FLEXFORUM

FlexForum Insights

Moving towards consistent contracting arrangements and terms of trade will increase the availability of flexible resources

31 March 2023

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Main points

The FlexForum is an association of organisations from across the electricity eco-system which want to accelerate progress with practical action to ensure distributed energy resources (DER) and flexibility are available to:

- support affordable and reliable operation of the electricity market and power system
- enable accelerated electrification by households and businesses as part of the transition to a zero emissions economy.

The FlexForum produced the Flexibility Plan 1.0[1] to provide an initial list of the practical, scalable and least-regret steps needed to enable households, businesses and communities to make choices which maximise the value of DER and flexibility.

The FlexForum gathered a series of insights and questions while developing Flexibility Plan 1.0 on the effect of contracting arrangements and terms of trade on the incentives to use and supply flexible resources, particularly for contracted flexibility where there is a direct exchange between end-users of flexibility (eg, distributors, transmission grid owner, System Operator, traders) and suppliers of flexibility (eg, flexibility suppliers, DER owners).[2]

Contracting arrangements refer to the process of buyers and suppliers of flexibility finding each other and potentially agreeing to transact flexibility. Terms of trade document the counterparties (who), the product or service being exchanged (what, where and when), and specify the practical requirements for delivery (how), and payment (how much).

The purpose of presenting these insights (which are a summary of questions and challenges raised with and by the FlexForum) is to create the conversations which are needed to identify the critical path and critical steps needed to make tangible progress.

We think this FlexForum Insights covers topics and questions most relevant to distributors, Transpower as grid owner and System Operator, flexibility suppliers, electricity retailers and other wholesale market participants, the Commerce Commission and Electricity Authority.

Working towards consistent contracting arrangements and terms of trade will increase the availability of flexible resources

Working towards consistent contracting arrangements and terms of trade will streamline the exchange of flexibility when the transaction involves one-to-one and one-to-many counterparty relationships across multiple locations. Reducing transaction costs will over time assist to create a virtuous cycle which increases the supply of flexible resources by making it easier for large and small suppliers to monetise investments in flexibility.

Encouraging the supply and use of flexibility provides more options to ensure electrification and decarbonisation occurs without diminishing reliability of supply and is as affordable as possible.

Consistent contracting arrangements and terms of trade should be allowed to evolve over time through a collaborative and experience-driven process which identifies fit-for-purpose exchange mechanisms for the range of flexibility use cases. The FlexForum prefers an evolutionary approach for consistency because settling on final arrangements now risks locking in inefficient processes, terms and outcomes. The immediate focus should be operational policies, specifying the protocols required for parties to physically coordinate with each other.

[1] You can find the Flexibility Plan 1.0 here. References are made to steps in the Flexibility Plan throughout this paper.

[2] A direct (bilateral) exchange between buyer and supplier is one method for exchange of flexibility. Flexibility will also be exchanged between buyer and supplier indirectly, for example, in response to price signals. This Ofgem paper on Flexibility_platforms_in_electricity_markets gives some useful context on different ways flexibility might be exchanged.

A good first step is to increase the transparency of contracting arrangements and terms of trade by having buyers publish their starting point contract for transacting flexibility – this is already happening through the Electricity Networks Association.[3] A further step will be to have buyers and suppliers share improvements, particularly about operational policies, arrived at through experience with commercial negotiations and implementation.

Additionally, careful consideration should be given to the most appropriate exchange mechanism when defining the specifications for services which which can be supplied using flexibility.[4] The exchange mechanism – be it a request for proposal (RFP) process or a flexibility platform[5] – should be suited to the service being exchanged and create a process which is as transparent, simple, consistent and repeatable as possible.

Managing the risks of non-performance while still in a learning phase is the immediate challenge

A flexibility buyer must currently take a 'leap of faith' in contracting to use flexibility as an alternative to existing, proven solutions such as physical network reinforcement. The underlying problem is the mis-match between reward and risk of non-performance while flexibility is in its pre-and-early commercialisation phases for most use cases and the probability of non-performance is both the greatest and least understood. This is especially pronounced in the phase prior to mass deployment of flexibility assets, as the buyer and seller may often be faced with both *deployment* risk (will enough units be sold) and *performance* risk (will the units do what I need them to do).

The commercial response in the current environment is for the buyer to pass the 'extra' risk on to the supplier and for the supplier to require 'extra' compensation for accepting that risk. Current regulatory settings and commercial incentives mean that the extra compensation is not generally available. The consequence is to slow the development of flexibility options.

