SCR Access sub-group Report 2: Option Variants of Access Choices

Annex 2: Detailed initial assessments of access arrangements options

Contents

1. Assessment of firmness of access defined by physical drivers

Option for access definition	Key design choices	Option variants	Option variants customer choice	Key combinations or hybrids	Guiding principles for assessment – pros and cons			Enablers / dependencies needed	User types which may be particularly well suited / unsuitable
					Arrangements support efficient use and development of network capacity	**Arrangements reflect the needs of consumers as appropriate for an essential service**	**Any changes are practical and proportionate**		
1) Physical firmness - network limits on access	Users' immediate connection to the network (i.e. redundancy in sole use or service assets.	Single circuit connection	Local connection arrangements	Linked to willingness to pay and acceptable level of resilience.	**Pros:** Provides basic connection to the network that can be delivered quickly and cheaply. **Cons:** Potentially minimises further development of the network.	**Pros:** This would be classed as a minimum cost scheme for the majority of connections and therefore is a cheaper connection. Value for money and appropriate for an essential service. **Cons:** May not deliver required resilience for essential service.	**Pros:** Both practical and proportionate. **Cons:** May not deliver required resilience for essential service.	Defined standards and CCCM for appropriate allocation of costs.	Suitable for most customers' current requirements. May not be suitable in the future if customers' resilience expectations increase.

		Double circuit connection			**Pros:** Provides more resilient connection to the network enabling better use of the network through operational flexibility. **Cons:** Provides connection to the network enabling better use of the network through operational flexibility.	**Pros:** **I**ncreases customers' resilience and hence service continuity**.** May be appropriate as part of an essential service. **Cons:**	**Pros:** Both practical and proportionate. More resilient connection. **Cons:** More expensive connection.	Defined standards and CCCM for appropriate allocation of costs.	More appropriate for customers that require greater service continuity e.g. some I&C customers, including DG and storage.
	Users' connection to the wider network, as defined by planning standards	Connection to the wider system below applicable standards (i.e. flexible connection)	Wider networks arrangements	Linked to willingness to pay and acceptable level of resilience.	**Pros:** Flexible connections deliver choices for customers and enable greater use of the network. **Cons:** Flexible connections enable greater use of the network' delivering choice for customers.	**Pros:** Provides choice to customers, balancing costs of connection and ongoing access. **Cons:** May not be appropriate as an essential service.	**Pros:** Practical. Offers customers choice and cheaper upfront connection. **Cons:** Brings ongoing curtailment obligations.	Defined standards and CCCM for appropriate allocation of costs (which includes information on how ANM costs calculated, via defined methodology).	More appropriate for active customers able to manage their consumption and/or generation e.g. distributed generation and storage.

		Connection to the system maintaining applicable standards (i.e. standard connection)			**Pros:** Vanilla option delivering what customers' want. Promotes efficient development of the network. **Cons:** May not promote efficient use of the network as network utilisation is <100%.	**Pros:** Appropriate as essential service arrangement. **Cons:** May not be appropriate for an essential service.	**Pros:** Practical. Vanilla option provided to (/ chosen by) most customers. **Cons:**	Defined standards and CCCM for appropriate allocation of costs.	Appropriate for most customers.
		Connection to the system with arrangements beyond applicable standards (i.e. "gold plated"/bespoke connection at user's request)			**Pros:** Enhanced option delivers what customers' want. **Cons:** Additional costs to serve and potentially decreasing network utilisation in areas of the network.	**Pros:** Provides choice to customers, balancing costs of connection and network resilience ensuring highly reliable secure access. **Cons**: Not appropriate as an essential service for some customers.	**Pros:** Practical. **Cons:** Not appropriate for majority of customers	Defined standards and CCCM for appropriate allocation of costs. Understanding of the likely costs for the bespoke connection and how calculated (i.e. defined methodology) and alternatives.	Customers that require greater service continuity e.g. some I&C customers, including distributed generation and Storage.

	Curtailment driven by capacity constraints	Curtailment permitted due to (specified types / specific instances of) capacity constraints	Degree of curtailment	Linked to time-profiling.	**Pros:** Supports efficient use of the network, if customers agree to this level of curtailment. **Cons:**	**Pros:** Offers choose options for customers. **Cons:** May not be appropriate as an essential service.	**Pros:** Practically possible. Proportionate for those customers willing to be flexible. **Cons:**	Knowledge of types and likely frequency of constraints to understand level of curtailment. Capacity constraint arrangements embedded in connection agreement (or other contract). Appropriate equipment and processes to deliver curtailment.	Some demand customers but mostly Distributed Generation and Storage customers.
		Curtailment not permitted for capacity constraint			**Pros:** May restrict efficient use of the network, if customers agree to this level of curtailment. **Cons:** Requires network reinforcement or flexible services to mitigate capacity constraint so potentially decreases efficient use of the network.	**Pros:** May be appropriate as essential service arrangement. **Cons:**	**Pros:** Practically possible. **Cons:** Proportionate for majority of customers.	Arrangements embedded in connection agreement (or other contract).	Most customers would expect no capacity constraints.

	Curtailment driven by faults and planned outages	Curtailment permitted post fault/ planned outage			**Pros:** Supports efficient use of the network, if customers agree to this level of flexibility. **Cons:**	**Pros:** **Cons:** May not be appropriate as an essential service.	**Pros:** Practically possible. Proportionate if customers accept this level of flexibility. **Cons:** Not proportionate if customers accept this level of flexibility.	Appropriate equipment and processes to deliver curtailment. Knowledge of types and likely frequency of fault to understand level of curtailment. Curtailment arrangements embedded in connection agreement (or other contract).	Some I&C customers, including Distributed Generation and Storage.
		Curtailment not permitted post fault/planned outage			**Pros:** Increased resilience may aid network development in growth areas. **Cons:** Requires greater network resilience and so decreases efficient use of the network.	**Pros:** Maybe appropriate as an essential service. **Cons:**	**Pros:** Practically possible. **Cons:** Unlikely to be proportionate due to the level of network assets/flexible services required for the resilience.	Appropriate standards and operational arrangements to manage service continuity post fault. Arrangements embedded in connection agreement (or other contract).	All customers, but in particular Distributed Generation and Storage.

