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Barriers to equal access

Worked examples and scenarios

INNOVATION AND PARTICIPATION ADVISORY GROUP

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Purpose of this slide pack

- Present worked examples to inform conversations with guest speakers
- Discuss the problem definition including feedback from email correspondence
- Suggest options for next steps
- Provide a summary of the consumer-centric arguments from submissions on *Enabling mass participation* (see Annex 1)

Worked examples

Structure of worked examples reflects agreed ToR

- **Set up** – Who is who? And who does what?
- **No barriers scenario** – Assumes no barriers to meet consumer needs
- **Barriers scenario** – Assumes that barriers to equal access identified through the enabling mass participation consultation have an impact
- **Assessment** – Impact on competition, efficiency and reliability. What does this mean for the consumer?

Worked examples represent a ‘worst case’ scenario

- Worked examples are specifically constructed to deliver a ‘worst case’ scenario. This is done for illustrative purposes only
- ‘Worst case’ scenario approach provides a benchmark from which to assess credibility/materiality of concerns raised
- We acknowledge that worked examples are simplifications; in reality:
  - impacts from barriers are likely to lie in a ‘grey’ area
  - distributors’ behaviours described will vary as a function of their governance arrangements, business approach to new technologies, etc
- Environmental and social impacts cannot be a focus (as suggested in comments to the terms of reference) given the Electricity Authority’s statutory objective
- Barriers analysed in the worked examples are based on feedback from enabling mass participation. That feedback focused on distribution networks. IPAG should remember that the transmission network is also within scope

Limitations from using worked examples

- Useful to illustrate a worst case impact of potential barriers to equal access on consumers' needs, but:
  - it is difficult to know what consumer needs might be in the future
  - focusing too much on what future consumer needs might be carries the risk of 'picking winners or losers'
  - it is important that equal access arrangements are flexible to allow known and unknown consumer needs to be satisfied when it is efficient to do so
- Looking at whether equal access arrangements satisfy some key design principles can also be useful to analyse whether future consumer needs will be efficiently met irrespective of whether they are known or unknown to us today
- For example, an assessment could also consider whether existing equal access arrangements satisfy some key design principles, such as:
  - promote consumer choice
  - are technology agnostic
  - ensure a level playing field between participants
  - allocate risks efficiently between participants including consumers
- A combination of looking at design principles combined with worked examples is suggested in the 'next steps' section

There are 4 worked examples

Worked example	Consumer needs/group considered	Barriers assumed/assessed (based on enabling mass participation consultation)
1	Be my agent	• Lack of distribution network information and procurement processes to consider the services from third-parties • Lack of efficient distribution prices • Distributors' ability to allocate capital expenditure in new technologies in the regulatory asset base (RAB)
2	Hands on	Distributors' incentives and ability to block or make competition more difficult in the provision of new energy services
3	Community (a new housing development)	
4	New mobility services	

Consumer groups based on research from ENA Australia

- Where possible we have used as a reference the consumer groups that appear in the Electricity Network Transformation Roadmap final report (Energy Networks Australia, April 2017)
- We can update consumer groups to reflect the work of ENA NZ once finalised
- But, reference to consumer groups and their needs is not critical to deliver the worked examples that capture the impact of barriers to equal access

Figure 7: Example of market segmentation curve for residential customers in 2027 (See *the Roadmap Interim Program Report* Dec, 2015).

Source: Plausible 2027 customer segments were informed by an international literature review, commissioned expert papers and structured stakeholder workshops. In particular, Rosemary Sinclair of Energy Consumers Australia is acknowledged for employing the market curve device to graphically represent customer segments (adapted with permission).