Explicit incentives, particularly for network operators, are needed to support efficient allocation of risk between buyers and suppliers of flexibility while they undertake learning-by-doing to build understanding of the nature and scale of risk of non-performance of flexibility and its potential.[6] The incentives could include lower performance thresholds while learning is happening.

How do you think we can answer the questions and turn the challenges into opportunities?

More information on the FlexForum and its members can be found on the **FlexForum webpage**

To have a conversation or to send your thoughts and views, please contact us at info@flexforum.nz

[3] The Electricity Networks Association is collating information EDB requests for non-network alternative services.

[4] This suggestion complements Flexibility Plan 1.0, Step #6 to develop a common definition for network services which could be supplied using flexibility, including minimum communication and technical requirements.

[5] Let's use the Ofgem definition here - a flexibility platform is an IT platform where the coordination, trading, dispatch or support services for flexibility markets take place. See Ofgem, September 2019, Flexibility_platforms_in_electricity_markets, page 6.

[6] This suggestion aligns with Flexibility Plan 1.0, Step #18 to ensure regulatory settings provide Transpower and distributors with sufficient resources, incentives, and permission to explore and use flexibility options.

Flexibility will increasingly be transacted across the electricity supply chain

Flexibility will increasingly be transacted across the electricity supply chain because it provides households, businesses, communities and industry participants an extra tool for managing costs and risk of obtaining and using electricity services.

Much flexibility will be used by households, businesses and communities to manage energy-related costs, provide a specific level of reliability and resilience or reduce emissions (or all three).

Flexibility will also be used more often that it is currently across the electricity supply chain to provide energy market services, network services and ancillary services when doing so suits the owner of the resource.

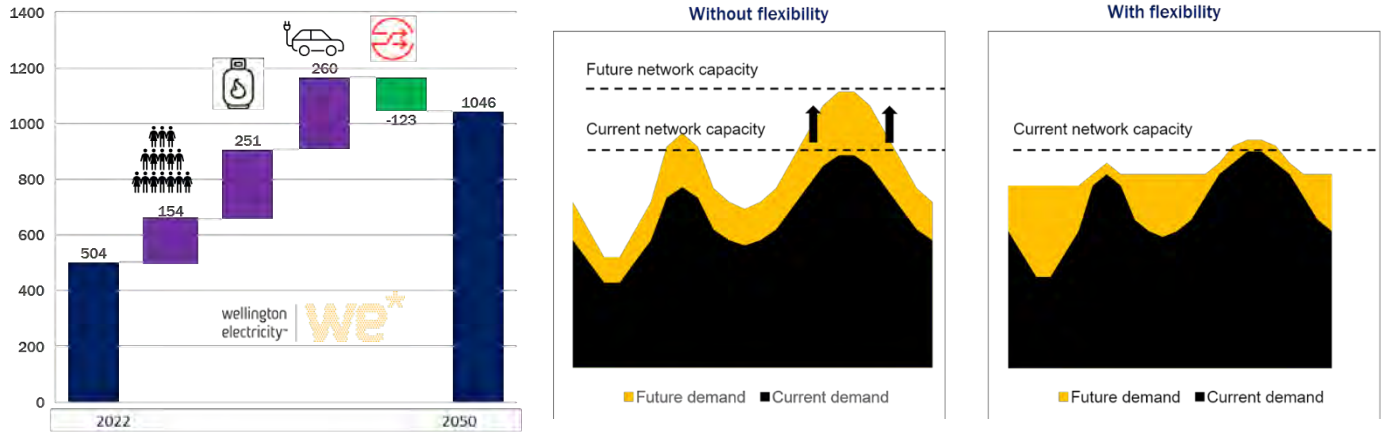
Source: Flexibility Plan 1.0

"…today's landscape for demand-side response [ie, flexibility] is changing markedly. New technology means that consumers who receive a dynamic price signal should no longer have to dynamically (and often manually) determine their response. The recent evolution of sensors, automation, algorithms and smart devices has dramatically reduced this need for consumer engagement. Advanced communications are enabling an increasing range of consumption devices to be controlled remotely. … This lays the platform for a range of commercial arrangements and tariffs through which market participants can procure and reward demand-side flexibility (DSF) from resource owners (customers)."[7]

Flexibility will be an important (but not the only) tool for maintaining a reliable and affordable power supply. Electricity retailers, distributors, and Transpower as the Grid Owner and the System Operator will need to use the flexibility available from household, business and community DER to manage costs of supply.