2. Assessment of firmness defined by customer outcomes

Key design choices	Option variants	Key combinations or hybrids – could be combined with:	Guiding principles for assessment – pros and cons			Enablers / dependencies needed	User types which may be particularly well suited / unsuitable
			Arrangements support efficient use and development of network capacity	**Arrangements reflect the needs of consumers as appropriate for an essential service**	**Any changes are practical and proportionate**		
Rules based	a) Through queues/position in queue before curtailment (e.g. LIFO, pro rata, market based)	a) queues for curtailment (e.g. LIFO) i) time-profiled options ii) caps, indices or other limits on drivers of curtailment iii) Potentially combine with physical drivers of constraints iv) Options for applying "rules" only to certain events as defined by network drivers	a) queues for curtailment (e.g. LIFO) **Pros:** • Connecting users have some basis to estimate likely curtailment levels • Provides network operators more flexibility to manage unexpected constraints **Cons:** • Without further limits, actual curtailment levels may be subject to increase beyond the level expected. • Curtailment may be impacted by microgeneration or other changes in demand locally, reducing certainty	a) queues for curtailment (e.g. LIFO) **Pros:** • Connecting users have some basis to estimate likely curtailment levels **Cons:** • Actual access may still be very uncertain	a) queues for curtailment (e.g. LIFO) **Pros:** • Arrangements are widespread under existing ANM schemes **Cons:** • Might have some roll-out costs in expanding to wider areas	a) queues for curtailment (e.g. LIFO) Caps or incentives to minimise curtailment may be needed to ensure efficient curtailment levels. Establishing mechanisms to trade curtailment liability likely to help improve efficiency	a) queues for curtailment (e.g. LIFO) More likely suited for: • Generation • Potentially I&C demand Unlikely suited for: • Small demand users (e.g. households)
Level / frequency of curtailment	b) Defined by number of curtailments c) Aggregate time of curtailment	b) Defined by number of curtailments	b) Defined by number of curtailments Pros: • Can be linked to events on the	b) Defined by number of curtailments Pros:	b) Defined by number of curtailments Pros: • Simple to implement	All options in this area would require customer-specific	Curtailment in general may be more suited to generation than demand.

	d) Timed using windows - more static e) Through a curtailment index f) Energy lost through curtailment (potentially defined by access)	c) Aggregate time of curtailment d) Timed using windows - more static e) Through a curtailment index f) Energy lost through curtailment All of the above options could be combined with financial firmness once their defined limits have been reached. All options could be combined with timed access where compensation is only paid in certain windows/outside of a profile.	network that may be used to justify investment on the network. Cons: • Number of curtailments is unlikely to accurately value the lost productivity of the consumer so not an accurate signal for impact c) Aggregate time of curtailment Pros • Time curtailed is more likely to reflect impact of curtailment on the customer. Cons • Depending on customers underlying activity, aggregate time may not accurately reflect impact of curtailment d) Timed using windows - more static Pros • Windows may be used to reflect customers underlying activity (i.e. windows based on sunlight for PV) Cons	• Simple for customers to understand Cons: • Number of curtailments is unlikely to accurately value the lost productivity of the consumer so not an accurate representation of impact c) Aggregate time of curtailment Pros • Time curtailed is more likely to reflect impact of curtailment on the customer. Cons • Depending on customers underlying activity, aggregate time may not accurately reflect impact of curtailment d) Timed using windows - more static Pros • Windows may be used to reflect customers underlying activity (i.e. windows based on sunlight for PV) Cons	c) Aggregate time of curtailment Pros • Relatively simple to implement d) Timed using windows - more static Pros • Relatively simple to implement Cons • Defining windows may be complex and very customer-specific e) Through a curtailment index Pros • Can be adapted to fit various situations (e.g. take account of relevant variables for area etc.) Cons • Depending on how index is compiled, could lead to inconsistencies or confusion f) Energy lost through curtailment Pros • Can be linked to known values such as spot price Cons	monitoring of curtailment events and a process to deal with actions taken when limits reached. Extra requirements listed below where relevant. b) Defined by number of curtailments c) Aggregate time of curtailment d) Timed using windows - more static Process to set windows is required and potentially customer or area specific database of defined windows. e) Through a curtailment index Process of setting index and limit required. Also potentially customer or area specific	For demand customers likely to only be a subset of demand that is considered flexible and therefore subject to curtailment. This may need reflecting in arrangements. f) Energy lost through curtailment Most suited to generation

			Cons • Static windows may not be best reflection of some users' underlying activity e) Through a curtailment index Pros • If index defined using relevant criteria, could accurately reflect impact of curtailment • Easy to benchmark over wider areas if applied consistently Cons • Depending on how index is compiled, could lead to inconsistencies or confusion f) Energy lost through curtailment Pros • Most accurate reflection of impact of curtailment Cons • Potentially complex to calculate and volatile	• Static windows may not be best reflection of some users' underlying activity e) Through a curtailment index Pros • If index defined using relevant criteria, could accurately reflect impact of curtailment • Easy to benchmark over wider areas if applied consistently Cons • Depending on how index is compiled, could lead to inconsistencies or confusion f) Energy lost through curtailment Pros • Most accurate reflection of impact of curtailment Cons • Potentially complex to calculate and volatile	• Potentially complex to calculate and volatile. Requires links to settlement process.	index definitions may be required. f) Energy lost through curtailment Requires links to markets to obtain value of energy (if to be valued). Requires knowledge of customers' underlying activity to determine what energy import/export would have been.	
Overrun / override	g) network company can exceed set	Both of these options can potentially be	g) network company can exceed set curtailment level	g) network company can exceed set curtailment level	g) network company can exceed set curtailment level	Both options require further systems to value	i) network company can exceed

options for curtailment	curtailment level under certain conditions / for a payment h) customer can override curtailment under certain conditions / for a payment	combined with any of the options above for setting limits Combine with rules if too many parties opt to override.	under certain conditions / for a payment Pros • Allows network operator control over any overrun scenario and therefore ensure network security and stability h) customer can override curtailment under certain conditions / for a payment Cons • Customer overrun could cause network security issues • This option would be volatile and hard to forecast/plan for	under certain conditions / for a payment Cons • Unpredictable for customers • Payment may not reflect value of overrun curtailment h) customer can override curtailment under certain conditions / for a payment Pros • Allows customer further choice over curtailment requirements	under certain conditions / for a payment Cons • Requires further communication channels between customer and network operator • System/method required to value payments h) customer can override curtailment under certain conditions / for a payment Cons • Requires further communication channels between customer and network operator • System/method required to value payments	payments and administer them Would require a system to assess a backstop (network protection is unlikely to be appropriate backstop)	set curtailment level under certain conditions / for a payment Unlikely to suit any customers except those with the most flexible requirements. j) customer can override curtailment under certain conditions / for a payment More suitable for customers in general but only likely to be truly suitable for those most engaged and therefore able to make decisions based on curtailment vs payment

