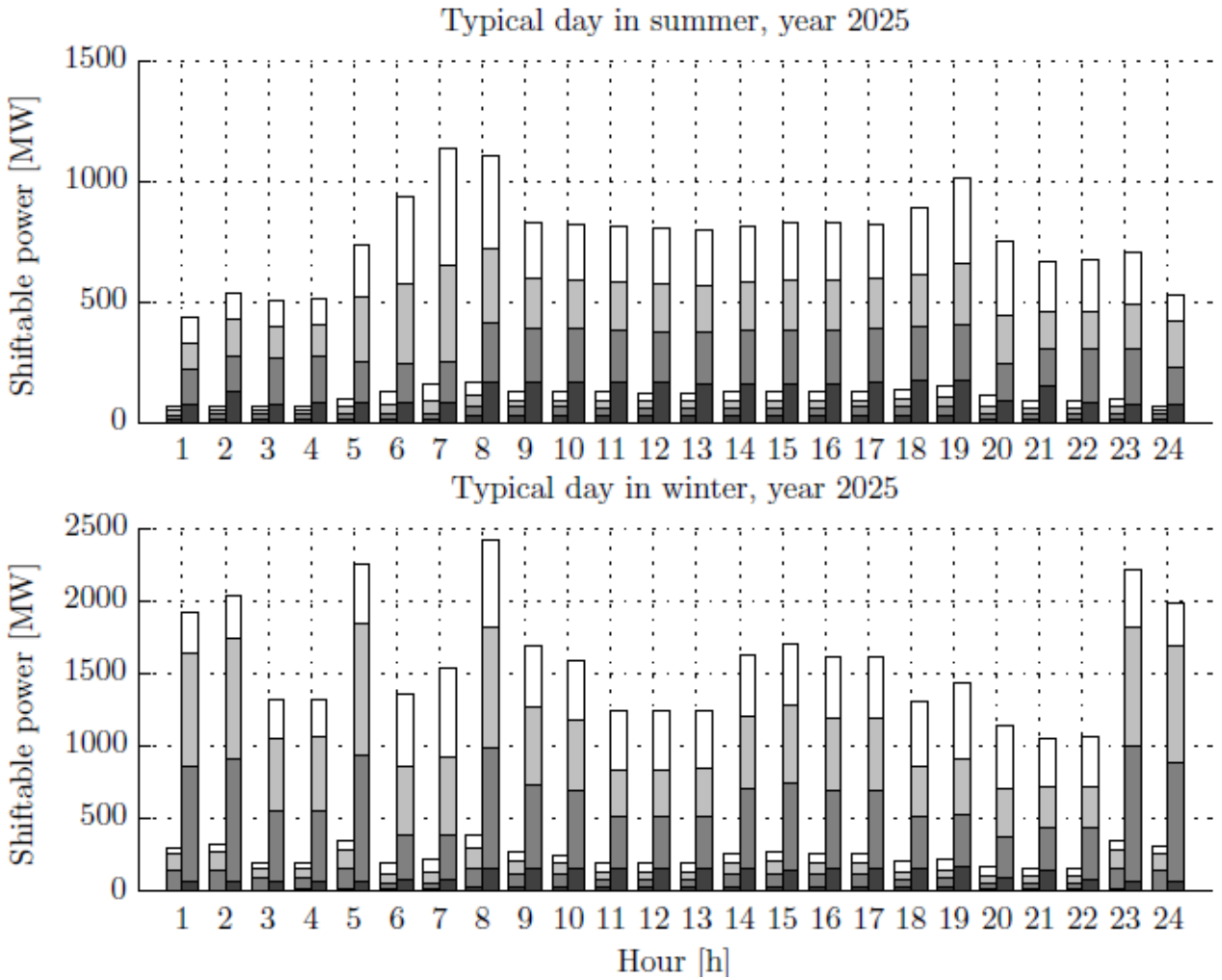
Uncertain Demand Response Development in Switzerland

Estimation of potential in residential sector, inkl. smart meter installation



- Potential of DSR, taking account of RES and Smart Meter expansion
- More potential in winter: Heating
- But difference between progressive and conservative scenarios very large

Master Thesis of Emanuel Thoma, 2015
Based on data from BFE, 2012

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What will be the Role of Demand Response in the Market?