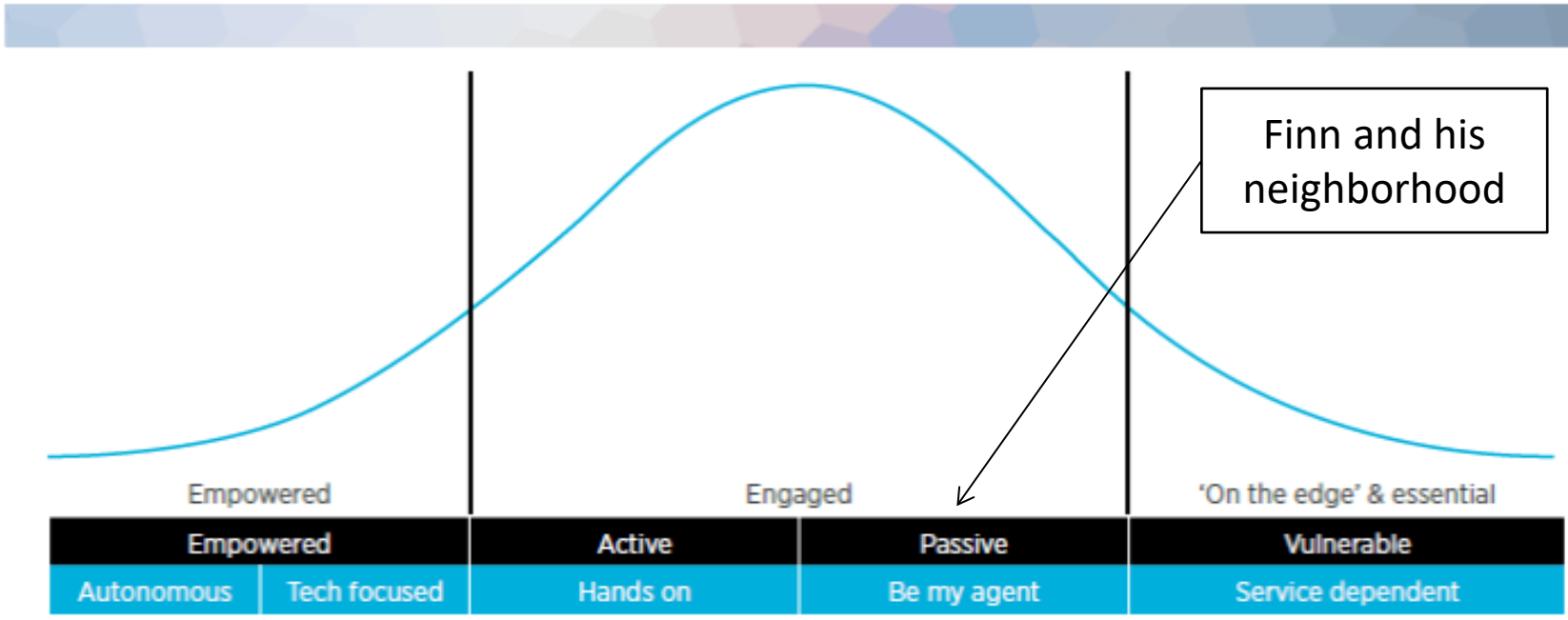
WORKED EXAMPLE 1

The set up

Finn is the consumer

- Finn is a consumer that lives in a residential neighborhood
- Finn has a large family and he is a high energy user

Figure 7: Example of market segmentation curve for residential customers in 2027 (See *the Roadmap Interim Program Report* Dec, 2015).



Source: Plausible 2027 customer segments were informed by an international literature review, commissioned expert papers and structured stakeholder workshops. In particular, Rosemary Sinclair of Energy Consumers Australia is acknowledged for employing the market curve device to graphically represent customer segments (adapted with permission).

Finn's needs

	Context	Potential need
Need 1	Not sure of the benefits from investing in new technologies	Advice and information about what new technologies can do
Need 2	There are planned changes to distribution network tariff structures	Manage energy consumption to maintain and/or decrease the energy bill
Need 3	Does not know what opportunities the electricity market arrangements offer him	Understand opportunities to get paid for providing electricity related services
Need 4	Does not have the time or the willingness to deal with the complexity of the electricity market	Energy management solutions that make things easy

The network business

NetCo is Finn's local distributor

- Demand growth is expected in Finn's neighbourhood and the distribution local network might become constrained

- NetCo is considering the following options to address the expected network constraint:
  - **Option 1:** Invest in new network capacity (poles, wires and transformers)
  - **Option 2:** Use demand response to avoid new investment. NetCo is considering more efficient network pricing structures that provide useful information to consumers about where and when operating solar panels and home battery technologies can avoid the need to invest in network capacity
  - **Option 2** is more economic than **Option 1**

Suppliers (1)

NetCo Solar is NetCo's subsidiary business

- Created to support a more efficient delivery of NetCo's core distribution business
- Sells and installs solar panels and home batteries in Finn's neighbourhood
- NetCo's solar battery technology is designed to provide an efficient demand response alternative to NetCo to avoid a new investment. This means that:
  - the battery is not necessarily designed to be operated to improve the end consumer experience.
  - the battery cannot easily provide services to other parties (eg, to Transpower's demand response (DR) programme, or ancillary service markets) without significantly affecting the asset life.
- Borrows money to manage an inventory of solar panels and batteries to sell to its customers

Suppliers (2)

iSERVE Limited (Ltd) is a new energy services provider

- Competes against NetCo Solar

- Provides an integrated ***home energy management service*** experience to the end consumer:
  - ***Provides energy management advice*** to end consumers
  - ***Supplies a new generation of solar panels and batteries***: Has an exclusive deal with a technology company for a very reliable battery that can be used to provide multiple services without adversely affecting its asset life
  - ***Develops and supplies home energy management software***: Has a state-of-the-art software developer unit. Has developed software that can quickly learn about consumption patterns and forecast electricity prices to optimise battery use
  - ***Intermediates to provide demand response aggregation services*****:** Manages a 'virtual power plant' (VPP) to provide demand response aggregation services to Transpower's DR programme, and for the system operator's ancillary service markets

- Borrows money to manage an inventory of solar panels and batteries to sell to its customers

WORKED EXAMPLE 1

No barriers scenario

How are consumer needs met?