[7] Market Development Advisory Group, *Price discovery in a renewables-based electricity system*, Options paper, December 2022

Wellington Electricity highlighted in 2022 its expectation that it will be looking for flexibility to offset about 123 MW of extra network capacity by 2050.



Source: Wellington Electricity, presented at the SEANZ 2023 conference

The flexibility of DER can unlock significant efficiencies for asset owners and consumers more broadly. Making it easier to supply and use flexibility provides more options to deliver affordable electrification and decarbonisation without diminishing reliability of supply.

Transacting flexibility will be easier with consistent contracting arrangements and terms of trade

Contracting arrangements – the process of buyers and suppliers finding each other and potentially agreeing to transact flexibility, and terms of trade, go together.

Contracting arrangements is used rather than 'procurement' to better reflect the two-sided nature of the exchange and the interests of both the buyer and supplier. For example, a buyer can use a procurement process to source a service while the supplier decides to participate and potentially makes an offer. Alternatively a buyer and supplier might match through a flexibility platform managed by a third party rather than through a self-managed procurement process.

Having pre-defined processes and commercial terms covering things like the contracting approach, product specification, performance requirements, and obligations for liability and costs will help to reduce unnecessary variation in contract terms and help to make both the buyer and supplier confident that the terms are fair and reasonable.

Consistent contracting arrangements and terms of trade have been developed in the United Kingdom. The Smart Systems & Flexibility Plan 2021 expects "Distribution networks will deliver and adopt a standardised approach to procuring flexibility and managing connections across all GB distribution networks by 2023, where the core set of flexibility products are identical across different networks wherever possible, including common approaches to valuing flexibility, baselining methodologies, pre-qualification, dispatch and settlement and monitoring requirements".[8]

[8] Department for Business, Energy & Industrial Strategy and ofgem, Smart Systems & Flexibility Plan, action 3.2, page 85

The conclusion reached in the UK context[9] is that a standardising contracting arrangements and terms of trade used by distributors to obtain flexibility increases the number of flexibility suppliers and volumes of flexibility (ie, liquidity):

- making it easier for flexibility providers to transact
- reducing the costs of procurement, legal review and negotiation for providers and buyers
- giving providers confidence that contract terms are fair and reasonable by avoiding unnecessary variation in contract terms
- avoiding conflicts across distribution and system operator services from potentially contradictory contract terms.

Identifying and using consistent processes and terms for procuring and transacting electricity services is not unique. Equivalent arrangements have evolved over time for connection of distributed generation, retailing electricity, and use of distribution networks.[10]

Consistent contracting arrangements should develop over time

FlexForum participant, Orion, is currently developing a draft contract for its Lincoln Flexibility Trial drawing on the RFP process and contracts developed by Aurora and Powerco and on UK contracts. The Orion version will be available to the next distributor (or other buyer) looking to procure flexibility and so on.

Distributors procuring flexibility, including Aurora, Network Tasman, Orion, Powerco and Vector, are sharing contracts and terms of trade. This is a positive step which will help with the evolution of consistent terms of trade.

Learning-by-doing is needed because although some use cases for flexibility are mature and well understood (eg, ancillary services, hot water management using price signals), other services such as deferral of network investment are nascent and there is little real practical experience with the what, when, how and why of transacting these.

The next step is to increase the transparency of contracting arrangements and terms of trade for new services through buyers publishing their starting point contract for transacting flexibility, plus sharing improvements made to all services arrived at through experience with commercial negotiations.

The FlexForum can support ongoing incremental improvements to contracting arrangements and terms by collating and sharing contract documents and by providing a channel for flexibility suppliers and buyers to share perspectives on opportunities to apply learning-by-doing.

Contracting arrangements should suit the service

In recent years several distributors have used RFP processes to source flexibility. The Transpower demand response programme used a platform to recruit flexibility suppliers to supply a specified service to the transmission grid owner.

Experience from the United Kingdom provides some insight into the opportunities and challenges around contracting arrangements. The perspective of Piclo - an independent marketplace for trading flexibility operating in the United Kingdom and several other jurisdictions - was shared with the FlexForum in May 2022.[11]

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[9] ENA Open Networks Project Phase 4 2020 Project Initiation Document, May 2020, page 28. See https://www.energynetworks.org/assets/images/Resource%20library/ON20-PRJ-Phase%204%20PID%20Post-Consultation-v2%20(published).pdf

[10] Distributed generators can contract with distributors for access to the network using the regulated terms in Part 6 of the Code. Contracts between customers and retailers for electricity retail services are expected to conform with Consumer Care Guidelines published by the Electricity Authority. Electricity retailers can contract with distributors for use of the distribution network using a regulated default distribution agreement.