Potential applications:

- Ø Individual **grid tariff optimization !?**
- Ø **Congestion management** in the distribution grid **!**
- Ø **Balancing** role with Ancillary Service Markets **!**
- Ø Provision of **Adequacy** to the energy system **!?**
- Ø Marketing at **Spot Wholesale Market ?**

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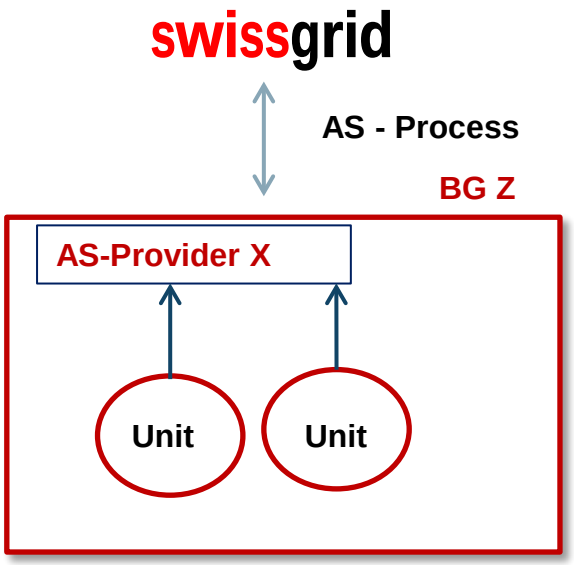
Swiss Pooling Concept – Ancillary Services

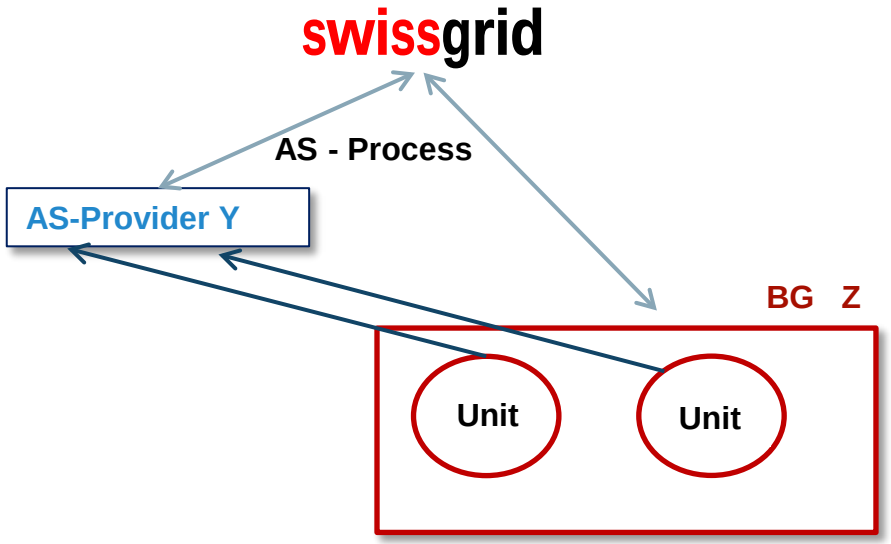
Concept allows

- the Balance Group simpler way to offer Ancillary Services to Swissgrid
- the pooling of technical units in the Grid Level 5 (50 kV) and Grid Level 7 (400 V)