3. Assessment of financial firmness

Option for access definition	Key design choices	Option variants	Key combinations or hybrids	Guiding principles for assessment – pros and cons			Enablers / dependencies needed	User types which may be particularly well suited / unsuitable
				Arrangements support efficient use and development of network capacity	**Arrangements reflect the needs of consumers as appropriate for an essential service**	**Any changes are practical and proportionate**		
3) Financial firmness and commercial conditions	Instances where payment is due – units to be compensated	a) Payment per instance of curtailment b) Payment for time curtailed	Must be clear in physical access arrangements under which circumstances compensation will be paid or not e.g. if fault on local network vs wider network (as set out in physical factors rows), with a link to the investment decision the user has made. It should also be clear in the contract how the payment calculation will work and under which circumstances it wont be paid e.g. force major.	**Pros** Build solutions may not be necessary if the cost of curtailment is cheaper leader to more efficient network. Time curtailed may achieve this more than number of instances **Cons** Users may choose to have a more robust connection if it could result in them being compensated, however this may not be more efficient for the whole network. Note – price signals are	**Pros** Users can better plan their business due to clear security over when payments will be received or not Consumers should benefit if commercial solutions are used when cheaper than build solutions Payment for time curtailed better reflects the service provided by users. One instance of curtailment may be for several weeks, and therefore a more accurate reflection of their	**Pros** The BM is an existing mechanism to implement this, which all transmission connected, larger embedded generators (with BEGAs) and aggregated embedded generation have access too Wider BM access is making the BM easier for parties to participate in **Cons** It could be costly for every embedded generator to have the equipment required to participate in the BM. Any monitoring equipment either for the BM or other compensation mechanism could be costly.		Option variant b (time curtailed) would be more suited to most user types as it more accurately reflects their loss of using the system. Large demand & all generation could be valid for

				needed to stop inefficient spend	usage is by time period, **Cons** Users may not know what service they require when they connect and therefore which financial terms to accept			
	How the unit price is determined	c) Value of lost energy (e.g. wholesale market, spot price) d) Value of lost market value (beyond energy cost) e) Value of lost production (demand) f) Value of avoided network cost (e.g. deferred network reinforcement / other e.g. based on charging model) g) Value of Lost Load (VoLL) similar to outage incentives	The model would need to be consistent & transparent across users. As set out above any instances where they would not be paid need to be clear in their agreements.	***All options*** As set out above ***Value of avoided network reinforcement*** **Pros** Supports efficient network as more realistic cost comparison between reinforcement vs commercial solution **Cons** Not practical for existing connections	***All options*** As set out above	***Value of lost energy*** **Pros** Value of lost energy is used today in the BM as parties bid on the price they wish to receive to be bid off. Value of lost energy, as provided by users, would be easier to calculate. **Cons** Open to "gaming" of market value if playing the market to ensure not taking any risk ***Value of lost market value*** **Pros** **Cons** Market value may change significantly by period e.g. depending on which balancing service contracts they have		

						Value of lost production **Pros** **Cons** Could be difficult to value More relevant to demand ***Value of avoided network reinforcement*** **Pros** **Cons** Could be difficult to value. Value of network reinforcement may be difficult for users to plan their business models around as it is out of their control. ***Value of lost load*** **Pros** Accepted term for outage payments **Cons**		

4. Assessment of time-profiled access

Option for access definition	Key design choices	Option variants	Option variants customer choice	Key combinations or hybrids	Guiding principles for assessment – pros and cons			Enablers / dependencies needed	User types which may be particularly well suited / unsuitable
					Arrangements support efficient use and development of network capacity	**Arrangements reflect the needs of consumers as appropriate for an essential service**	**Any changes are practical and proportionate**		
4) Time-profiled access	Degree of variation with time	Fixed 24/7 access (i.e. no time profile)	No time profiling		**Pros:** **Cons:** Limits efficient use and development of the network.	**Pros:** Ideal as a core service for all customers. **Cons:** May provide opportunity to crowd out access capacity of other users at particular times.	**Pros:** As-is now - easy to implement and manage with simplified record keeping and required limited capability of billing system. **Cons:**	Clear rules for consequences of breach of access conditions. An ability to process HH information to penalise contract excursions.	Ideal as a core service for all customers.
		Time bands/ windows i.e. specific periods of access within: a. Season Day b. Month c. Week d. Day e. HH	Time-profiled		**Pros:** Enables greater utilisation of the network. Potential to better utilise existing system capacity if spread of users. Could help network operators know when capacity in parts of the network are needed, and at which points in the year. **Cons:** Users' prediction of usage may be flawed – what then?	**Pros:** Better as optional service access arrangements. **Cons:**	**Pros:** Make use of developing existing / planned ANM scheme technologies. **Cons:** More difficult to implement with more complex record keeping and greater required capability of billing system.	An ability to receive and process HH information to monitor/control behaviour in real time and/or to penalise contract excursions, after the event. Greater complexity in how network companies plan and operate the system. The more choice, the more complex and volatile the signals will be and less diversity can be assumed when allocating capacity.	Ideal for active customers able to manage their consumption and/or generation.