Finn prefers iSERVE Ltd over NetCo because it can best meet his needs

	Potential need	iSERVE Ltd services to Finn
Need 1	Advice and information about what new technologies can do	• Estimates the rate of return from investing in a new home energy management system • Advises Finn which retailer to switch to and which bank to take a loan from to invest
Need 2	Manage energy consumption to maintain and/or decrease the energy bill	Sells to Finn an exclusive home energy management system: • Finn buys new generation solar panels and a battery • Software optimises the use of technology while accounting for Finn's consumption patterns and electricity prices to manage Finn's energy bill
Need 3	Understand opportunities to get paid for providing electricity related services	iSERVE's VPP services earn Finn extra money from providing demand response services to Transpower and into the ancillary service markets
Need 4	Energy management solutions that make things easy	iSERVE's software settings and learning capabilities ensure that the home energy management system runs smoothly to keep Finn's family comfortable without Finn having to worry

Summary of benefits in the no barriers scenario

Benefits of competition between iSERVE Ltd and NetCo Solar

- iSERVE Ltd has a successful product and becomes a major provider of home energy management systems in Finn's neighbourhood:
  - More neighbours can better manage their energy bills, invest in a technology that will last longer, enjoy a more reliable electricity supply and have access to extra income while paying a competitive price for their home energy management system
  - All neighbours enjoy lower distribution network charges from more efficient network investment because NetCo can avoid investment in new network capacity
- More consumers participate and get paid through the VPP service for providing a competitive DR service to Transpower and the system operator
  - All neighbours enjoy the benefits of lower transmission network charges, and lower electricity prices because of more efficient competition from iSERVE's VPP in Transpower's DR programme and ancillary service markets

WORKED EXAMPLE 1

Barriers scenario

Description of the barriers

Barriers from Enabling mass participation consultation

- **Potential barrier 1 – Lack of information and procurement processes**
  - NetCo does not have:
    - a procurement process to consider how 3rd parties might be able to contribute to efficiently avoid a network upgrade
    - useful publicly available information about where distribution network upgrades are expected
    - more efficient distribution network pricing structures
- **Potential barrier 2 – Guaranteed cost recovery**
  - NetCo can allocate all capital expenditure from investing in a home battery and solar panels to the RAB because these assets are only used to avoid investment in distribution network capacity

Investments might not be considered equally in the barriers scenario

iSERVE Ltd cannot compete because it cannot supply a valuable service to NetCo and consumers through avoiding distribution network investment

- iSERVE Ltd cannot provide value to consumers because there are no efficient network pricing structures that signal the value of iSERVE's home energy management system to Finn and his neighbours
- A lack of information on expected network upgrades prevents iSERVE Ltd from taking the first step to talk to NetCo about what its home energy management services can do for NetCo if more efficient pricing structures were available
- A lack of procurement process also fails to signal to iSERVE Ltd that NetCo is looking for alternatives to an expensive network investment
- iSERVE Ltd is 'out of the money' and cannot rely on facilitating competitive services to Transpower's DR programme and ancillary service markets to recover the costs and make a return from selling its home energy management system

Investments might not be treated equally in the barriers scenario

NetCo allocates capital expenditure to the RAB which can reward poor technology choices made on behalf of consumers, or provide an unfair competitive advantage

- **NetCo enjoys close to a guaranteed cost recovery (including a return on investment) when capital expenditure in new technologies is allocated to the RAB:** This means that it is Finn that bears the downside risks from NetCo's decision to invest in new technologies on his behalf. This may imply that NetCo could still recover all or a significant proportion of costs (including a return on investment) from consumers even if NetCo made a bad technology choice on Finn's behalf.

- **iSERVE Ltd operates in a competitive environment and does not have a guaranteed cost recovery on its investments:** iSERVE Ltd is exposed to the downside risks from its own investment decisions. Being exposed to the downside risks requires iSERVE Ltd to search for efficient means to deal with this risk to compete effectively. For example, iSERVE has an incentive to invest in the right technologies at the right time and location and use efficient contractual arrangements with its customers to manage downside risks. Making bad technology choices or inefficient contractual arrangements might mean that iSERVE will fail as a business.

- **NetCo's guaranteed cost recovery might translate into unequal treatment in capital markets with respect to iSERVE Ltd:** Bankers might decide to offer finance to iSERVE Ltd at a higher market rate compared to an equivalent investment made by NetCo. This is because a RAB arrangement might offer a stronger guarantee to the bank that it will recover its loan compared to the guarantee that iSERVE's contractual arrangements with its customers may offer

Less competition could be likely in the barriers scenario

iSERVE Ltd's business model is not viable and NetCo only considers its own investment options

- NetCo's options to deal with network congestion in Finn's neighbourhood under the barriers scenario are:
  - **Option 1:** Invest in new network capacity
  - **Option 2:** Coordinate a scheme with NetCo Solar to install solar panels and batteries in Finn's neighbourhood in exchange for lower network tariffs that will avoid the need for a network capacity upgrade
  - **Option 2** is still more economic than **Option 1**
- NetCo Solar is 'first in' to supply solar panels and batteries to Finn and his neighbours
- iSERVE Ltd is not given an opportunity to compete on equal footing with NetCo Solar to provide services that would have made its business model viable and provide more value to consumers compared to NetCo's Solar proposition