AS – Conventional Process



AS – with Pooling



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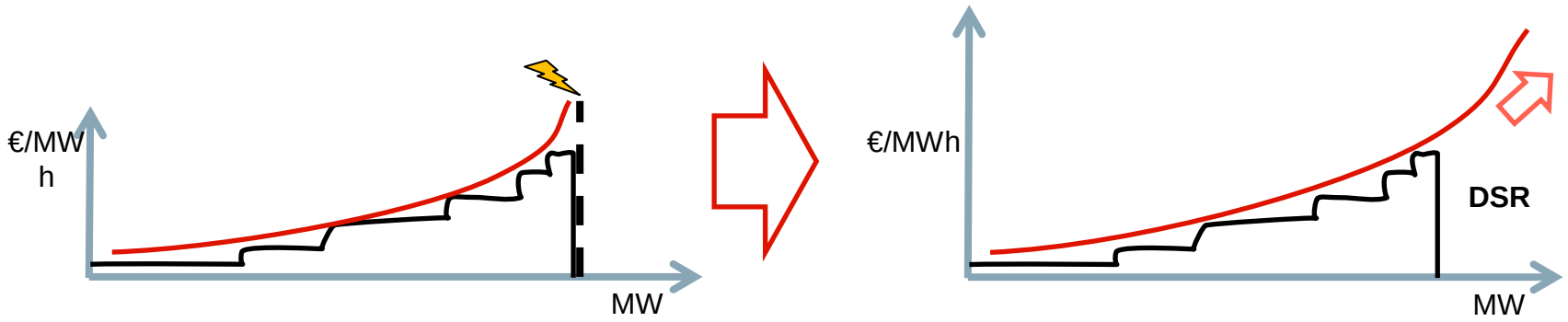
Example: Demand-side Response Promote Adequacy

- Today's merit order curve gives a **limited price signal**.
- Without capacity market, installed production capacity will eventually **hit** consumption.
- Extreme prices and **system collapse** are very close.

- Large capacities of demand-side response could lead to a **"liquid" market** with occasional high prices.
- High prices give a **price signal** to more demand-side and production investments [1)].
- A **stable and innovative** system could be reached.



è Extreme prices not set by production cost, but customer value!

1) This e.g. compares to regulation of the Texas ISO.

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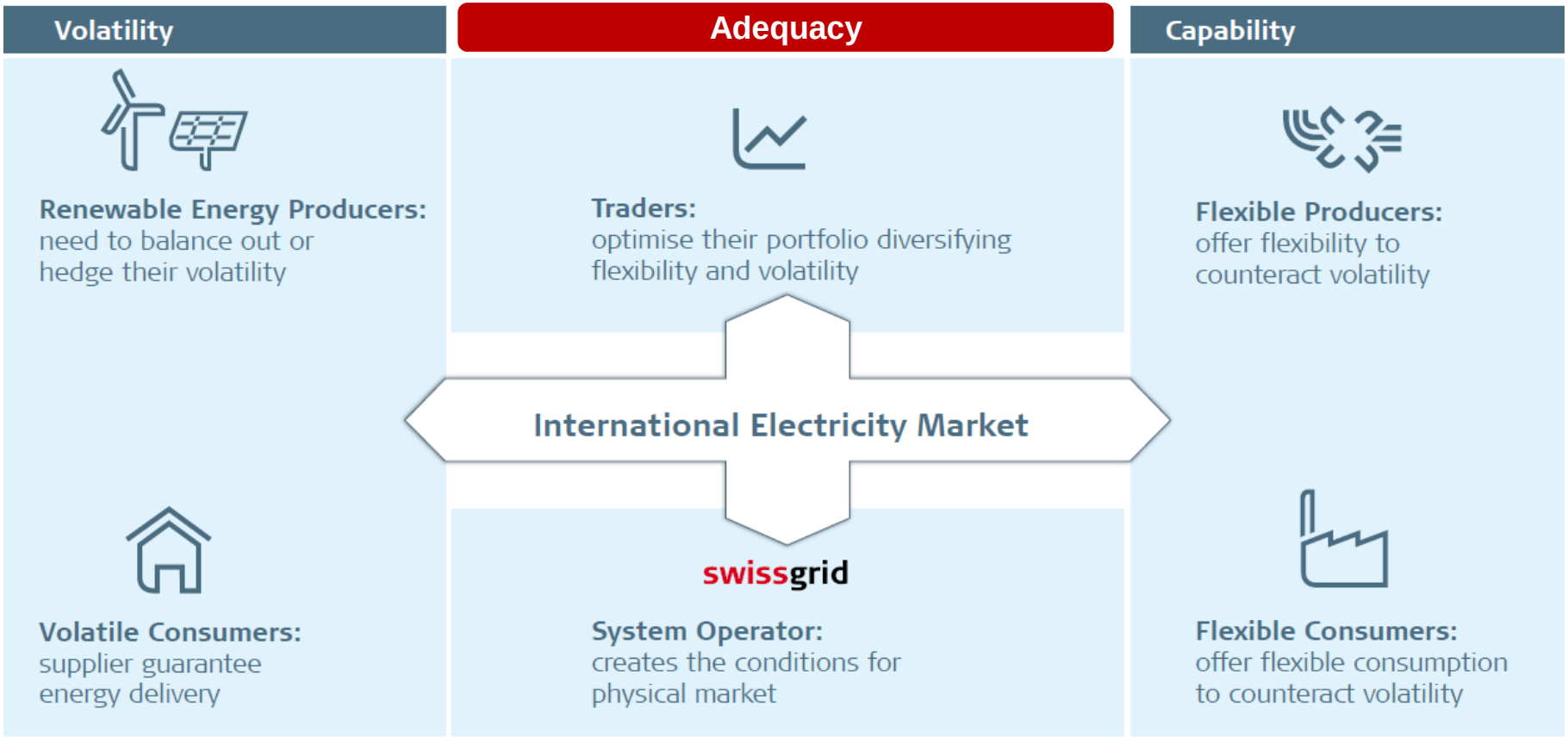
Aspects of a Future Market for Flexibility