		Event or condition based i.e. coincidence with factors such as weather conditions	Event or condition based		**Pros:** Enables greater utilisation of the network. **Cons:**	**Pros:** **Cons:** May not be appropriate as essential service arrangements.	**Pros:** **Cons:** More difficult to implement with more complex record keeping and greater required capability of billing system.	An ability to receive and process HH information to monitor/control behaviour in real time and/or to penalise contract excursions, after the event.	Ideal for active customers able to flex their consumption and/or generation.
	Degree of variability	Static (predetermined pattern) or dynamically (continuous variable) defined	Predetermined pattern or dynamically varying		**Pros:** Dynamic arrangements enable greater utilisation of the network. Static arrangements are easier to implement and manage. **Cons:** Dynamic arrangements are more difficult to implement and manage. Static arrangements may deliver less network utilisation.	**Pros:** Static is more appropriate for an essential service. **Cons:** Dynamic may not appropriate for an essential service.	**Pros:** Static timed access periods are easy to schedule. Dynamic time access periods offer greater flexibility. **Cons:** Static timed access periods may limit flexibility. Dynamic time access periods are difficult to agree, monitor and manage.	Static windows are easier to implement, whereas dynamic operation is more difficult to implement and is generally event/condition based.	Ideal for active customers able to manage their consumption and/or generation.
		Different notice periods for change	Is this really a customer choice or consequence of deciding the above choices?		**Pros:** **Cons:**	**Pros:** **Cons:**	**Pros:** **Cons:**		

5. Assessment of time-limited access

Option for access definition	Key design choices	Option variants	Option variants customer choice	Key combinations or hybrids	Guiding principles for assessment – pros and cons			Enablers / dependencies needed	User types which may be particularly well suited / unsuitable
					Arrangements support efficient use and development of network capacity	**Arrangements reflect the needs of consumers as appropriate for an essential service**	**Any changes are practical and proportionate**		
5) Time-limited access	Duration	Maximum and minimum duration	Length of short term access right (< 1 year)		**Pros:** Potential to encourage better utilisation of network capacity. **Cons:**	**Pros:** **Cons:** May not appropriate for an essential service.	**Pros:** Offering flexibility requires new commercial and contractual arrangements. **Cons:** Offering flexibility requires new commercial and contractual arrangements, increasing administrative resources.	May require a level of automation and network company access to user data. Clear rules for consequences of breach of access conditions – political consequences for domestic users	Ideal for active customers able to manage their consumption and/or generation.
	Static or dynamic windows	Defined or flexible start and end points	Start and end points		**Pros:** Generally encourages greater network utilisation with flexible start and end points encouraging better utilisation of available network capacity. **Cons:**	**Pros:** **Cons:** May not appropriate for an essential service.	**Pros:** Static windows are easier to define and manage. **Cons:** Dynamic windows are more complex to define and manage.		Ideal for active customers able to manage their consumption and/or generation.

6. Assessment of shared access

Option for access definition	Key design choices	Option variants	Key combinations or hybrids	Guiding principles for assessment – pros and cons			Enablers / dependencies needed	User types which may be particularly well suited / unsuitable
				Arrangements support efficient use and development of network capacity	**Arrangements reflect the needs of consumers as appropriate for an essential service**	**Any changes are practical and proportionate**		
Shared access	Number and type of parties participating	a) Any number of parties – commercially limited b) Maximum number of participating parties c) All types of usage / user can participate d) Limits on types of usage / user (e.g. domestic / new / existing)		a) **Pros** • Increases the number of sharing parties and so increases the potential for individual customers with diversified individual demands to collectively operate below the agreed shared maximum. **Cons** • The larger the number of parties increases the difficulty for the coordinating hand to manage collective or individual breach of access terms. Potentially solved through agree fixed term arrangements. • May create seasonal gaming issues with	a) No, not for the generality of consumers, but could benefit informed customers of different sizes. But complexity increases dramatically with the number of parties. b) No, not for the generality of consumers, but	a) This may be more complex to administer and manage. b) Limiting the number of parties, may make the administration and management of these access rights less complex.	For all options throughout, Enablers to address regarding confidentially and privacy are likely to be needed to create platforms/lists to form sharing groups. Potential sharing group members need to be able to identify each other or identified by a coordinating hand. Assumes that each participating customer has half hourly metering and HH data collection as a minimum	All options are likely to be better suited to larger, better informed customers and commercially capable customers. Customers who can monitor and manage their demand/export (or have it monitored and managed on their behalf). Customers who can take their share of responsibility for any breach of terms. Unsuitable for the generality of consumers.

				customers joining for short periods only. b) **Pros** • this option is more manageable than a) with clearly identifiable customers potentially working more closely with each other or the coordinating hand to operate under the access ceiling. • Compared to a) under option b) it is easier to identify and manage breach of terms. **Cons** • Compared to a) option b) reduces the number of sharing parties so reduces the potential for individual customers with diversified individual demands to collectively operate bellowed	could benefit informed customers of different sizes who could join specific sharing groups. c) **Cons** • Users need to be limited to those who fully understand the terms and conditions of the shared access deal and be able to take responsibility for the consequences of any breach.	c)This may be more complex to administer and manage. d) Limiting the number of parties, may make the administration and management of these access rights less complex.	(granularity of data is important). For all options, we need to consider whether sharing access is possible under the Electricity Act 1989 (ie sharing a maximum power requirement across multiple premises.	

				the agreed shared maximum. c) **Pros** • Potentially increases the size of the sharing group with diversity benefits. **Cons** • Users need to be limited to those who fully understand the terms and conditions of the shared access deal and be able to take responsibility for the consequences of any breach. d) **Pros** • More practicable and manageable than option c) by establishing pre-qualification for the sharing group e.g. customers of a similar size, technical competence or commercial acumen.	d) Yes, limits would be needed. This option is not appropriate for the generality of consumers, but could benefit informed customers of different sizes. **Pros** • More practicable and manageable than option c) by establishing pre-qualification for the sharing group e.g. customers of a similar size, technical competence or commercial acumen. • Sharing groups could be banded e.g. small medium and			

				• Sharing groups could be banded e.g. small medium and large and avoid mixed groups.	large and avoid mixed groups.			
	Locational conditions	a) Limited area only – proximity requirements b) Wide area – potential Exchange Factor needed		a) **Pros** • Could efficiently utilise network capacity e.g. behind a local constraint. • Parallels with existing multi-user private networks operating behind an agreed boundary capacity. **Cons** b) Yes, potentially, but like option a) above complexity increases dramatically with the number of parties. **Pros** • Increases the number of sharing parties and so increases the potential for individual customers with	a) • This may place limits on who is able to share access with each other. • Provides potential benefits and value to a group of newly connecting customers or customers seeking more capacity behind a constraint. • Potentially useful for a smaller group of customers who can cooperate with each other and	a) It easier to implement and administer across a limited area. b) It may be less practical or proportionate if applied across very wide areas.		

				diversified individual demands to collectively operate below the agreed shared maximum. **Cons** • The larger the number of parties increases the difficulty for the coordinating hand to manage collective or individual breach of access terms. Potentially solved through penalties agree fixed term arrangements (perhaps with a review prior to renewal). • May create seasonal gaming issues with customers joining for short periods only. • Could duplicate existing network operator arrangements that manage network sharing and diversity across a wide area, but with	be coordinated. b) • Removes any limits on who is able to share access with each other. • However the potential benefits and value to users may be lower.			

				additional potentially costly and inefficient commercial arrangements. • Sharing access would need to provide distinct network utilisation benefits that can be valued in order to have merit e.g. to defer or remove the need for reinforcement. This may be less clear over a large area.				
	Route for striking agreements	a) Sharing facilitated by DNO b) Sharing facilitated by customers		a) **Pros** • Network Operators already manage network sharing. • Network operator can analyse all customer's half hourly demands/exports for compliance with collective or individual breach of terms. • Network operator can address breach with individual parties confidentially	a) This approach may be more beneficial where customers are unable to manage the sharing of access themselves.	a) Places a larger burden on the network operator.		

