



DSM from distribution customers:
From an increasing reality today in MV
to perspectives tomorrow for all

- MV renewable
 - Explicit flexibility for congestion
- MV customers
 - Now for balancing
 - Low voltage illustration
 - Challenges for the electrical system and the customers
 - Opportunities for an aggregator and his costumers
 - Implicit flexibility tomorrow for network management

MV renewable

Explicit flexibility for congestion

- AGW TFLEX
 - Business case for DSO/TSO investment
 - Leads to contractual capacities (connection contract)
 - Permanent
 - Activations with financial compensation of the producer
 - Flexible
 - Activations without compensation of the producer
 - Market is informed in case of activations
- When possible, easier and cheaper, a nearby situated customer should be allowed, via an FSP, help the DSO
- This is volume or explicit flexibility
- How interpret this with MV and LV customers tomorrow ?

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Now for balancing

Collaboration with TSO

- Collaboration between TSO and DSO has opened the balancing market to distribution grid users since 2014 :
 - Medium voltage
 - Head-meter with 15' granularity
 - Via an aggregator, sometimes directly
- In addition to the TSO – aggregator specifications and contracts, DSO participates
 - In the pre-contractual phase
 - During the execution of the contract

Now for balancing

Pre-contractual phase

- Provision of relevant information about the connection contract between DSO and grid user, typically:
 - EAN and connection capacity
 - Correct use of emergency generators
- Network Flexibility Study NFS
 - Control of effects of simultaneous behavior's, rebound effect
 - Leads to reservation of grid capacity
 - Evolution from 2014 to 2017 :
 - Trimestral study
 - Green light given for undefined period
 - Delay of 12 months in case of congestion risks
 - Independent from aggregator change

Now for balancing

Pre-contractual phase

- Metering data for the TSO certification
- Generic aggregator – DSO contract
- All information available on <http://www.synergrid.be/index.cfm?PageID=16832>

C8/01 et Contrat FSP - GRD	08.2015	Network Flexibility Study pour participation aux produits d'Elia SDR 2015-2016 et R3DP 2016 (révision 08.2015)
	08.2015	Modèle de contrat GRD/FSP (Prestataires de services) dans le cadre des réserves stratégiques 2015-2016 et des réserves tertiaires R3DP 2016 (révision 08.2015)
	06.2016	Modèle de contrat entre le GRD et le Prestataire de services de flexibilité dans le cadre de la livraison de R1 asymétrique à Elia par l'utilisation du réseau de distribution
C8/02	08.2015	Sous-comptage par le GRD: modalités générales dans le cadre du produit R3 DP 2016
C10/11	06.2012	Prescriptions techniques spécifiques de raccordement d'installations de production décentralisée fonctionnant en parallèle sur le réseau de distribution. Voir aussi : 1/ FAQ concernant l'application du C10/11 (08.2016) 2/ Que faire si mon installation photovoltaïque se déconnecte régulièrement du réseau ? 3/ (FR) Déclaration de conformité C10/11 révision 06.2012 - §2.10, §2.13 et annexe 4 (EN) Declaration of compliance C10/11 revision 06.2012 - §2.10, §2.13 and annex 4

Now for balancing

During the execution of the contract

- DSO as flexibility data manager in distribution :
 - Is in charge of the access register with the pool of customers
 - Makes the (aggregated) link with the impacted source BRP
 - Calculates the availability of flexibility
 - Calculates the activated volume for the TSO

Now for balancing

It works !

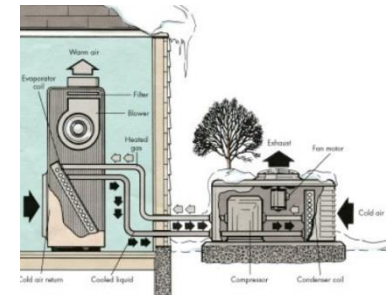
- TSO and DSO processes, timings & procedures are aligned
- Market is functioning for products at DSO-level
 - Prequalification by DSOs
 - 2015: 679 MW (371 DGUs)
 - 2016: 885 MW
 - Complementary for strategic reserves 2015-16: 314 MW (66 DGUs)
- Ready to tackle new challenges