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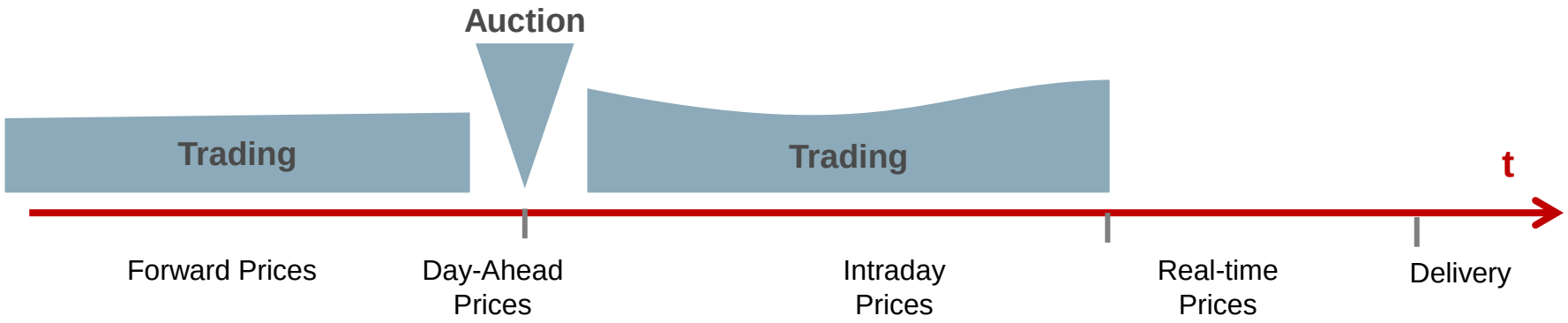
Trading Process Today