Consumer needs might be imperfectly met in the barriers scenario

Finn can only choose NetCo's offer and technology choices

	Potential need	NetCo's services to Finn
Need 1	Advice and information about what new technologies can do	Finn is not offered advice. Instead Finn is offered the opportunity to sign up to an agreement to allow NetCo's solar panel and battery to be installed in his house in exchange for a lower distribution network charge
Need 2	Manage energy consumption to maintain and/or decrease the energy bill	The battery and solar panel is operated to ensure that investment in distribution network capacity is avoided, not to manage Finn's overall energy bill
Need 3	Understand opportunities to get paid for providing electricity related services	NetCo's battery is not prepared to be operated to provide services into Transpower's DR programme, or the system operator's ancillary service markets
Need 4	Energy management solutions that make things easy	NetCo's solar panels and batteries are not necessarily operated to maintain Finn's family needs and preferences. Finn might be tempted to start changing the battery settings

Impacts in the barriers scenario

- There is **restricted choice** because Finn and his neighbours can only choose to either sign up or not to NetCo's solar panel and battery deal in exchange for a lower distribution network charge
- Products and services available **do not necessarily meet Finn and his neighbours' needs** because solar panels and batteries are operated to ensure that investment in network capacity can be avoided rather than to manage their energy consumption needs
- Network costs are lower because the need for capacity investment has been avoided. However, Finn and his neighbours are **subject to the downside risks from investing in new technologies**. If NetCo's technology choices are inefficient the network service might become more costly but NetCo's profitability might not necessarily suffer as a result. This means that over time Finn and his neighbours **might see their distribution network charges increase** as a result.
- Finn and his neighbours **cannot participate** in Transpower's DR programme or in the ancillary service markets. This means **less opportunities to lower transmission costs and ancillary services costs from using competition** resulting in higher electricity prices

WORKED EXAMPLE 1

Assessment

Impact on competition, reliability and efficiency

Barrier identified	Impact on CRE compared to no barriers scenario	Impact on consumers compared to no barriers scenario
Lack of network information and robust procurement processes	**Less competition in** • Markets for new technologies • Markets for new energy services that operate as an alternative to distribution and transmission network investment • Ancillary service markets	• Less choice on technology offerings and services resulting in unmet consumer needs • Higher distribution and transmission network charges • Higher electricity prices
	Inefficient • Operation of new technologies • Investment in new technologies • Investment in distribution and transmission networks	• Technologies are not operated to meet end consumer needs • Higher distribution and transmission network charges • Higher electricity prices
Allocating capital expenditure in technologies to the RAB	**More costly reliability from** • Inefficient investment in poorly chosen technologies	• Higher distribution network charges

Some key questions

- What type of information and procurement processes do 3rd parties need to be able to compete effectively?

- Are distributors guaranteed a cost recovery when they invest in new technologies through the RAB? If so:
  - What are the trade-offs from allowing distributors to directly pass on to consumers the downside risks from investing in new technologies?
  - How material is the capital cost advantage from being able to allocate capital expenditure to the RAB?

WORKED EXAMPLE 2

The set up

Make-it Co is the consumer

- Make-it Co is a manufacturing company
- They are a heavy energy user and have enough roof space to install >100 kW of solar panels

Make-it Co's needs

	Context	Potential Needs
Need 1	Wants to install solar panels on its factory roof to: • self-supply in order to have access to cheaper electricity • demonstrate its commitment to sustainability	• Comprehensive advice on technology choice, system size, system performance (consideration of distribution tariffs, connection requirements and the export congestion policy) to enable calculation of return on investment • Suitable add-on services covering technology supply, performance guarantees, on-going service maintenance etc.
Need 2	Wants to export excess generation when the factory is closed, production is low or electricity prices are high to maximise the return on investment	• Weather and electricity price forecasts and a trading strategy

The network business

NetCo is Make-it Co's local distributor

- Other companies near Make-it Co have already installed solar panels, and the network experiences export congestion in some circumstances, causing voltage issues

- The configuration of the network in this area is relatively complex, and it is not guaranteed that connection will be straightforward

Suppliers (1)

NetCo Solar

- Is a business unit within the wider NetCo business
- Supplies and installs solar panels for industrial and residential consumers
- Uses a simple, low-cost solar technology and selects the most convenient system size for the customer

Suppliers (2)

iSERVE Ltd.

- Is a new entrant competing against NetCo Solar
- Offers a comprehensive solar package:
  - supplies and installs advanced solar technology with proven performance that automatically adjusts its orientation to maximise performance
  - developed proprietary tools to optimise system sizing, design and export revenues from solar systems
  - provides ongoing maintenance service support including software and inverter upgrades
  - manages all interactions with the distributor and the retailer, including connection applications

WORKED EXAMPLE 2

No barriers scenario

How are consumer needs met?

