



Department for  
Business, Energy  
& Industrial Strategy

# EVALUATION OF THE TRANSITIONAL ARRANGEMENTS FOR DEMAND SIDE RESPONSE

Phase 3 – Appendices



August 2018

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# Appendix 1: Introduction to the second TA scheme

## Introduction to the TA and CM

The Transitional Arrangements for Demand-Side Response (TA) is a pilot and forms part of the Capacity Market (CM) for security of electricity supply, within the government's Electricity Market Reform (EMR) programme. The TA aims to support BEIS's overall objectives of promoting growth and energy security, while ensuring affordability of the energy supply.

The TA aims to encourage development of DSR that is increasingly needed to balance supply and demand in a decarbonised electricity grid<sup>1</sup>. This report uses the CM definition of DSR: the activity of reducing the metered volume of imported electricity of one or more customers below an established baseline, by means other than a permanent reduction in electricity use. Under this definition, DSR may be achieved through any combination of onsite generation, temporary demand reduction or load-shifting. We use the term 'turn-down' DSR to refer to the last two activities.

The TA scheme involves two auctions for specific types of capacity within the CM, the first for delivery of capacity in the 2016/17 delivery year<sup>2</sup> and the second for delivery of capacity in 2017/18. While the first TA scheme was open to all types of DSR and also small-scale distribution-connected generation between 2 MW and 50 MW, the second TA scheme is only open to turn-down DSR and has a lower minimum threshold of 500 kW.

The TA auctions are additional to the main CM auctions: the main four-year ahead auctions (T-4) and the smaller one-year ahead auctions (T-1) which will deliver capacity from 2018/19 onwards, and the Early Auction which is delivering capacity in 2017/18. The main CM auctions offer generation, storage and DSR capacity.

The second TA has two main objectives: to encourage turn-down DSR and to contribute to the development of flexible capacity for the future CM. In contrast to the first TA, BEIS's aim for the second TA do not include a significant contribution to security of supply in the delivery year (2017/18), because short-term system tightness has already been addressed through introduction of the Early Auction alongside the TA. The objectives of the second TA scheme are therefore:

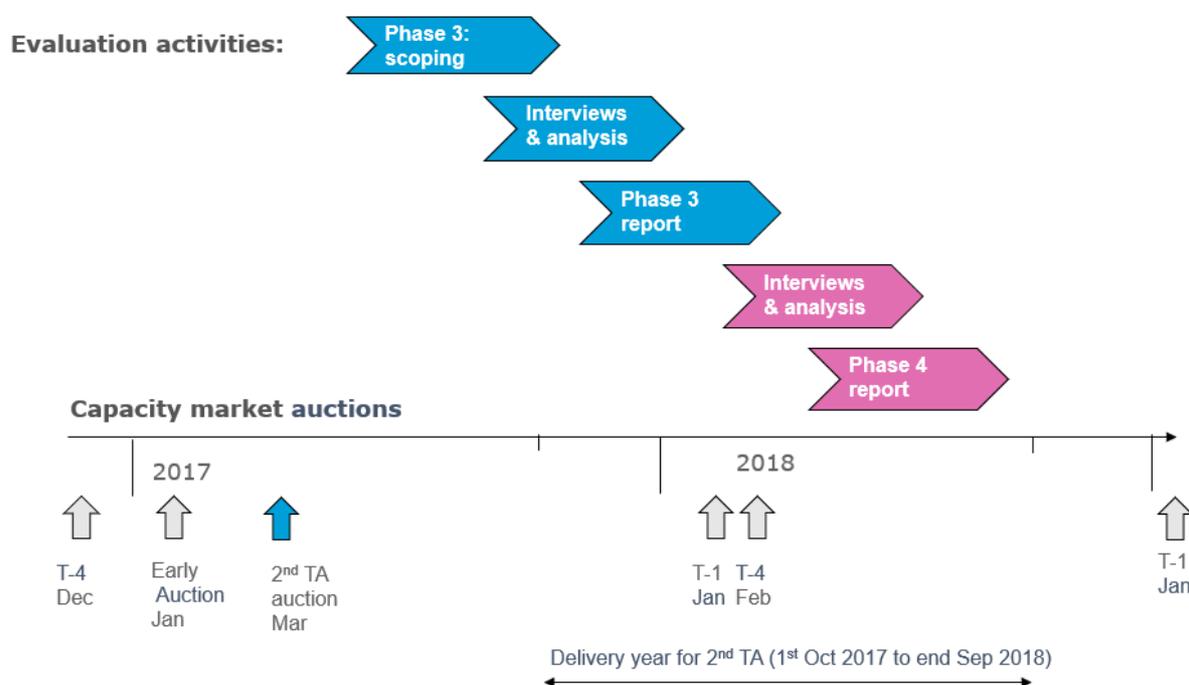
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<sup>1</sup>National Infrastructure Commission (2016) *Smart Power: A National Infrastructure Commission Report*. Available at: <https://www.gov.uk/government/publications/smart-power-a-national-infrastructure-commission-report>. Accessed 27/7/2016

<sup>2</sup> The delivery year runs from first October of one year through to 30<sup>th</sup> September of the following year.

1. To develop a stock of flexible capacity<sup>3</sup> that can be available for future CM auctions, thereby contributing to competitiveness and liquidity in the CM.
2. To encourage enterprise and develop experience, confidence and understanding so that turn-down DSR will be able to realise its potential and ultimately compete with larger generation assets in the CM.

The TA is designed to be a stepping stone to the main CM for flexible capacity<sup>4</sup> that might have difficulty in competing in the main CM. While the TA does not automatically lead on to future CM participation, it aims to build capacity and confidence so that providers of DSR are better placed to compete in future CM auctions. The timeline for the second TA and other capacity market auctions is shown in Figure A1.1 below. Phase 3 of the evaluation focused on the second TA auction, while Phase 4 will focus on delivery of obligations during the winter period of the delivery year for the second TA.



**Figure A1.1: Timeline for second TA and main CM auctions, in relation to evaluation activities**

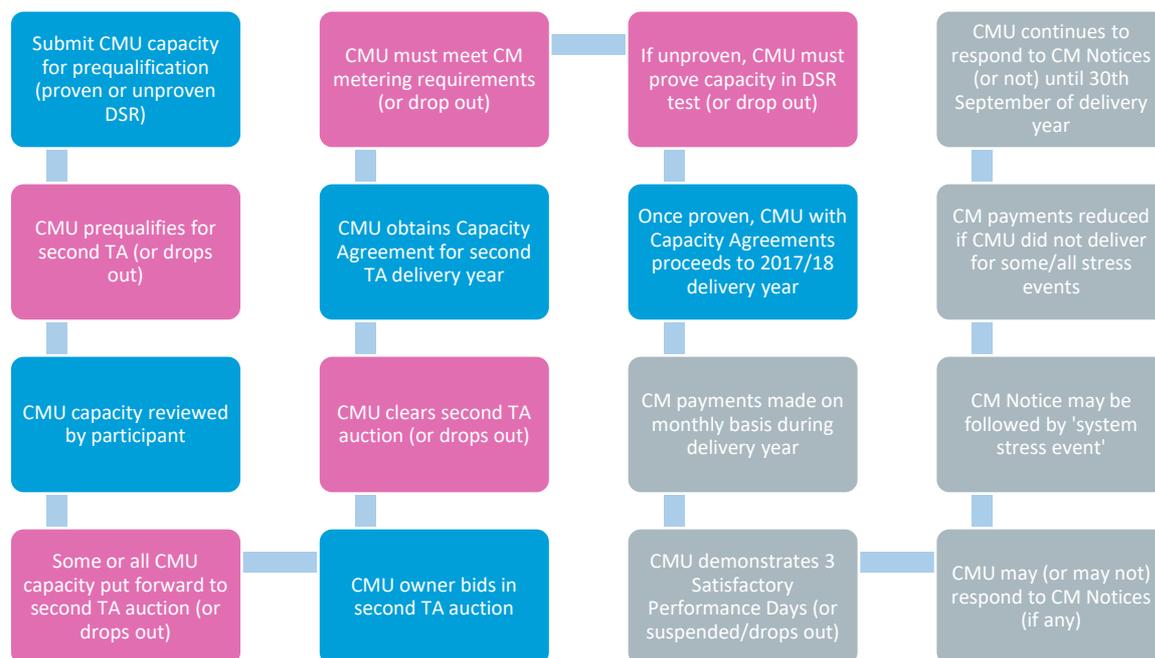
## Overview of the TA process

The main steps in the TA process for each 'Capacity Market Unit' (CMU) are outlined in Figure A1.2 below, with drop-out points shown in pink. The main CM auctions follow a very similar process. The

<sup>3</sup> Flexible capacity means electricity generating capacity and demand that is able to increase or decrease in response to signals, to help balance supply and demand of electricity across the GB grid.

<sup>4</sup> Ofgem defines flexibility as 'modifying generation and/or consumption patterns in reaction to an external signal (such as a change in price) to provide a service within the energy system'.

grey steps had not occurred at the time of Phase 3 research and will be researched, where feasible, in Phase 4.



**Figure A1.2: Main steps in process for second TA**

The main elements of this process are described in more detail below.

### Prequalification

Organisations seeking to participate in the second TA had to submit prequalification information for their CMUs to National Grid in autumn 2016. To prequalify, these CMUs had to comprise turn-down DSR within Great Britain. Their capacity had to be between 500 kW and 50 MW but they could comprise multiple components across different sites and organisations. As in other CM auctions, the second TA was open to both direct participants, putting forward their own capacity, and aggregators, putting forward capacity on behalf of clients.

The turn-down DSR CMUs put forward for the second TA could be 'proven' or 'unproven'. 'Proven' CMUs were known assets that had already demonstrated their capacity for the CM by passing a DSR test, as explained further below. 'Unproven' CMUs had not yet passed a DSR test and could consist of known assets or an 'empty bucket' for capacity that would be identified after the auction.

National Grid reviewed the eligibility of CMUs put forward for prequalification and published prequalification results in the initial 'CM register' for the second TA.

CMUs that cleared in the third T-4 (held in December 2016) or the Early Auction (held in January 2016) were excluded from participating in the second TA. There were some changes to prequalification status when the results of these auctions were known.

### The TA auction process

Those participants that successfully prequalified CMUs had the option to put their CMU capacity forward to the second TA auction in March 2017. They could choose whether to put forward some or all of their prequalified capacity for each CMU into the auction.

Unproven DSR CMUs had to submit credit cover for their bidding capacity before the auction. Conditions in the TA were softer than the main CM, to encourage new entrants: the level of credit-cover collateral for unproven DSR CMUs was set at £500/MW, compared to £5,000/MW in the main CM. If a participant with a prequalified unproven DSR CMU fails to deliver 90% of the bidding capacity in DSR tests and SPDs (see below), then they lose their credit cover for that CMU. This mechanism was designed to dissuade speculative bids into the auction.

The second TA auction was held in March 2017. This was a descending clock, 'pay as clear'<sup>5</sup> auction in the same format as the main CM auctions. The auction price started at a price cap of £70/kW, which was specified by BEIS before the auction. The auction price was then reduced, round by round, until the volume of capacity remaining in the auction matched the demand that BEIS had specified it would buy at a given price<sup>6</sup>. Auction participants had the option of submitting an 'exit bid' for each of their CMUs in each round, to indicate the price below which they would withdraw a given CMU from the auction. All CMUs that remained in the auction when it cleared stood to receive the auction clearing price for their contracted capacity.

Participants successful in the auction were awarded a capacity agreement for their CMU(s) in the 2017/18 delivery year.

### Testing requirements

Following the award of capacity agreements for the first TA auction, participants had to pass standard CM tests to confirm their capacity. The tests are summarised in Table A1.1 and explained further below.

**Table A1.1: Summary of CM testing requirements**

<p><b>Metering assessments</b> are required for all Capacity Market Units (CMUs) to determine which metering option applies to each of their sites. Three metering options qualify, as follows:</p>
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- |   |
|---|
| <ul style="list-style-type: none"><li>(a) Supplier settlement metering;</li><li>(b) Bespoke metering; and</li></ul> |
|---|

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<sup>5</sup> Bidding strategies are likely to differ between 'pay as clear' auctions (where participants tend to bid their own supply costs, knowing that they will receive the clearing price if successful) and 'pay as bid' auctions (where participant bids are influenced by their estimate of the bid price for the last unit likely to clear the auction).

<sup>6</sup> BEIS specified a demand curve before the auction, indicating how much capacity it would buy at different prices, between the auction price cap and £0/kW.

(c) Balancing services metering

**Metering tests** are required for sites using metering options (b) and (c), but not option (a).

**DSR tests** are required for unproven DSR CMUs to demonstrate that they can deliver the required demand reduction against a measured baseline of demand. The 'proven' capacity of the CMU reflects the outcome of DSR testing.

**Three 'satisfactory performance days' (SPDs)** are required for all CMUs to demonstrate that their capacity remains available through the winter delivery period.<sup>7</sup>

### About metering assessments

All sites within a CMU require a metering assessment, as part of the operational readiness checks prior to Capacity Market participation. The purpose of the metering assessment is to ensure that each metering set-up accurately reflects the energy use on site so that the performance of the capacity obligation can be observed; and that metered data is appropriately assured and regularly submitted to the settlement body in a suitable format.

The CM rules stipulate accurate metering. For DSR CMUs, this involves metering of a demand reduction against a measured baseline. Three metering options qualify, as follows:

- (a) Balancing and Settlement Code (BSC) Supplier or Balancing Mechanism Unit (BMU) metering, generally referred to as 'supplier settlement metering';
- (b) Bespoke metering; and
- (c) Balancing services metering.

Option (a) is the default metering for electricity market settlement. It is well understood and governed by industry codes of practice. Whilst all participants will have some form of settlement metering, they might not want to use these meters for the CM (e.g. because the settlement meter measures capacity at the boundary of a site, net of onsite loads). In these cases they may wish to install bespoke metering (option (b)), or use metering specifically in place for participation in National Grid-run balancing services (option (c)).

Accurate metering is also required for any renewable generation assets behind the meter that receive government subsidy (e.g. the Feed-In-Tariff). Separate metering is required for these assets so that subsidised renewable generation can be netted off the capacity offered to the CM, avoiding double-

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<sup>7</sup> The winter delivery period for the second TA is defined as 1<sup>st</sup> October 2017 to 30<sup>th</sup> April 2018. Demonstration of satisfactory performance days would not be required if there had been three stress events within this period.

subsidy. The metering requirements for the CM are more demanding than those required for the Feed-In-Tariff.

For the second TA, but not for other CM auctions, accurate metering is also required for other generating assets behind the meter. This is to ensure that capacity is delivered using turn-down DSR rather than back-up generation assets. Alternatively, participants have the option of making a declaration that they will not use back-up generation behind the meter during tests or stress events, to avoid having to install metering solely for the purposes of the second TA.

Options (b) and (c) require a metering test for each meter (i.e. multiple tests per CMU if multiple CMU components were using these options). This is because accuracy cannot be taken for granted as industry codes do not govern these metering options.

For CMUs that know their metering arrangements in advance (e.g. proven DSR), metering assessments are submitted as part of the pre-qualification process. Unproven DSR CMUs can defer their assessments by up to one month prior to the delivery year.

### **Metering statements**

CMU components that require a metering test must complete a metering statement. The requirements of a metering statement are detailed in Schedule 6 of the CM regulations.

The whole metering system encompasses the meter device, current, voltage and power transformers, data collection systems and communication system. All these elements contribute to overall metering accuracy.

There is evidence (presented in the main report) that many participants found it challenging to meet these accuracy requirements, particularly for metering options (b) and (c). The reasons for this are discussed further in Appendix 1 of the Phase 2 report.

### **Metering tests**

For participants successful in the second TA that required a metering test, a test had to be completed and a certificate had to be issued by 31 August 2017 – one month prior to the delivery year for the second TA. Once the metering statement has been completed, the test itself was simply a desk-based review of the metering statement submissions, which included a CSV file from the day of meter commissioning.

Electricity Market Reform Settlements Limited (EMRS) could nominate sites for a site visit for further validation of, for instance, the location of meters and associated equipment.

### **About the DSR test**

The DSR test is used to verify that all CMUs can achieve their capacity output. The test establishes a baseline and then calculates the capacity reduction of a DSR component by comparing a test data point against the baseline. The following rules apply for the timing of the tests:

- The DSR test can be conducted prior to the prequalification window, in which case the applicant, if successful, can apply as a proven DSR CMU; or

## Appendix 1: Introduction to the second TA scheme

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- After the award of the capacity agreement but no later than one month prior to the delivery year, in which case the applicant can apply as an unproven DSR CMU.
- A DSR test may not take place during the prequalification assessment window.

The DSR test process is as follows:

1. The CMU must submit to the System Operator (i.e. National Grid):
  - Metering Point Administration Number(s) (MPANs) of the meters for the site for all components.
  - A metering test certificate or confirmation that the CMU has a Capacity Market (CM) approved meter configuration.
2. Historic test – 3 x 30mins<sup>8</sup> over the last two years can be evidenced from balancing services; or
3. Live test – two working days' notice of the CMU's intention to test the DSR CMU, together with the Settlement Period in which the activation will be carried out.
4. National Grid has 5 days from receipt of meter data from the Settlement Body to calculate:
  - Baseline Demand (over the 6 week baseline period);
  - the DSR evidenced (which can be zero); and
  - the Proven DSR Capacity
5. Following a successful test National Grid must provide a DSR test certificate in 5 days. CMUs have the option for a further retest.