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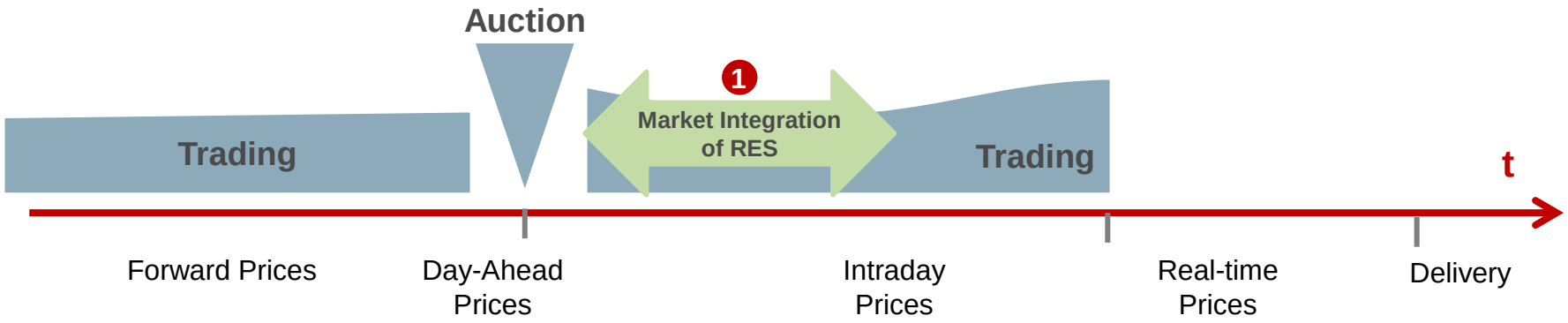
Building Markets for Flexibility: Strengthening overall Price Signals

= new key elements



1

» Adapting the current Market Design to allow renewable integration

» Renewable producers are to correctly forecast their feed-in and hedge their volatility in order to improve system security and economic efficiency

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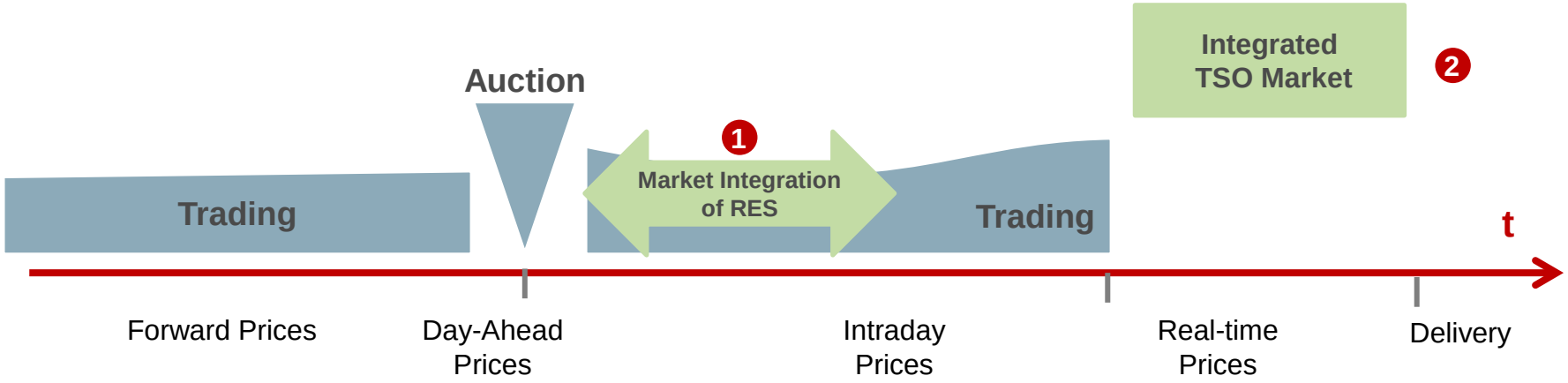
Building Markets for Flexibility: Strengthening overall Price Signals

= new key elements



2

» Harmonizing TSO products on a new TSO marketplace

» Concentration of the procurement of tertiary, redispatch-energy as well as further internationally exchanged TSO products on one single market place in real-time timeframe