[11] Refer FlexForum_Session 9_Notes, Thursday 25 May 2022.

The Piclo platform supports the procurement journey from publication of flexibility needs (based on network constraint analysis), provider qualification, technical asset qualification, competitive auctions and big analysis and results. The Piclo platform does not control or manage devices. Nor does it get involved in contract negotiations. Technical specifications underpinning qualification of resources are nationally consistent based on the flexibility service products.

The platform emerged in 2018 when Piclo was awarded innovation funding to develop a user friendly, scalable and cost-effective flexibility procurement process for distributors to recruit flexibility. Distributors had started by using traditional procurement platforms but found these were not fit-for-purpose for flexibility suppliers and labour intensive for both distributors and flexibility suppliers.

The FlexForum is not advocating for a Piclo-type platform or any other process. However, effort should be directed to developing recruitment processes which are suited to the service being exchanged, and are as transparent, simple, consistent and repeatable as possible. Simplifying recruitment processes lowers participation costs, increases access to flexibility suppliers and increases volume of assets able to participate.

Terms of trade for flexibility already share many common features

Arriving at detailed rules - like a set of common terms of trade - requires coordination and a credible prospect of regulatory intervention.[12]

Expecting an organic 'market-led' process to develop efficient terms of trade for flexibility through some amicable process involving multiple buyers and multiple sellers ignores experience with developing electricity markets the world over. Sometimes it's helpful to go back to basics - on markets, Ronald Coase tells us that detailed rules are necessary for markets to approach the competitive ideal, with this insight borne out by looking at 100 years of evolution of exchange traded markets for all sorts of commoditised goods and services.[13]

The FlexForum in mid-2022 looked at four contracts[14] from the United Kingdom, California and Aotearoa New Zealand finding four broad categories of contract terms. Appendix A gives more detail on the matters covered in each type of term.

- Commercial – terms about the service/product being transacted, contract term, fees and payment, and dispute resolution
- Technical and operational – terms specifying the technical and operational requirements for delivery
- Risk management – terms intended to protect the buyer in the event of non-delivery

[12] Regulatory intervention is a plausible response if there is wide variation in terms of trade and a prevalence of terms which unnecessarily and inefficiently impose costs and risks on one party over the other. Part 12A of the Electricity Industry Participation Code is written to include additional default agreements.

[13] Ronald Coase, The Firm, The Market and The Law. Chicago University Press, 1988, for Coase's views on markets and regulation

[14] The contracts considered were:

- Aurora Energy, Upper Clutha Non-Network Electricity Capacity Support Agreement.
- Pacific Gas & Electric Company, Distribution Investment Deferral Framework Standard Offer Contract, Technology Neutral Pro Forma Agreement, available at: https://www.pge.com/en_US/for-our-business-partners/energy-supply/electric-rfo/wholesale-electric-power-procurement/didf-soc-pilot.page?WT.mc_id=Vanity_didf-soc-pilot. The California Public Utilities Commission required utilities in California to develop a standard offer contract.
- Transpower, Demand response programme participation agreement. The Demand response participation agreement was modelled on the Grid Support contract, refer https://tpow-corp-production.s3.ap-southeast-2.amazonaws.com/public/plain-page/attachments/design-features-for-grid-support-contracts_0.pdf?VersionId=ysjhFEx9Zdp76tngDRvFLlsidTYBb__a
- Western Power Distribution (now National Grid) Flexibility Services Agreement & ENA Flexibility Services Standard Agreement version 2, August 2021, available at: https://www.energynetworks.org/assets/images/Resource%20library/ON21-WS1A-P4%20Standard%20Agreement%20for%20procuring%20Flexibility%20Services%20(Version%202)%20(13%20Aug%202021).docx. These are broadly equivalent as the WPD/National Grid agreement reflects the ENA Standard Agreement.

- Legal and procedural – terms which matter to lawyers but little practical impact on day-to-day transacting of flexibility.

The main insight from looking at the four contracts is the terms were generally consistent. Broadly speaking, the commercial, technical and operational terms in the Aurora, PG&E, Transpower and WPD/ENA contracts were aligned with the nature and type of service being transacted.

Further, many of the contract terms were similar to those found in existing contracts used to exchange other electricity services.[15] This alignment with terms in contracts for existing services should simplify the process of arriving at a common contracting approach and terms of trade for transacting flexibility.

The FlexForum considers the requirements and expectations on the buyer and seller can be guided by existing practice (eg, regarding dispute resolution) and by experience from developing requirements relating to valuing and rewarding flexibility and technical and operational parameters.

