

Renewables project: Stage 3 – Recap on preferred options and submissions – *For Discussion*

MARKET DEVELOPMENT ADVISORY GROUP



Outline

- Recap key elements and preferred options
- Initial review of submissions overall
- Initial discussion on members' view of preferred options – assess scope of any differences to be worked through

Recap on issues paper

Issues paper – Recap key points (1)

- In a nutshell, we examined the likely effects of 100% renewable supply on the electricity system as a whole. We concluded that all renewable supply appears to be technically achievable at a *system level* if the right settings are in place.
- From that analysis, we distilled the following key implications for *market design*:
 - Real time coordination will become more challenging and make an effective spot market even more important;
 - The types and quantities of ancillary services will need to change to maintain secure supply;
 - Accurate spot price signals will be crucial for demand-side, contracting and investment incentives;
 - Demand side flexibility will become more important;
 - Contracts market will have to do more ‘heavy lifting’; and
- Sufficiency of competition will be vital, particularly in flexible supply

Issues paper – Recap key points (2)

We set out five pre-conditions that need to be satisfied for our 'energy-only' arrangements to work well, namely:

- Wholesale prices reflecting real supply and demand conditions, including very high prices in times of scarcity;
- Confidence among wholesale buyers and sellers that the high prices make sense (which means confidence in the structure and rules of the market, including the sufficiency of competition);
- Availability of 'tools' for wholesale buyers and sellers to manage their exposure to those spot price risks;
- General public and political acceptance that volatility and high prices (in times of scarcity) in the wholesale market are, in fact, in the best long-term interest of consumers, and that measures to 'soften the landing for unhedged participants' can trigger a vicious circle of undermined investment incentives and higher future prices; and
- Confidence among consumers/politicians that investment will be timely and competitive.

We observed that achieving (d) and (e) above is highly influenced by whether (a) to (c) are satisfied

Issues paper – Recap key points (3)

- We also pointed out that higher prices with more frequency in an energy-only regime will likely require both a change of mind-set and measures to strengthen delivery of the criteria outlined above.
- In conclusion, we emphasised that although there is much that New Zealand can learn from international experience, our physical characteristics and lack of any grid interconnection to other countries mean the challenges and opportunities we face are unique in many areas.
- As New Zealand moves forward on its decarbonisation journey, it will be important to monitor international developments but also to think deeply about the particular features on our system and the opportunities and challenges they present

Recap on options paper

[Content of the following slides has been extracted from our Options Paper]

Related work-streams

We took a very open and cooperative approach to sharing our work with other initiatives, and will continue to do so. Other projects in this space include:

- NZ Battery Project
- NZ Energy Strategy
- Gas Transition Plan
- Future Security and Resilience Project
- Wholesale Market Review
- Boston Consulting Group (BCG) Report
- Winter 'peak' issue
- Flex Forum

International experience and expertise

We conferred closely with:

- European Union – Agency for the Cooperation of Energy Regulators
- Alberta – Market Surveillance Administrator
- Australia – Energy Security Board
- Singapore – Electricity Market Authority
- Columbia – Prof. Peter Cramton
- PJM, Texas, other markets - Prof. Peter Cramton

What we are published

- Options paper
- 'Library' of Options
- Summary of submissions
- Competition analysis
- Demand-side flexibility (DSF)
- DSF case studies
- 'Nega-watt scheme'

Overall goal

In our options paper, we expressed the overall goal as follows:

Put succinctly, we want our wholesale electricity market to deliver *renewable* and *reliable* electricity *at least cost* to consumers where:*

- (a) “**Renewable**” means generation from solar, wind, hydro, geothermal, biomass, tidal, wave, or ocean current sources;
- (b) “**Reliable**” means having adequate generation and demand response to continuously meet consumers’ demand for electricity across all timeframes – within the half hour, hour, day, week, season, year and beyond; and
- (c) “**Least cost**” means using the lowest cost resource to meet the next unit of demand in the relevant period, whether a half hour, hour, day, week, season, year or beyond.

- Peter Cramton, Electricity market design, Oxford Review of Economic Policy, Volume 33, Number 4, 2017, pp. 589–612 – with the addition of “renewable”.
- This objective is reflected in the Electricity Authority’s statutory objective.

Goal of 100% renewable

- Our analysis and proposals did not depend on reaching 100%RE, or even 96%.
- Future is happening now
- Government's Emission Reduction Plan released in May 2022 – aims for 50% of total final energy consumption coming from renewable sources by 2035.
- 100%RE by 2030 is as an aspirational target.
- Climate Change Commission projects renewables at 96.5% share by 2030.

Industry challenges

In our options paper, we framed the following key challenges:

- The future is arriving faster than expected - and so it is imperative that we prepare now for the transformative role that electricity will play in our economy and our day to day live
- Huge ramp-up in new energy supply capacity will be needed
- Supply and demand-side solutions are likely to emerge that are currently not known or currently considered not viable. In short, innovation will continue to drive costs and technology in ways that we can't predict
- Cost of reducing or shifting consumption will become increasingly competitive as an alternative to using supply-side resources, particularly as the value of flexibility heightens with the decline of flexible, dispatchable fossil-fuelled plant
- System and network operations become more complex – more 'neural'

Do we need a market?

In its own chapter, we addressed:

- What is a “market”?
- We will need it more than ever – but it needs to be strengthened
- Why marginal cost pricing?
- Cooperation in competition
- Measures need to work for New Zealand and avoid complicating features

“Electricity markets are necessarily complex. This follows from the complexity of the engineering and economic problems that must be solved. Still designers should strive to keep the design as simple as possible. Complicating features should only be added if they are necessary and consistent with market principles” - Professor Peter Cramton

'Market' – Is it still our preferred way forward?

We first defined what we mean by a 'market' – namely enabling a diversity of parties to offer their best solutions to satisfy the next unit of electricity demand across all timeframes, with the lowest cost option prevailing.