Make-it Co chooses iSERVE Ltd over NetCo Solar because their solar system provides the best return on investment including valuable add-on services

	Potential Need	iSERVE services to Make-it
Need 1	Comprehensive advice on technology choice, system size, system performance (consideration of distribution tariffs, connection requirements and the export congestion policy) to enable calculation of return on investment	• Uses consumption data, building dimensions, electricity price and tariff information and connection requirements to optimise the solar system design • Forecast the return on investment from installing the solar system
Need 1	Suitable add-on services covering technology supply, performance guarantees, on-going service maintenance etc.	Can offer a 10-year performance guarantee and an associated on-going service agreement
Need 2	Weather and price forecasts and a trading strategy	Provides on-line access to performance optimisation software that forecasts weather and electricity prices and calculates a trading strategy

Benefits in the no barriers scenario

Benefits of competition between iSERVE Ltd and NetCo Solar

- Make-it Co choses a provider that best meets its needs and values
- With iSERVE Ltd, Make-it Co can maximise the return on its investment in an advanced solar system:
  - ‘locks-in’ for its business cheap electricity from an advanced solar technology to reduce energy costs and compete more vigorously in the market
  - reduces distribution and transmission network charges
  - maximises the value of the solar energy and export when prices for electricity are high

WORKED EXAMPLE 2

Barriers scenario

Barriers considered in the barriers scenario

Barriers from the Enabling mass participation consultation

- **Potential barrier – conflict of interest**
  - NetCo has a potential conflict of interest, and could establish connection processes, technical specifications, pricing plans and data sharing arrangements to favour its own commercial activities (ie, NetCo Solar)

Lack of confidence on equal treatment between network users in the barriers scenario

iSERVE Ltd may not be treated equally, or be confident that they are being treated equally, and might decide not to provide services in the barriers scenario

- By virtue of its shared ownership, NetCo might have an incentive to favour NetCo Solar
- To favour NetCo Solar, NetCo could:
  - **Subject NetCo Solar to less onerous connection requirements compared to iSERVE Ltd:** For example, the requirements to connect iSERVE Ltd's solar technology could be made more onerous, more complex, and take longer compared to connecting NetCo Solar
  - **Allow NetCo Solar to avoid some connection costs**: While NetCo decides these fees are required from iSERVE Ltd (to a regulated maximum of $1,200), NetCo might decide not to apply these fees to NetCo Solar
  - **Share with NetCo Solar any insight gathered into iSERVE Ltd's business plans through the connection process** to favour NetCo Solar's competitive position against iSERVE Ltd

Make-it Co's needs might be imperfectly met in the barriers scenario

	Potential Need	NetCo Solar's services to Make-it
Need 1	Comprehensive advice on technology choice, system size, system performance (consideration of distribution tariffs, connection requirements and the export congestion policy) to enable calculation of return on investment	Chosen solar system configuration results in higher distribution and transmission charges and lower wholesale market revenues, reducing the return on investment
Need 1	Suitable add-on services covering technology supply, performance guarantees, on-going service maintenance etc.	Solar installation offers lesser performance, higher degradation over time and a lower guarantee
Need 2	Price forecasts and an offer/trading strategy	Make-it Co has to figure this out for itself or pay a third party to understand when it is best to export the solar energy

Impacts in the no barriers scenario

- There is **restricted choice** because Make-it Co can only choose NetCo Solar's service offering
- NetCo's **distribution network service does not meet Make-it Co's needs** because it is delivered to favour NetCo Solar
- Make-it Co does not necessarily export solar at times of high prices **reducing competition in the wholesale market**
- New technologies are **operated less efficiently**:
  - causing greater distribution and transmission network costs that will increase network charges to consumers

WORKED EXAMPLE 2

Assessment

Impact on competition, reliability and efficiency

Barrier identified	Impact on CRE compared to no barriers scenario	Impact on consumers compared to no barriers scenario
Potential conflict of interest	**Less competition in** • markets for new technologies and energy services • the wholesale electricity market	• Reduced choice in the market for new technologies • Higher electricity prices
	Less efficient • operation of new technologies	• Higher distribution and transmission network charges
	No impact on reliability	

Key questions

- Why are network users not confident that distributor behaviours as described in the worked example are possible?
- Do concerns relate to all distribution businesses? Or do concerns differ depending on distributors' governance arrangements, business approach to new technologies, ownership structure etc.?
- Why aren't the existing Code arrangements providing confidence that barriers are addressed?
  - Under Part 6 of the Code, distributors are required to "act at arm's length" when distributed generation wants to connect their network
  - Connection and operation standards should be consistent with good industry practice

WORKED EXAMPLE 3

The set up

Hooptown is a new housing development

- Hooptown will be a small community

Figure 7: Example of market segmentation curve for residential customers in 2027 (See *the Roadmap Interim Program Report* Dec, 2015).