We expect terms of trade for the better understood use cases and services will evolve to enable new participants, while completely new use cases will see a period where terms of trade reflect the relative experience of the buyer and the seller, maturity of procurement systems, relative risk appetites, and relative risk management capabilities. The resulting variation will create cost and hassle for both buyers and sellers, but both the variation and cost should fall over time.

The FlexForum prefers an evolutionary approach for standardisation because settling on 'final' terms now would risk locking in conservative and inefficient arrangements which reflect current understanding and risk appetites, rather than allowing existing services to evolve and new services to mature their arrangements based on experience.

Managing the risk of non-performance while still in a learning phase is the immediate challenge

Flexibility buyers must currently take a ‘leap of faith’ in contracting to use flexibility as an alternative to existing, proven solutions such as physical network reinforcement because doing so involves accepting a range of risks.

The risks encompass counterparty risk (will the supplier do what it says over the necessary timeframe), deployment risk (can sufficient units of flexibility be deployed in time), and performance risk (will the flexibility deployed perform as expected).

The standard commercial response to uncertainty and the associated risk of non-performance is for the buyer to pass the associated risks on to the supplier and for the supplier to require ‘extra’ compensation for accepting that risk.

The number and size of these risks mean a flexibility buyer currently needs to make a calculated business decision about the extent to share or transfer risk to suppliers, trading off a choice to support growing the supply of a pre-commercial service and trying to manage risk by transferring it to the supplier. The risk are exacerbated for network operators in particular because they will be held accountable through regulatory settings and the community if learning to use flexibility negatively impacts reliability levels and consumers. This, naturally, leads to a degree of conservatism on their part.

At the same time, current regulatory settings and commercial incentives mean that network operators are not funded to provide the extra compensation a flexibility supplier might need to accept the associated risks of non-performance. Most suppliers do not have

[15] For example, agreements between distributors and electricity retailers for use of the network, see the Wellington Electricity Default Distributor Agreement, at https://www.welectricity.co.nz/disclosures/dda/document/232 , and contracts between electricity retailers and customers for electricity supply, see the Ecotricity Residential Terms of Use, at https://ecotricity.co.nz/terms-of-use-residential#section_2.

the ability to solely manage the risk of non-performance when the probability of non-performance is both the greatest and least understood. In this circumstance, there is a mis-match between risk and reward which deters participation and slows the development of flexibility options.

The challenge is amplified for use cases with limited market liquidity, for example, the risk of non-performance when using aggregated flexibility for ancillary services can be mitigated by limiting procurement volumes as new solutions mature and procuring flexibility needs from several suppliers (diversification). However, procuring flexibility as an alternative to network-reinforcement is generally a binary commitment.

Consequently the mis-match between risk and reward during the pre-and-early commercialisation phase of flexibility is a key issue to resolve, both as a contracting matter and to gain buy-in about allocation of risk of non-performance when there is little opportunity to manage risk through diversity.

Explicit incentives are needed, particularly for network operators, to support learning-by-doing to build understanding of the nature and scale of risk of non-performance of flexibility and its potential. The incentives could include lower performance thresholds while learning is happening.

The importance of risk management while our understanding of flexibility is developing is the reason steps #29 and #34 of the Flexibility Plan call for a common approach to risk management in contracts to exchange flexibility directly involving consumers and in contracts to supply flexibility for network reasons, eg, between a distributor and flexibility supplier.

Balancing pre-emptive assurance and after-the-fact consequences and repercussions

The four contracts considered included two main types of risk management mechanism:

- requirements for pre-emptive testing and assurance, eg, insurance, performance bonds and proving tests
- provisions setting out after-the-fact consequences and repercussions of non-performance, eg, financial damages and termination payments.

Pre-emptive obligations include financial mitigations, eg, insurance or performance bonds, and proving tests to confirm device performance. After-the-fact obligations relate to financial penalties, ranging from non-payment for non-performance to liquidated damages to termination payments. Pre-emptive and after-the-fact obligations impose costs on the buyer and the supplier, though in the examples considered most of the costs are incurred by the supplier. Things to consider in developing risk management approaches for flexibility in existing circumstances include:

- how liability and consequences (penalties) are determined given the nature of the resource and circumstances of the supplier
- how performance obligations are determined given the capability of the resources
- how to manage customer and regulatory expectations while experience is gained with using flexibility.