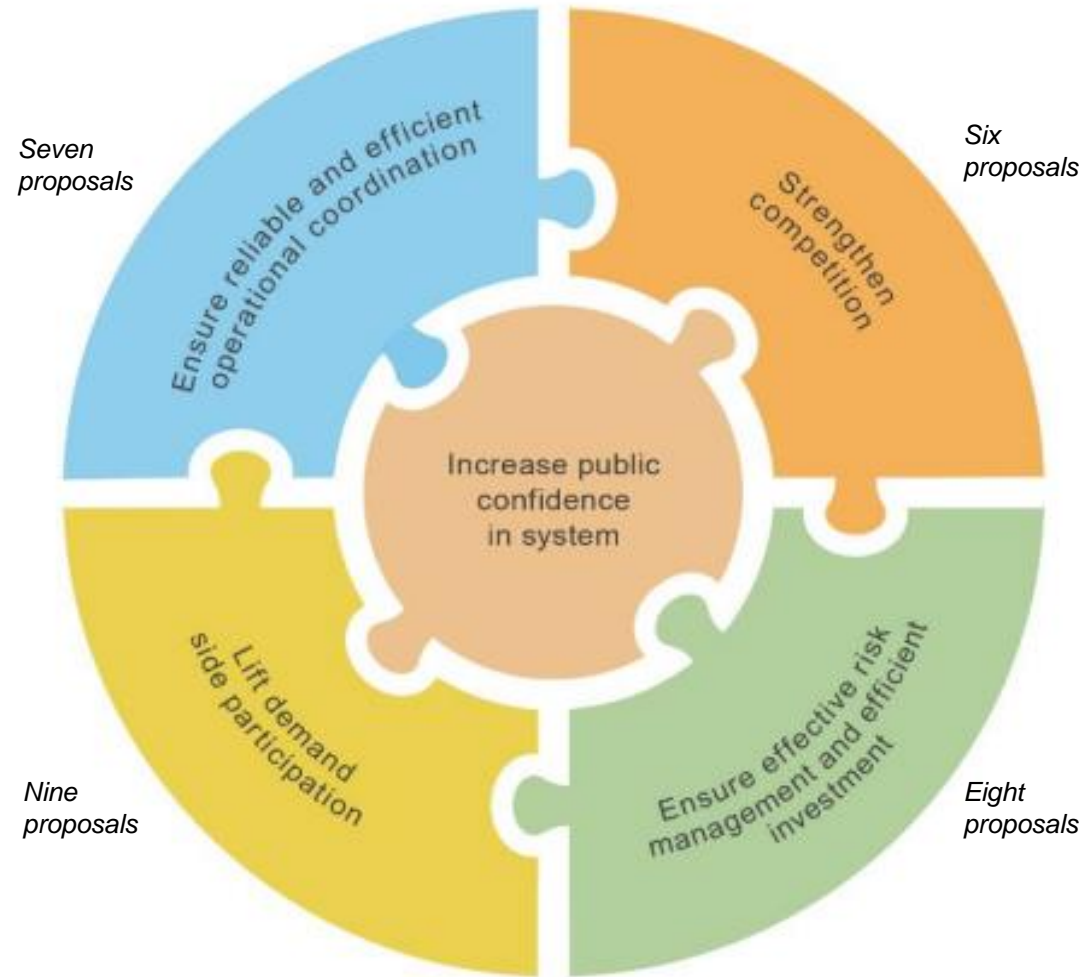
We noted the five mechanisms essential to enable this process:

- (a) **Accurate (efficient) prices:** A transparent process of discovering prices that accurately signal the value of an additional unit of electricity in the short, medium and longer term at different locations. In effect, these marginal prices become targets that market participants are competing to beat;
- (b) **Tools to manage risk:** Parties will find an array of different ways to manage their risks beyond the choices likely to be deployed by a handful of near-monopoly decision-makers. However, the good regulatory framework needs to enable the risk to be allocated to parties best placed to manage risk;
- (c) **Sufficient competition:** A level of competition to provide the best solution to meet demand such that no party has the means and incentive to exercise significant market power
- (d) **Robust rules and governance;** and
- (e) **Public and political confidence.**

Our conclusion was that this 'market' approach will become particularly valuable as we see more diversity come into the system with decarbonisation. This was emphasised by overseas experts like Prof Peter Cramton.

However, for a 'market' approach to work, key mechanisms need to be **strengthened significantly** to meet the challenges noted earlier

MDAG's five fields to be strengthened



Operational coordination context

We noted that:

- The laws of physics require that the amount of electricity being injected onto the grid must continuously match the quantity being taken off. If operational coordination processes fail to maintain this balance, the electricity system will quickly become unstable and there will be widespread power cuts.
- Our electricity system is undergoing a revolution. For over 100 years it had few suppliers and consumers were largely passive. Operational coordination was relatively simple – just match the generation to consumer demand.
- Our system is becoming far more decentralized and diverse. Falling solar and wind costs mean that more consumers and communities can become suppliers. Technology is also making it easier for consumers to alter their demand to help balance the system. For example, a growing number of consumers have smart devices that can alter their power usage – lifting demand when supply is plentiful and cutting or deferring consumption when power supply is tight.
- For example, Transpower estimates there will be 3.9 million distributed energy resources across the system by 2035. A more decentralized and diverse system offers significant benefits to consumers. However, it still needs to be tightly coordinated if it is to be reliable.

Operational coordination measures

	OPTION NAME	RATIONALE	START	IN PLACE BY
A1	Improve short-term forecasts of wind, solar, and demand	Provides better information for decision-makers leading into real-time	2023	2024
A2	Strengthen governance for next phase of FSR Project	Better ensures future design of system will be consumer centric	2023	Mid 2023
A3	Update shortage price values	Ensures price signals are better aligned to consumers' interests	2023	2025
A4	New reserve product to cover sudden reduction from intermittent sources	Ensures ancillary services reflect changing needs of system	2023	Mid 2024
A5	Offer price reductions after gate closure	Unlocks some flexibility that is otherwise held back	Mid 2024	Mid 2025
A6	Investigate + develop ahead market	Clearer price signals in lead-up to real-time should help parties to coordinate their plans	2025	Mid 2027
A7	Remove UTS over-ride of trading conduct provisions	Reduces likelihood of confusing price signals from overlapping code provisions	Mid 2025	2027

Risk management context (1)