Source: Plausible 2027 customer segments were informed by an international literature review, commissioned expert papers and structured stakeholder workshops. In particular, Rosemary Sinclair of Energy Consumers Australia is acknowledged for employing the market curve device to graphically represent customer segments (adapted with permission).

Hooptown's needs

	Context	Potential need
Need 1	Likely to be environmentally motivated	Be a community that uses new renewable technologies to meet their energy needs
Need 2	A new local distribution network infrastructure for the new development is needed	Use the best engineering contractors to build the local distribution network infrastructure to reduce costs and prices in Hooptown
Need 3	A secure and reliable source of electricity supply	Need connection to the main distribution network

Who is the distributor?

NetCo is the distributor that Hooptown could connect to

- There is sufficient capacity in NetCo's network to connect and supply Hooptown
- But a new connection needs to be built to supply Hooptown
- NetCo manages the impact of more penetration of new technologies in its network area using a network congestion policy

Suppliers (1)

NetCo Build is NetCo's own engineering services contracting arm

- Can design and deliver:
  - the new network connection
  - the new local network in Hooptown

- To date NetCo Build has performed efficiently

Suppliers (2)

iSERVE Ltd is a new energy services provider

- Can design and deliver:
  - the new network connection
  - the new local network in Hooptown
- Can supply and install solar panels and batteries and design the network to ensure that these technologies are deployed efficiently across sunny locations in Hooptown
- Can operate solar panels and batteries to ensure that Hooptown does not experience power quality problems related to higher penetration of new technologies in Hooptown's network

WORKED EXAMPLE 3

No barriers scenario

How are consumer needs met?

Hooptown prefers the services of iSERVE Ltd over NetCo Build

	Potential need	iSERVE Ltd services to Hooptown
Need 1	Be a community that uses new renewable technologies to meet their energy needs	• Installs solar panels and batteries at good sunny locations at Hooptown • Allows for efficient integration of technologies ensuring that they are operated to keep good power quality levels
Need 2	Use the best engineering contractors to build the local distribution network infrastructure to reduce costs and prices for Hooptown	• Designs and builds the new local distribution network infrastructure at a competitive cost to Hooptown
Need 3	Need connection to the main distribution network	• Designs and builds the local distribution network connection at a competitive price to Hooptown to ensure security of supply

Summary of benefits in the no barriers scenario

Benefits of competition between iSERVE Ltd and NetCo Build

- iSERVE Ltd services can better meet Hooptown's needs
  - can benefit from a distribution network built at a competitive price while still maintaining security of supply which reflects in the distribution network charges for Hooptown
  - improved access to new technologies because these are deployed more efficiently across sunny locations
  - new technologies are operated more efficiently providing Hooptown with good power quality

WORKED EXAMPLE 3

Barriers scenario

Description of the barriers

Barriers from Enabling mass participation consultation

- **Potential barrier – conflict of interest**
  - NetCo has the ability and the incentive to block or make competition difficult because it participates in a business that is active in the new energy service markets

Investments may not be allowed equal consideration in the barriers scenario

iSERVE Ltd cannot compete because NetCo can force Hooptown to use NetCo Build for both network connection and building the new local network

- To allow for connection NetCo requires Hooptown to buy the services of its engineering services contracting arm NetCo Build

- NetCo's Build option is:
  - more costly to Hoopstown
  - not designed to support too much penetration of solar panels and batteries. Hooptown needs to comply with NetCo's congestion policies which means that not as many solar panels and batteries can be deployed

Hooptown's needs might be imperfectly met in the barriers scenario

Hooptown is forced to adopt NetCo Build's choices and network solutions

	Potential need	NetCo's services to Hooptown
Need 1	Be a community that uses new renewable technologies to meet their energy needs	• Hooptown community members can still install solar panels and batteries • But their choices are restricted by NetCo's congestion policy
Need 2	Use the best engineering contractors to build the local distribution network infrastructure to reduce costs and prices for Hooptown	• NetCo designs and builds the local distribution network infrastructure at a higher cost to Hooptown
Need 3	Need connection to the main distribution network	• NetCo designs and builds distribution network connection at a higher cost to Hooptown

Impacts in the barriers scenario

- There is **restricted choice** because **Hooptown is forced to adopt NetCo Build's choices and network solutions**

- **Distribution network charges are higher** because Hooptown is forced into NetCo's more expensive choice for network connection and build for similar security of supply levels

- Hooptown's **needs are not necessarily met** because NetCo's congestion policy restricts the deployment of solar panels and batteries in Hooptown to maintain power quality levels

WORKED EXAMPLE 3

Assessment

Impact on competition, reliability and efficiency

Barrier identified	Impact on CRE compared to no barriers scenario	Impact on consumers compared to no barriers scenari0
Potential conflict of interest	**Less competition in** • Markets for new technologies and services	• Less choice on technology offerings and services resulting in unmet consumer needs • Higher distribution network charges
	Inefficient • Management of penetration and impact of new technologies • Inefficient distribution network investment	• Technologies are not deployed and operated in a way that allows for efficient deployment across the network • Higher distribution network charges
	Expensive reliability/security • Higher connection costs to the distribution network	• Pay for more expensive means to achieve similar reliability/security outcomes

Some key questions

- How material is distributors' incentive and ability to impose technical solutions and standards on network users?
- Do equal arrangements provide the right balance between allowing consumer choice and the requirement to maintain security and quality of supply to consumers?
- Are new technologies offering new choices to the consumer on the security and quality of supply they want to experience?