				• Network operator can manage data confidentiality. **Cons** b) Yes, potentially for a small group of customers, but complexity increases dramatically with the number of parties. **Pros** • Empowers the customers in the sharing group to work collectively to benefit from any incentive. **Cons** • The larger the number of parties may increase the difficulty for the customers to manage against the terms collectively. • Unclear who manages non-compliance with terms • There may be difficulties in sharing	b) Gives customers greater control over the sharing of access. Requires users that are able to do this.	b) Reduces the burden for the network operator.		

				maximum import /export data. • Potential difficulties in managing breach if there is no coordinating hand. • An individual parties' breach may need to be managed publically across the sharing group with the likelihood of disputes.				

7. Assessment of standardisation

Option for access definition	Key design choices	Option variants	Key combinations or hybrids	Guiding principles for assessment – pros and cons			Enablers / dependencies needed	User types which may be particularly well suited / unsuitable
				Arrangements support efficient use and development of network capacity	**Arrangements reflect the needs of consumers as appropriate for an essential service**	**Any changes are practical and proportionate**		
7) Standardisation of access	Scope of standardisation	a) All parameters fully standardised with limited set of standard options		a) All parameters fully standardised with limited set of standard options **Pros:** • Standardisation can aid speed and efficiency of system design and forecasting by providing set assumptions or 'building blocks' of user access when determining impacts on the network **Cons:** • Could limit / restrict the ability to innovate or improve	a) All parameters fully standardised with limited set of standard options **Pros:** • Simplified choice is potentially more accessible for wider range of customers • May avoid requirements for some customer-DNO specific agreements for smaller users by e.g. incorporation in NTCs. Supplier could maintain intermediary role with small users without	a) All parameters fully standardised with limited set of standard options **Pros:** • More efficient to administer than many bespoke arrangements • Does not require many complex site-specific charging arrangements. **Cons:** • Depending on where in practice the standardisations occur, significant changes to systems, process and arrangements could be required.	a) . Requires amendments / new Codes, engineering standards New charging arrangements Amendments to charging methodologies to reflect standard options Depending on extent of standardisation, shift to new arrangements needs to happen simultaneously across industry where changes are nationwide	Small – medium demand users (e.g. domestic and small commercial) – standard options better suit customers who are unable or have no interest in agreeing bespoke parameters. Also volume of these users in GB creates issues around practicality of non-standard arrangements.

				network utilisation	need for additional customer-DNO interactions / agreements. • Customers could more easily compare and select level of access and weigh-up options e.g. supplier offerings • Enables better defined access rights and improved transparency where these are standardised in Codes, NTCs etc. **Cons:** • Broad approach restricts opportunities for some customers which do not sit neatly into standardised access arrangements.		and / or where there is interaction across options.	

					• Needs to be careful consideration of impacts on customers who are not able to engage in opportunities for access • Could restrict the ability for markets to differentiate and develop innovative offerings.			
		b) Hybrid - some aspects of access standardised, with others bespoke		b) Hybrid - some aspects of access standardised, with others bespoke **Pros:** • Facilitates the ability to innovate whilst maintaining standards • Provides ability to fine-tune connection and network requirements to improve network efficiency / utilisation	b) Hybrid - some aspects of access standardised, with others bespoke **Pros:** • Increases choice for consumers where there is an option to opt-in or opt-out of standard arrangements or bespoke arrangements. • May offer some protection through standard arrangements	• Hybrid - some aspects of access standardised, with others bespoke **Pros:** • Enables a balance between the easier-to-facilitate standard arrangements and more administration-intensive bespoke arrangements. **Cons:** • Increased complexity for users, network operators and market participants where bespoke arrangements lead to different approaches between areas.	May require ability to opt-in or opt-out of standard arrangements to facilitate bespoke options and protect those not able/willing to have bespoke choices.	Small to medium DG connections – ability to have elements of standardisation and then some flexibility of bespoke arrangements may be better suited to these customers where full access at all times might not be needed

				Cons: • Increases complexity of design by having to consider an increased number of individual user access arrangements' when assessing impact on network.	for those who are not able to engage with bespoke access, whilst providing bespoke options for those that can. **Cons:** • Needs to be careful consideration of impacts on customers who are not able to engage in opportunities for access			
		c) Fully bespoke – all parameters can be bespoke		c) Fully bespoke – all parameters can be bespoke **Pros:** • Detailed user requirements can facilitate more fine-tuning of network requirements, flexibility options, network forecasts and investment requirements	c) Fully bespoke – all parameters can be bespoke **Pros:** • Tailored to customers' individual requirements • Fine-tuned to maximise opportunities for customers to benefit from specific access rights • Suppliers and market	• Fully bespoke – all parameters can be bespoke **Pros:** • - **Cons:** • High burden of administration, data capture/retention/management and requirement to draft and enter into bespoke commercial arrangements • Increased bespoke arrangements would require increased and more granular chagrining arrangements leading to more complexity • High burden of administration as volume of individual		Large DG – the ability to fine tune requirements to network conditions and markets may be best suited to these customers due to their ability to control their technology and network operators' ability to have communication equipment in place at these

				• Could help facilitate innovation by enabling increased flexibility in commercial arrangements and design enabling further increases in network efficiency **Cons:** • Increased granularity of information, requirement to assess network on many more individual users' access and wide range in which to assess new user requirements would need significant design resources.	participants able to offer customers tailored supply contracts and multiple product offerings • Facilitates innovation in product offering and ability to differentiate and could therefore facilitate competition. **Cons:** • Not all customers able to make necessary assessment of options and take advantage of bespoke offering (analogous to uptake in Supplier switching) • Some customers not able to access opportunities where they	access rights across customers and network operators requires matching DNO-Supplier-customer arrangements. • Increased ongoing interactions with customers on commercial and compliance (e.g. overruns etc.) would require increased resource for all parties involved.		smaller volumes. Large demand connections – may have more requirement to agree bespoke arrangements and have greater flexibility in their requirements / operations.

