PROVISION OF FREQUENCY RESPONSE SERVICES BY WIND: KEY MESSAGES

June 2018

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SUMMARY MESSAGES

WIND GENERATION DOES NOT PROVIDE RESERVE / RESPONSE SERVICES IN FRANCE

Aim to seek to enhance arrangements to improve overall competition and efficiency

Situation

- Wind generation is not currently active in provision of response / reserve services in France
- Participation is technically feasible but commercial viability is challenging

Consequence

- System does not have access to a growing pool of flexible capacity, especially for downward regulation, which has value to the system
- Need for participation by wind (and other currently non-participating technologies) may increase as available resource mix changes over coming years

Challenge

- What can be done to increase potential participation in response / reserve markets to deliver more competitive arrangements and more efficient outcomes for the system?

WIND TURBINE TECHNICAL CAPABILITY IS NOT THE ISSUE TO PROVISION OF FREQUENCY RESERVE SERVICES

Wind turbines technical capability is there

- Most wind turbines, both currently installed and new models, have the technical capability to provide downward frequency reserve services
  - Upward FCR provision subject to synthetic inertia emulator and de-loaded running for upward a/mFRR
- Beyond technical capability, they can also meet frequency reserve product technical characteristics in terms of timings, etc.

Why do they not provide these services?

- Primary constraint is connected to market and regulatory frameworks
- Possibility of further technical developments are de facto hampered and wind turbine manufacturers are not encouraged to invest in potentially enhancing capabilities

MODIFYING PRODUCT CHARACTERISTICS AND PROCUREMENT ARE A MUST TO REDUCE BARRIERS. IMPROVING INTERACTION WITH RES SUPPORT WOULD ALSO HELP EARLY PARTICIPATION

1 Allow separate upward and downward products

1. Allowing asymmetric products will **increase and diversify the pool of providers** available to TSOs to secure reserve requirements, facilitating security of supply and more efficient procurement of services
2. **Reduces reliance on illiquid secondary market** and de facto need for aggregation (improved transparency and liquidity of secondary market also helpful)

2 Make capacity procurement as close to real time as possible (day-ahead or preferably later)

1. Day (hour)-ahead wind forecasts are accurate enough for producers to commit to frequency reserve service provision (when wind conditions are favourable)
2. Shorter procurement timescales **increase the pool of potential resource from which TSOs can undertake efficient procurement**

3 Shorten duration commitment

1. Shorter block (1, 2, 4, 6 hour) commitments will increase compatibility with wind (and more generally intermittent renewables) generation patterns
2. Shorter commitment periods **increase the pool of potential resource from which TSOs can undertake efficient procurement**