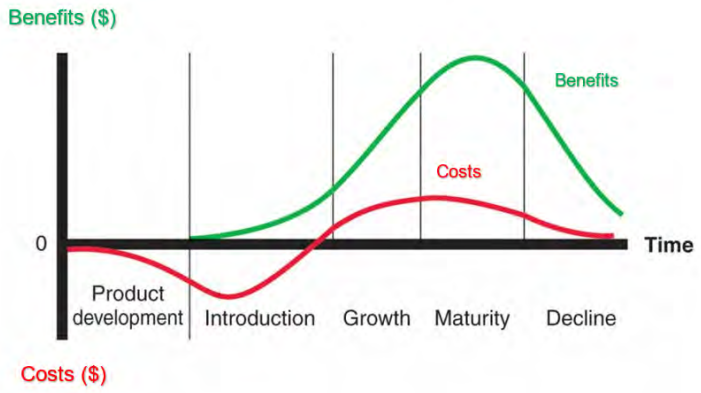
A key insight highlighted by the experience of Transpower and the United Kingdom distributors is the potential for risk management provisions, for example penalties for non-performance to deter participation and reduce availability and liquidity of flexible resources.

In the United Kingdom, penalties for non-performance have not been included in the initial contracts for flexibility for network reasons, although the ancillary services procured by the system operator have very strict non-delivery mechanisms. Penalties were found to reduce the supply of flexibility by deterring participation. In the absence of strict performance requirements distributors

over-procure flexibility, or develop other contingencies, which also require funding. The penalty for non-performance has been no payment, though some may be phased in over time.[16]

The Transpower contracting approach during its demand response programme pilot deliberately excluded obligations and penalties for non-performance (aside for non-payment) to make it as easy as possible for parties to participate. A similar approach has been adopted by Aurora for the upper Clutha non-network alternative programme.

The underlying problem is the allocation of risk and cost between the buyer and seller in the pre-and-early commercialisation phases of new flexibility services when the probability of non-performance is greatest.



In a mature product market, the performance expectations and requirements for flexibility are be well-known by both the buyer and seller. However, there is currently considerable uncertainty about the range of performance of flexible resources, creating uncertainty and risk for the buyer about whether the service will be delivered. The commercial response is to pass this risk on to the seller (to the extent possible; this will necessarily exclude regulatory compliance risks borne by the buyer) and shifts considerable product development risk and the associated costs to the seller, which may not have the resources to absorb the associated costs. The consequence is to deter participation and slow development of flexibility options.

A learning-by-doing approach has been used by Transpower, Aurora and in the United Kingdom to support commercialisation of flexibility – the buyer has absorbed some of the product development risk while working to better understand the range of performance of flexible resources. However, in each case, the learning-by-doing has been supported by the regulator providing explicit financial support (funded by consumers through a regulatory allowance). There has been less appetite for absorbing product development risk when the regulator did not make explicit financial incentives available.

The learning-by-doing will build understanding of the nature and scale of risk of non-performance of flexibility. The FlexForum considers that the level of risk of non-performance may be overstated (due to a lack of familiarity) relative to the status quo performance of traditional alternatives. Simply put, no distribution network is 100% reliable, so it is not reasonable to hold a flexibility solution to a never-fail standard.

[16] This perspective was shared by Randolph Brazier, Director of Innovation and Electricity Systems, ENA UK. A recording of the presentation and discussion is available here: https://youtu.be/5CW74yDxSw4

Appendix A: assessment of common terms used when transacting flexibility

Table 1 lists terms of trade across four functional areas which are practically required to transact flexibility. The list was developed by a non-lawyer from a plain reading of flexibility contracts from the United Kingdom, California and Aotearoa New Zealand. It is not a comprehensive listing of contract provisions.

Tables 2 to 4 give a summary description of the matters covered in the commercial, technical and operational and risk management term types. The matters covered in the legal and procedural term type are not described because they are boring and do not directly affect day-to-day transacting of flexibility.

Several of the flexibility contracts included references to obligations created by legislation. These provisions are not considered in this assessment because they are unlikely to be directly relevant to the day-to-day transacting of flexibility. Examples include obligations relating to Health and Safety, Modern Slavery, Anti-Bribery and Living Wage (in Great Britain).