WORKED EXAMPLE 4

The set up

Who is the consumer?

- aV-to-b provides transport services using a fleet of autonomous EVs and own charging stations

aV-to-b needs

	Context	Potential Needs
Need 1	Requires sufficient charging capacity to keep enough vehicles on road	Be confident to connect and use the distribution network to install EV charging stations to meet consumers' demand for new mobility services
Need 2	Wants more efficient distribution pricing structures to optimise its automated charging process	More efficient distribution pricing structures to: • charge the EV fleet more efficiently; and • signal to consumers when their mobility service is more expensive

Who is the network?

NetCo is aV-to-b's local distributor

- NetCo has prepared the city's network for the increased uptake of EVs:
  - has transitioned to more efficient distribution pricing structures; and
  - completed a series of network investment upgrades

Meeting consumer needs

NetCo Charging

- Is a business unit within the wider NetCo business
- Is also deploying a network of EV charging stations around the NetCo network
- Uses technology that charges at a slower rate compared to aV-to-b's

WORKED EXAMPLE 4

No barriers scenario

How are consumer needs met?

	Potential Need	NetCo's services to aV-to-b
Need 1	Confidence to connect and use the distribution network in areas with sufficient capacity to install EV charging stations to meet consumers' demand for new mobility services	• NetCo provides a distribution network service to aV-to-b using a connection and a use-of-system agreement • Is confident that the distribution service is based on equivalent terms and conditions compared to NetCo Charging
Need 2	More efficient distribution pricing structures to: • charge the EV fleet more efficiently; and • signal to consumers when their mobility service is more expensive	NetCo implements new distribution pricing structures that reflect the available network capacity on a locational and time varying basis

Summary of benefits in the no barriers scenario

Benefits of competition from aV-to-b

In the no barriers scenario, aV-to-b can:

- provide consumers of mobility services the benefits of quicker EV charging stations in direct competition with NetCo Charging
- Use more efficient distribution pricing structures to:
  - optimise the charging of the EV fleet by using the network more efficiently. This allows aV-to-b to incur lower distribution network charges and compete more effectively to provide autonomous EV mobility services that cost less to consumers
  - use more efficient distribution prices to manage demand for its own mobility services. This allows for the distribution network to be used more efficiently avoiding unnecessary network upgrades paid for by consumers

WORKED EXAMPLE 4

Barriers scenario

Barriers considered in the barriers scenario

Barriers from the Enabling mass participation consultation

- **Potential barrier – conflict of interest**
  - NetCo has a conflict of interest, and could establish pricing plans, connection processes, technical specifications and data sharing arrangements to favour its own commercial activities (ie, NetCo Charging)

Lack of confidence that network users are treated equally in the barriers scenario

aV-to-b <u>may not</u> be treated equally and might decide not to provide services in the barriers scenario

- By virtue of shared ownership, NetCo might have an incentive to favour NetCo Charging

- To favour NetCo Charging, NetCo could:
  - **Subject NetCo Charging to connection requirements that are less onerous than aV-to-b's**: For example, the requirements to connect aV-to-b could be made more onerous, more complex and take longer compared to connecting NetCo Charging's technology
  - **Allow NetCo Charging to avoid elements of NetCo's fees** such as any inspection and testing requirements to connect to the network
  - **Share with NetCo Charging any insight gathered into aV-to-b's business plans through the connection process to** favour NetCo Charging's competitive position
  - **Consider delaying the introduction of more efficient distribution pricing structures** until NetCo Charging has managed to get access to a faster charging technology

aV-to-b's needs might be imperfectly met in the barriers scenario

	Potential need	NetCo's services to aV-to-b
Need 1	Confidence to connect and use the distribution network in areas with sufficient capacity to install EV charging stations to meet consumers' demand for new mobility services	• Connection and use of system agreements for aV-to-b might favour NetCo Charging rather than focus on meeting aV-to-b's needs efficiently • NetCo's ownership of NetCo Charging makes aV-to-b less confident that connection and use of the network is on equivalent terms compared to NetCo Charging
Need 2	More efficient distribution pricing structures to: • charge the EV fleet more efficiently; and • signal to consumers when their mobility service is more expensive	• Potential delay in introducing more efficient distribution pricing structures to favour NetCo Charging, rather than encouraging EVs to use the network more efficiently

Impacts in the barriers scenario

- **Restricted choice and higher cost of mobility services** to consumers from:
  - only having a choice to charge from NetCo Charging's stations
  - not being able to access new EV autonomous mobility services
  - longer waiting time to charge EV
- **Higher distribution and EV network charging costs** to consumers from NetCo's incentive and ability to delay transition to more efficient distribution pricing structures to favour NetCo Charging