In the TA, a DSR Test Certificate remained valid for so long as the components in a DSR CMU remained the same. Where they did not, the certificate was invalidated and the CMU was deemed to be an Unproven DSR CMU until such time as a new DSR Test Certificate was issued.

The requirement for CMU components to remain unchanged explained why few of the DSR CMUs that were 'proven' in the first TA were carried forward to the second TA. Only those CMUs that consisted only of turn-down DSR components could be carried forward as 'proven DSR' in the second TA. Most DSR CMUs in the first TA included some back-up generation components and therefore could not enter the second TA unchanged.

Ofgem is currently considering a rule change that would allow some changes to CMU components in the main CM, without requiring a new DSR test for the whole CMU.

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<sup>8</sup> Settlement Period or DSR Alternative Delivery Period (i.e. 30mins that is not on the hour or half hour)

### About the Satisfactory Performance Days (SPDs)

Satisfactory Performance Days are intended to check during the delivery period that the CMUs are still available to achieve their capacity output. Each CMU must nominate three half-hour settlement periods, on different days within the winter period (between 1<sup>st</sup> October and 30<sup>th</sup> April), when they were delivering their full capacity. For DSR CMUs, delivery for a system stress event over the winter period can also count as an SPD even if the load following capacity obligation is lower than the full capacity obligation; similarly delivery of capacity in response to a request for a balancing service can also count as an SPD for DSR CMUs.

As noted above, the baseline methodology for SPDs is the same as that of the DSR test. However, the participants can retrospectively nominate any half hour periods of their choice within the winter period. The intention is to minimise disruption to the participants, in that they can choose a time when the DSR asset is in the required operational state for other reasons. For example, generation assets might be being operated for Triad or turn down assets might be switched off during a holiday period.

If a CMU fails to demonstrate 3 SPDs over winter, the CMU's capacity payments is suspended until 3 SPDs have been met. If a CMU fails to deliver output of 1kWh during system stress events in 2 or more months, the CMU is required to demonstrate 6 SPDs over winter, instead of 3.

### Joint DSR Test and SPDs

A rule change was introduced in 2016 (Rule 13.2B) that allows several CMUs that have the same Capacity Provider to be tested together for the purposes of DSR tests and SPDs.

If a capacity provider fails to meet its combined obligation, it will not receive a DSR test certificate. The CMU is able to have one retest. Each CMU under joint test has its own DSR test certificate. Any changes to the composition of the CMUs involved in a joint DSR test will result in the certificate becoming invalid and a new test will be needed.

A CM rule change introduced before the second TA auction allows participants to retain their credit cover if they demonstrate at least 90% of their auction capacity in a joint test, while previously they had to demonstrate 100% of capacity.

## Fulfilment of obligations

Participants with CMUs in the TA must deliver against their Capacity Obligation at any time of system stress during the Delivery Year, or face a financial penalty. A 'System Stress Event' means a Settlement Period in which a System Operator Instigated Demand Control Event occurs where such event lasts at least 15 continuous minutes.

TA participants are required to deliver the 'Adjusted Load Following Capacity Obligation' (ALFCO) for all of their units during a 'System Stress Event'. The ALFCO is a period of (involuntary) load reduction, by voltage reduction or demand disconnection, which is necessary to maintain the security of the system in the event of a shortage of generation.

Capacity Market Notices (CMNs) are issued by National Grid when a shortage of generation is anticipated. The CMN is a signal to all providers that system stress is anticipated. Capacity providers are not 'called upon' to deliver capacity or receive an individual despatch instruction. The Capacity Market Notice is a signal to all providers that system stress is anticipated (although may not materialise). Four hours after the issue of the Capacity Market Warning, if a System Stress Event occurs, any participant who fails to deliver their ALFCO will be subject to penalties.

At the time of this research, no CMUs had been issues during the 2017/18 delivery year. Only two CMNs were issued during the 2016/17 delivery year, and neither developed into a stress event.

After a live CMN, the delivery body determines whether a System Stress Event has occurred. This is determined retrospectively, by examining the balance between supply and demand in the GB electricity system.

If a System Stress Event has occurred, the settlement body compiles meter data for all CMUs which had a capacity obligation at the time, and uses this to assess whether each CMU met its Adjusted Load Following Capacity obligation (ALFCO). Subsequent penalties/over-delivery payments are determined once all data has been submitted, which is no later than 9 working days after the end of the month the System Stress event takes place in.

Penalties for failure to deliver for a specific System Stress Event are related to a provider's Capacity Market Payment. Penalties for repeated failure to deliver are capped at 100% of a Capacity Provider's annual Capacity Market Payment with respect to a CMU, and at 200% of a CMU's monthly Capacity Market Payment. The penalty regime is the same as the main CM: penalties cannot exceed the original CM payment set by the auction clearing price.

## Appendix 2: Participants in first and second TA

**Table A2.1: Comparison of participants in first and second TA schemes (source: CM register)**

Name of participant	Attempted to prequalify for first TA	Capacity agreement for first TA	Attempted to prequalify for second TA	Ongoing capacity agreement for second TA
Aggreko UK Ltd	Yes	Generation		
Alkane Energy UK Ltd/ Regent Park Energy Ltd	Yes	Generation		
Ameresco Limited	Yes	DSR	Yes	Unproven DSR
Anglian Water Services Ltd	Yes	DSR		
BOC Ltd	Yes	DSR	Yes	Proven DSR
British Sugar plc	Yes	Generation	Yes	-
Cargill PLC	Yes	Generation		
Cofely East London Energy Ltd/ Cofely Industrial Energy Services Ltd	Yes	Generation		
Dow Corning Ltd	Yes	-		
E.ON UK CHP Ltd/ E.ON UK plc/Citigen (London) Ltd	Yes	Generation and DSR	Yes	Unproven DSR
EDF Energy Customers plc	Yes	-	Yes	Unproven DSR
ENER-G Combined Power	Yes	-		
Endeco Technologies	-	-	Yes	-
Energy Pool UK Ltd	Yes	DSR	Yes	-
EnerNOC UK Ltd	Yes	DSR	Yes	Unproven DSR
Flexitricity Ltd	Yes	DSR	Yes	-
GB Gas Holdings Ltd	Yes	DSR		
Green Frog Power Ltd	Yes	Generation		
Harworth Power Generation Ltd	Yes	Generation		

## Appendix 2: Participants in first and second TA

Name of participant	Attempted to prequalify for first TA	Capacity agreement for first TA	Attempted to prequalify for second TA	Ongoing capacity agreement for second TA
Imerys Minerals	Yes	Generation		
KiWi Power Ltd	Yes	DSR	Yes	Unproven DSR
Limejump Ltd	Yes	-	Yes	Unproven DSR
REstore Flexpond UK Ltd	Yes	Generation		
SITA Ltd (various locations)	Yes	-		
Smartest Energy Limited	Yes	DSR	Yes	Unproven DSR
Southern Water	Yes	-		
Tata Steel UK Ltd/ Speciality Steel UK Ltd	Yes	DSR	Yes	Proven and unproven DSR
Tempus Energy Supply Ltd	Yes	-		
UK Power Reserve Limited	Yes	Generation	Yes	-
Welsh Power (various locations)	Yes	-		

# Appendix 3: Methodology for qualitative research

## Introduction

The research involved in-depth telephone interviews with 35 organisations from October and December 2017, with representatives of nearly all participants in the second TA, a sample of aggregator clients and a small sample of non-participants, including aggregators and organisations that could potentially have participated as clients or direct participants. The sampling is explained further below. An email survey was also sent to the ten participants and the ten aggregator clients that were interviewed. Nine full or partial responses were received.

For participants in the second TA, as well as some of the non-participant aggregators, these Phase 3 interviews extended the information already gathered through fieldwork conducted in Phases 1 and 2 of the evaluation.

## Sampling and recruitment

The research involved in-depth telephone interviews with representatives of:

- Eight of the ten **organisations that obtained capacity agreements in the second TA auction**. Two TA participant organisations, one aggregator and one direct participant, did not provide a response to our request for interview, despite extensive attempts to contact them
- Three of the four **organisations that put forward CMUs for prequalification but that were not subsequently entered into the auction**
- Ten **aggregator clients** involved in the second TA
- Six **aggregators who did not participate in the TA**
- Eight **organisations** that were considered through a screening survey to have the **potential to participate** in the second TA either as a direct participant or an aggregator client.

Alongside these in-depth interviews, a screening survey was conducted to identify organisations that were considered to have the potential to participate in the second TA (see below). In addition, an email survey was sent to the ten organisations that obtained capacity agreements, and to the ten aggregator clients interviewed for the research.

A summary of the sampling approach and the response rates is presented in Table A3.1.

**Table A3.1: Summary of sample for Phase 3 qualitative research**

Sample group	Description	Population	Sampling strategy	Target no. of interviews	No. of interviews completed	Email response only	Total responses (% target)	Response rate (% of sample contacted)
TA participants								
Aggregators	Organisations with CMUs with Capacity Agreements post-auction (could also have had CMUs that 'dropped out', see below). There are 2 direct participants and 8 aggregators.	8	Census (8)	8	7	0	7 (87.5%)	87.5%
Direct participants	Organisations with CMUs with Capacity Agreements post-auction (could also have had CMUs that 'dropped out', see below). There are 2 direct participants and 8 aggregators.	2	Census (2)	2	1	0	1 (50%)	50%
Prequalification 'drop-outs'	Organisations with CMUs that applied for the TA but do not have a Capacity Agreement. Three main sub-categories: <ul style="list-style-type: none"> <li>• Applied but not prequalified</li> <li>• prequalified but dropped out before the auction</li> </ul>	4	Sample (3) <sup>9</sup>	3	3	0	3 (100%)	100%

<sup>9</sup> One of the prequalification drop-outs was not included in the sample because it was already clear from Phase 2 research that this organisation had submitted ineligible generation capacity because they were not fully aware of the rules for the second TA.

## Appendix 3: Methodology for qualitative research

Sample group	Description	Population	Sampling strategy	Target no. of interviews	No. of interviews completed	Email response only	Total responses (% target)	Response rate (% of sample contacted)
Aggregator clients	Organisations participating in the second TA through an aggregator (in CMUs known to be going forward to delivery at the time of the research)	47	Census for screening survey (47); sample for in-depths(10).	45 <sup>10</sup> screening survey plus 10 in-depths	15 screening interviews Plus 10 in-depths	0	15 (33%) – screening interviews  10 (100%) – in-depths	33% (screening)  22% (in-depths)
Non-participants								
Aggregators	Aggregators that might have been expected to participate in the second TA who did not	14	Sample identified through National Grid list of aggregators (14, of which 9 contacted)	7	6	2	8 (114%)	89%
Potential aggregator clients	Organisations with characteristics similar to aggregator clients (and with assets potentially suitable for turn-down DSR) who did not participate in the second TA, either directly or via an aggregator, but who may offer turn-down DSR through other services	Not known	Initial sample of 308 organisations; of these 202 were relevant to the sample and 178 were contacted	178 screening survey Plus 10 in-depths	37 screening interviews Plus 8 in-depths	0	37 (21%) – screening interviews 8 (80%) – in-depths	21% (screening)  4% (in-depths)

<sup>10</sup> Contact details could not be sourced for 2 out of the 47 organisations identified from the MPAN list, so only 45 were contacted.

## Screening survey

Databuild undertook a screening survey, which involved a brief quantitative survey of organisations with significant electricity use.

The proposed aims of the screening survey were three-fold:

1. To identify aggregator clients suitable for in-depth interview.
2. To provide basic characterisation of the turn-down DSR provided by aggregator clients, to feed into Verco's analysis of turn-down capacity and related costs.
3. To identify *potential* aggregator clients suitable for in-depth interview.

There were two versions of the screening survey: version 1 for known aggregator clients and version 2 for potential aggregator clients. The text of both surveys is provided in Annex 3A, while sampling for each survey is explained below.

### Sampling for aggregator clients (screening survey version 1)

National Grid provided addresses, and in most cases organisation names, for components within aggregator CMUs that were going forward to delivery in the second TA. Databuild sourced contact details and business characteristics for these addresses and organisations. This enabled them to identify (for almost all sites) the main business activity, organisation name, head office telephone number and website addresses for these components.

Databuild contacted all identified organisations on the list of aggregator clients.

The total sample was 51. This was reduced to 45 as there were two duplicates, two who then turned out not to be aggregator clients, and two for whom Databuild were unable to source contact information.

Attempts were made to contact all 45 organisations: while one organisation did not respond at all despite numerous attempts, Databuild were able to communicate with a representative of 44 of these organisations. For 21 organisations, Databuild were able to identify and make contact by telephone with the appropriate person to speak to. For a further 16 organisations Databuild were able to identify the person believed to be the appropriate respondent but direct contact was made via email only, as there was no response to any attempts to contact via telephone. For the remaining 7 organisations, the organisation did not identify an appropriate person for Databuild to speak to.

Of the 21 where contact by telephone was made with the appropriate person, 15 completed a screening survey and the remaining 6 initially agreed to be called at a more appropriate time but then were unavailable despite numerous attempts to contact.

Of the 15 screened, all initially agreed to an IDI but 2 later declined. A total of ten interviews were subsequently recruited for interview.

### Sampling for potential clients (screening survey version 2)

A sample of potential clients was developed comprising three main elements:

1. **Organisations known to be providing turn-down DSR via other routes, outside the TA.** For example, this included organisations that are highlighted in Power Responsive and aggregator case studies. The purpose of including these organisations was to explore the choice between (say) frequency services and provision of capacity via the TA, for different types of turn-down assets.
2. **Organisations that demonstrated some interest or engagement with DSR by attending the Energyst DSR event in September 2017<sup>11</sup>.**
3. **The sample was supplemented by drawing additional contacts from DueDil, a commercial data source,** closely matching the sample to the profile of known aggregator clients on the grounds of business activity/sector and size. Specifically, the sample was boosted with companies in the aluminium, steel/metal-working, paper products and cold storage sectors, as these sectors which were well represented in the aggregator client sample but relatively unrepresented in the potential client sample from sources (1) and (2). Only companies with a turnover of more than £5m were included (because most of the known aggregator clients had turnover in excess of £5m).

Databuild began the screening survey with a sample of 308 (of which 114 were imported to Databuild's Computer Aided Telephone Interview (CATI) system initially from sample sources (1) and (2), and 204 from sample source (3) were imported at a later date).

Contact was made with 284 organisations. 6 of these were duplicates under a slightly different name and 54 were not in the target sector (for example; of those imported later, 59 of them were listed as warehousing and storage but of these 40 didn't have any cold storage and had a very low energy use). There were also 9 refusals.

This left 202 remaining on call back lists, of which contact had been made with 178 organisations by the end of the fieldwork period. 37 screening interviews were completed in total. Eight in-depth interview were undertaken with organisations who expressed willingness to take part in further interviews. These were purposively selected to prioritise organisations which were already undertaking – or were at least considering - turn-down DSR. As far as possible, we selected these interviews to fill gaps in our understanding of turn-down DSR in different sectors, across Phases 1-3, covering sectors that were both similar to and different from the main sectors represented in the TA. For example, in Phase 3 we purposively interviewed some public sector organisations to find out why they had not participated in the second TA; and we also interviewed some metal-related and food-related companies to find out why they had not participated while others in their sectors had done so.

### Interview and email survey approach

For TA participant organisations, and other organisations interviewed in previous phases of the research (including two non-participant aggregators), the interviews were generally undertaken with the key contact at

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<sup>11</sup> <https://theenergyst.com/dsr-event-2017/>

the organisation who was involved in previous phases (i.e. the person primarily responsible for implementation of TA requirements).

Respondents were encouraged to involve other individuals in their organisation if needed, to cover the range of topics under discussion. A small number of the interviews involved conference calls with more than one respondent in the organisation. A few others involved follow-up responses by email or telephone on more technical points.

For aggregator client and ‘potential participant’ organisations, we interviewed the key contact identified during the screening survey. This was generally the person responsible for liaising with the aggregator and/or the person with responsibility for energy management. Contacts for aggregator non-participants were initially identified from National Grid’s aggregator list.

The email survey, consisting of an Excel spreadsheet, was sent to the ten organisations that obtained capacity agreements, and to the ten aggregator clients interviewed for the research.

Table A3.2 provides an overview of the topics covered with the different respondent types in both the depth interviews and the email survey. Annex 4B sets out a sample topic guide for a participating aggregator.