					cannot control their demand characteristics and bespoke access choices could widen this gap compared to more controlled standard arrangements.			
	Level of standardisation	d) Bespoke parameters can be freely chosen on a continuum e) Standardised bands / thresholds allowing for some further elements of choice, within limits f) Parameters fully standardised – bespoke options available by exception g) Parameters fully standardised – no ability to select a bespoke option		• to e) **Pros:** • Increasing the level of bespoke parameters maximises efficient utilisation of network through fine-tuned design parameters • Levels of standardisation enable macro-level design parameters rather than micro-analysis of individual users. • Fully standardised access enables more	d) to e) **Pros:** • Fully bespoke allows users to fine-tune their requirements and match their requirements and behaviour to how much value they place on their access needs • Increasing standardisation can provide options which are more accessible to non-expert users • Providing some bespoke options facilitates some users	d) to e) **Pros:** • Fully standardised limits the number of new design, contractual and charging arrangements as well as the required numbers and frequency interactions between parties for setting arrangements, entering agreements, varying these etc. • Standardised option, bands and thresholds can be incorporated in codes, charging methodologies, NTCs etc reducing the need for specific contractual / commercial arrangements. **Cons:** • Fully bespoke requires significant increased data, administration, contractual arrangements and interactions required to instigate and maintain access	Collaboration at industry level in development of new requirements can help share the workload Increasing numbers of standardised options, parameters, bands or level of bespoke access may require new systems and interfaces (whether at DNO or national level)	As per a-c above

				streamlined design approach • Partial standardisation enables base-line parameters with ability to utilise bespoke arrangements where system constraints require alternative approach **Cons:** • Fully bespoke parameters require huge amounts of data and time to study to determine bespoke options and their impacts on a scheme by scheme basis. • Fully standardised approach limits extent to which network can be fully utilised to	with the ability / desire to refine their access requirements. • Thresholds / bands provide transparency around the long-term impact of access choices and offer more 'off-the-shelf' style options. **Cons:** • Fully bespoke choice could be bewildering to all but the most 'expert' users or those able to pay for advice. • Fully standardised may not offer some consumers the arrangements which meet their requirements • Bands/ thresholds could be detrimental to	arrangements for all parties involved. • Monitoring access compliance requires significant resource which increases along the scale from fully standard to fully bespoke •	Standards, bands and thresholds will require transparency and understanding of consequences of overrun and non-compliance.	

				maximise efficiency	customers which are outliers and do not fit neatly.			
	Boundaries for standardisation	h) Universal standard options at national level i) DNO-specific standard options j) Options standardised by type of network (eg transmission vs distribution, urban vs rural, spare capacity vs congested) k) Standard options set by area based on local conditions l) Options standardised by type of user.		ALL **Pros:** • Universal standardisation provides clear design parameters for consistent approach across GB **Cons:** • National standardisation could hinder innovation and may require significant resources to change existing DNO's own standards. • Differentiating by location (whether geographic or network) could discriminate against certain users who have no choice on their location.	ALL **Pros:** • National standardisation provides consistency for customers with connections in multiple DNO regions • DNO-specific options enables customer to benefit from innovation and / or fine-tuning to DNO specific network issues which could better meet their needs. More localised options could further increase this potential benefit. **Cons:** • Options standardised by user type could hinder	ALL **Pros:** • Standardisation at national level enables some degree of collaboration to facilitate required changes to codes, charging methods, standards etc. **Cons:** • The standardised options may require a much larger change for the DNOs which are the least aligned with the standards.	Universal standardisation requires collaboration on new Codes, engineering standards systems processes and interfaces to ensure robust implementation Local standardisation requires the necessary room within codes, standards, methodologies etc. to facilitate bespoke choices without non-compliance. Or a clear pathway to derogation.	Parameters based on local network conditions may be suited to large DG and Demand users where there is little diversity with other users on the network so the ability to tailor to the local situation could improve access options.

					users which straddle more than one type			
	Route to standardisation	m) standardised options established in industry codes n) Planning standards could facilitate range of bespoke arrangements 'bookended' by minimum and maximum characteristics . o) Options defined as set standardised choices in planning standards, industry codes, or charging arrangements. p) Options explicit in contractual arrangements, supplier agreements, connection offers q) Standard and bespoke	Combination of implicit and explicit	ALL **Pros:** • establishing broad standards on a national basis in codes rather than very prescriptive standards, whilst enabling bespoke or opt-in/-out standards can provide freedom to manage compliance with individual DNOs approach to risk and innovation (along with management of historic network standards). • Bookended planning arrangements with min / max standards could provide a framework to	ALL **Pros:** • Standardisation in national documents provides transparency and consistency for customers along with an element of reassurance over fair treatment • Confirmation of option arrangements in explicit contractual terms and agreements can aid transparency and understanding particularly where conditions are as a result of a standardised design option based on user / connection type, which the	ALL **Pros:** • Standardisation of codes, planning standards, engineering recommendations and other nationally agreed and set documents provides opportunity to reduce individual burden via industry collaboration and national stakeholder engagement. **Cons:** • Increased bespoke contractual arrangements may require increased resource and interactions from both network operators and users	Clear and transparent communication of options to users. Particularly where there are requirements to opt-in or opt-out of standard arrangements. This may be via network operators, suppliers and/or other market participants.	Agreement in contractual arrangements is suited to customers with larger HH-billed supplies where connection agreements exist. Extending this to NHH customers could be difficult due to volumes. Standardisation in codes, standards codes of practice may suit small users which do not have the ability to benefit from bespoke arrangements.