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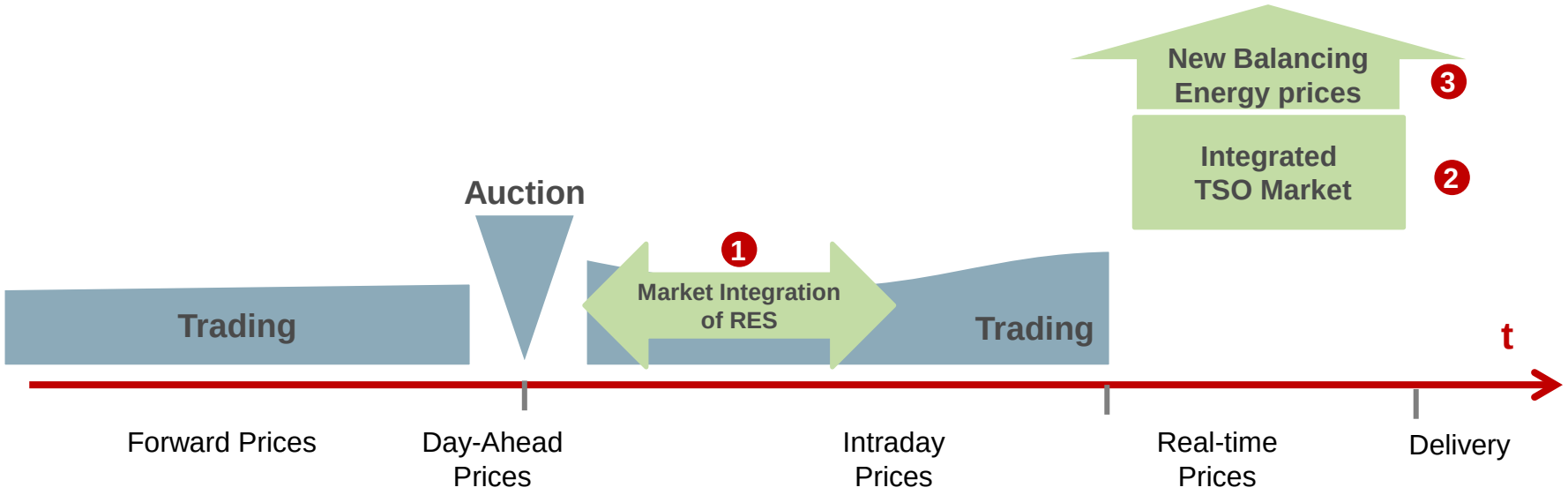
Building Markets for Flexibility: Strengthening overall Price Signals

= new key elements



3

- » Introduction of costs-by-cause principle and strengthen responsibility for balancing groups
- » Implementing a transparent real-time full marginal cost mechanism, to create an efficient scarcity price towards balancing groups

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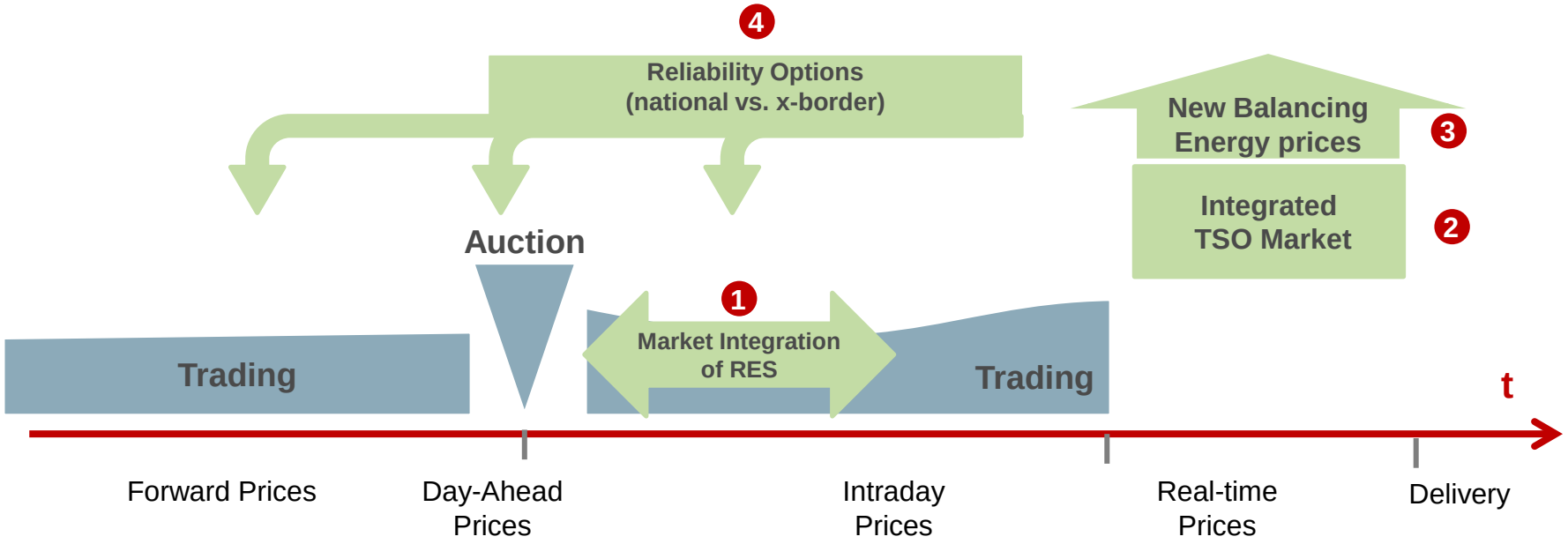