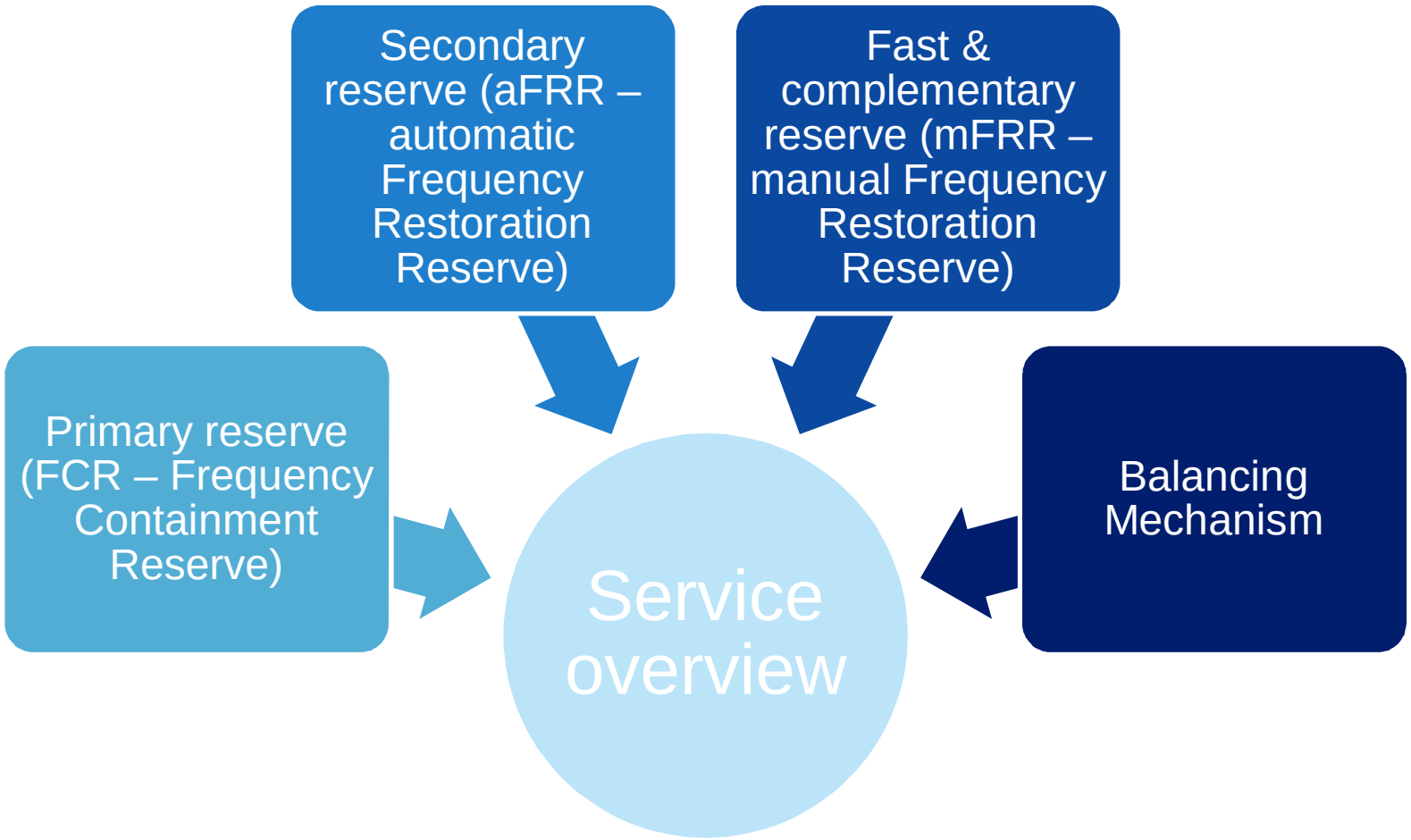
4 Explore accommodation of frequency service provision in RES support[1]

1. Address participation constraints (regulatory, economic) linked to RES support
2. Allow for remuneration of TSO instructed reserve provision through **adjusting basis for market premium payment** (avoids opportunity cost bidding)
3. **Ensuring RES (like other technologies) is no worse off if providing reserve**

1. This issue is common, with support arrangements not taking account of impacts of reserve provision on basis for support payment.

CONTEXT

FREQUENCY SERVICES UNDER CONSIDERATION



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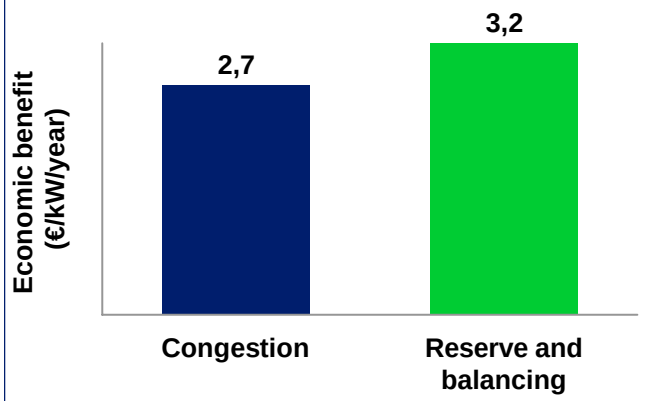
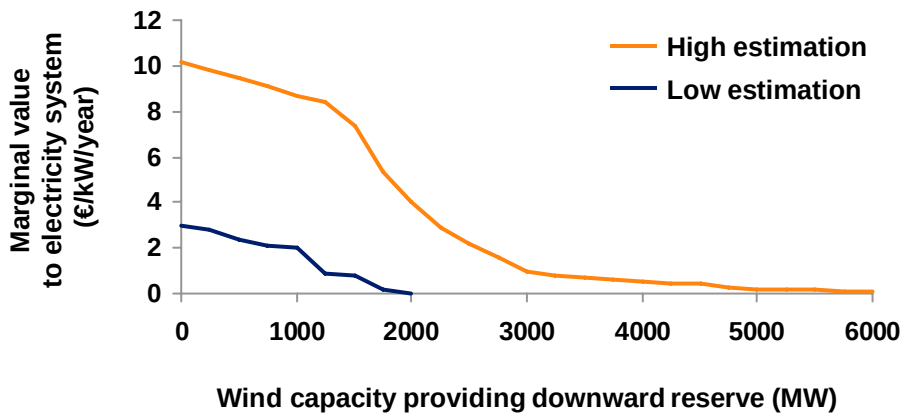
STUDIES HAVE STARTED TO QUANTIFY SYSTEM WIDE AND SOCIETAL BENEFITS BUT FURTHER ASSESSMENT IS REQUIRED