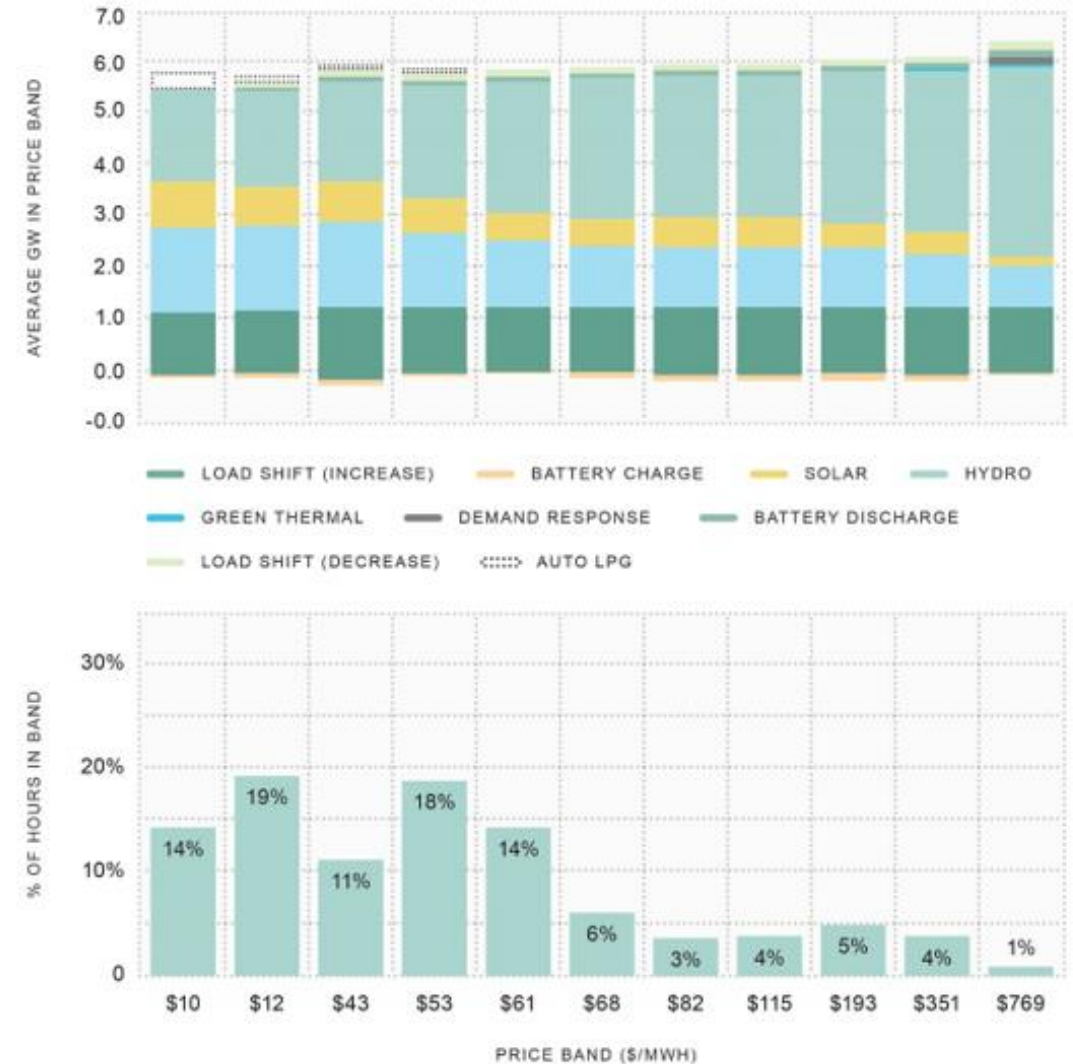
- From a market design perspective, there are two basic approaches for organising contracting and investment decisions:
 - One approach relies on market participants to actively manage their forward exposure to spot price risks. Participants do this via their own investments in supply or demand response capability, or by contracting with other parties (who in turn are incentivised to make investments). This is often referred to as an '**energy-only**' approach because the regulated spot market provides for suppliers to be paid only for energy production, and any other payments are based on private contracts.
 - The alternative approach is for a regulator (or another central body) to determine a target for capacity adequacy, and then enforce contracting (or levying) obligations on purchasers to ensure the required capacity is deployed. A wide range of regulatory instruments have been developed for this purpose, which are often referred to as '**capacity adequacy mechanisms**'.
- For the reasons set out in the Options Library report, we think it will be very hard for a regulator to efficiently identify the best mix and level of resources for the system, especially as the share of renewable supply increases and makes the system much more dynamic. This was a strong and consistent message from overseas regulators and experts (including a leading former proponent of capacity mechanisms).
- We think the much better approach is to rely on buyers and sellers putting in place effective risk management measures that are least cost for their circumstances, including a wider mix of options (for example demand side flexibility) that the transition to renewables is likely to foster.

Risk management context (2)

A key question raised in the Issues Paper was whether the availability and liquidity of hedge products – especially shaped products – will be sufficient to allow parties to workably manage risk in a renewables-based system. Assessing the willingness of market participants to buy and sell contracts (i.e. generate liquidity) in a future world is difficult, given the behavioural factors involved. However, some insight can be gained examining what types of resources would be the natural “backing” for risk management products at those price levels. To this end, we extracted relevant data for the Issues Paper reference case scenario for 2035.

Key observations from the simulation results are shown in the adjoining chart

Figure 9: Contribution from resource types by price band (2035 reference case)



Risk management context (3)

The likely implications for the contract market from these simulation results include:

- Contractual products that offset price risk associated with intermittent generation are likely to become much more important. Parties seeking such shaped contracts could include developers seeking to sell a firmed product to end-users/retailers, or end-users/retailers seeking to buy a firming product to complement their purchase of intermittent generation output.
- The 'natural' providers of such products include hydro generators are flexible supply bases (noting some hydro generation is relatively inflexible), but green peakers, energy storage providers, and parties with demand-side flexibility would also be potential hedge providers.

...

The contract market has a vital role to play in addressing these competition concerns because it can allow different business models to be tested and for customers to choose the model that best meets their needs.