**Table A43.2: Overview of topics to be covered in Phase 3 depth interviews and email survey**

Key: P3 DI: Phase 3 depth interview P3 ES: Phase 3 email survey	Group 1: TA participants	Group 2: TA prequal ‘drop-outs’	Group 3: Non-participant aggregators	Group 4: Aggregator clients	Group 5: Non-participant potential clients
Introduction	P3 DI	P3 DI	P3 DI	P3 DI	P3 DI
Organisational contexts	P3 DI	P3 DI	P3 DI	P3 DI	P3 DI
Participation theory testing (aggregator and direct participant)	P3 DI	P3 DI	P3 DI	P3 DI	P3 DI
Auction participation theory testing	P3 DI	P3 DI	n/a	n/a	n/a
Auction bidding theory testing	P3 DI	n/a	n/a	n/a	n/a
‘Journey to turn-down’ exploration <sup>12</sup>	P3 DI	P3 DI	P3 DI	P3 DI	P3 DI
Testing experiences	P3 ES / P3 DI	n/a	n/a	P3 ES	n/a

<sup>12</sup> Including nature of assets that is or could be used for turn-down, and some indication of turn-down costs in different circumstances.

Key: P3 DI: Phase 3 depth interview P3 ES: Phase 3 email survey	Group 1: TA participants	Group 2: TA prequal 'drop-outs'	Group 3: Non-participant aggregators	Group 4: Aggregator clients	Group 5: Non-participant potential clients
CMUs: turn-down characterisation	P3 ES	n/a	n/a	P3 ES	n/a
CMU design strategies/theory testing	P3 DI	n/a	n/a	n/a	n/a
Future plans	-	P3 DI	P3 DI	P3 DI	P3 DI

Future plans were not discussed with TA participants (Group 1) because this topic will be discussed in Phase 4 interviews, when more information is available. Testing experiences were covered with TA participants through the email survey and (where time permitted) through in-depth interviews in Phase 3: we will seek to fill any evidence gaps on testing in the Phase 4 interviews.

## Analysis approach

We used spreadsheets to code the Phase 3 interview responses against contexts, mechanisms and outcomes (C-M-Os) in the Theoretical Framework, and to capture additional contexts, mechanisms and outcomes that were supported by the interview evidence but not yet captured by the theory. (See Table A3.3 for an explanation of CMOs). Using evidence from Phase 3, supplemented by contextual information about the respondent organisations from earlier phases of research, from email survey responses, from auction data, from the CM Register and from published statements, we then analysed which outcomes were observed for each organisation, how and why individuals within those organisations made choices that led to these outcomes and what factors influenced their choices. While some of the influencing factors that we examined related to the design of the TA, others were external factors relating to the main CM, other flexibility services, the wider energy market or business contexts. We summarised this analysis in the form of 'tailored' C-M-Os for each case, where a case represented an organisation (i.e. a TA participant, non-participant or aggregator client). Where one organisation exhibited several types of reasoning (e.g. submitting different bids in the auction for different CMUs), we prepared developed separate 'tailored' C-M-Os to cover this. We then looked for patterns across these 'tailored' C-M-Os and analysed the extent of support for different C-M-Os in the initial framework (see Appendix 4). Finally, we refined and expanded the initial set of C-M-Os to create a revised theoretical framework (see Appendix 5), that simplified and generalised the findings from the 'tailored' case-by-case C-M-Os. This preserved anonymity for respondents while retaining the essence of our findings for individual cases.

As explained above, this analysis drew on data from other sources where relevant, in addition to the Phase 3 interview responses, including:

- Analysis of TA scheme data (e.g. auction data, CM Register)
- Findings from the email survey (where available)

- Data from previous phases of the evaluation
- Published information (e.g. website statements; conference presentations)

The coding and analysis was undertaken by two researchers and findings were cross-checked by the wider project team. Members of the wider project team commented on draft findings from the qualitative research and took part in an internal workshop to discuss results emerging from the qualitative research and other workstreams.

In Phase 3, we did not apply ‘contribution tracing with Bayesian updating’ (a variant of ‘process tracing’). This method was applied to analysis of additionality hypotheses during Phases 1 and 2 but was not used in Phase 3 because we were not testing additionality hypotheses during Phase 3. Process tracing will, however, be used as part of the Phase 4 analysis, to weigh the strength of evidence where there is conflicting evidence for particular cases.

**Table A3.3: CMO glossary**

CMOs	Context-Mechanism-Outcome configurations. These are realist hypotheses about how the policy is expected to work, which are tested during the evaluation. See ‘realist evaluation’
Context	The circumstances which affect whether a policy ‘works’ and for whom. Consideration of ‘context’ forms an important part of realist approaches to evaluation.
Mechanism	A change in people’s reasoning, brought about through the resources provided by a policy, which leads to a policy outcome. Identification of causal ‘mechanisms’, which operate in particular ‘contexts’, forms an important part of realist approaches to evaluation.

<b>CMOs</b> Context-Mechanism-Outcome configurations. These are realist hypotheses about how the policy is expected to work, which are tested during the evaluation. See 'realist evaluation'	
Outcome	A change in the state of the world, brought about as a result of a policy or other influences. Realist approaches to evaluation attempt to identify the 'contexts' and 'mechanisms' that lead to a particular 'outcome'.
Realist evaluation	A realist approach <sup>13</sup> to evaluation emphasises the importance of understanding not only whether a policy contributes to outcomes (which may be intended or unintended) but how, for whom and in what circumstances it contributes to these outcomes.

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<sup>13</sup> Pawson and Tilley (1997), Pawson (2006)

## Annex 3A. Screening surveys

### Version 1 – screening survey to characterise TA clients and identify candidates for in-depth telephone interviews.

#### Introduction

Good morning/afternoon. My name is XXXX and I am calling from an organisation called Databuild Research on behalf of the Department for Business, Energy and Industrial Strategy - BEIS. Can I just check, I am speaking with <name>

Thank you for speaking to me today. Databuild are a research consultancy, who have been commissioned (with partner organisations) to undertake an evaluation of the Transitional Arrangements for Demand-Side Response<sup>14</sup>.

We are currently carrying out some research for BEIS, speaking to organisations who provide Demand-Side Response services through an aggregator<sup>15</sup> for the Transitional Arrangements scheme.

From National Grid data that has been shared with us via BEIS, we understand that your company is involved with the second Transitional Arrangements scheme, via the aggregator XXXXXX.

Would you have time now to answer a few questions?

[if necessary, explain this will take 5-10 minutes]

[if necessary, arrange another time to call back]

[If necessary, explain that they are welcome to contact BEIS to confirm the legitimacy of the research. The BEIS project manager is: [xxxxx]

Just to reassure you, we will keep any information that you share with us confidential and only share it with BEIS in anonymous form, unless otherwise agreed with you. Your information will only be used for this research project, which will inform BEIS policy-making on Demand-Side Response.

#### Confirming TA participation

[If any doubt about relationship with aggregator] Could you confirm that your organisation works with aggregator [NAME FROM LIST]? [This will help us to double-check that we are speaking to the right organisation.]

Could you confirm whether your organisation is participating in the second Transitional Arrangements scheme, which runs from October 2017 to September 2018 (to your knowledge?) [YES/NO/DON'T KNOW]

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<sup>14</sup> Explanation of the **Transitional Arrangements**, for interviewer reference: The Transitional Arrangements auctions offer targeted support to Demand Side Response (DSR), to encourage enterprise, and increase levels of participation in the Capacity Market.

<sup>15</sup> Explanation of the term '**aggregator**': an aggregator offers flexibility services to a number of clients and puts forward their joint capacity to the National Grid or the Capacity Market. Their services might include Triad warnings, STOR, frequency services or the Capacity Market.

[If NO or DON'T KNOW] Does your organisation provide any flexibility services which involve turning down electrical demand, or shifting the timing of electrical load, in response to occasional requests from National Grid or XXXX (name of the aggregator)? [YES/NO/DON'T KNOW]

**If not a TA client, thank and close interview.**

**If TA client: I'd like to understand a bit more about your organisation and its TA sites, this will only take a few minutes.**

Can I just check, does XXXXXX [business activity description from sampling frame] describe your organisation? [YES/NO/DON'T KNOW]

- [If NO/DON'T KNOW] capture accurate sector detail.

Can you confirm that you put forward YY sites to the second TA, via the aggregator YYYYYY? [interviewer uses information on list of components]

If you know this, can you tell us the approximate capacity (in MW) which you offer via the second TA? [total across all the TA sites]

Can you explain roughly how this breaks down between your TA sites?

- [capture verbatim, relating to the list of sites put forward by this organisation. Where there is a long list of sites, the interviewer could ask whether all the sites are similar or whether there are any that are larger/smaller]

Can you describe the main process(es) undertaken at these sites? [again, interviewer captures this for each site or group of sites, as appropriate]

Can you describe the equipment that you use to provide turn-down at these sites? [Select one or more from the following list, for each site or group of sites:]

- Pumps
- Refrigeration and related processes
- Building Heating Ventilation and Air Conditioning (HVAC)
- Other motors and drives (e.g. air compressors, blowers, fans, centrifuges, conveyors, process equipment – please specify)
- Process heating
- Water heating
- Lighting
- Other (please specify)

If you choose to respond to a particular call for turn-down for the TA, would this normally be through:

- load shifting<sup>16</sup> (i.e. shifting normal business activities to another time)
- load shedding<sup>17</sup> without significantly affecting normal business activities
- load shedding with impact on normal business activities (e.g. temporary loss of production)
- a mixture of these
- don't know (or it depends)

Did you put this capacity forward for the first TA as well? (YES/NO/DON'T KNOW)

Do you use these assets for other flexibility services, as well as the TA, and if so which services? [prompt : Triad, red zone management, STOR, frequency services, other (please specify), none, don't know]

**Permission to recontact:**

Either myself or a member of my team may need to call you back to verify anything we have discussed. Would this be OK?

Would it be possible for us to contact you for future research regarding your experiences with flexibility services and the TA? [YES/NO]

In particular would you be happy to be re-contacted to take part in an in-depth telephone interview for this research? [YES/NO]

Thank you very much for your time. One last thing: would you like the number of the UK Market Research Society should you wish to check our organisation's status as members? [xxxxx]

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<sup>16</sup> Explanation for interviewer: **load shifting** means moving electrical demand to another time of day, after or before the period for which turn-down of electrical load is requested, but keeping the overall usage of electricity about the same.

<sup>17</sup> Explanation for interviewer: **load shedding** means reducing electrical demand at the time requested, but not (or not significantly) increasing demand at other times to compensate.

## Version 2 – screening survey to identify potential clients active in (or with potential for) flexibility services

### Introduction

Good morning/afternoon. My name is XXXX and I am calling from an organisation called Databuild Research on behalf of the Department for Business, Energy and Industrial Strategy - BEIS. Can I just check, I am speaking with <name>

Thank you for speaking to me today. Databuild are a research agency, who have been commissioned (with partner organisations) to undertake an evaluation of the Transitional Arrangements for Demand-Side Response<sup>18</sup>.

We are currently carrying out some research for BEIS, speaking to organisations who currently provide Demand-Side Response<sup>19</sup> in electricity use (via the Transitional Arrangements scheme or other flexibility schemes), or who have potential to offer Demand-Side Response in future.

The questions I will ask you will cover some background about the profile of your business, your approach to energy management and your awareness and level of interest in schemes for Demand Side Response.

Would you have time now to answer a few questions?

[if necessary, explain this will take 5-10 minutes]

[if necessary, arrange another time to call back]

[If necessary, explain that they are welcome to contact BEIS to confirm the legitimacy of the research. The BEIS project manager is: [xxxxx]

Just to reassure you, we will keep any information that you share with us confidential and only share it with BEIS in anonymous form, unless otherwise agreed with you. Your information will only be used for this research project, which will inform BEIS policy-making on Demand-Side Response.

### First, I just want to understand a bit about your organisation

Can I just check, does XXXXXX [name SIC code from sampling frame] describe your organisation?  
[YES/NO/DON'T KNOW]

[If NO/DON'T KNOW] capture accurate sector detail.

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<sup>18</sup> Explanation of the **Transitional Arrangements**, for interviewer reference: The Transitional Arrangements auctions offer targeted support to Demand Side Response (DSR), to encourage enterprise, and increase levels of participation in the Capacity Market for electricity.

<sup>19</sup> Explanation of **Demand-Side Response**: by DSR, we mean a temporary reduction or shifting of electricity demand to avoid peak demand periods or to respond to National Grid or aggregator instructions. This is sometimes called load reduction or load shifting.

Can you tell me roughly how many sites do you operate in, within the UK? [if necessary, explain that a 'site' means a particular geographical location where the organisation operates or has assets]

To your knowledge, does your organisation use more than 3,000 MWh of electricity per year?  
[YES/NO/DON'T KNOW]

- [IF DON'T KNOW] Would you say that your organisation is a high<sup>20</sup> user of electricity?

### **I now want to ask you about your organisation's energy management approach and capability**

*[note: in some cases e.g. property management company or a financial investment vehicle, the questions may need to be rephrased to ask about 'your organisation and its subsidiaries']*

Does your organisation currently manage the timing of its electricity demand, for example by reducing its consumption during peak hours or shifting its load away from peak times? [Yes/No/Don't Know]

- If no, would your organisation be willing and able to reduce its electricity at peak times if there was a business case to do so?
  - If no, can you please explain why? [code main reasons]

Does your organisation receive warnings about Triad periods? [Yes/No/Don't Know]

- If yes, are the Triad warnings provided by your electricity supplier, an energy management company, an aggregator<sup>21</sup> or another type of organisation? [specify]

*[For organisations who have been involved with turn-down, load shifting or Triad management in some way..]*

To your knowledge, has your organisation provided Demand-Side Response (by turning down or shifting electrical demand, rather than by boosting generation), by engaging with any of the following, either through an aggregator or in its own right:

- Triad Avoidance or Triad Targeting [Yes/No/Don't Know]
- Red zone management [Yes/No/Don't Know]
- Short-Term Operating Reserve (STOR) [Yes/No/Don't Know]
- Long-term STOR [Yes/No/Don't Know]
- Firm Frequency Response [Yes/No/Don't Know]
- Enhanced Frequency Response [Yes/No/Don't Know]

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<sup>20</sup> Explanation of the term '**high**': by 'high' we mean 3,000 MWh of electricity consumption or more. Any organisation that pays CRC charges or has a Climate Change Agreement would count as 'high'.

<sup>21</sup> Explanation of the term '**aggregator**': an aggregator offers flexibility services to a number of clients and puts forward their joint capacity to the National Grid or the Capacity Market. Their services might include Triad warnings, STOR, frequency services or the Capacity Market.

- Demand Side Balancing Reserve (DSBR) [Yes/No/Don't Know]
- Fast Reserve [Yes/No/Don't Know]
- T-4 (four year ahead) Capacity Market auctions (T-4) [Yes/No/Don't Know]
- Early Capacity Market auction [Yes/No/Don't Know]
- T-1 Capacity Market auction [Yes/No/Don't Know]
- First Transitional Arrangement auction [Yes/No/Don't Know]
- Second Transitional Arrangement auction [Yes/No/Don't Know]

Does your organisation work with an aggregator to offer any of these services, and if so which aggregator and which services? [Yes/No/Don't Know/Prefer not to say – if yes, specify/code]

Has your organisation been engaged in any other way with a Distribution Network Operator or energy supplier to reduce peak demand? [Yes/No/Don't Know]

- If so, how? [code]

### **Awareness of the Capacity Market and Transitional Arrangements**

[If not already obvious] Were you aware of the Capacity Market auctions (T-4, T-1, TA) before this phone call? [yes/no]

Are you aware of the Transitional Arrangements auctions? [yes/no]

- If no, go to 'Would it be possible to recontact you...' question

Did your organisation actively consider participating in the second Transitional Arrangements auction, either directly or via an aggregator? [yes/no]

Please tell me the main reason why you did not apply to participate? [code response]

### **Permission to recontact:**

Either myself or a member of my team may need to call you back to verify anything we have discussed. Would this be OK?