Economic benefit of wind participation – 2030



Source: "Feuille de route de l'équilibrage du système électrique Français", Juin 2016. RTE*

System value of wind participation to reserve and balancing - 2030



Source: "Feuille de route de l'équilibrage du système électrique Français", Juin 2016. RTE

- Provision of frequency reserve service (and congestion management) by wind has an economic benefit and a value to the electricity system
  - Value is decreasing for each additional MW providing the service
- Current reserve arrangements do not allow for capturing benefits of wind providing such services, potentially resulting in more system costs than could be achieved

Further detailed economic assessment to be provided in RTE's White Paper on the future of the French balancing arrangements to comply with the EU Regulations and Network Codes

* Assessment based on 100MW participation from wind capacity. Economic benefit for first MW.

As of June 2018

IN FRANCE, PROCUREMENT AND OBLIGATION TIMESCALES ARE AN ISSUE, AS IS SYMMETRY OF RESPONSE REQUIREMENTS

	FCR	aFRR	mFRR[1]	RR[1]
Procurement lead-time	-	✓	✗	✗
	• Week ahead	• Days (running notification) / hours (adjustments to running schedules)	• Annual contracting round but contracted periods can be split • Offers in BM*** procured days / hours ahead	
Length of commitment	-	?	✗	✗
	• Week long	• Min of 30 mins based on submitted running programme	• Year (although ability to split by month and WD/WE periods), 30 mins for BM	• Year (although ability to split by month and WD/WE periods), 30 mins for BM
Size	✓	✓	-	-
	• 1MW	• 1MW	• 10MW • 1MW in BM	• 10MW • 1MW in BM
Symmetry	✗	✗	✗	✗
	• Symmetry of standard product*	• Symmetry of standard product*	• Upward only** • Non-symmetry for non contracted BM offers	• Upward only** • Non-symmetry for non contracted BM offers

* Asymmetry possible on secondary market for FCR and aFRR but highly illiquid

** Secondary market available to re-trade contracted commitments

*** BM: Balancing Mechanism

[1] In addition of those contracted reserves (1.5GW), characteristics of the Balancing Mechanism are also presented as free (not contracted in advance) offers of balancing actions can also be proposed

As of June 2018

ARRANGEMENTS ELSEWHERE ARE BETTER SUITED FOR RES, PROVIDING INSIGHTS FOR CONSIDERATION IN FRANCE

	FCR	aFRR	mFRR
Procurement lead-time	 • D-1 auction	 • D-1 auction	 • D-1 auction
Length of commitment	 • 4 hour blocks	 • 4 hour blocks	 • Ranging from 1 hour to 8 hour blocks across countries
Size	 • Ranging from 0.3MW to 1 MW across countries	 • 1MW	 • Ranging from 1MW to 5MW across countries
Symmetry	 • Separate upward and downward products or mixture of symmetric / asymmetric	 • Separate upward and downward products	 • Separate upward and downward products

As of June 2018

BUT SOME BARRIERS LINKED TO TIMESCALES ARE BEING REDUCED BY CROSS BORDER INITIATIVES

	FCR	aFRR (PICASSO)	mFRR (MARI)	RR (TERRE)
Procurement lead-time	✓ 8am D-1 better than current	✓ Gate Closure of <=60mins before real time (uncontracted)	✓ <=30 minutes	✓ Gate Closure of 55-60mins before real time
Length of commitment	✓ 4 hour products more workable	✓ Validity Period of 15 mins or max 1 hour	? Validity Period to be considered in next phase*	✓ Defined by BSP within 15-60min
Size	✓ 1MW	✓ 1MW	✓ 1MW	✓ 1MW
Symmetry	✗ Symmetry of standard product (but views to be sought in future)	✗ Symmetry of standard product	✗ Upward only	✓ Non-symmetry via Balancing Mechanism (TERRE is symmetric)

* Minimum provision is for 5 mins but not maximum duration agreed to date

TERRE proposed implementation framework for RR on 18-Jun-18. Picasso and MARI are within first 12 months of activity (Picasso has recently consulted on proposed implementation framework (consultation launched Apr-18 and closed Jun-18)).