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Low voltage

Imagine 2030

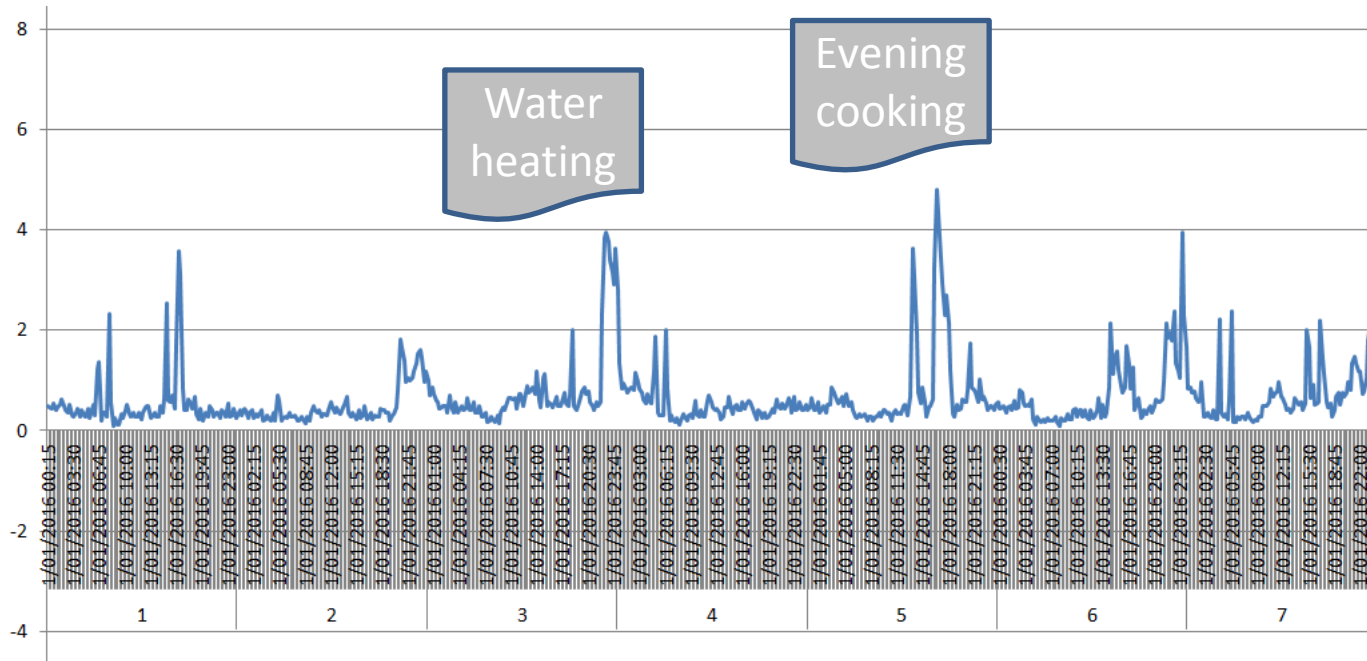
- 2016
 - 90.000 prosumers (7%) with 5kVA
- 2030
 - 270.000 prosumers with 10kVA
 - EV between 100.000 and 300.000
 - HP between 80.000 and 160.000
- Evening peak increase