Would it be possible for us to contact you for future research regarding this area? [yes/no]

In particular would you be happy to be re-contacted to take part in an in-depth telephone interview for this research? [yes/no]

Thank you very much for your time. One last thing: would you like the number of the UK Market Research Society should you wish to check our organisation's status as members? [xxxxx]

## Annex 3B. Example topic guide for in-depth interview with a participating aggregator

Guidance for interviewer	Sub-topics	Prompts and probes	approx mins
<b>Introduction</b>			
<i>Aim: To introduce the research, ensure the interviewee is aware of and set the context for the proceeding discussion</i>			5
<i>Keep the intro as brief as possible to leave room for the interview proper</i>	<ul style="list-style-type: none"> <li>• Introduce yourself and CAG Consultants [very brief]</li> <li>• State that the evaluation has been commissioned by BEIS [no need to provide more detail than this]</li> <li>• <b>Introduce the study:</b> <ul style="list-style-type: none"> <li>- Overall objective of the study is to evaluate the effectiveness of second Transitional Arrangements</li> <li>- Main purpose of the interview is to explore experiences of the second TA up to and including the auction, as well as exploring wider experiences of turn-down DSR provision</li> <li>- findings will inform government policy development about DSR going forward</li> </ul> </li> </ul>		

	<ul style="list-style-type: none"> <li>• <b>Talk through key points about the interview:</b> <ul style="list-style-type: none"> <li>- Length of interview [estimated 90 minutes]</li> <li>- Any data used from the interview will be anonymised (neither the interviewee nor the organisation will be identifiable to BEIS) in our reporting of the findings</li> <li>- Interview data will be stored securely in accordance with the Data Protection Act</li> <li>- Note that we would like to record the interview and explain that the recording, transcription and notes will not be shared outside of the research consortium (BEIS will not have access to them)</li> <li>- Check that they consent to you recording the interview [if they don't, still go ahead with interview, just take notes]</li> </ul> </li> <li>• Ask if interviewee has any questions before you start</li> </ul>		
<p><b>Clarification re 2nd TA CMUs (if needed)</b></p>			
<p><i>If the status of this aggregator's CMUs is unclear, start with a brief clarification - to set the context for the remainder of the interview.</i></p>			

<p><i>Only if some CMUs have not yet passed testing, and may be subject to appeal.</i></p>	<p>Establish the current status of their various CMUs.</p> <p>Explain that the accompanying email survey provides an opportunity for them to give feedback on metering and DSR testing processes.</p> <p>Explain that this interview will focus mainly on earlier stages in the TA process, but that there may be time for them to explain more about metering and DSR testing issues at the end of the interview. We will cover these in a further interview in the Spring - when testing and appeal issues have been resolved.</p>		
<p><b>Organisational contexts</b></p>			
<p><i>The aim of these opening questions is to establish whether the organisational contexts we identified in the first phase of research may have changed for this organisation. We want to understand whether there might be changes to the organisation's contexts which may have an impact on its decisions (i.e. mechanisms) about its participation in the TA and the wider flexibility market.</i></p> <p><i>Keep this section brief as specific contexts will be explored throughout the interview</i></p>			<p>5</p>
<p><i>Only if interviewing a different person from the Phase 1&amp;2 interviews</i></p>	<p>Establish the interviewee's role in the organisation</p> <p>Establish the interviewee's experience in relation to the Capacity Market</p>		

<p><i>Interviewer to refer back to the interviewee's responses from Phase 1 and 2 interviews on organisational contexts</i></p>	<p>Establish if the organisation's overall approach to providing capacity in the flexibility market has evolved since they were last interviewed for this evaluation</p> <p>If it has changed, establish how it has changed, to what extent it has impacted on their overall approach to the Capacity Market (if any), and why</p>	<p><b>Desirable but not essential</b></p> <p><i>Probe for:</i></p> <ul style="list-style-type: none"> <li>- any changes in the type of capacity they provide (e.g. between turn-down and generation capacity)</li> <li>- any changes in their client base or client offer evolved (for example the types of/number of clients you work with)</li> <li>- any changes in the organisation's business case for (and perceptions of risks associated with) providing flexible capacity changed</li> </ul>	
<p><b>Participation theory testing</b></p>			
<p><i>Aim: to understand which 'contexts', 'mechanisms' and 'outcomes' apply to the organisation in relation to the participation theory</i></p> <p><i>i.e. we want to test the participation theory, establish their reasoning for participating in the second TA and to understand the contexts that led to this reasoning</i></p>			<p>20</p>
<p><i>Exploring participation theory mechanisms</i></p>	<p>Explore the <u>primary</u> reason(s) why the organisation is participating in the second TA</p> <p><i>Start with open questioning, then use prompts and probes to refine/identify key reasoning</i></p> <p><i>Here, and throughout, try to identify the primary reason for their participation, as well as any secondary reasoning</i></p>	<p><i>Prompts (explore which of these apply, if any)</i></p> <p>Is it because they think the TA:</p> <ul style="list-style-type: none"> <li>- provides specific revenue stream for turn-down DSR (resource), so it's cost effective to offer participation to your existing clients</li> <li>- provides an opportunity to recruit new clients</li> <li>- is an opportunity to build experience, credentials and a client base for turn-down DSR</li> </ul> <p>Explore other reasons for participation (even if prompts apply)</p>	

		<p>If multiple reasons given, clarify what the <u>most important reason</u> was, if not already clear</p>	
<p><i>Exploring participation theory contexts</i></p>	<p>Explore the factors that enabled, encouraged or influenced their decision and reasoning to participate in the second TA</p>	<p><i>Prompts (explore which of these apply, if any)</i>            How important were the following factors in influencing their reasoning (and their decision to participate in the second TA):  <b>[tailored list inserted for each participant, based on Phase 1&amp;2 data]</b>            Factors listed in theory:            - They already aggregate turn-down DSR for TRIAD/STOR etc.            - They are involved in aggregation of other services (or electricity supply) and want to enter the turn-down DSR market            - They are Involved in aggregation outside the UK and want to enter UK market            - They have funding available for investment            - They have the skills and resources (or IT systems) to meet TA requirements            - They consider turn-down DSR a strategic opportunity</p> <p><i>Probe for other factors that were important in determining their reasons for participating in the TA</i>            (e.g. explore what elements of the scheme design (i.e. the second TA design) influenced their decision and reasoning about participating)</p>	

<p><i>Exploring participation theory outcomes (also important for contribution tracing)</i></p>	<p>For the CMUs the organisation has in the second TA, establish:</p> <ol style="list-style-type: none"> <li>1. what proportion of the capacity is 'new' (i.e. was not being provided to the market until the second TA) and what proportion is existing</li> <li>2. what proportion of the capacity in each CMU is from existing clients (i.e. from organisation that were already clients prior to the second TA)</li> <li>3. what proportion of the capacity in each CMU is from new clients (i.e. clients that have been recruited for the second TA)</li> </ol> <p><i>Note for interviewers: Point 1 is asking how much capacity overall is 'new' (i.e. from existing clients AND new clients). Point 3 is about 'new' capacity only from new clients.</i></p>		
<p><i>Exploring participation theory mechanisms</i></p>	<p>Explore the <u>primary</u> reason(s) why their CMUs have this particular mix of existing and new clients/capacity</p> <p><i>Start with open questioning, then use prompts and probes to refine/identify key reasoning</i></p>	<p><i>Prompts (explore which of these apply, if any)</i></p> <p>Is it because they think:</p> <ul style="list-style-type: none"> <li>- the TA timetable meant there was insufficient time to recruit new clients and bring the loads on stream</li> <li>- A lack of a long term commitment (to turn-down DSR) by government means that they don't have confidence to invest in new capacity/clients for turn-down DSR</li> <li>- the TA is a new product which gave them an opportunity to recruit new clients</li> </ul> <p><i>Probe for other reasons for their particular mix of</i></p>	

		<p><i>new/existing capacity/clients</i></p> <p>If multiple reasons given, clarify what the <u>most important reason</u> was, if not already clear</p>	
<p><i>Exploring participation theory contexts</i></p>	<p>Explore the factors that were important in influencing the reasoning for their particular new/existing capacity/client mix</p>	<p><i>Probe to explore factors that were important</i></p> <p>e.g. timescale for the TA; CM rules; compatibility with other flexibility services; experience of other CM auctions</p>	
<p><b><i>Desirable but not essential to explore [i.e. if time allows]</i></b></p>	<p>Identify what criteria were used to determine whether they should participate in the second TA. What was the business case</p>		
<p><b><i>Desirable but not essential to explore [i.e. if time allows]</i></b></p>	<p>Explore what level of Return on Investment they were looking for from the second TA</p>		
<p><b><i>Desirable but not essential to explore [i.e. if time allows]</i></b></p>	<p>Explore how long are they prepared to invest in turn-down DSR before it becomes profitable for them</p>		
<p><b><i>Desirable but not essential to explore [i.e. if time allows]</i></b></p>	<p>Explore what makes turn-down DSR strategically important for the organisation</p>	<p><i>Probes:</i></p> <p>e.g. does reputation or Corporate Social Responsibility matter, do they think turn-down DSR has a long-term future</p>	
<p><b>Auction participation theory testing</b></p>			

<p><i>Aim: to understand which 'contexts' and 'mechanisms' apply to the organisation in relation to the auction participation theory</i></p> <p><i>i.e. we want to test the auction participation theory, establish their reasoning for participating in the second TA auction and to understand the contexts that led to this reasoning</i></p>		10
<p><b>Before the interview, please:</b></p> <ul style="list-style-type: none"> <li>- check how many CMUs went into auction and how many cleared in the 2nd TA auction</li> <li>- check how many CMUs were not entered into auction</li> </ul>		
<p><i>Only for organisations who had CMUs that were prequalified for the TA but were not entered into the auction</i></p>	<p>For CMUs that were prequalified for the second TA but were not entered into the auction, explore the primary reason(s) why this was the case</p> <p><i>Start with open questioning, then use prompts and probes to refine/identify key reasoning</i></p>	<p><i>Prompts (explore which of these apply, if any):</i></p> <ul style="list-style-type: none"> <li>- Expected revenues and minimum capacity requirements meant that although this would have been a good deal, they were not confident that they could meet the capacity commitments</li> <li>- Expected revenues meant that they felt it was no longer a good deal for them</li> <li>- Expected revenues meant that although this would have been a good deal they were not confident that they have the resources to manage their TA obligations</li> </ul> <p>Explore other reasons for participation (even if prompts apply)</p> <p>If multiple reasons given, clarify what the <u>most important reason</u> was, if not already clear</p>

	<p>Explore the factors that were important in influencing their reasoning for <u>not</u> entering the CMU(s) into the auction</p>	<p><i>Prompts</i></p> <p>How important were the following factors in influencing their reasoning to not put forward the CMU(s) into the auction:</p> <ul style="list-style-type: none"> <li>- they were no longer able to provide the capacity (explore in what way/why)</li> <li>- they assessed that the likely clearing price would provide insufficient return on investment (explore in what way/why)</li> <li>- they were no longer interested in the Capacity Market (explore in what way/why e.g. was it a result of internal changes or better opportunities elsewhere)</li> </ul> <p><i>Probe for other factors that may have influenced their reasoning not to enter the CMU(s) into the auction</i></p>	
<p><i>Only for organisations who had CMUs that were prequalified for the TA and were entered into the auction</i></p>	<p>For CMUs that were prequalified for the second TA and were entered into auction, explore the reasons why they entered these CMUs into the auction</p> <p><i>Start with open questioning, then use prompts and probes to refine/identify key reasoning</i></p>	<p>Prompts (explore which of these apply, if any):</p> <ul style="list-style-type: none"> <li>- Expected revenues meant that they still considered the second TA to be a good deal for them</li> </ul> <p>Probe for other reasons why they entered these CMUs in the auction (or check whether they considered at all whether to withdraw the CMUs from the auction, and if so why they decided to go ahead after all?)</p>	

	<p>Explore the factors that were important in influencing their reasoning for entering the CMU(s) into the auction</p>	<p><i>Prompts</i></p> <p>How important were the following factors in influencing their reasoning to enter the CMU(s) into the auction:</p> <ul style="list-style-type: none"> <li>- they were confident they could provide the capacity they had put forward for the CMU(s) (explore in what way/why)</li> <li>- they had assessed that the likely clearing price would provide them with sufficient return on investment (explore in what way/why)</li> </ul> <p><i>Probe for other factors that may have influenced their reasoning to enter the CMU(s) into the auction</i></p>	
<p><b>Auction bidding theory testing</b></p>			
<p><i>Aim: to understand which 'contexts', 'mechanisms' apply to the organisation in relation to the auction bidding theory</i></p> <p><i>i.e. we want to test the auction bidding theory, establish their strategy for bidding, the reasoning behind this strategy and the factors that influenced this reasoning/strategy</i></p>			<p>10</p>
<p><b>Before the interview, please:</b></p> <p><b>- check what their CMU bid prices were</b></p>			
<p><i>Testing outcomes for the auction bidding theory</i></p>	<p>Highlight that we are aware that their bid price was <b>[information inserted - low/medium/high price for relevant CMU(s)]</b></p> <p>For each CMU that were prequalified for the second TA and were entered into auction, ask participants to describe their bidding strategy</p>	<p><i>Prompts - based on their bid price</i></p> <p>Which of these bidding strategies applied to them (if any)</p> <ul style="list-style-type: none"> <li>- They accepted the clearing price for this CMU or submitted a minimal exit price</li> <li>- They submitted a 'medium to low' exit price for this CMU</li> <li>- They submitted a high exit price for this CMU, close to the price cap</li> </ul>	

		<p><i>Explore other reasons for participation (even if prompts apply)</i></p>	
<p><i>Testing mechanisms for the auction bidding theory</i></p>	<p>For each CMU, explore why the primary reason(s) why they chose their bidding strategy</p> <p><i>Start with open questioning, then use prompts and probes to refine/identify key reasoning</i></p>	<p><i>Prompts:</i> Did they choose this strategy because:</p> <p><b><i>[if they accepted the clearing price for this CMU or submitted a minimal exit price]</i></b> - Bidding rules allowed them to bid no exit price (or a minimal exit price) for this CMU, at or below hassle cost level, as any income would be acceptable</p> <p><b><i>[if they submitted a 'medium to low' exit price for this CMU]</i></b> - Capacity Market rules and TA requirements meant there was a medium to low price below which they would not be willing to contract in the TA</p> <p><b><i>[if they submitted a high exit price for this CMU, close to the price cap]</i></b> - Capacity Market rules and TA requirements meant they would not be willing to contract in the TA except at a high price</p> <p><i>Probe for other reasons why they chose their strategy</i></p> <p>If multiple reasons given, clarify what the <u>most important reason</u> was, if not already clear</p>	

	<p>Explore the factors that were important in influencing the reason(s) why they chose their bidding strategy</p>	<p><i>Prompts</i></p> <p>How important were the following factors in influencing why they chose their bidding strategy:</p> <p><b><i>[if they accepted the clearing price for this CMU or submitted a minimal exit price]</i></b></p> <ul style="list-style-type: none"> <li>- they were already providing capacity via other compatible services, and the additional cost of TA participation was minimal</li> <li>- they anticipated a low number of stress events</li> <li>- the organisation had strategic goal of building turn-down DSR portfolio in CM, even if it's not cost-effective in short term</li> </ul> <p><b><i>[if they submitted a 'medium to low' exit price for this CMU]</i></b></p> <ul style="list-style-type: none"> <li>- Some costs, or opportunity costs, needed to be covered if this CMU was to participate in the TA (explore what these were)</li> <li>- they anticipated a moderate number of stress events (explore their assumptions)</li> </ul> <p><b><i>[if they submitted a high exit price for this CMU, close to the price cap]</i></b></p> <ul style="list-style-type: none"> <li>- the organisation was concerned about the high cost of signing up new clients</li> <li>- the organisation was concerned about the loss of revenue from other flexibility services (explore what these were)</li> </ul>	
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		- they anticipated a high number of stress events (explore their assumptions)  <i>Probe for other factors that may have influenced their reasoning in relation to their bidding strategy</i>	
<b>Journey to turn-down exploration</b>			
<i>Aim: to understand their organisational journey in developing a turn-down DSR portfolio</i>			15
	Map when, how and why the organisation started developing a turn-down DSR portfolio		
<b><i>Desirable but not essential to explore [i.e. if time allows]</i></b>	Establish how turn-down DSR capacity has evolved over time		
	Explore the organisation's primary motivations for continuing to aggregate turn-down DSR		
<b><i>Desirable but not essential to explore [i.e. if time allows]</i></b>	What services does (and has) the organisation provided turn-down DSR for, and why  What is the scope to combine different turn-down services		

<p><b><i>To understand more about the 'journey to turn-down' within client organisations</i></b></p>	<p>How do they go about approaching a client to get on board? What types of staff do they typically engage with (energy managers, finance directors, etc), and why?</p>	<p>Probes:                  Are the people that the aggregator engages with the same people making the decision for the organisation, or are decisions generally taken elsewhere in the organisation?                   Why do they engage with certain staff types, and does this differ with the size/type of organisation? Are there certain types that are more accessible, or more straightforward to engage with, etc?</p>	
	<p>Explore the factors that have enabled or hindered turn-down DSR aggregation for the organisation</p>	<p><i>(Note to interviewer: it may be helpful to refer to the characterisation of turn-down DSR for their components, to explore whether some factors apply to particular technologies, types of business process, types/sizes of site or assets participating in other flexibility services. A list of their components is available within the email survey - see below.)</i></p>	
<p><b>CMU design strategies (theory building)</b></p>			
<p><i>Aim: to build a new theory about how organisations select the composition of their CMUs (Note to interviewer: it may be helpful to refer to the list of components in their CMUs, within the email survey).</i></p>			<p>15</p>
	<p>Establish how they constructed the CMU(s) entered into the second TA</p>	<p>Probes:                  - What type/size/number of turn-down assets did they aim to recruit for their CMUs (and why)                  - what business sectors did they target (and why)                  - was there a minimum size of CMU components they were looking for, and why?                  - are there particular types of assets which are more/less</p>	

		<p>suitable for the TA/CM compared to other flexibility services?</p> <p>- did they target organisations already active in flexibility (e.g. Triad)? (link to question above about new clients)</p>	
	<p>Explore whether they (or their clients) include 'slack' in their CMUs/assets to ensure they can comply with testing/delivery requirements</p>	<p><i>Probes:</i></p> <p>- degree of slack?</p> <p>- if their CMU passed DSR testing with a higher capacity than the capacity they submitted at auction, was this driven by the need for 'slack'? If not, why did they do this?</p>	
	<p>In recruiting for their CMUs, what did they assume about the number and length of stress events</p>		
	<p>What are their strategies, if any, to enable sustained provision of capacity during a long stress event (e.g. more than 30 minutes)</p>		
<p><b>Email survey follow-up</b></p>			
<p><i>Aim; to fill gaps in the email survey response and/or to chase a response if none has been provided yet</i></p>			<p>5</p>

Appendix 3: Methodology for qualitative research

	Chase / clarify responses to email survey. If survey not responded to, either run through questions/answers at end of interview (if time) or ask them to complete asap	Ensure that we have a good understanding of the different types of turn-down DSR provided by their components, from the email survey - and how prevalent each of these types are.  If not addressed earlier in interview, fill any gaps in understanding about the suitability of these different types of turn-down DSR for the TA/CM and other flexibility services.	
<b>Feedback on metering and DSR testing process [OPTIONAL - ONLY IF YOU HAVE SPARE TIME AT THE END OF THE INTERVIEW]</b>			
<i>Aim; to gather informal feedback on the metering and DSR testing processes, while they are fresh in the respondent's mind (amplifying their responses in the email survey). We will research testing further in Spring fieldwork.</i>			
<i>ONLY IF TIME - OPTIONAL</i>	<i>What was their overall experience of the metering assessment and/or testing process for the second TA</i>		
<i>ONLY IF TIME - OPTIONAL</i>	<i>What was their overall experience of the DSR testing process for the second TA?</i>		
<b>Interview close and thank you</b>			
			5
	Would interviewee like to say anything else about the second TA		

	Highlight plans for further interview in spring (covering experiences of meter/DSR testing, the responses to Capacity Market Notices, further details about the composition of their CMUs and their future plans in relation to turn-down DSR and the Capacity Market		
	Thank the participant for their time. Reiterate that their anonymity will be protected in our reporting. Tell them they are welcome to contact members of the study team to ask questions at a later date if they wish		
	Tell them we will contact them again in the Spring 2018 for a follow-up interview		
	<b>END INTERVIEW</b>		

# Appendix 4: Initial theoretical framework for the second TA

The initial theoretical framework for the second TA was developed at the start of Phase 3, drawing on the theoretical framework emerging from Phase 2 of the evaluation. The initial framework in Phase 3 was adjusted to reflect the narrower specification of capacity participating in the second TA (i.e. turn-down DSR only).