New Zealand is perceived by some international academics to have one of the most advanced electricity contract markets in the world, that has adapted over the last 20 years to increasingly meet the needs of participants. This work is by no means done. Looking forward, we think the key areas to focus on are:

- Increasing the visibility on contract prices – especially prices for different product shapes, such as the price to firm wind or solar output.
- Improving the information available for investment and longer-term contracting decisions.
- Ensuring that vertically integrated players with significant flexibility cannot use that to hinder competition

Risk management measures

	OPTION NAME	RATIONALE	START	IN PLACE BY
B1	Greater transparency of hedge info (esp non-base load) covering offers, bids + agreed prices	Make it easier for participants to compare prices, especially for non baseload contracts. Also get better info for regulator	2023	Mid 2024
B2	Market-making for longer dated futures (for price discovery)	Improve forward price discovery and supports OTC longer term contracting	2024	Mid 2025
B3	Publish aggregated information on pipeline of new developments, energy and capacity adequacy	Provide more information to help participants with contracting and investment decisions	2023	2024
B4	Enhance stress testing regime	Help ensure that participants are actively considering and managing their exposure to spot price risk	2023	2024
B5	Develop standardised 'shape' product(s)	Develop some standardised non-baseload products	2024	2025
B6	Develop flexibility access code (non-price elements)	Promote reasonable access to 'flexibility contracts'	2025	Mid 2026
B7	Extend trading conduct rules to hedge market	Deters participants from exercise of significant market power	2025	2026
B8	Market making in caps or other shaped products	Strengthen forward discovery and liquidity for a shaped contract. [Potential augmentation for B1, B5, B6-B7]	Mid 2025	2028

Demand-side flexibility context (1)

if the marginal cost of reducing or shifting demand is less expensive than the cost of producing an additional unit of electricity from the next cheapest source of generation, then the demand-reduction or demand-shifting option should prevail – it is best for the economy, the environment and consumers.

...

In addition to the benefits of demand-side response in general, the benefits of DSF in particular include:

- Lowering overall system costs for consumers
- Mitigating market power concerns
- Lowering the need for forced demand curtailment in periods of scarcity
- Adding consumer-driven valuations of consumption into the demand curve, and
- More consumer engagement with the pricing process.

Demand-side flexibility context (2)

We expect the cost of reducing or shifting consumption will become increasingly competitive as an alternative to using supply-side resources, particularly as the value of flexibility heightens with the decline of flexible, dispatchable fossil-fuelled plant.

...

[Barriers or problems to be overcome] We see it as extremely important to have market arrangements that enable DSF to compete efficiently with supply-side resources in delivering reliability at least over the short, medium and longer terms. For this to happen:

- (a) Consumers need to have choice about whether and how they provide demand flexibility, with arrangements available to suit different customer preferences about the level of automation, engagement, cost volatility, service level and control; and
- (b) Simultaneously, we need to ensure consumers have access to the information that will help them make good decisions about providing DSF (benefits, costs, service impacts); and
- (c) Tariff and technology innovation is needed to drive the development of these tariffs, and to lower the transaction costs of making demand-side flexibility available to the wholesale market; and
- (d) DSF should have access to relevant value streams (sharing in the underlying benefits) where it has an economically efficient service to provide. This includes how large-scale DSF is integrated into existing markets.

DSF flexibility measures

1 OPTIONS TO ADDRESS STRATEGIC ISSUE 1				
Tariffs mute a signal for flexibility: Yet to see widespread emergence of DSF-rewarding tariffs that enable DSF owners to make risk-value and engagement trade-offs				
	Option name	Rationale	Start	in place by
C1	Monitor provision + uptake of DSF-rewarding tariffs	Provide reliable quantitative and time-series basis on which to assess retail market development and uptake of DSF tariffs	2023	2024
C2	Sunset profiling if smart meters in place	Continued use of profiles is impeding retailers' development of DSF tariffs	2024	2025
C4	Develop standardised shape-related hedge products to reward DSF	Enable large consumers to smooth volatile revenues from DSF	2024	Mid 2025
C5	Significant funding for pilots/trials to kick-start dynamic tariff use	Help cut through complexities and risks in enabling use of DSF tariffs	2024	Mid 2026

2 OPTIONS TO ADDRESS STRATEGIC ISSUE 2				
Market is not able to achieve the highest aggregate value for DSF, therefore compromising benefits				
	Option name	Rationale	Start	in place by
C10	Procurement process for high-scarcity DSF (RERT)	"Last resort" DSF should be formally contracted and paid for.	2025	2027
C11	Ensure distribution pricing reflects network needs	Improve coordination and optimising the use of DSF across both network and wholesale market	2023	2025
C12	Investigate extending LMP into distribution networks [Backup if C11 doesn't provide signals]	Static cost reflective tariffs may not provide the most efficient signal of dynamic network needs for flexibility, undervaluing the role that DSF can provide	Mid 2026	Mid 2029

3 OPTIONS TO ADDRESS STRATEGIC ISSUE 3				
Consumers and intermediaries have low awareness of current or future DSF value				
	Option name	Rationale	Start	in place by
C13	Info to help large users with upcoming DSF investment decisions	Help large consumers to better quantify the value of DSF in electrification investment decisions - see examples in accompanying 'DSF Case Studies'	2023	2024
C14	Info to help domestic customers with DSF decisions	Help smaller consumers to better understand benefits of DSF tariffs	Mid 2024	2026

Competition context (1)

“Ensuring competition is a non-negotiable prerequisite for the market in general, much less for proper energy price formation” - Michael Hogan, 2016

Competition has a critical role to play in spurring innovation and driving its uptake. Experience shows that innovation is the biggest source of gains in terms of cost reductions, better service levels, and environmental improvements. Lack of confidence in competition is also bad for consumers and suppliers..

...

Flexibility services will be extremely important in the shift to a renewables-base system. We see competition –

- *Strengthening* in the provision of *short-term* flexibility services and some ancillary services (< few days), but
- *Thinning* in the provision of *medium to longer term* flexibility services (weeks or longer) with longer-term flexibility becoming more concentrated among parties with flexible hydro generation capacity (all other things being equal).

...

When assessing how competition for flexibility services could affect the wider market, it is important to consider the structure of spot prices. If some parties have sufficient market power to sustainably alter the structure of spot prices, those parties would likely have scope to influence competitive dynamics in other parts of the wholesale market. A particular concern would be if parties could increase the ‘volatility of volatility’.