	Average (kW)	Individual (kW)
EV	1,2	3
HP	1,7	4

Low voltage

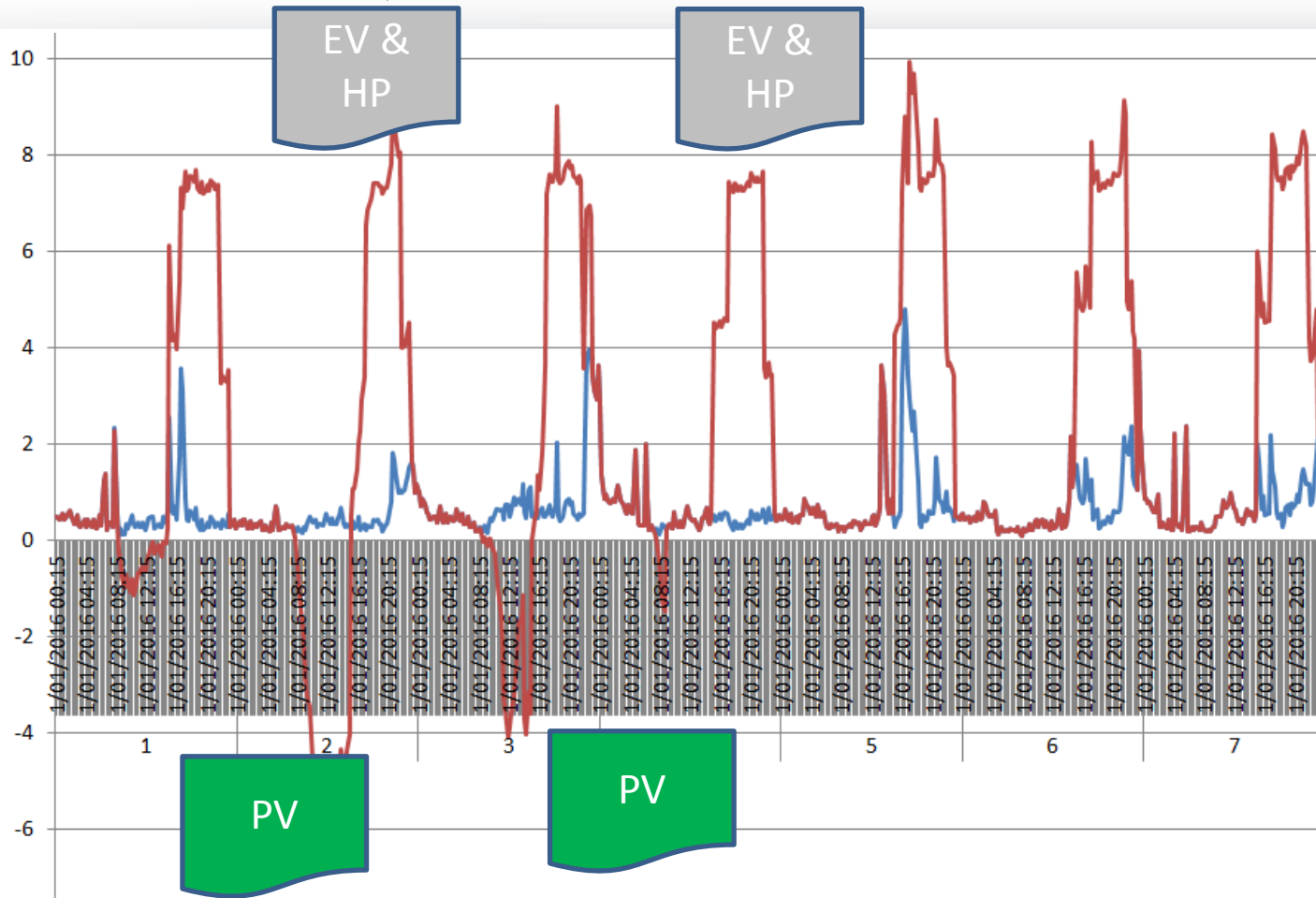
Risks for a DSO and their customers



Typical individual load profile without PV, EV and HP

Low voltage

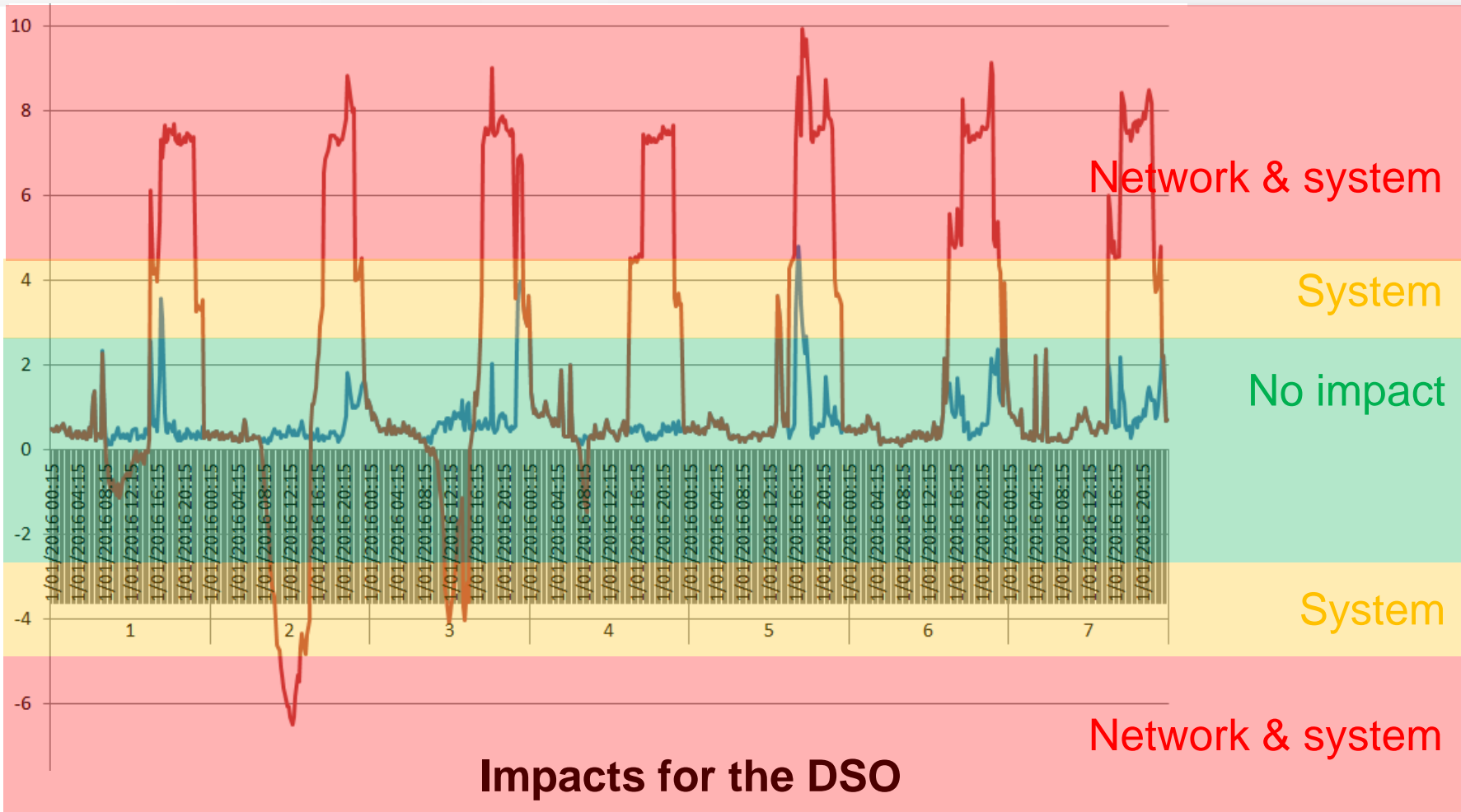
Risks for a DSO and their customers



Typical individual load profile with PV, EV and HP

Low voltage

Risks for a DSO and their customers



Low voltage

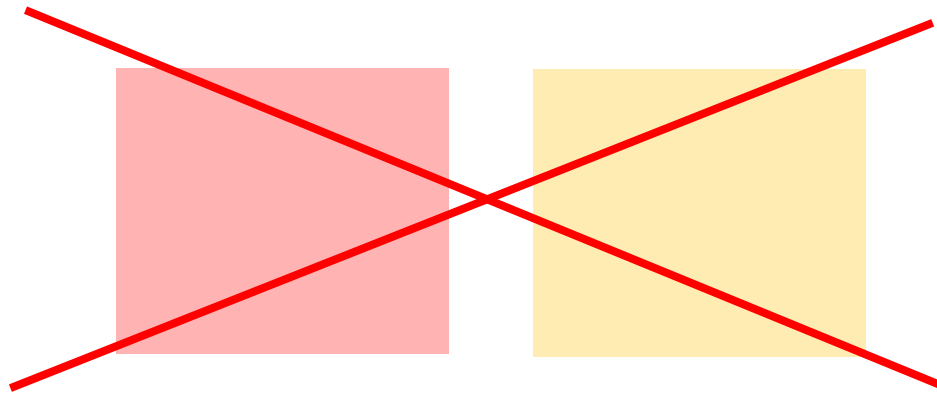
Risks for a DSO and their customers

***Because of the peak increase at the interface
between TSO and DSO,
the grid bill of all the customers could
increase by ~ +10%***

Low voltage

Opportunities for an aggregator and his costumers

- We believe it is possible to let the customer free to invest (or not) in EV, HP and PV
- We also believe it is possible to avoid lots of these costs
- We see one way ...