4

» Establishment of real-time market for reliability options

» Implementation of decentralised reliability options allows also foreign market players to participate in the mechanism, provided that appropriate cross-border hedges are available.

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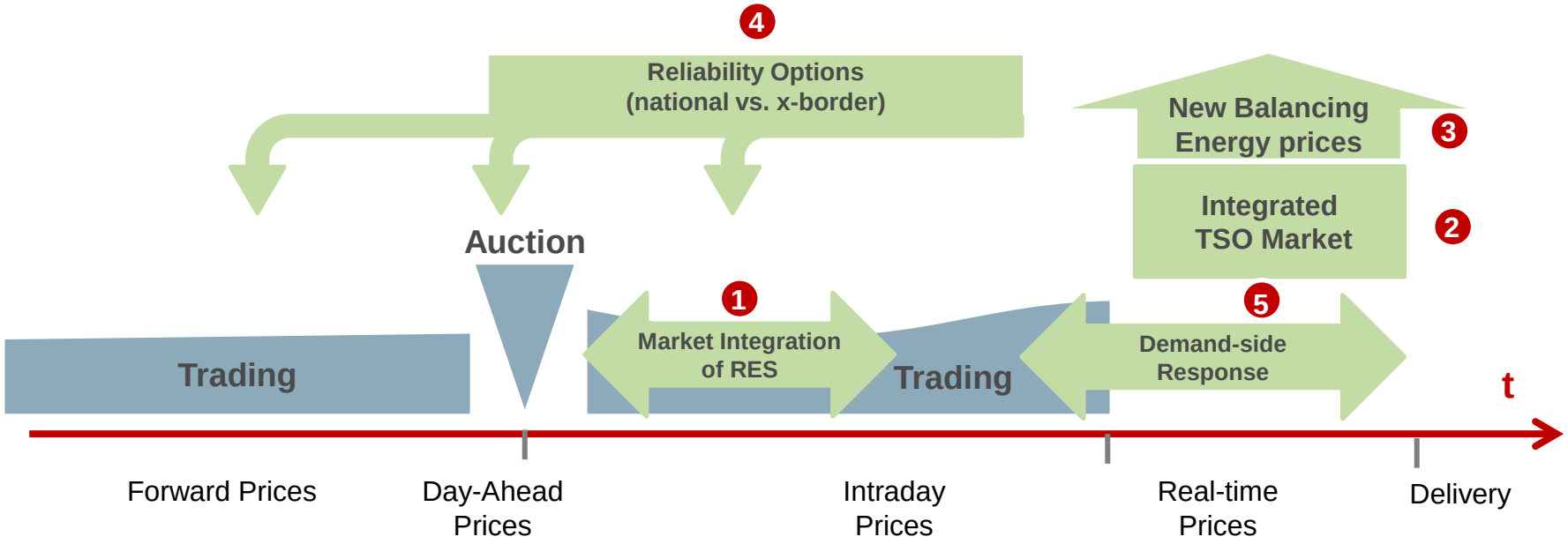

5

» From a centralized generation system to a decentralized prosumer system

» Further development of pooling concept for flexible loads by supplying customer flexibility on the balancing energy and wholesale market

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A common goal:

With the development of markets for flexibility, we try to exploit potentials of the future electricity system

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