WORKED EXAMPLE 4

Assessment

Impact on competition, reliability and efficiency

Barrier identified	Impact on CRE compared to no barriers scenario	Impact on consumers compared to no barriers scenario
Potential conflict of interest	**Less competition in** • the supply of EV network charging services • the supply of EV autonomous mobility services	• Less EV charging choices • Less innovative EV mobility services • Higher cost to charge EV (including waiting time) • Higher distribution network charges
	Less efficient • utilisation of the distribution and EV charging network • inefficient investment in the distribution and charging network	• Higher cost to charge EV (including waiting time) • Higher distribution network charges
	No impact on reliability	

Key questions

- Why are network users not confident that distributor behaviours as described in the worked example are possible?
- Do concerns relate to all distribution businesses? Or do concerns differ depending on distributors' governance arrangements, business approach to new technologies, ownership structure etc.?
- Distributor behaviours described are difficult to monitor. How do we assess whether there is a problem?

Equal access
Problem definition

Definition based on email correspondence

- Current equal access arrangements to electricity networks have served consumers relatively well to date. They have provided a platform for competition in markets for retail, wholesale and ancillary services.
- There should be no impediment to the adoption of new technologies or business models from within or outside the electricity sector, which aims to provide greater choice, increased competition, desired levels of reliability and a lower cost for the long-term benefit of consumers.
- Given the likelihood of industry changes, equal access arrangements to electricity networks might need to evolve to ensure the long-term benefits to consumers are maximised
- The IPAG will use scenario analysis to investigate the hypothesis that there is (or is not) equal access to retail, wholesale and ancillary services in the electricity supply chain.

Key points to consider for the problem definition

- IPAG's working hypothesis that equal access arrangements that were designed with the 'one-way' supply chain model to the consumer in mind might not be suitable for an industry that is already evolving to a 'two-way' supply chain model? For example, consumers will be supplied to, but they can already provide services across the supply chain
- A key issue to investigate is why there is low confidence between network users that equal access arrangements are not suitable for the future?
- Scenario analysis might be only one of a number of available approaches to analyse whether there is a problem?

Suggested next steps to stimulate discussion

Key activities to consider

Subject to agreement on the problem definition, key activities to consider could be:

- Decide scope and prioritise work
- Establish whether there are strong indications that equal access arrangements might need to change
- Assess what the barriers to equal access to networks are (if any)

Scope and prioritisation

- Equal access arrangements are complex, have many moving parts and are wide ranging
- Scope includes transmission as well as distribution networks
- **Should IPAG prioritise work around distribution networks, given that concerns were mainly focused on this network?**

Establishing whether there are strong indications for change

- It is important the IPAG considers all available evidence to establish whether there is a need to change equal access arrangements
- Establishing whether consumers can compete to offer services up the supply chain is a strong indication change might be required (is two-way already here, or expected to be here soon enough?)
- **The IPAG could consider instructing the secretariat to perform the following tasks**:
  - **Survey** who is considering/planning to use, or has an interest in using, new technologies to deliver services up the supply chain
  - **Develop case studies** of actual examples that show change is already here, and to what degree
  - **Define what services** to distribution networks can be subject to competition from capable 3rd parties

An assessment framework

- The IPAG could consider developing an assessment framework to guide its analysis to understand whether equal access arrangements might need to change

- The IPAG could define a set of design principles that equal access arrangements should satisfy to promote competition, reliability and efficiency for the long-term benefits of consumers

- As mentioned previously, some suggested principles could be that equal access arrangements:
  - **promote consumer choice**
  - **are technology agnostic**
  - **ensure a level playing field between participants**
  - **allocate risks efficiently between participants including consumers**

Benefits of a principles based approach

- Avoids having to make judgements about:
  - what consumers' needs might be in the future, or
  - what could be viable businesses, products or services
- Some problematic behaviours are difficult to monitor, and finding evidence that they are actually occurring is also difficult
- A principles based approach would look at 'incentives' to engage in such behaviours rather than making a judgement, or finding evidence, of a particular behaviour. This should avoid 'pointing fingers'

Applying the assessment framework

- Use concerns from the *Enabling mass participation* consultation and intelligence gathered through presentations and the ‘two pager’ consultation to **elaborate a list of potential barriers**
- Barriers could then be analysed with respect to their **impact on how equal access arrangements score against the principles** to understand their impact on competition, efficiency and reliability
- **Worked examples** can be used to show how barriers impact on the principles and on competition, efficiency and reliability

Applying the assessment framework

- The IPAG could instruct the secretariat to:
  - **Develop** the assessment framework and key design principles
  - **Assess** how distributors' ability to include investments in new technologies in the RAB may not align with the principles, and the trade-offs in terms of competition, efficiency and reliability (Consultant for independent advice?)
  - **Assess** whether distributors have incentives and scope to engage in problematic behaviours, and how those behaviours change how equal access arrangements against the principles to work out the impact on competition, efficiency and reliability