The strategic objectives of the second TA were also narrower than the first TA, because BEIS still intended the second TA to be a 'nursery' for new DSR capacity that could participate in the main CM in future, but did not expect it to contribute significantly to security of supply in the 2018/19 delivery year. This was because the Early Auction had been introduced, in parallel with the second TA, to address security of supply in winter 2018/19.

The theoretical framework consists of the following elements, set out in the figures below.

Figure A4.1: Overall map of theory

Figure A4.2: Participation theory for aggregators

Figure A4.3: Participation theory for direct participants

Figure A4.4: Participation theory for aggregator clients

Figure A4.5: Auction participation theory (direct participants and aggregators)

Figure A4.6: Auction bidding theory (direct participants and aggregators)

Figure A4.8: Additionality theory H1 – TA contributes to more (competitive) flexible capacity for the CM in 2018/19 and subsequent years

Figure A4.9: Additionality theory (H2) – the TA contributes to wider encouragement of turn-down DSR

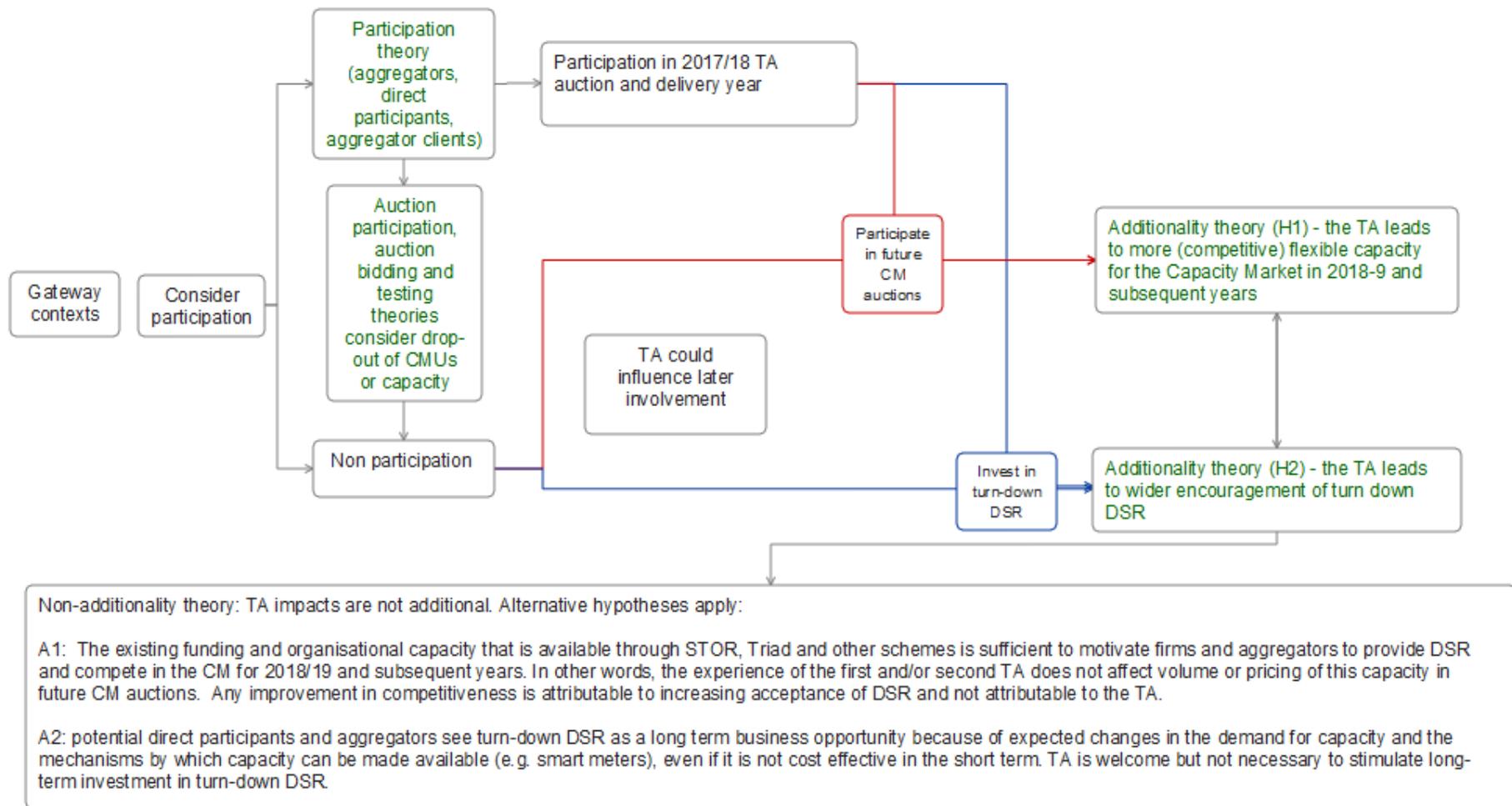


Figure A4.1: Overall map of theory

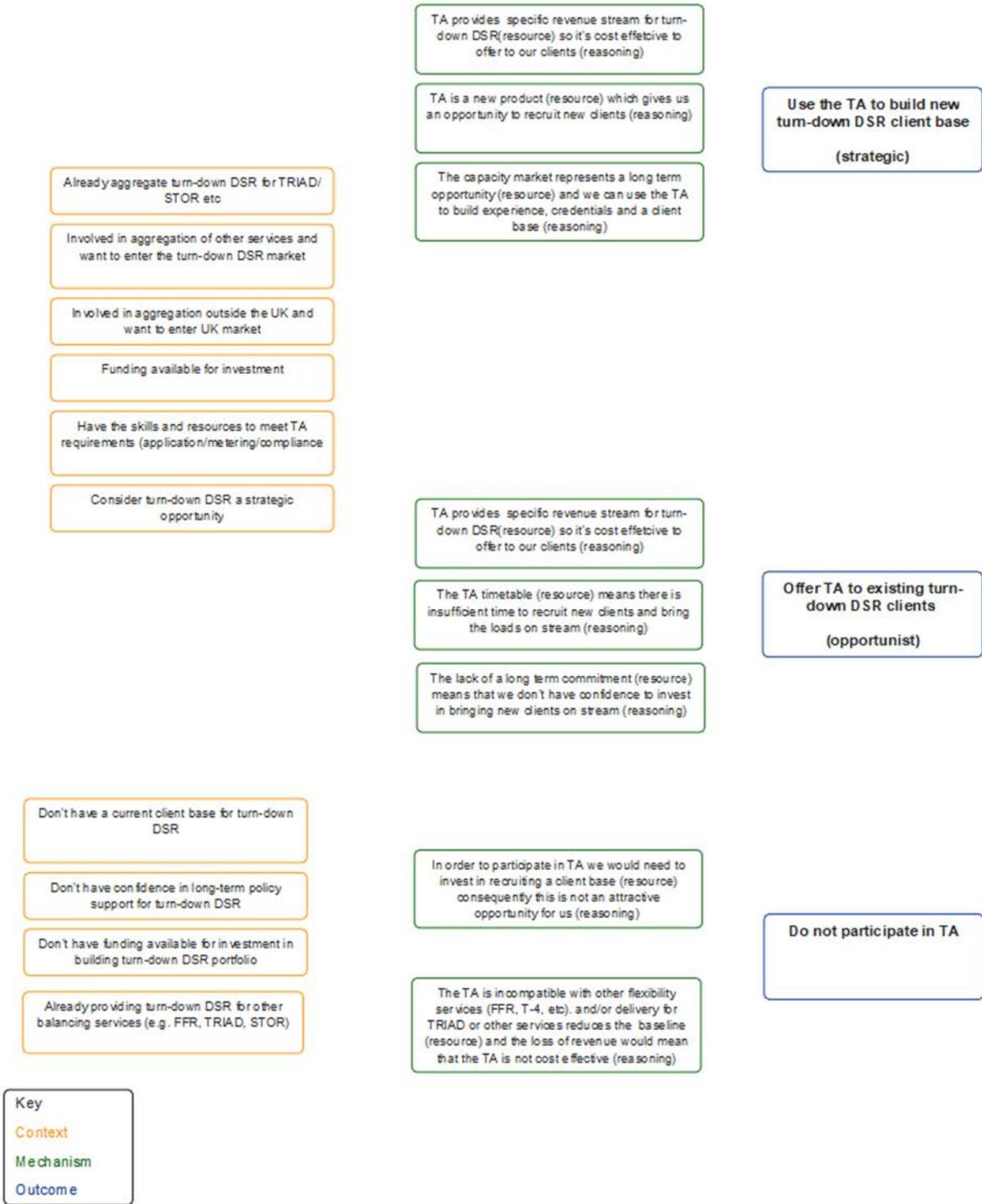


Figure A4.2: Participation theory for aggregators

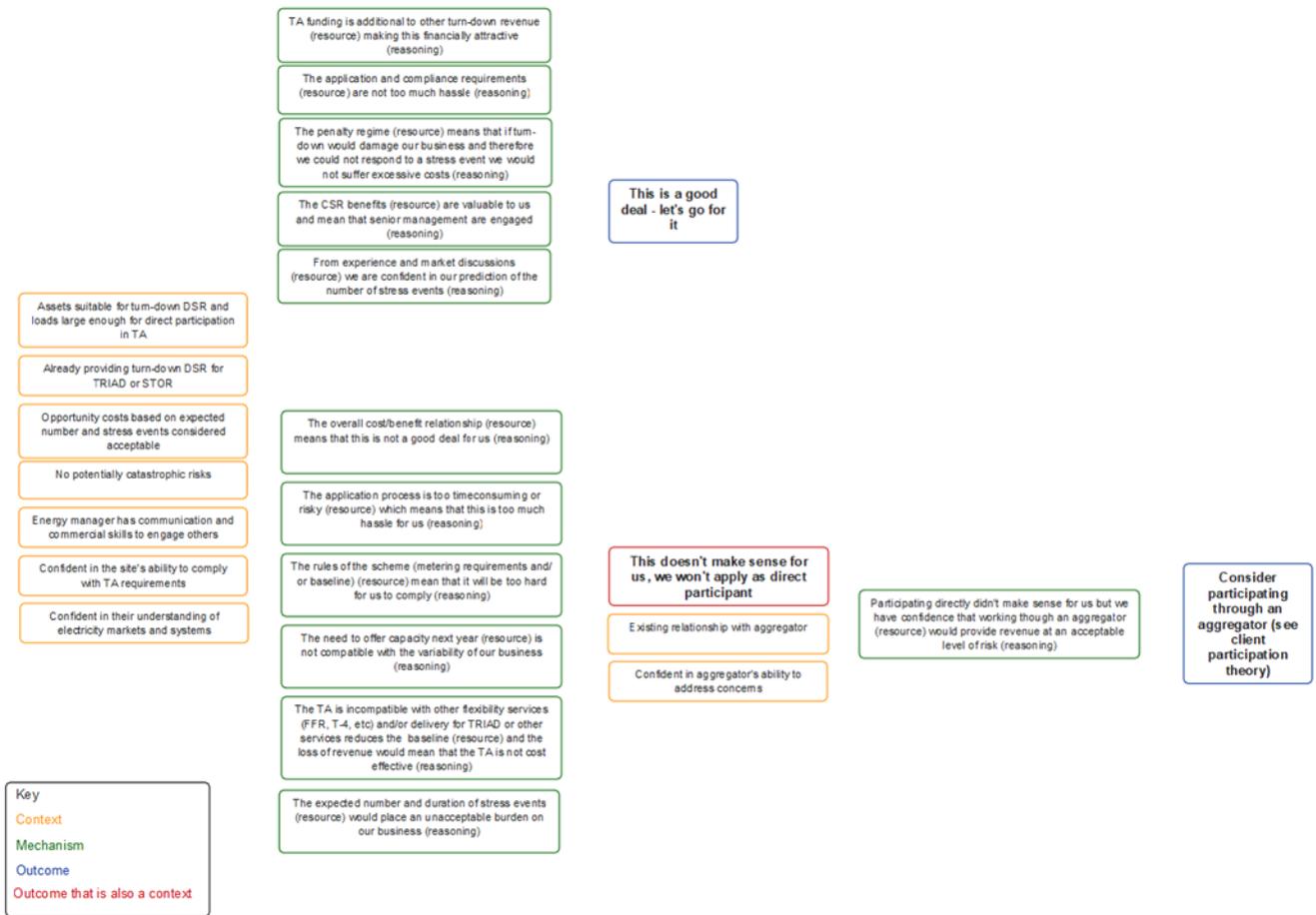


Figure A4.3: Participation theory for direct participants

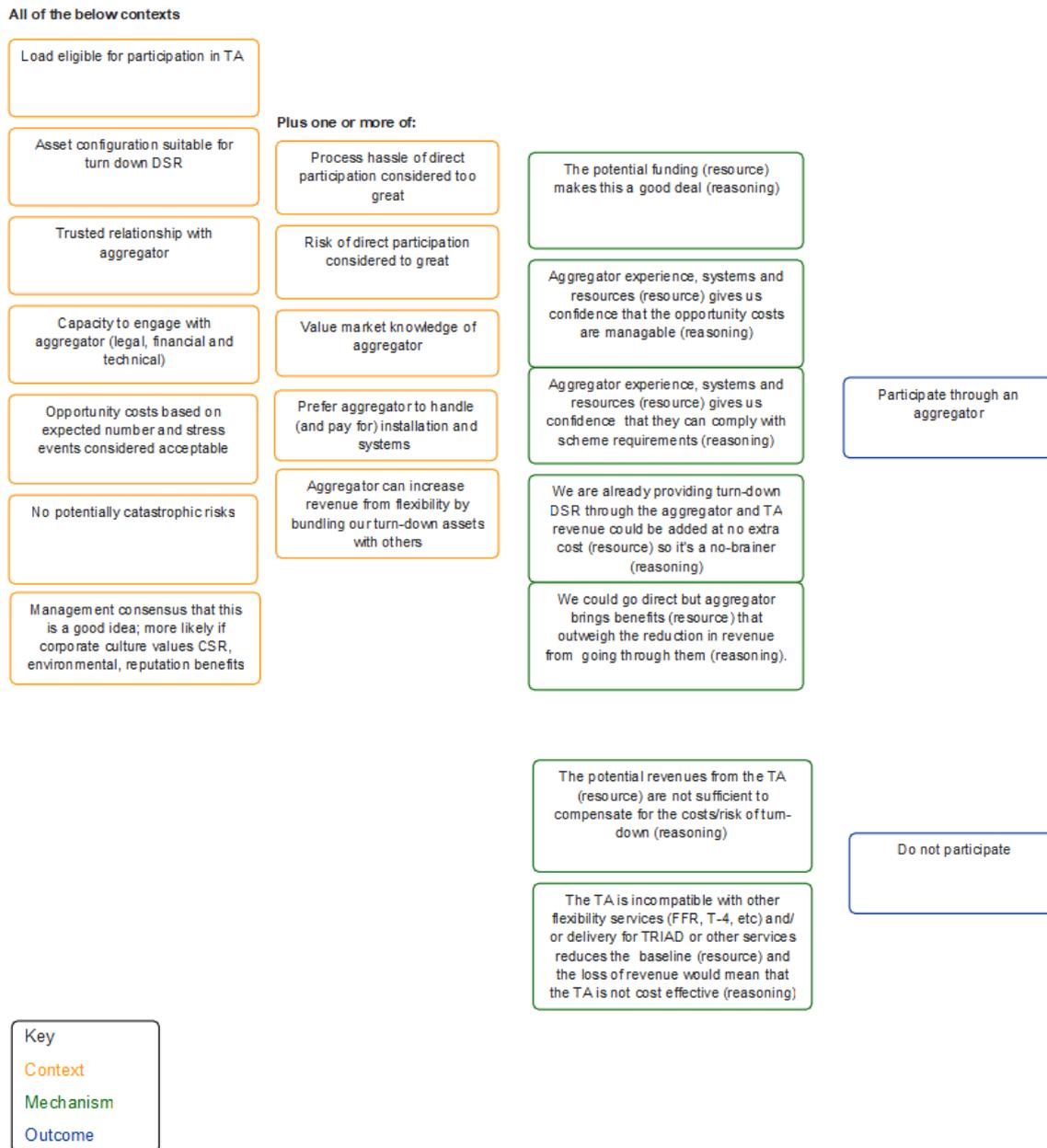


Figure A4.4: Participation theory for aggregator clients

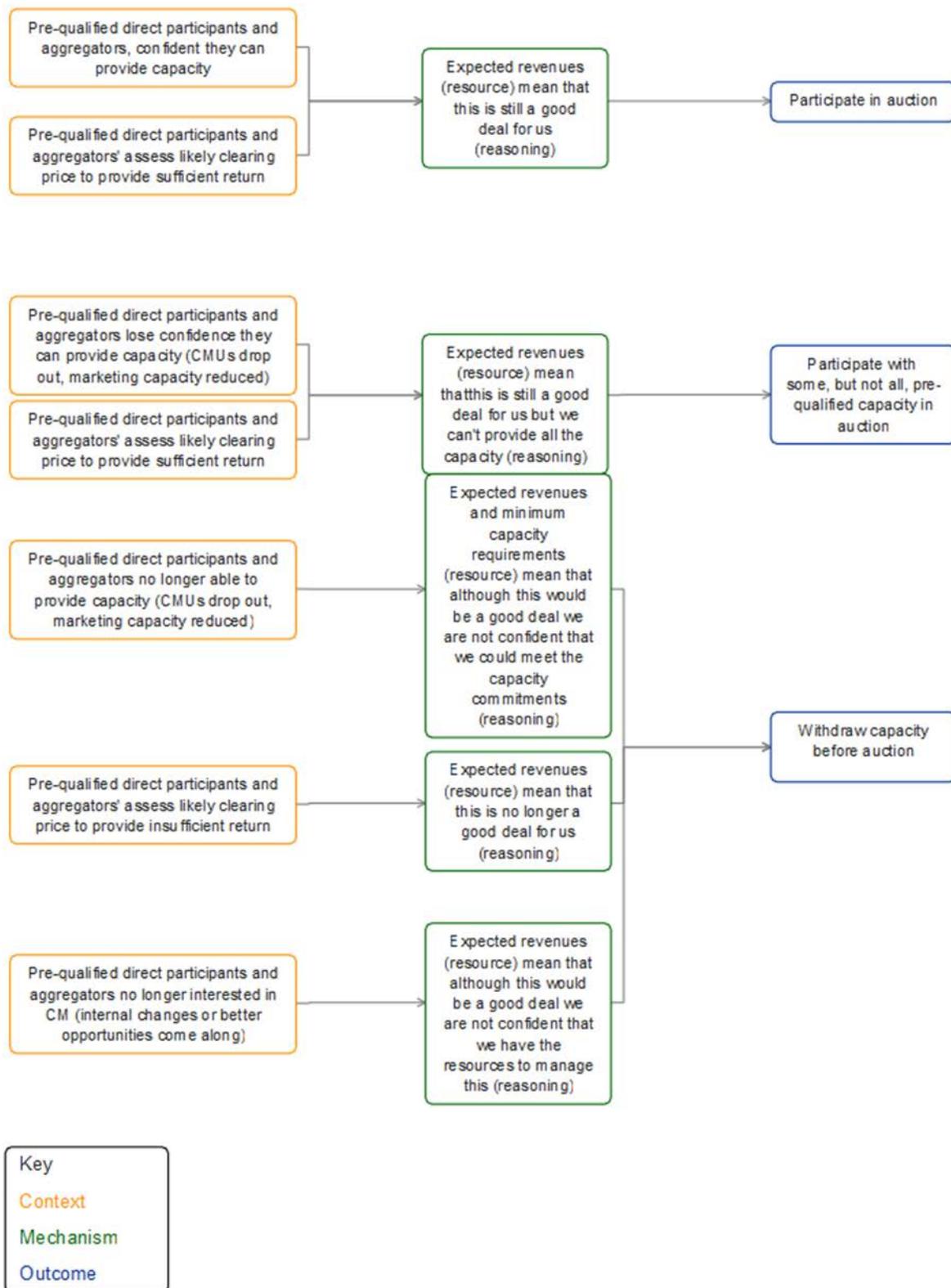


Figure A4.5: Auction participation theory (direct participants and aggregators)

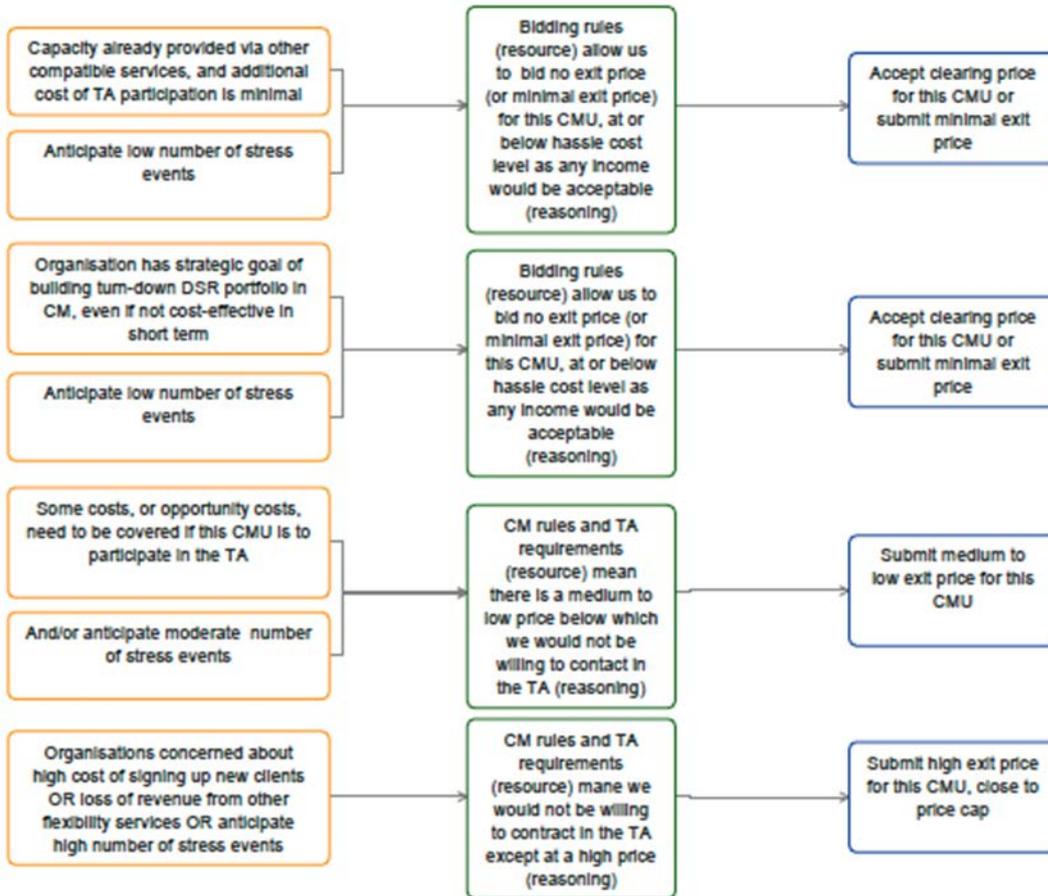


Figure A4.6: Auction bidding theory (direct participants and aggregators)

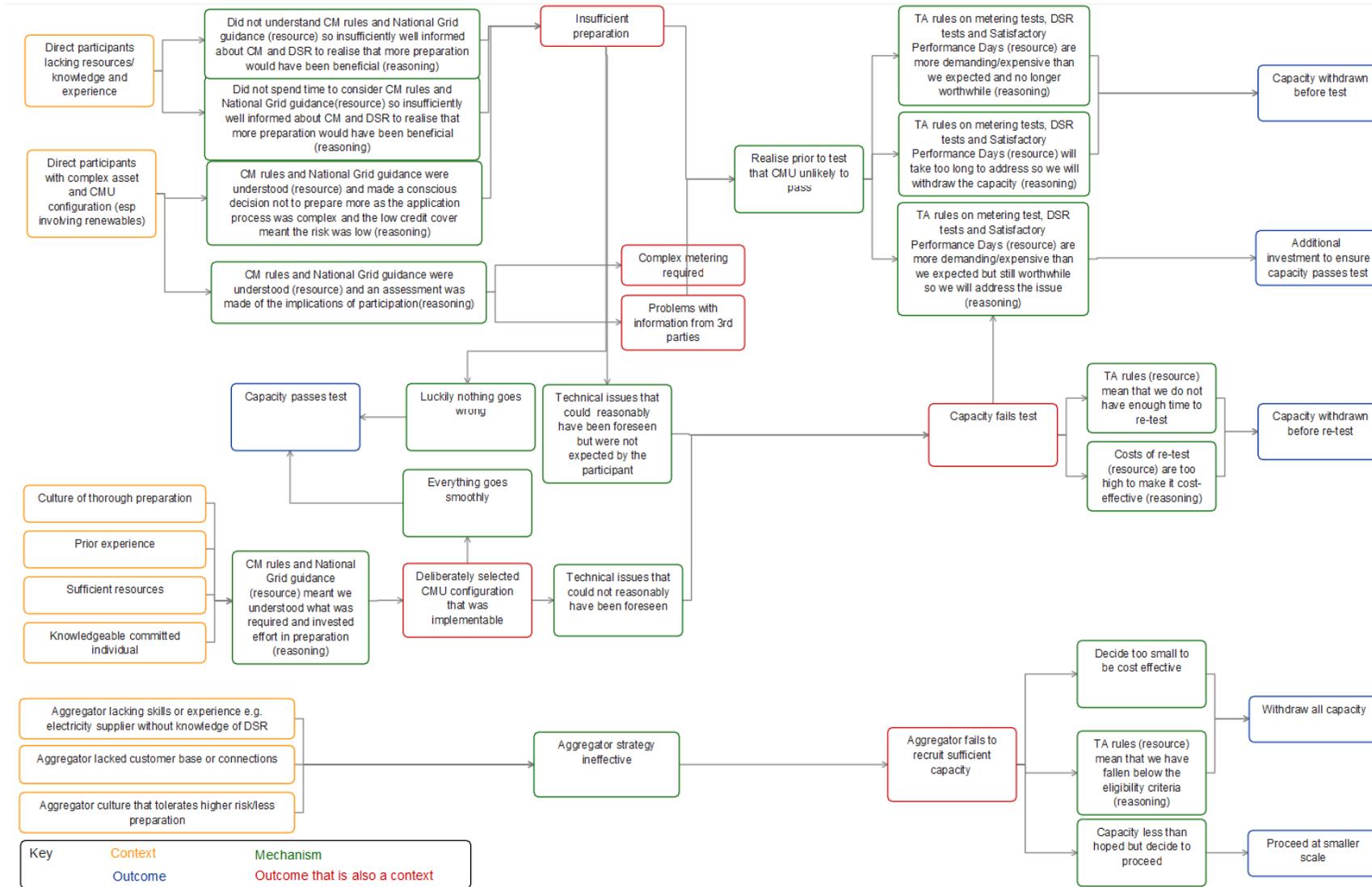
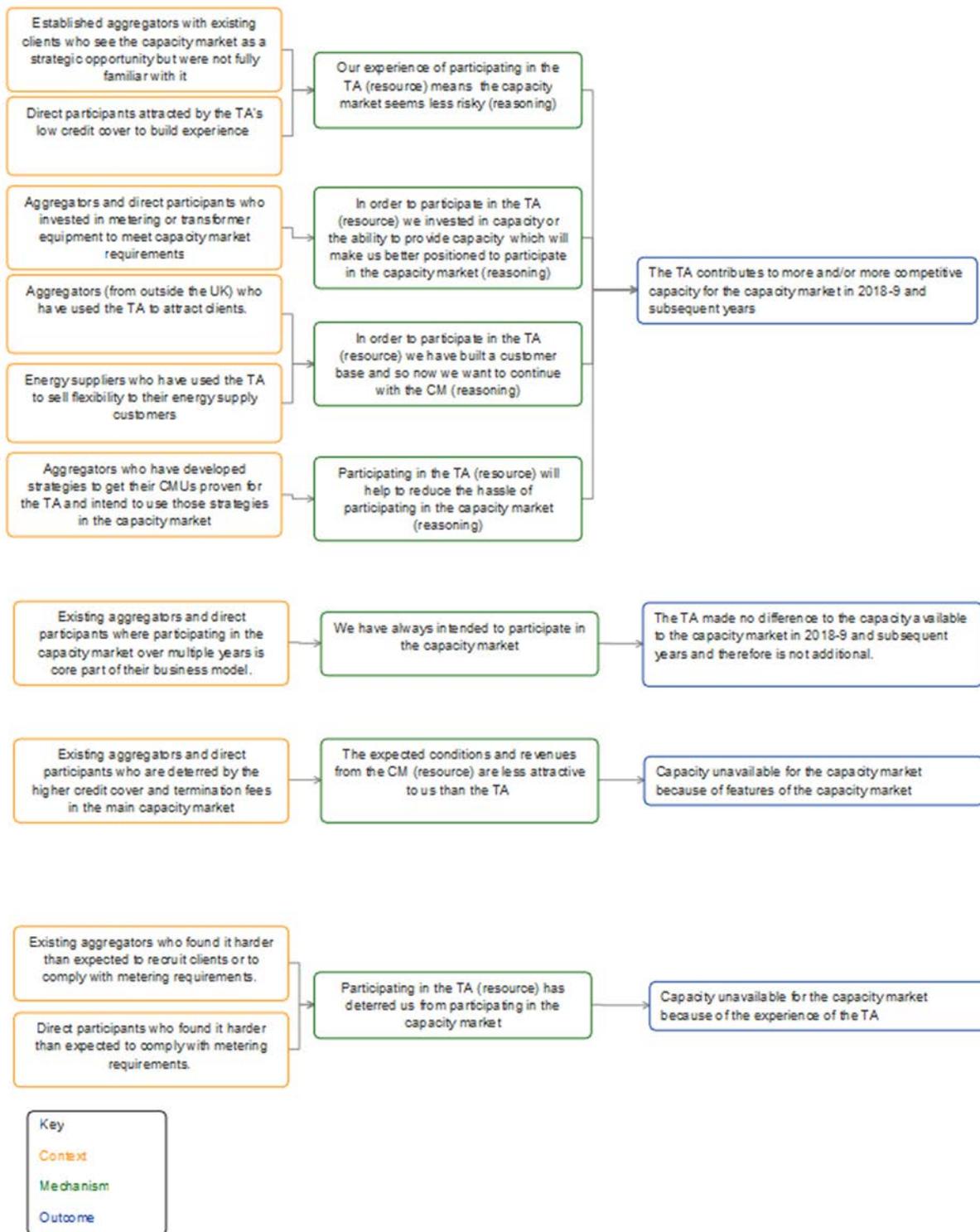


Figure A4.7: Testing theory



**Figure A4.8: Additionality theory H1 – TA contributes to more (competitive) flexible capacity for the CM in 2018/19 and subsequent years**