Table 1 Matters covered in the four types of provision included in contracts for transacting flexibility

Type of term	Matters covered
Commercial: terms about the service/product being transacted, contract term, fees and payment, and dispute resolution	• Service / scope • Fees / payment • Term / duration • Invoicing and payment [process] • Disputes [process]
Technical and operational: terms specifying the technical and operational requirements for delivery	• Service levels • Events / instructions • Monitoring & equipment / communications • Measurement
Risk management: terms intended to protect the buyer in the event of non-delivery	• Service failure and material breach • Termination • Force majeure • Indemnity, liability & insurance • Certification of capability / attestations
Legal and procedural: terms which matter to lawyers but would rarely have a practical impact on day-to-day transacting of flexibility	All the contracts considered included a range of legal and procedural terms. Examples of these provisions include terms about: Variation, Representations & Warranties, Assignment, Sub-contracting and Change in Ownership, Limitation, Confidentiality, Governing law and Jurisdiction, and Notices.

Commercial terms

This section provides a description of the five 'core' commercial terms of trade found in the review of the flexibility contracts.

Table 2 Overview of common commercial terms

Terms of trade	Description & discussion
Service(s)	Provision(s) describing the type, specification, and scope of the service being procured through the contract. Emerging practice is to put details about service types and technical specifications in a schedule and use pre-defined service parameters (eg, the sustain, dynamic, secure, restore products). … contract clearly describes the service. The definitions say "Flexibility Services" means, and more particularly described in Schedule 1, the services to be provided…[to] give the Company the ability to manage the load at a specific point of the Network at certain points in time… Schedule 1 describes the operational requirements, including service parameters, and technical service requirements.
Term of agreement & service delivery period	Provisions specifying the start and end dates and operational delivery period for the service. Contract start and end dates may not align with delivery period. … contract refers to operational periods and anticipated operational period as part of the operational requirements. This aligns with The Aurora contract implies an operational period starting 1 April 2021.
Fees & payment	Provision(s) describing the level and structure of fees and payment for services. …contract sets out in a schedule the payment and performance calculations. • Dynamic service – utilisation payment and availability payment • Secure service – utilisation payment and arming payment • Restore service – utilisation payment … contract specifies an Availability Payment and Event fee.
Invoicing [process]	Provision(s) describing invoicing requirements and payment timeframes. … contract appears to align with industry standards. Valid invoices received on or before the 5th business day will be paid on or before the 20th of that month.
Disputes [process]	Provision(s) describing how disputes on invoicing or other matters will be resolved. … contract describes a 3-step dispute resolution process: good faith efforts; escalation to senior representatives after 30 days; escalation to mediation or legal proceeding after 30 days. … contract describes a similar process: good faith efforts, escalation to senior representatives after 5 days; escalation to chief executives after 15 days; and then legal or arbitration proceedings.

Technical and operational terms

This section provides a description of the four 'core' technical and operational terms of trade found in the review of the flexibility contracts.

Table 3 Overview of common technical and operational terms

Terms of trade	Description & discussion
Service levels and performance expectations	Provision(s) specifying the service parameters and the technical performance requirements the provider is expected to achieve. … contract says the provider must "ensure that its System NNS has the required capacity and storage to operate in aggregate to achieve an operational demand reduction service to levels specified in Table A during each Peak Period…" The Supplier must ensure that its affected Systems respond to the Event as set out in **Error! Reference source not found.**, by reducing electricity demand on the Network to the maximum extent possible, taking into account the need to preserve the ability to reduce demand during later Peak Periods. Also, The supplier must ensure that the Network load during any transition reflects the Transition Decrease Rate (no more than 500kW a minute) and Transition Increase rate (no more than 1MW a minute) … contract covers service parameters and technical performance along with the service description, ie, the specifications for the sustain, dynamic, secure, restore services.
Event instruction	Provision(s) specifying how flexibility will be dispatched … contract says "The parties will work together to determine the required response capability, timing and plan applicable to unplanned contingency Events as set out in Schedule 2 prior to 1 September 2021" … contract refers to four levels of response: 1 battery discharge 25%; 2 battery discharge 50%; 3 battery discharge 75%; and 4 battery discharge 100% "To enable the Supplier to prepare their Systems for maximum response on these days, the buyer will aim to provide an Event day signal on or before 8pm on the day prior to the peak load day." … contract establishes an offer and bid process for a specified period. … contract refers to the portal used as the operational platform for flexibility providers to declare availability, submit meter readings and instruct events. "By 23:59 hours on each Wednesday (or as otherwise agreed between the Parties), the Provider shall notify Central Control of any Site(s) / CMZ Group that is Available for the despatch of Demand Response in a Zone…"
Monitoring & equipment / communications	Provisions outlining what information and data will be exchanged and how … contract lists real time communication requirements • The supplier must provide aggregated information on: system available capacity (MW); system available capacity (MWh); total load of consumers with flexible resources; and signal received • …must provide communications status; signal sent; status of circuits; and total load of circuits … contract refers to signal and control requirements - the API requires continual provision of minute-by-minute data throughout the operational season, and ideally 3 weeks before the season begins.