		arrangements may require the choice to derogate or opt in / opt out of planning, design and security standards r) standardisation established contractually or in codes of practice, but without an explicit basis in planning standards		work within facilitating more efficient design rather than an open-ended, fully-bespoke option. **Cons:** • Without minimum standards there could be a pressure to accommodate increasing risk on the network or on users in terms of increased impact of greater curtailment.	customer may not have a specific choice of. **Cons:** • Where standardisation is prescribed in industry codes there can be a lack of understanding or transparency from users on the impacts on them or any choices they may/may not have.			
	Option availability	s) all options available for all usage types t) limits on types of option available for some / all usage (e.g. thresholds / limits on access options)	Core access Non-core access	a) all options available for all usage types **Pros** • Symmetric application **Cons** • Inappropriate choice may lead to under/over provisioning • May permit some	a) all options available for all usage types **Pros** • Apparent equity **Cons** • May 'force' vulnerable customers to make an inappropriate choice	a) all options available for all usage types **Pros** • Single process **Cons** • excessive bureaucracy where choice is irrelevant	Mechanism for customers to express choice Agreed thresholds and definition of core 'access'	a) all options available for all usage types: larger commercial/ energy trading connections b) limits on types of option available for some / all usage (e.g. thresholds /

				customers to make inappropriate choices which cannot be realised e.g. interruptible supply for a nursing home b) limits on types of option available for some / all usage (e.g. thresholds / limits on access options) **Pros** • Prevents under-provisioning resulting from inappropriate choice **Cons** • Prevents release of access below the threshold	b) limits on types of option available for some / all usage (e.g. thresholds / limits on access options) **Pros** • Protects customers from inappropriate choice **Cons** • Threshold could be set too high increasing costs	b) limits on types of option available for some / all usage (e.g. thresholds / limits on access options) **Pros** • simpler application for some users **Cons** n/a		limits on access options) : domestic, smaller HV

8. Assessment of monitoring, breach and enforcement

Option for access definition	Key design choices	Option variants	Key combinations or hybrids	Guiding principles for assessment – pros and cons			Enablers / dependencies needed	User types which may be particularly well suited / unsuitable
				Arrangements support efficient use and development of network capacity	**Arrangements reflect the needs of consumers as appropriate for an essential service**	**Any changes are practical and proportionate**		
	Monitoring and enforcement	a) No formal monitoring, rely on contractual arrangements b) Technical monitoring solution		a) No formal monitoring, rely on contractual arrangements **Pros** • n/a **Cons** • relies on good behaviour and hence requires a degree of overprovisioning • Monitoring may need to be at a smaller interval than half—hourly to capture granular network effects b) Technical monitoring solution **Pros** • Monitors actual usage **Cons** • The risk of de-energisation may be too severe and represent a user	a) No formal monitoring, rely on contractual arrangements **Pros** • inobtrusive **Cons** • relies on customer reporting and discipline (is this reasonable) b) Technical monitoring solution **Pros** • give customer information of their actions **Cons**	a) No formal monitoring, rely on contractual arrangements **Pros** • Low cost **Cons** • Costs of excess actions are not readily recovered • Also, as with principle 1, simpler arrangements require the customer to implement controls to keep within access rights. b) Technical monitoring solution **Pros** • Lower costs • Can allocate costs	Infrastructure for monitoring and/or control	No formal monitoring is best suited to situations where actions in access of obligations are rare and the costs of exceeding are low

				investment risk, leading to inefficient over-provision but could also encourage users to 'book' their requirements with greater accuracy		**Cons** • Requires billing arrangements • There needs to be a balance of complexity, visibility and severity of action reflective of user type. Small users may require different treatment		
	Overrun conditions	a) Temporary or permanent b) Consequences of exceeding – either financial (excess charge), physical (curtailment, de-energisation), contractual (forfeit of specific arrangements?) c) Automatic requirement for upgrade requiring contribution d) Automatic movement from one access choice to another (e.g. move from a lower band to a higher band where user has exceeded their		a) Temporary or permanent **Pros** • Temporary – applicable when overrun is rare and does not trigger immediate action and reinforcement • Permanent – applicable when even occasional overrun riggers immediate action and reinforcement • There is potential for a market in overrun requirements to request and offer capacity from other users and/or the network. • May require measures to	a) Temporary or permanent **Pros** • Temporary – seen as less penal • Permanent – where cost reflective, may better allocate costs **Cons** • Risk that access definitions do not match physical actions (i.e. excessively prohibitive or lenient)	a) Temporary or permanent **Pros** • Temporary – could be seen as more proportionate • Permanent – reduced ambiguity **Cons** • Ambiguity leads to subjective decisions and lack of clarity	Performance monitoring	Customers who have made a conscious access choice

		chosen band's characteristic) e) Able to exceed agreed access under certain circumstances / conditions (eg to provide network flexibility)		detect and protect against 'gaming' or other unintended consequences. **Cons** • Risk that access definitions do not match physical actions (i.e. excessively prohibitive or lenient) b) Consequences of exceeding – either financial (excess charge), physical (curtailment, de-energisation), contractual (forfeit of specific arrangements?) **Pros** • Ensure access decisions are given sufficient rigour **Cons** • Must be cost reflective else can lead to inefficient decisions c) Automatic requirement for upgrade requiring contribution **Pros**	b) Consequences of exceeding – either financial (excess charge), physical (curtailment, de-energisation), contractual (forfeit of specific arrangements?) **Pros** • Ensure access decisions have given sufficient rigour **Cons** • May encourage excessive or inadequate access choice c) Automatic requirement for upgrade requiring contribution **Pros** • Minimal manual engagement **Cons**	b) Consequences of exceeding – either financial (excess charge), physical (curtailment, de-energisation), contractual (forfeit of specific arrangements?) **Pros** • Increases customer engagement **Cons** • Complex to implement c) Automatic requirement for upgrade requiring contribution **Pros** • If cost reflective, ensures correct payment towards investment **Cons** • Requires systems to		

				• Captures increased requirements without manual intervention **Cons** • May force undesired increase to requirement d) Automatic movement from one access choice to another (e.g. move from a lower band to a higher band where user has exceeded their chosen band's characteristic) **Pros** • Captures increased requirements without manual intervention **Cons** • May force increases to requirement which are not desired e) Able to exceed agreed access under certain circumstances / conditions (e.g. to	• Could increase cost exposure for smaller or otherwise unaware customers d) Automatic movement from one access choice to another (e.g. move from a lower band to a higher band where user has exceeded their chosen band's characteristic) **Pros** • Minimal manual engagement • Could extend reductions if banding is excessive and/or not required. **Cons** • Could increase cost exposure for smaller or otherwise unaware customers	monitor and detect • Financial arrangements may be complex to implement. d) Automatic movement from one access choice to another (e.g. move from a lower band to a higher band where user has exceeded their chosen band's characteristic) **Pros** • If cost reflective ensures correct payment towards investment **Cons** • Requires systems to monitor and detect e) Able to exceed agreed access under certain circumstances / conditions (eg to		

				provide network flexibility) **Pros** • Adds further richness in description of capacity requirement how this changes when providing a service **Cons** • May increase complexity without aiding understanding • Consequences should be considered in context to drive the right behaviours and reflect network capability. • • Consequences may be considered in sequence with financial arrangements applied up until physical limit causes direct action. • There may be parallels with 'Ratchet Charges' in gas.	e) Able to exceed agreed access under certain circumstances / conditions (eg to provide network flexibility) Pros • N/A Cons • N/A	provide network flexibility) Pros • Further refinement Cons • Complex		