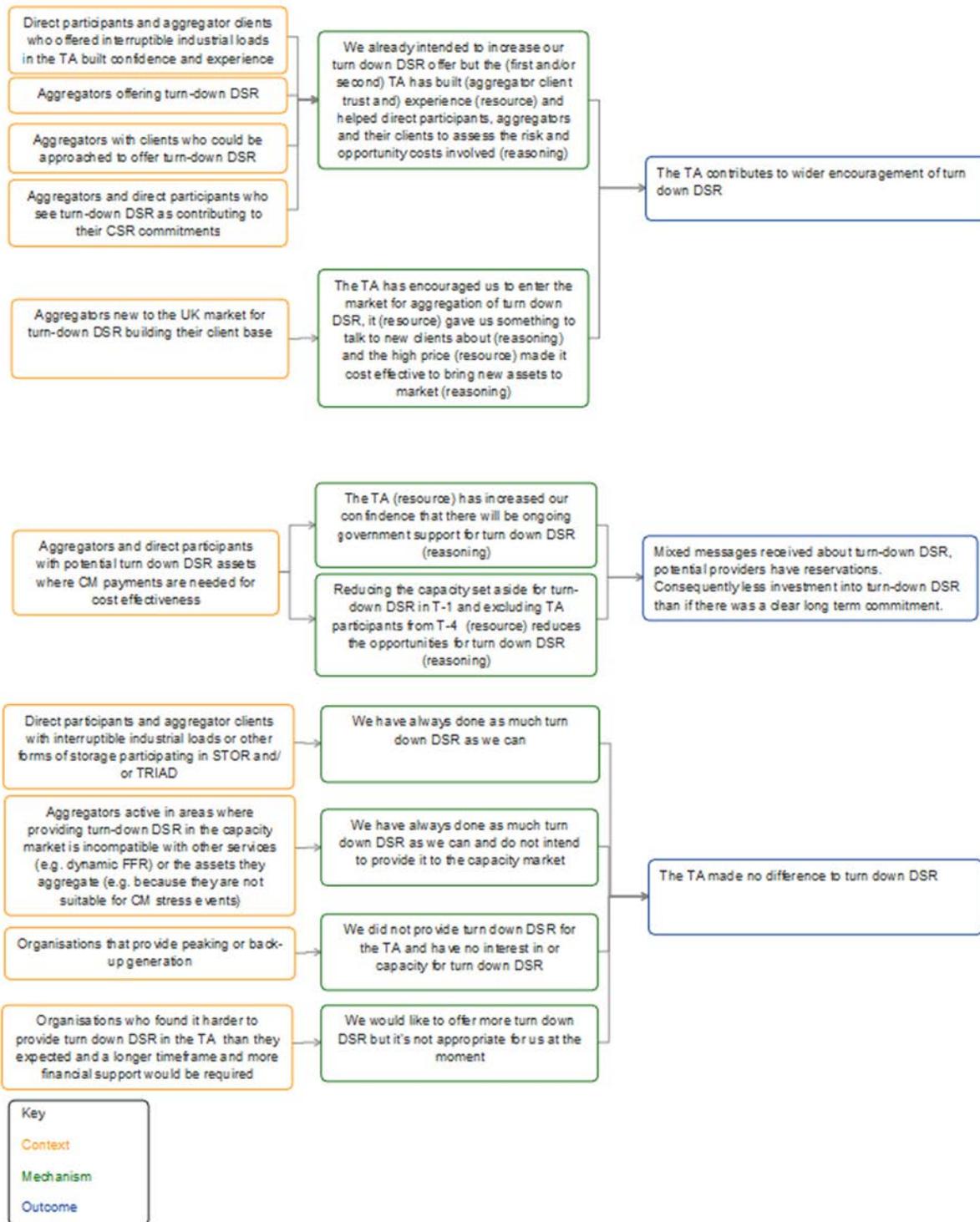


Figure A4.9: Additionality theory (H2) – the TA contributes to wider encouragement of turn-down DSR

## Appendix 5: Revised theoretical framework for the second TA

The revised theoretical framework is presented below. This is based on the initial theoretical framework, as presented in Appendix 4, but has been revised to reflect new insights from Phase 3 of the evaluation. This revised theoretical framework will inform the final phase of evaluation research in Phase 4, and will be finalised at the end of Phase 4. Phase 4 research will focus on testing additionality theory and reliability theory.

The revised theory presented below comprises:

Figure A5.1 Revised participation theory for aggregators

Figure A5.2 Revised participation theory for direct participants

Figure A5.3 Revised participation theory for aggregator clients

Figure A5.4 Revised auction participation theory

Figure A5.5 Revised auction bidding theory

Figure A5.6 New CMU design for reliability theory

Figure A5.7 Revised additionality theory (H1) – TA contributes to more (competitive) flexible capacity for the CM in 2018/19 and subsequent years

Figure A5.8 Revised additionality theory (H2) – the TA contributes to wider encouragement of turn-down DSR

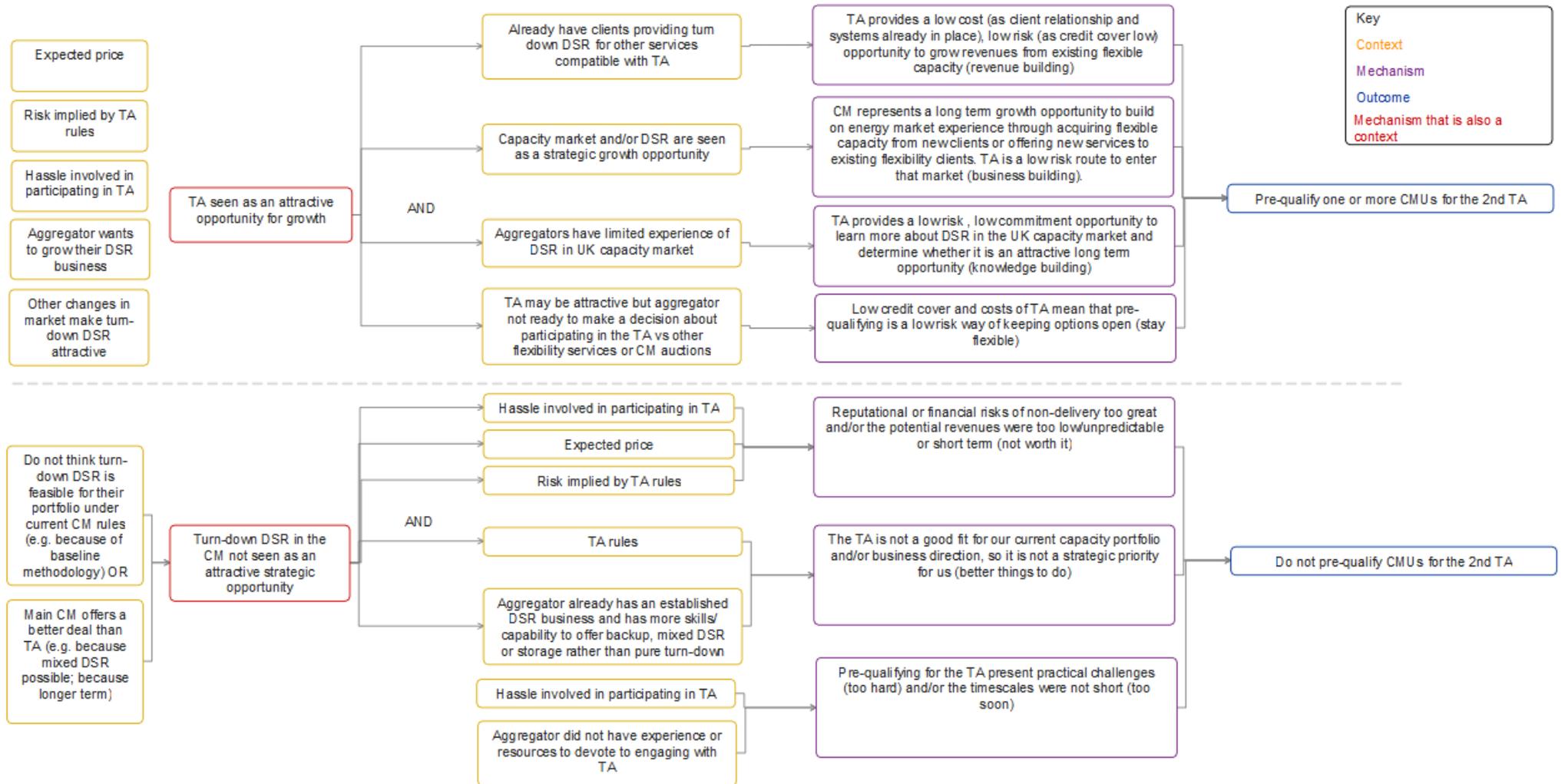


Figure A5.1: Revised participation theory for aggregators

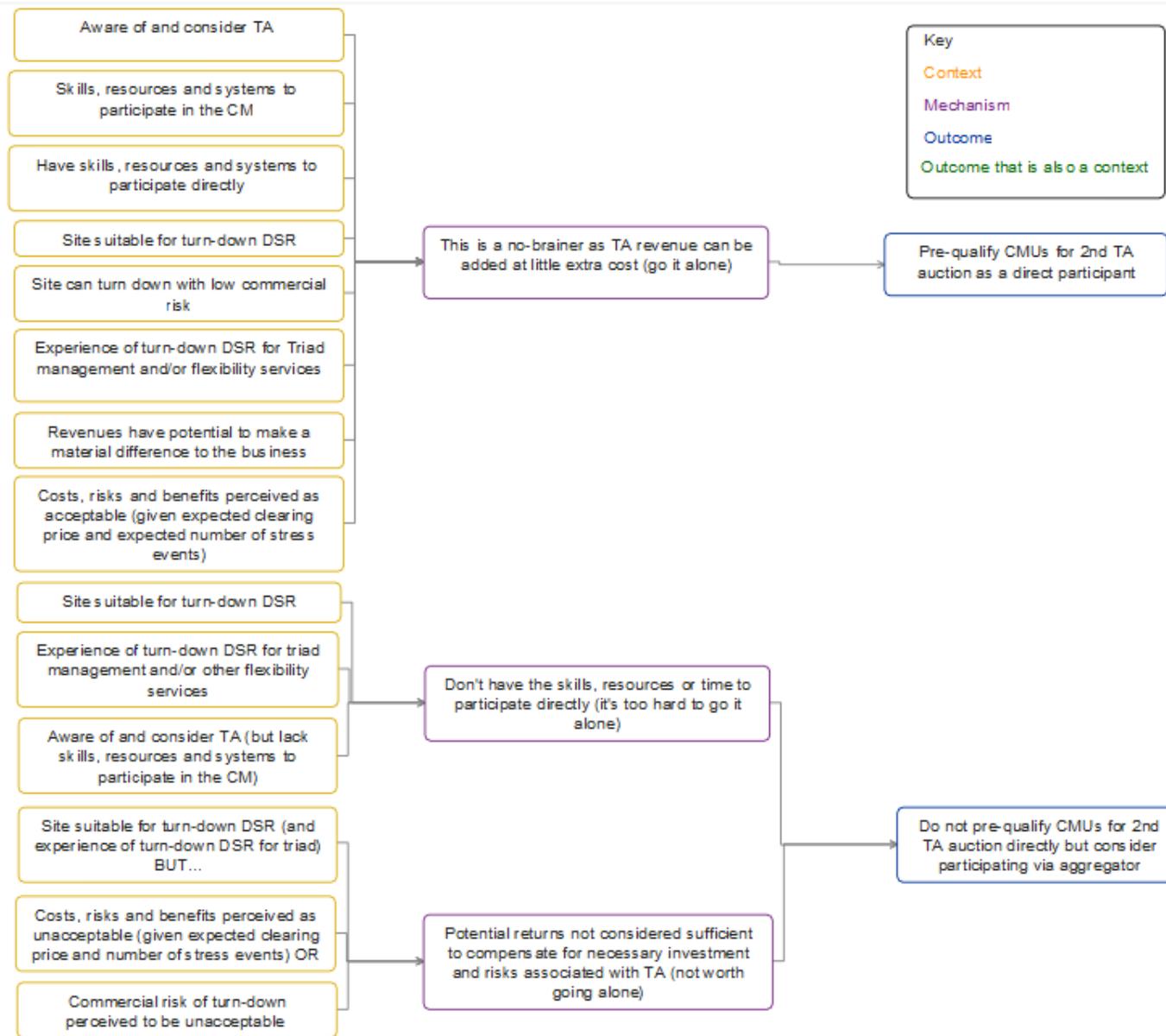


Figure A5.2: Revised participation theory for direct participants

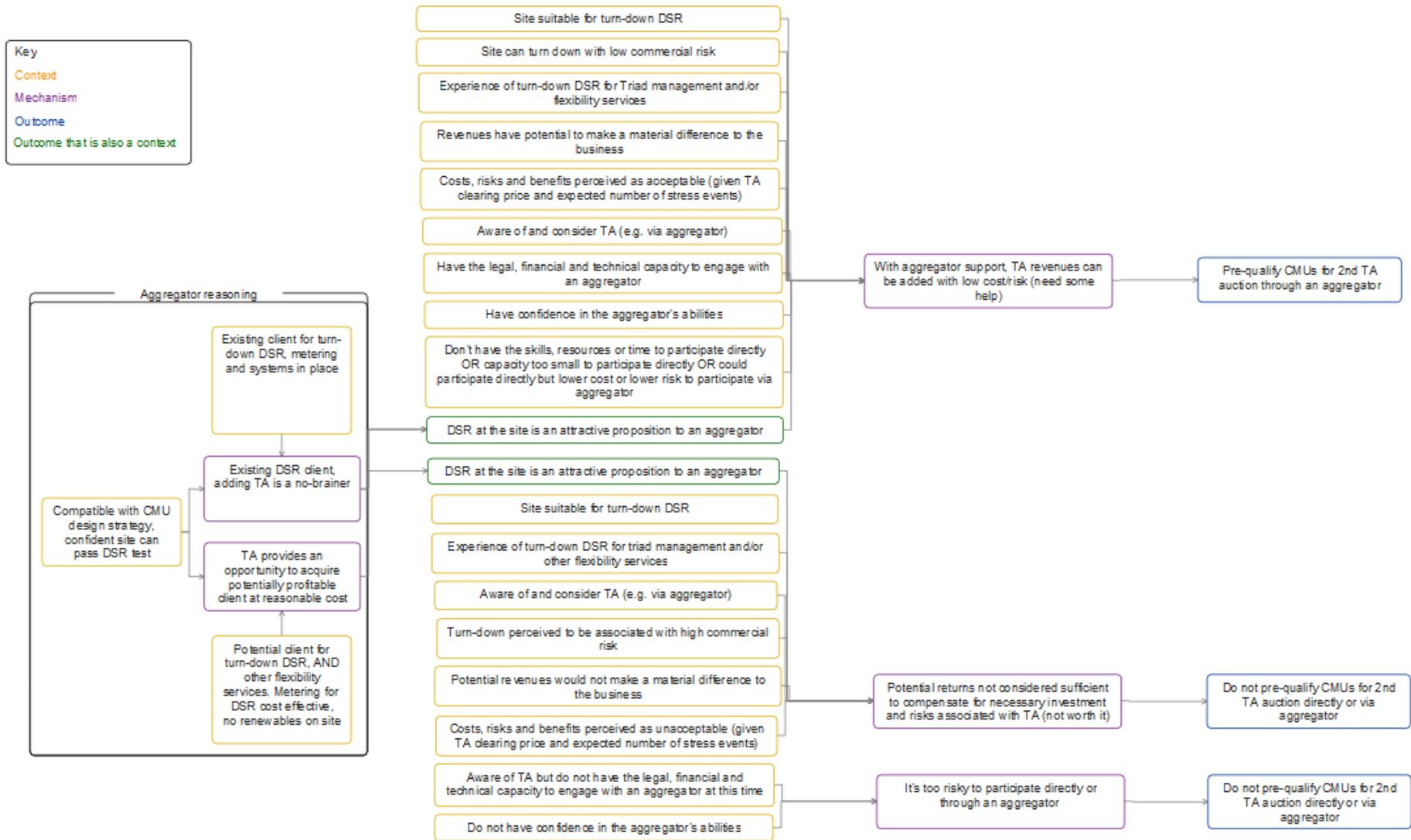


Figure A5.3: Revised participation theory for aggregator clients

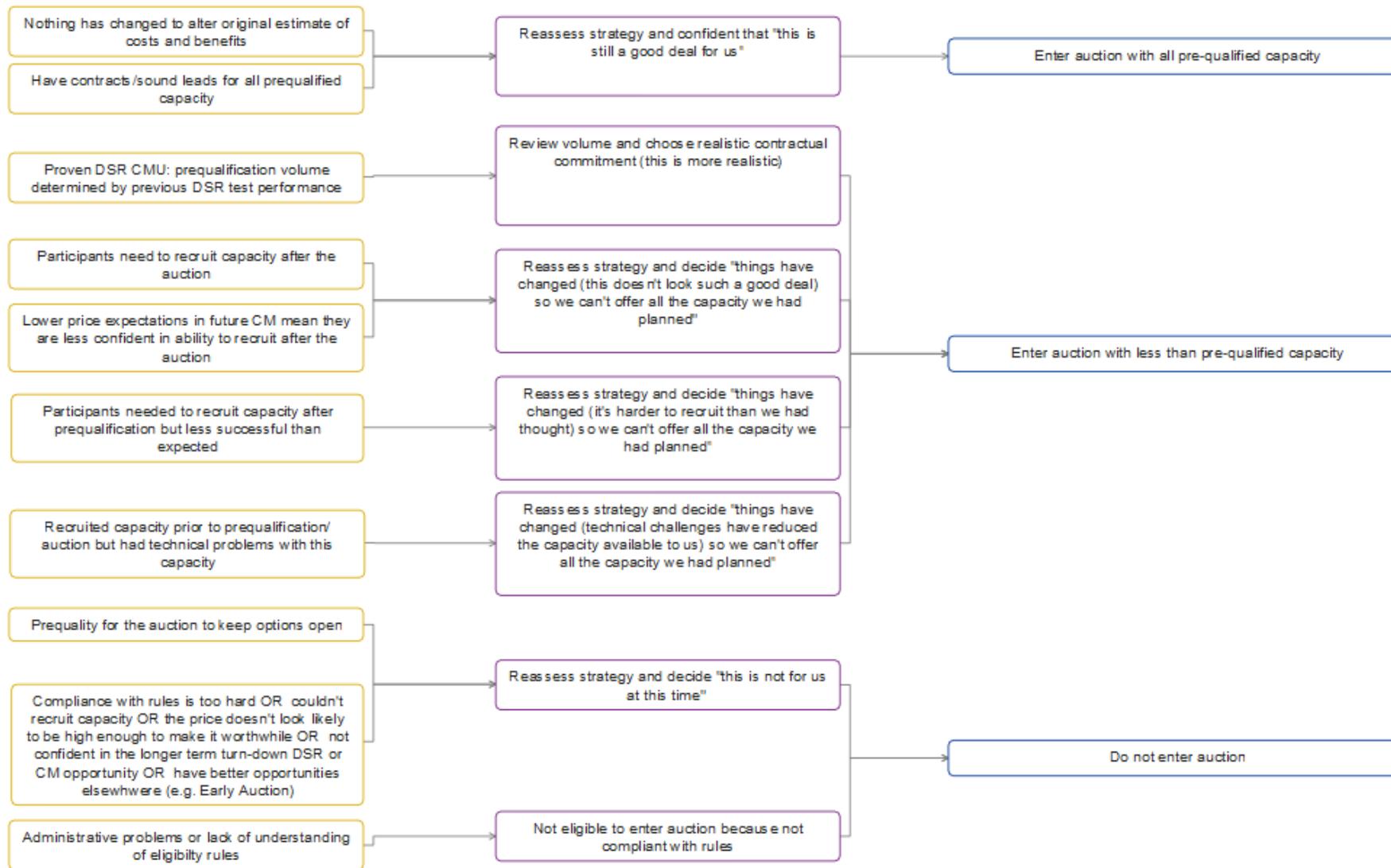


Figure A5.4: Revised auction participation theory (aggregators and direct participants)