RECOMMENDATIONS

1 ALLOW SEPARATE UPWARD AND DOWNWARD PRODUCTS

Issue	• FCR and aFRR are currently procured as symmetric products requiring both upward and downward response, which is problematic for some technologies • Secondary market theoretically allows providers to transfer elements of service obligations to others, but it is highly illiquid and so not viable • Resources can be blended (potentially via an aggregator) into a portfolio that is collectively able to meet symmetry requirements, but without aggregation non-symmetric provision is not possible
Rationale for recommendation	• Allowing for separate upward and downward products, alongside symmetric products, increases the pool of potential providers without need for aggregation or reliance on illiquid secondary market • TSOs can still secure requirements across the suite of products • Non-symmetric products in Denmark (FCR, mFRR) and Belgium (FCR, aFRR)
Opportunities / levers to influence	• Article 25 of Electricity Balancing Guideline calls for facilitation of participation by RES in balancing energy and capacity provision • Article 32 of Electricity Balancing Guideline requires separate procurement of upward and downward capacity for FRR and RR unless exemption granted • Cross border FCR arrangements are symmetric at present but recent consultation committed to seeking views on this in future • Ongoing consultations through PICASSO and MARI processes

2 MAKE CAPACITY PROCUREMENT AS CLOSE TO REAL TIME AS POSSIBLE (DAY-AHEAD OR PREFERABLY LATER)

Issue	• FCR currently procured at week ahead stage, at which point it is difficult for variable generation to commit given uncertainty concerning weather conditions
Rationale for recommendation	• At the day-ahead stage (or even closer to real time), accurate forecasts of expected wind conditions are available allowing wind resource to commit when conditions are favourable • Increases the pool of potential resource from which TSOs can undertake efficient procurement • Procurement is at day-ahead stage elsewhere e.g. Denmark (FCR, mFRR)
Opportunities / levers to influence	• Article 25 of Electricity Balancing Guideline calls for facilitation of participation by RES in balancing energy and capacity provision • FCR platform already planning to move to 08:00 D-1 auctions. Other cross-border arrangements proposing procurement 30-60 mins ahead of real-time. • RTE indicated potential move to closer to real-time arrangements, potentially D-1

3 SHORTEN COMMITMENT DURATION PERIOD

Issue	• FCR currently involves commitment for full week and mFRR involves commitment for year (although allows some differentiation across the year), which is difficult for variable generation to commit to given uncertainty concerning weather conditions
Rationale for recommendation	• Commitment for 1, 2 or 4 hour blocks is more compatible with variability of potential generation patterns given weather conditions allowing wind resource to commit when conditions are favourable • Increases the pool of potential resource from which TSOs can undertake efficient procurement • Commitment is for 4 hour blocks for FCR (Denmark) and 1 to 8 hour blocks for mFRR (Denmark, Belgium, Germany)
Opportunities / levers to influence	• Article 25 of Electricity Balancing Guideline calls for facilitation of participation by RES in balancing energy and capacity provision • FCR platform already planning to move to 4 hour blocks products and other cross-border arrangements proposing similar or shorter commitment periods. • RTE indicated potential move to commitment potentially in line with settlement period duration

4 EXPLORE ACCOMMODATION OF FREQUENCY SERVICE PROVISION IN RENEWABLE SUPPORT ARRANGEMENTS IN FRANCE

Issue	• FiT supported renewable capacity is legally prevented from contracting, selling, making available part of its generation to the TSO • Support to onshore wind under "complément de rémunération" (CR) is paid on net volumes injected onto the grid. Downward adjustment has a direct volume effect on MWh supported, which is not accounted for. Any TSO instructed actions are not remunerated, thus resulting in loss of potential revenues renewable generator would have otherwise received.
Rationale for recommendation	• Allowing for remuneration of TSO instructed provision of reserve services through adjusting the basis for market premium payment • Removes opportunity cost bidding for CR element of lost revenue, so reduces short-term dispatch signal distortion • Ensures wind (or other renewable energy) is no worse off when providing reserve, as long as it does so in line with instructions (same treatment as other technology)
Opportunities / levers to influence	• Article 25 of Electricity Balancing Guideline calls for facilitation of participation by RES in balancing energy and capacity provision

RECAP ON KEY MESSAGES

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