Competition context (2)

Our work to date indicates that:

- Larger generators with flexible resources may well have greater means to significantly and rapidly raise volatility of volatility under a renewables-based system than in the past.
- Large generators with significant flexibility would not appear to face much direct cost or disruption from raising the volatility of volatility.
- It seems likely that significant volatility of volatility would deter potential new entrant intermittent generators.
- Generators with significant flexible resources face would appear to derive material gain if new entry is deterred.
- If increased volatility of volatility hinders new generation entry, that could lead to higher *average* prices.

These findings are not determinative, however they indicate the critical importance of maintaining effective competition for longer term flexibility products.

Competition context (3)

While some may advocate for a ‘wait and see’ approach, we think this would be unwise .”

- First it will take time to design options and put them in place. Waiting for a problem to emerge before starting that work could mean that an extended harm occurs before a solution is in place, or that hasty and sub-optimal solutions are implemented.
- Second, confidence in competition is a foundational ‘must have’ element for an electricity market. If that confidence is not present, parties will be unlikely to invest at the pace needed to provide reliable and affordable power and there is a continual risk of government intervention.

Given these factors, we *strongly* recommend that pro-competitive measures directed at the provision of flexibility services be pursued with dispatch

...

The costs of sustained significant market power have the potential to be extremely high. Without broad confidence in the sufficiency of competition, the foundations of the wholesale market are weak and all participants are exposed to the serious risk of *ad hoc* regulatory changes that effectively give up on a market process

Competition measures

	OPTION NAME	RATIONALE	START	IN PLACE BY
D1	Dashboard of competition indicators for flexibility segment of wholesale market	Better assess how competition for flexibility products is changing	2023	2024
D2	(=B1) Greater transparency of hedge info (esp non-base load) covering offers, bids + agreed prices	Make it easier for participants to compare prices, especially for non baseload contracts. Also get better info for regulator	2023	2024
D3	(=B6) Develop flexibility access code (non-price elements)	Promotes reasonable access to 'flexibility contracts'	2025	Mid 2026
D4	(=B7) Extend trading conduct rules to hedge market	Deters participants from exercise of significant market power	2025	2026
D5	(=B8) Market-making for shaped contract products	Creates better forward price discovery and market liquidity for a shaped contract	Mid 2025	2028
D7	Virtual disaggregation of flexible generation base	Addresses market power at source via structural change	High level outline 2023/24	2029 (if needed)

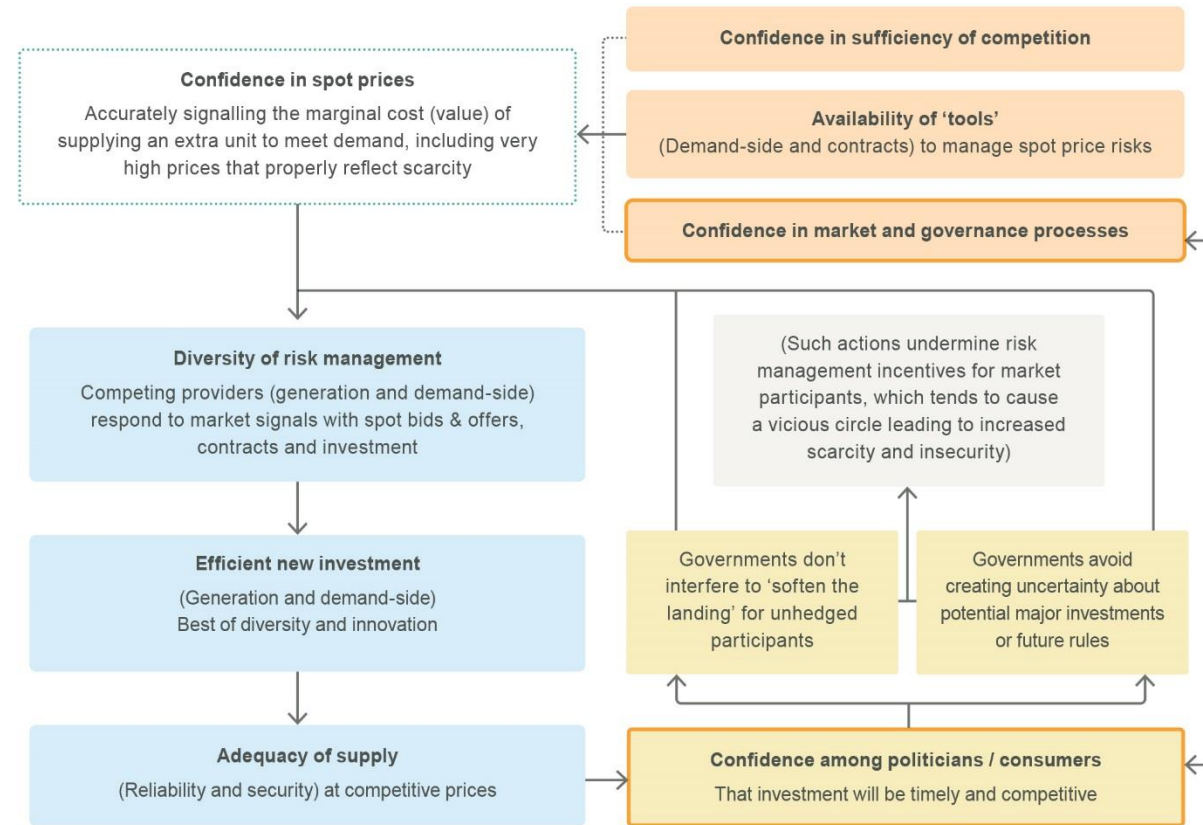
Additional public confidence context

For our preferred energy-only [decentralized] approach to work, five conditions need to be satisfied, two of which centre on public confidence, namely:

- General public and political acceptance that volatility and high prices (in times of scarcity) in the wholesale market are, in fact, in the best long-term interest of consumers, and that measures to 'soften the landing for unhedged participants' can trigger a vicious circle of undermined investment incentives and higher future prices; and
- Confidence among consumers/politicians that investment will be timely and competitive.

...Put simply, public and government confidence underpin at a fundamental level how incentives work among market participants.