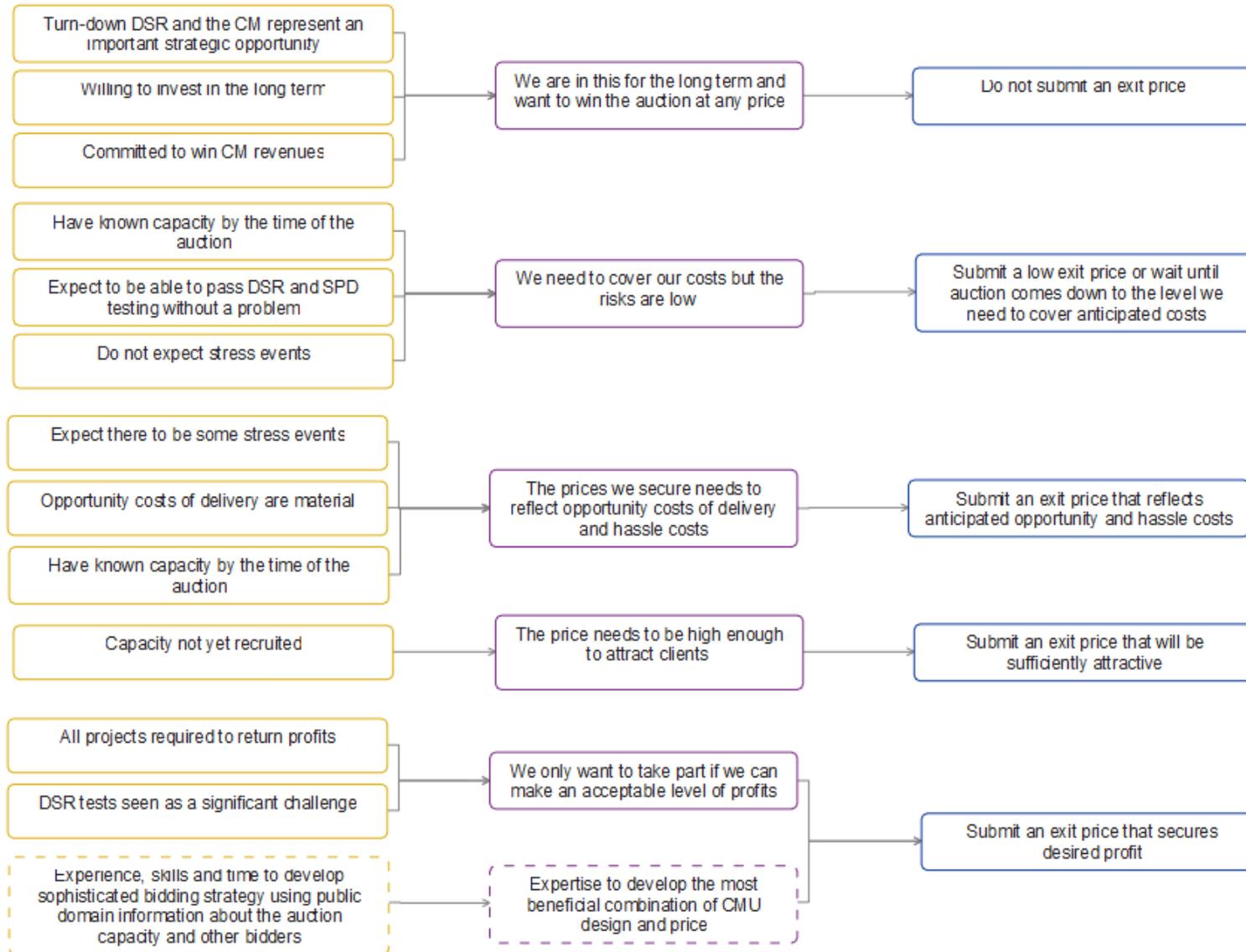


Figure A5.5: Revised auction bidding theory (aggregators and direct participants)

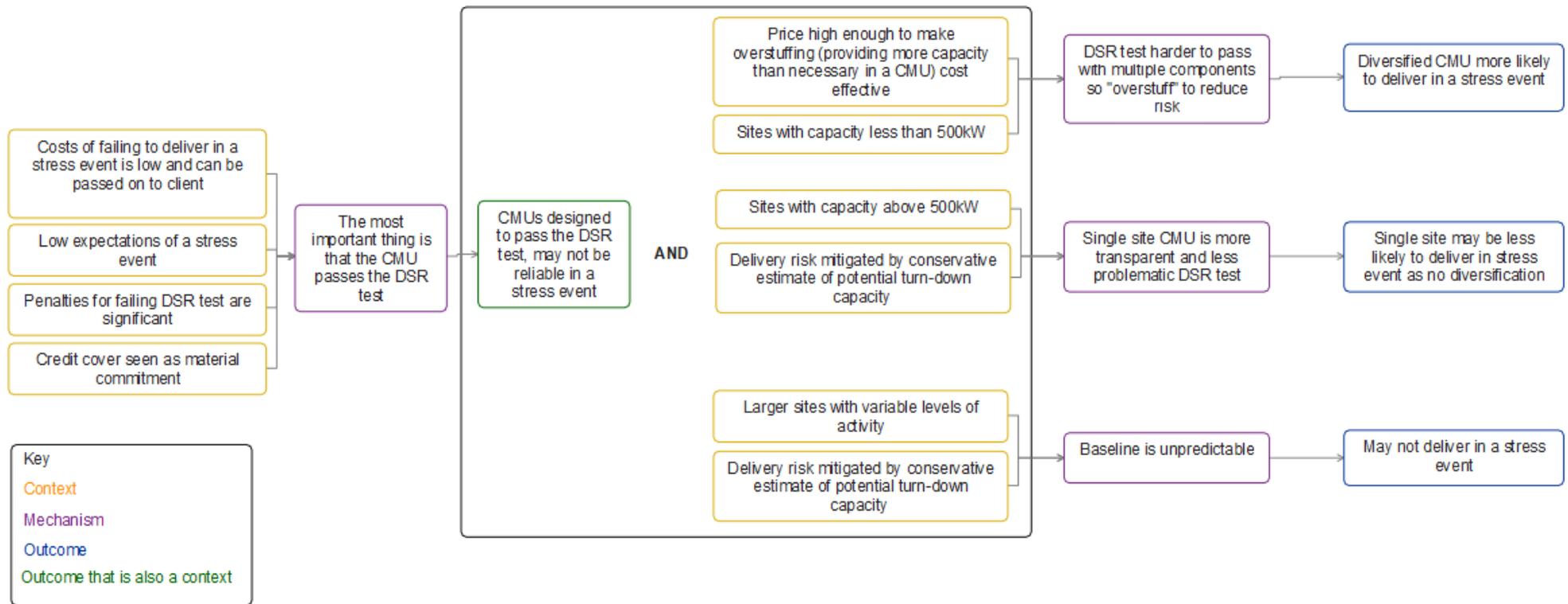


Figure A5.6: New CMU design for reliability theory (aggregators and direct participants)

## Appendix 5: Revised theoretical framework for the second TA

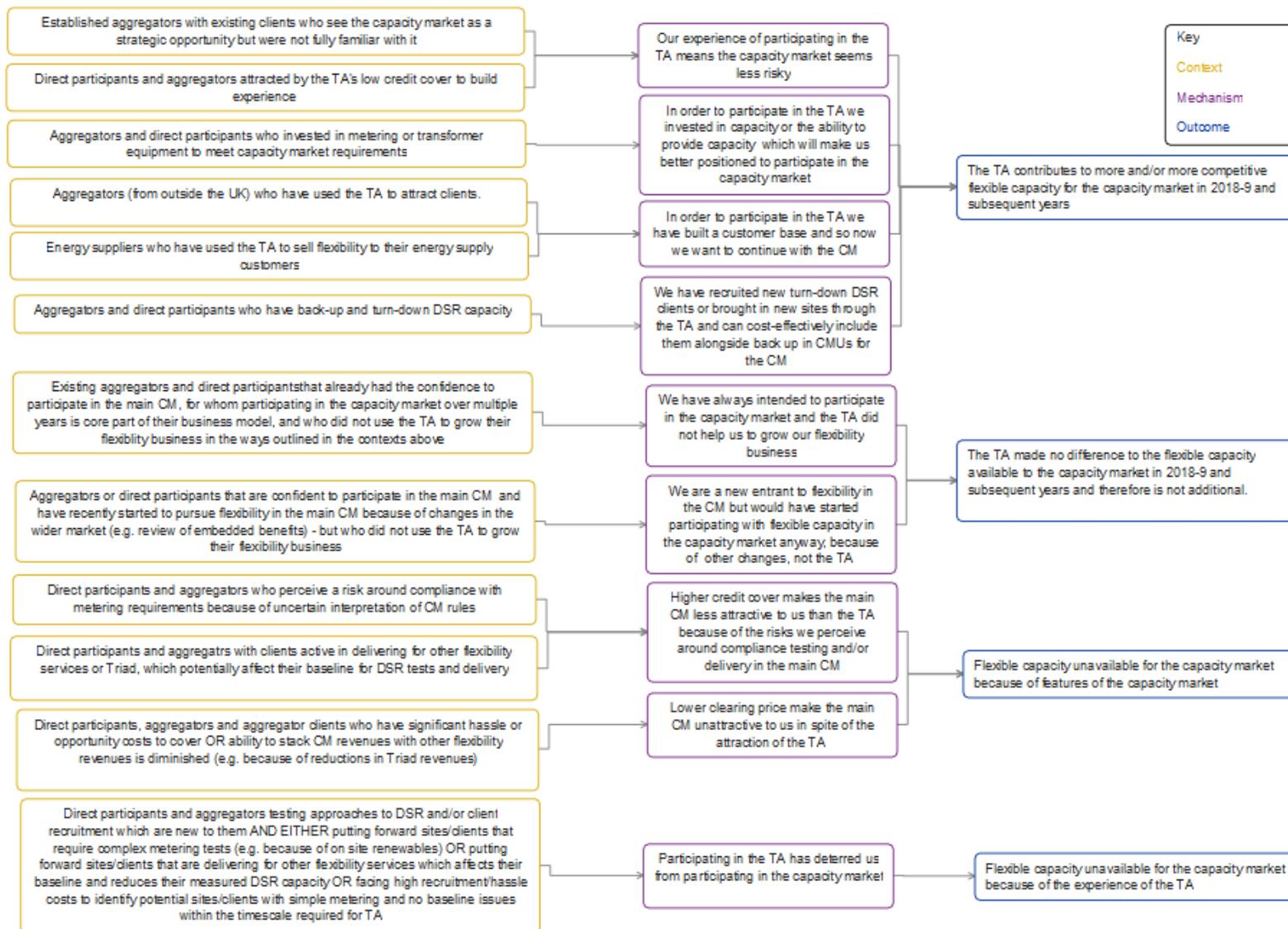


Figure A5.7: Revised additionality theory (H1) – TA contributes to more (competitive) flexible capacity for the CM in 2018/19 and subsequent years

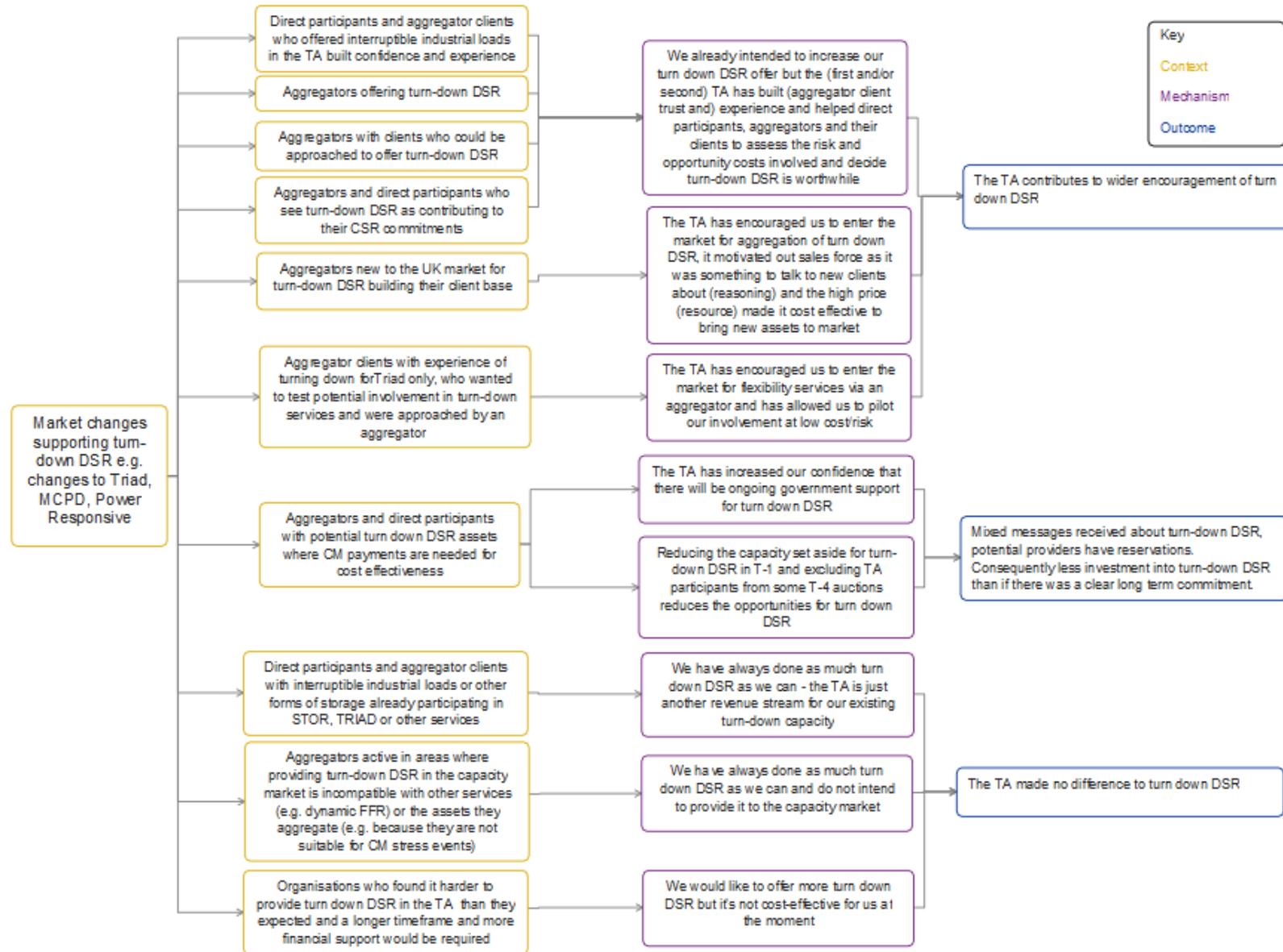


Figure A5.8: Revised additionality theory (H2) – the TA contributes to wider encouragement of turn-down DSR



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