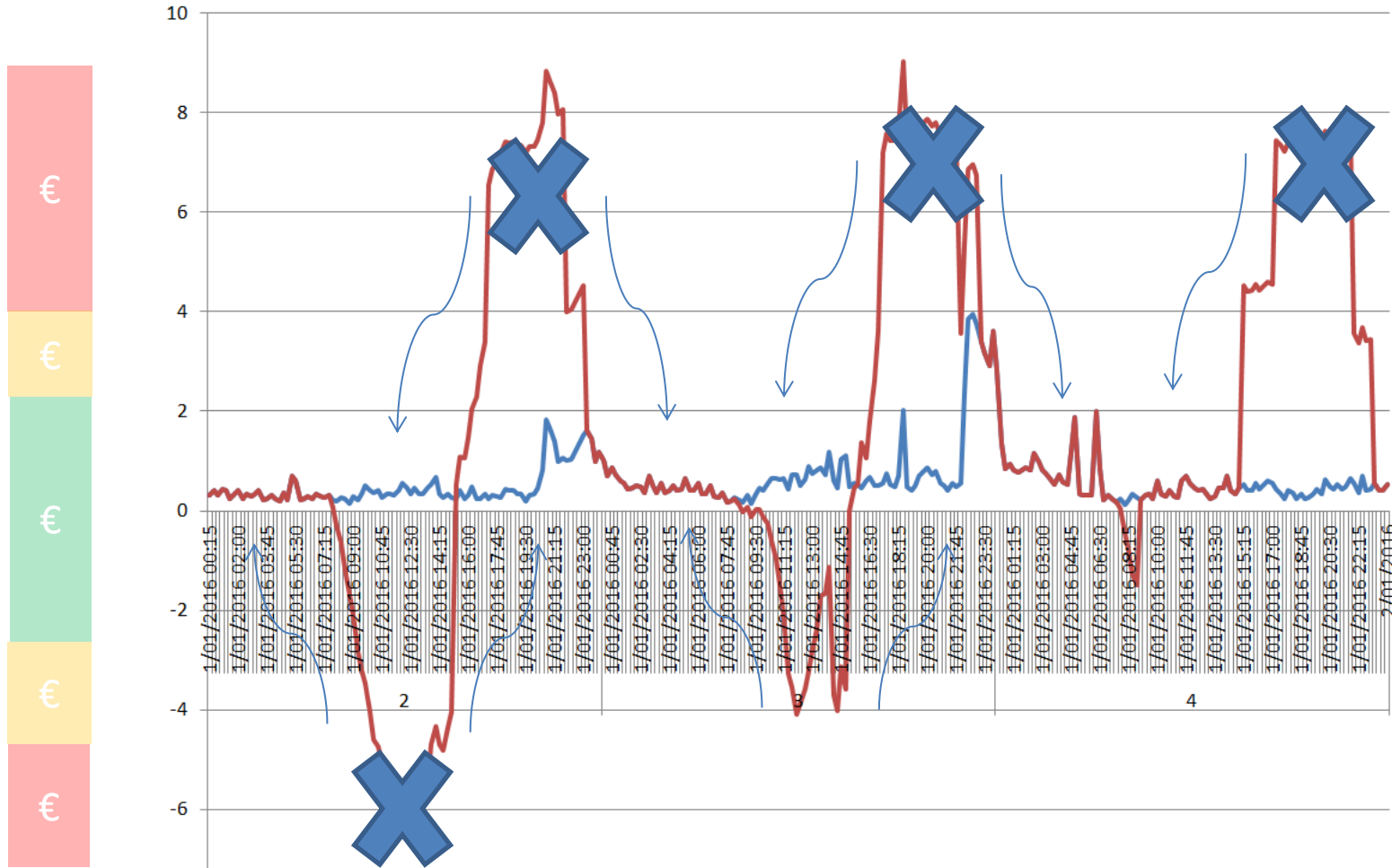
Low voltage

Opportunities for an aggregator and his costumers

- Equip these customers with a **smart meter** with 15' granularity
- Make **incentivizing tariffs** in order to avoid most of these synchronous peaks
- Good technology can help the customer to avoid these peaks
- Moreover, as a market party, the aggregator or supplier that uses that technology could valorize the flexibility
 - Security of supply
 - Portfolio and unbalance

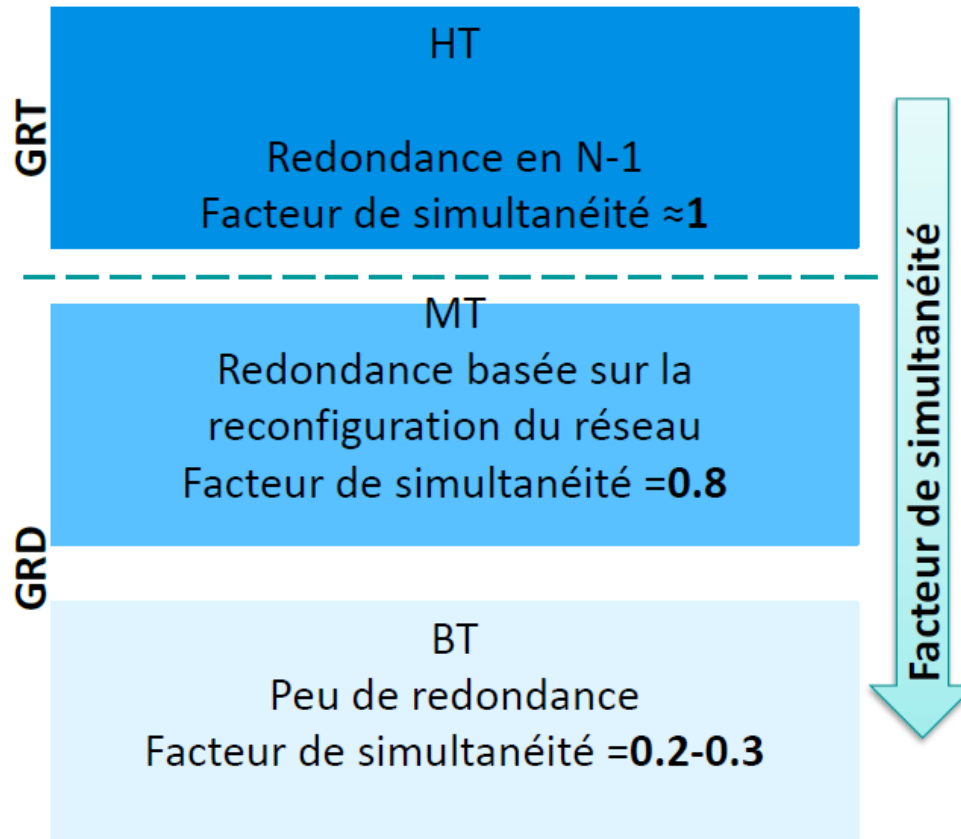
Low voltage

Opportunities for an aggregator and his costumers



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Implicit flexibility tomorrow for congestion



Similarity between LV and MV

Conclusion

From explicit to implicit flexibility for the DSO

	Investment	Permanent capacity	Flexible capacity
Renewable MV	Mandatory when reasonable	Regulated choice Compensation	Regulated choice No compensation
Renewable LV	Mandatory	Customer choice	Incentive
Customer MV	TBD	Customer choice	Incentive
Customer LV	TBD	Customer choice	Incentive

- Let's use the existing network and avoid new investments
- Let's invest in measurement tools and intelligent tariffs
- Let's valorize the flexibility from both the professional and residential sectors

Conclusion

From explicit to implicit flexibility for the DSO

Thank you !