...Given the importance of governments not intervening to suppress efficient spot prices, it is very important to strengthen public and political understanding of how pricing works and what to expect as we transition to more renewables



Additional public confidence measures

As we move to a renewables-based system, it is important that we strengthen the means by which governments in the future and the public in general can gain the assurance they need. Our preferred options below have also been developed to this end

	OPTION NAME	RATIONALE	START	IN PLACE BY
E1	Structured information programme for wider stakeholders	Explaining how security of supply is managed, both physically and via contracting, should promote better informed discussion of system performance	2023	2024
E2	Regular briefings for Ministers and officials on current and expected conditions	Regular updates should reduce scope for surprises and foster awareness that weather-induced spot price volatility is expected and should not be artificially suppressed	2023	2024
E3	Increase inter-change with international experts	Helps New Zealand to benefit from insights and experience from other jurisdictions	2024	Mid 2024
E4	Enhance monitoring with more autonomy	Closer and more independent scrutiny of market performance should identify help to identify and remedy problems - and foster confidence in regulatory system	Mid 2024	2026
E5	Periodic warrant of fitness review for independent regulatory agencies	Periodic independent reviews external should ensure any weaknesses are identified and contribute to confidence in regulatory system	2027	2028

Preferred options – as a whole

Options Paper package

2023

2024

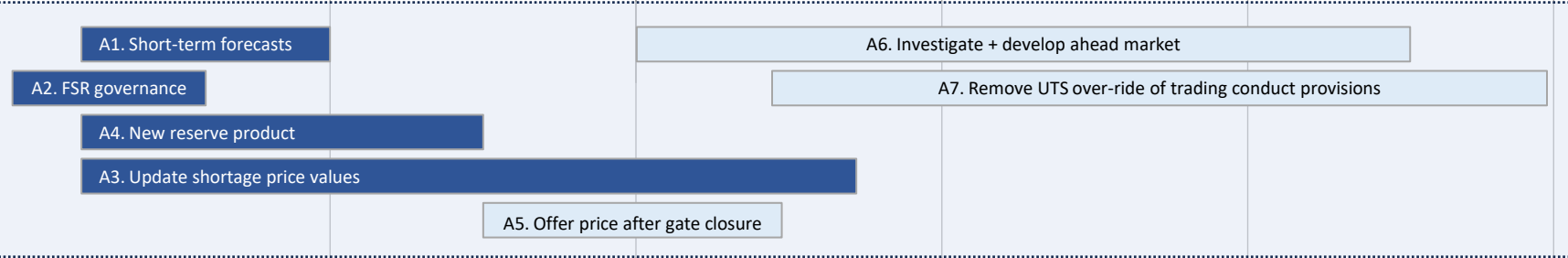
2025

2026

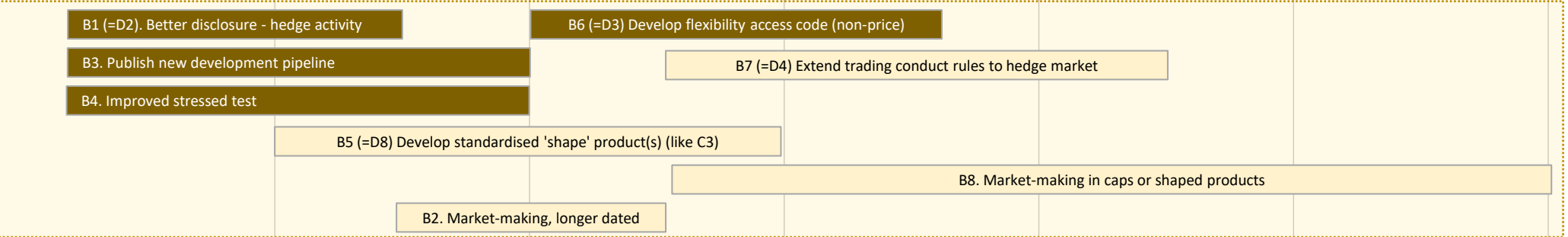
2027

2028

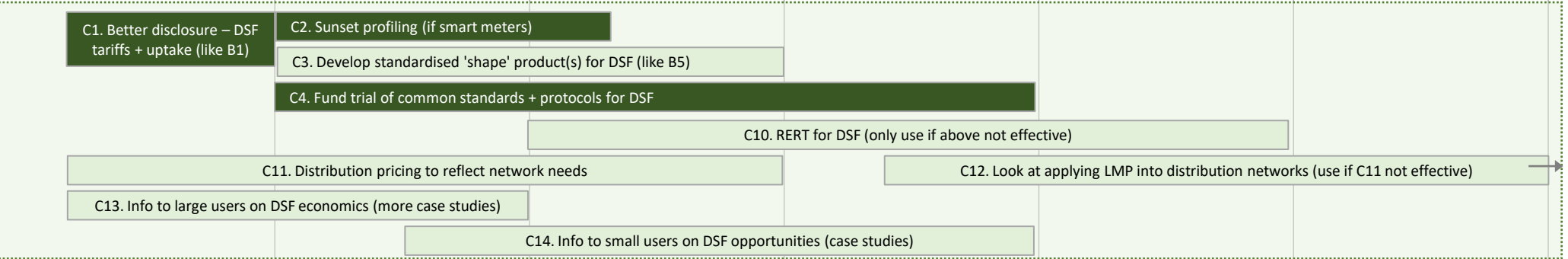
Operational co-ordination



Risk management



DSF



Competition



Additional public confidence



Submissions - overview

- A taxonomy of submissions has been prepared as an accompanying paper, which distils the key points in each submission relative to each key issue.
- The following slides set out summary tables showing the relative alignment across submissions in relation to each option. Note that this is a preliminary assessment.
- The taxonomy and summary tables should be **read together**.