Terms of trade	Description & discussion
	Providers are expected to develop their own interface for the API to the assets that they intend to offer to the Company." Signals between the provider and buyer are: • The provider must provide current power usage in kW, with timestamp, per zone; and emergency stop signal • …must provide dispatch start control; and dispatch stop control.
Measurement	Provisions outlining how performance (delivery of flexibility) will be measured … contract says "The Flexibility Services require constant metering with data collected throughout the course of the month. This is collected via the API and confirms that the Company has operational communications, but also facilitates the acquisition of background data to calculate the historical consumption, used for establishing a baseline. … contract says The Provider must provide Verification Data for each Call within 20 Business Days after the end of the Call Period. The Verification Data must cover the entire Call Period and any other periods required to apply the relevant Verification Methodology

Risk management terms

This section provides a description of the seven 'core' risk management terms of trade found in the review of the flexibility contracts.

Table 4 Overview of common risk management terms

Terms of trade	Description & discussion
Service failure & material breach	Provisions relating to failure to provide the contracted service • …contract expects the provider to give notice once aware of the inability to provide flexibility. Buyer may ask for a written explanation and to implement a rectification plan or vary the service requirements. Failure to improve performance after 30 days will be a material breach and allow termination • …contract says if the Supplier fails to meet the Firm Service Levels, the parties will meet to discuss and address the resolution of the issues, which may include a reduction of Fees, amendments to the Plan, or termination of this Agreement • … contract allows liquidated damages of $1333/MW/day if the buyer does not achieve the initial delivery date for any reason other than force majeure • … contract allows PG&E to take a first priority security interest all such Performance Assurance posted with PG&E – this performance assurance is $40/kW for project development security and the same for delivery term security
Termination	Range of reasons for early termination • …contract allows for termination for a material breach, receivership etc. Termination for material breach allows recovery of the cost, loss and expenses incurred from termination, including where relevant appointed a replacement provider. The expenses are subject to the cap on liabilities • … contract allows termination for poor performance with 20 days' notice. Termination is without prejudice • …contract allows the seller to terminate the contract if the interconnection upgrade cost is above an amount or the interconnection stud/agreement is delayed. The Seller must pay a $20/kw early termination payment

Terms of trade	Description & discussion
	• … contract specifies a range of events of default which allow early termination. Events include receivership etc, and failure to perform (less than 80% of service). A termination payment is payable
Force majeure	A provider is not obliged to meet its contract obligations due to a force majeure event • … contract expects the provider to provide notice of a force majeure event. Early termination is allowed if the force majeure event continues for more than 8 weeks. • The contract details Force Majeure events. Termination is possible if the vent extends for 60 days or more
Indemnity, liability & insurance	Provisions relating to indemnity, liability and insurance • … contact caps the aggregate total liability of either party at the greater of £1M or an amount equal to the total charges payable and already paid in the year. The provider shall procure appropriate insurances to cover its total potential liabilities • … contract caps liability at the sum of all DR Fees accrued in that 12-month period • … contact sets total aggregate liability at $10M for the Supplier and at the amount of Fees paid to the Supplier in the preceding 12 months. The suppliers must have public and product liability insurance of not less than $10M per event and in aggregate, professional indemnity insurance of not less than $5M per event and in aggregate
Priority	Provisions giving the buyer priority or exclusivity over the flexibility resource • … contract says that if the Supplier is engaged to provide flexibility to other purchasers, it must ensure that priority is given to providing non-network support
Testing	Obligations to test device performance • … contract explicitly does not require a proving test – No Proving Tests (test of ability to deliver a response) of assets or asset groups are required in order for the Provider to commence provision of service as detailed … • …contract requires a test event within 3 months of the start of the initial term and at least twice per contract year, with the timing agreed • … contract requires an initial performance test (against specified procedures) and gives the buyer the option to request further tests no more than once a year
Certification of capability	Provisions to provide the Buyer with comfort about the capability of the provider to do what they are contracted to do • … contract requires the Supplier to provide a plan (annually) and a monthly report demonstrating how it will meets its obligations. The plan must include things like: how the systems will be marketed to consumers; how service levels will be met; etc. The Buyer must approve the plan. The Supplier must implement the plan • … contract says the provider shall "Ensure or procure the Availability of the DER and perform the Flexibility Services in compliance with this Agreement…".