9. Assessment of cross-system access

Option for access definition	Key design choices	Option variants	Key combinations or hybrids	Guiding principles for assessment – pros and cons			Enablers / dependencies needed	User types which may be particularly well suited / unsuitable
				Arrangements support efficient use and development of network capacity	**Arrangements reflect the needs of consumers as appropriate for an essential service**	**Any changes are practical and proportionate**		
	Explicit access to local network only, implicit access to wider system			**Pros** **Cons** This may undermine network planning, as network operators do not have full visibility of access requirements on their networks. If users do not have access to the wider system, then it may lead to inefficient use and development of wider system capacity, because charges are not being signalled for wider system access.	**Pros** Could be more proportionate for small user – where access to the wider system is less of a concern. **Cons** It may undermine business cases is users do not have clear access rights e.g. if users do not have clarity about which markets they can also participate in	**Pros** Limited changes required to current arrangements.		
	Explicit access to local network, and to provide wider services (eg			**Pros** The aggregated position as managed through a Supplier may drive	**Pros** This may help users plan their business cases e.g. which	Consideration would be required about how "whole system" access would be reflected		

	balancing/DSO), otherwise implicit			network benefits that can be transacted by Suppliers. Having whole system access for everyone connected to the network should allow better network planning as flows of energy across the network may be more realistic (a generator connected to an IDNO's network cannot stop its electricity flowing past the IDNO boundary within interaction with DNO and transmission systems). This should improve the consistency of access rights across the whole electricity system and help ensure that generators and other network users are able to compete on a level playing field. **Cons**	markets they can also participate in, Contract arrangements should be simpler for users if they have access to the whole system rather than requiring any additional contracts. **Cons** For smaller users e.g. domestic non-half hourly metered customer, it is unlikely that specific access rights will be a main concern,	in DCUSA and CUSC **Pros** Contractual arrangements however should be simpler if access = access and therefore no additional contracts are required for additional access, such as a BEGA today **Cons** Determining equivalence of access to upstream networks, given the increasing diversity of embedded users impact on upstream networks, will add complexity. The exact mix of rights at any point in time will be complex, particularly if agreeing time specific access rights across networks. Whole system access may require more alignment		

						between planning specifications at transmission and distribution or if any other changes are required.		
	Explicit access to the whole system			**Pros** The aggregated position as managed through a Supplier may drive network benefits that can be transacted by Suppliers. Having whole system access for everyone connected to the network should allow better network planning as flows of energy across the network may be more realistic (a generator connected to an IDNO's network cannot stop its electricity flowing past the IDNO boundary within interaction with DNO and transmission systems). This should improve the consistency of access rights across the whole electricity system and help ensure that generators and other network users are able to compete on a level playing field. **Cons**	**Pros** This may help users plan their business cases e.g. which markets they can also participate in Contract arrangements should be simpler for users if they have access to the whole system rather than requiring any additional contracts. **Cons** For smaller users e.g. domestic non-half hourly metered customer, it is unlikely that specific access rights will be a main concern	Consideration would be required about how "whole system" access would be reflected in DCUSA and CUSC **Pros** Contractual arrangements however should be simpler if access = access and therefore no additional contracts are required for additional access, such as a BEGA today **Cons** Determining equivalence of access to upstream networks, given the increasing diversity of embedded users impact on upstream networks, will add complexity.		

						The exact mix of rights at any point in time will be complex, particularly if agreeing time specific access rights across networks. Whole system access may require more alignment between planning specifications at transmission and distribution or if any other changes are required.		

10. Assessment of cross-cutting – other

Option for access definition	Key design choices	Option variants	Key combinations or hybrids	Guiding principles for assessment – pros and cons			Enablers / dependencies needed	User types which may be particularly well suited / unsuitable
				Arrangements support efficient use and development of network capacity	**Arrangements reflect the needs of consumers as appropriate for an essential service**	**Any changes are practical and proportionate**		
	Other conditions on access	f) UIOLI (use it or lose it) g) UIOSI (use it or sell it) h) Power factor		dd) UIOLI (use it or lose it) **Pros** • Encourages clearer definition of requirement at outset • Ensures capacity is allocated to an 'active' use **Cons** • Prevents customers from signalling a growing/ future requirement • Not clear on what use means and hoe this applies to occasional or back up capacity • Legitimacy may be questioned in should paid for service/product be withdrawn • Transfers specification risk on to customer, whereas network	dd) UIOLI (use it or lose it) **Pros** • Prevents underutilised capacity **Cons** • Removes ability of DNO to take a risk view of capacity and removes the fortuitous' availability presently available to serve changes in vulnerable customer needs ee) UIOSI (use it or lose it) • As above	dd) UIOLI (use it or lose it) **Pros** • **Cons** • Very hard to monitor and assess if capacity is not being used (over what time frame etc) • Unclear how back-up or reserve capacity should be treated ee) UIOSI (use it or lose it) **Pros** • **Cons** • Unclear how mandated sale can be enforced – to	Commercially/legally acceptable terms Performance monitoring	Users with entirely commercial uses of energy (i.e. generation) or entirely discretionary use of energy

				operator may be better placed to manage ee) UIOSI (use it or lose it) • as above with some improvement in terms of legitimacy ff) Power factor **Pros** • (if PF is a relevant drive of cost or benefit) allows this to be signalled **Cons** • Not clear if PF is a driver of cost or benefit aside from the raw capacity (kVA) requirement. • Cost benefit for other purposes, say voltage control varies geographically and temporarily	ff) Power factor None	whom, at what price etc. ff) Power factor **Pros** • **Cons** • To what extent can the time-varying nature of power factor cost/benefit be identified? • Highly variable from site to site	ff) Power factor Clear cost/benefit assessment	