Alignment on operational coordination measures (A)

Code	Name	MDAG status	Parties that support	Parties that partially support	Parties that do not support
A1	Improve short-term forecasts of wind, solar, and demand	● 2	Contact, EPOC, Fonterra, Genesis, Haast & indep. Retailers, Mercury, Meridian, MEUG, Neil Walbran, Nova, NZWEA, Orion, Transpower, Vector	SolarZero	
A2	Strengthen governance for next phase of FSR Project	● 2	Contact, Genesis, Mercury, Meridian, MEUG, Neil Walbran, NZWEA, Orion, Transpower, Vector, WEL	LMS Energy, SolarZero	
A3	Update shortage price values	● 2	Contact, Genesis, Mercury, Meridian, Neil Walbran, Nova, NZWEA, SolarZero, Transpower, Vector		
A4	New reserve product to cover sudden reduction from intermittent sources	● 2	Contact, Energy Resources Aotearoa, EPOC, Genesis, Mercury, Meridian, Neil Walbran, Nova, NZWEA, Transpower, Vector	Fonterra, SolarZero	
A5	Offer price reductions after gate closure	● 2	Mercury, Neil Walbran, Nova, Vector	Contact, Genesis, Meridian, MEUG, NZWEA	Transpower
A6	Investigate + develop ahead market	● 2	EPOC, Fonterra, Genesis, Mercury, Neil Walbran, NZX, SolarZero, Transpower, Vector	Contact, Haast & indep. Retailers, Meridian, NZWEA	
A7	Remove UTS over-ride of trading conduct provisions	● 2	Contact, Genesis, Mercury, Meridian, Neil Walbran, Nova, Vector	MEUG	Entrust, Haast & indep. Retailers
A8	Negative offers/prices	● -1	Transpower	NZX	Contact, Genesis, MEUG
A9	Centralised commitment based on complex offers	● -1	Transpower		Contact, Genesis, MEUG
A10	Warming contracts	● -1		Genesis	Contact, Fonterra, MEUG





Alignment on contracts and investment measures (B)

Code	Name	MDAG status	Parties that support	Parties that partially support	Parties that do not support
B1 (=D2)	Greater transparency of hedge info (esp non-base load) covering offers, bids + agreed prices	● 2	Electra, Energy Resources Aotearoa, ERANZ, Haast & indep. Retailers, Mercury, Meridian, Neil Walbran, NZWEA, Vector	Genesis	Contact
B2	Market-making for longer dated futures (for price discovery)	● 2	Energy Resources Aotearoa, Fonterra, LMS Energy, Mercury, Neil Walbran, NZWEA	Meridian, MEUG	Contact, Genesis
B3	Publish aggregated information on pipeline of new developments, energy and capacity adequacy	● 2	Energy Resources Aotearoa, Genesis, Mercury, Meridian, Neil Walbran, NZWEA, Transpower	MEUG	Contact
B4	Enhance stress testing regime	● 2	Energy Resources Aotearoa, Genesis, Manawa, Mercury, Meridian, Neil Walbran, NZWEA	Contact, MEUG	
B5	Develop standardised 'shape' product(s)	● 2	Energy Resources Aotearoa, Haast & indep. Retailers, Mercury, Meridian, Neil Walbran, Nova, NZWEA		Contact, Genesis
B6 (=D3)	Develop flexibility access code (non-price elements)	● 2	Electra, Energy Resources Aotearoa, ERANZ, Mercury, Meridian, Neil Walbran, NZWEA, Vector	Genesis	Contact
B7 (=D4)	Extend trading conduct rules to hedge market	● 2	Electra, Energy Resources Aotearoa, ERANZ, Genesis, Haast & indep. Retailers, Mercury, Meridian, Neil Walbran, Nova, NZWEA, Vector		Contact
B8 (=D5)	Market making in caps or other shaped products	● 1	Electra, ERANZ, Haast & indep. Retailers, Mercury, NZWEA	Meridian, MEUG	Contact, Genesis
B9	Capacity mechanisms	● -1		EPOC, Genesis	BEC, Contact, Fonterra, Haast & indep. Retailers, MEUG, NZX
B10	Strategic reserve	● -1		Genesis	BEC, Contact, Energy Resources Aotearoa, Fonterra, MEUG, NZX

Alignment on demand side flexibility measures (C)

Code	Name	MDAG status	Parties that support	Parties that partially support	Parties that do not support
C1	Monitor provision + uptake of DSF-rewarding tariffs (incl automation)	 2	Genesis, Mercury, Meridian, Neil Walbran, Nova, NZWEA, SolarZero, Vector	Enel X	Contact, Flick
C2	Sunset profiling if smart meters in place	 2	Contact, Flick, Genesis, Haast & indep. Retailers, Mercury, Meridian, Neil Walbran, NZWEA, NZX, Vector, WEL	Enel X, SolarZero	
C3	Require retailers to offer DSF tariffs	 1	Mercury, WEL	Enel X, Meridian, SolarZero	Contact, Flick, Genesis, Haast & indep. Retailers, NZWEA
C4	Develop standardised shape-related hedge products to reward DSF	 2	Enel X, Flick, Manawa, Mercury, Meridian, Neil Walbran, NZWEA, SolarZero, Vector	Fonterra, Genesis	Contact
C5	Provide significant funding for pilots/trials to kick-start dynamic tariff use	 2	BEC, Enel X, Haast & indep. Retailers, Manawa, Mercury, Meridian, Neil Walbran, NZWEA, Orion, SolarZero, Vector, WEL	Contact, Flick, Genesis	MEUG
C6	Use Customer Compensation Scheme to reward DSF	 -1		SolarZero	Contact, Enel X, Genesis, MEUG, NZWEA
C7	Negawatt scheme for wholesale market	 -1	Contact, Enel X	SolarZero	Genesis, MEUG, Nova, NZWEA
C8	FSR – improve DSF visibility and remove Code barriers	 2	Contact, Enel X, Genesis, Mercury, Meridian, Neil Walbran, NZWEA, Vector, WEL	SolarZero	
C9	FSR - accelerate new ancillary services for DSF uptake	 -1	Enel X, MEUG, NZWEA, SolarZero	Genesis, Haast & indep. Retailers	Contact
C10	Procurement process for high-scarcity DSF (RERT)	 1	Enel X, Mercury, Meridian, SolarZero, Transpower	Contact, Genesis	
C11	Ensure distribution pricing reflects network needs	 2	BEC, Contact, Genesis, Mercury, Meridian, MEUG, Neil Walbran, Orion, Vector, WEL	Aurora, Enel X, SolarZero	
C12	Investigate extending LMP into distribution networks	 1	Mercury	Aurora, Genesis, Meridian, SolarZero, WEL	Contact, Enel X, Transpower
C13	Provide info to help large users with upcoming DSF investment decisions	 2	Enel X, Energy Resources Aotearoa, Genesis, Mercury, Meridian, Neil Walbran, Nova, Orion, Vector		Contact, MEUG
C14	Provide info to help domestic customers with DSF decisions	 2	Enel X, Energy Resources Aotearoa, Flick, Genesis, Haast & indep. Retailers, Mercury, Meridian, Neil Walbran, Nova, Orion, SolarZero, Vector		Contact, MEUG

Alignment on demand side flexibility measures (C)

Code	Name	MDAG status	Parties that support	Parties that partially support	Parties that do not support
D1	Develop dashboard of competition indicators for flexibility segment of wholesale market	 2	Electra, ERANZ, Genesis, Mercury, Meridian, NZWEA, Transpower, Vector	MEUG	
D2 (=B1)	Greater transparency of hedge info (esp non-base load) covering offers, bids + agreed prices				
D3 (=B6)	Develop flexibility access code (non-price elements)				
D4 (=B7)	Extend trading conduct rules for hedge market				
D5 (=B8)	Market making in caps or other shaped products				
D6	Physical disaggregation of flexible generation base	 -1	Entrust, Haast & indep. Retailers	2degrees, Electra	BEC, Contact, Energy Resources Aotearoa, EPOC, Genesis, MEUG, Nova, NZWEA
D7	Virtual disaggregation of flexible generation base	 1	Entrust, Haast & indep. Retailers, Octopus Energy (unofficial), Vector	2degrees, Contact, Electra, EPOC, Meridian	BEC, Energy Resources Aotearoa, ERANZ, Genesis, Mercury, Neil Walbran, Nova, NZWEA
D8	Price caps applied in the electricity spot market	 -1			Contact, Genesis, MEUG

Alignment on further confidence measures (E)

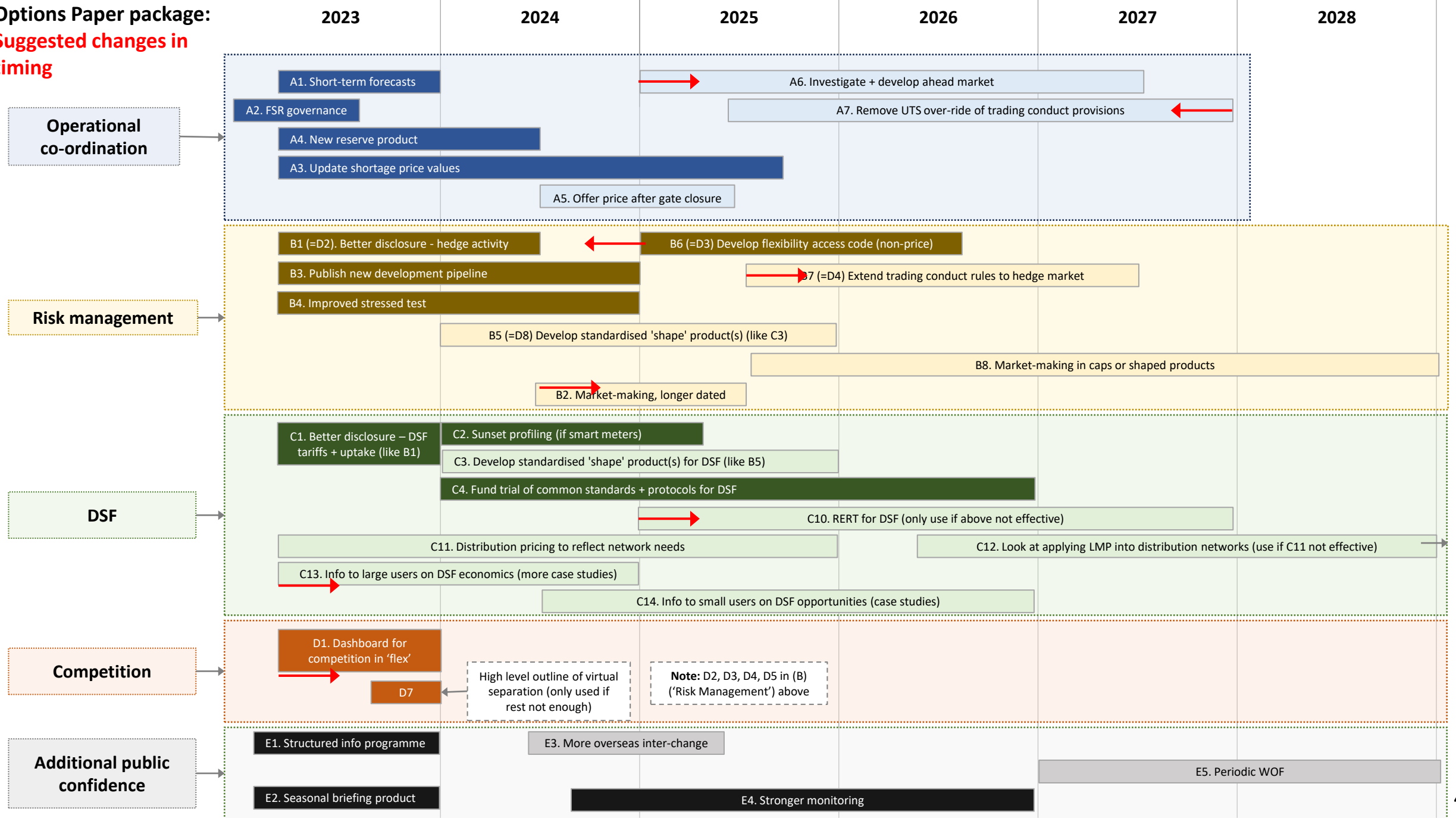
Code	Name	MDAG status	Parties that support	Parties that partially support	Parties that do not support
E1	Structured information programme for wider stakeholders	● 2	ERANZ, Genesis, Mercury, Meridian, Neil Walbran, Nova, NZWEA, SolarZero, Vector	Haast & indep. Retailers	MEUG
E2	Regular briefings for Ministers and officials on current and expected conditions	● 2	ERANZ, Genesis, Mercury, Meridian, Neil Walbran, Nova, NZWEA, Vector	SolarZero	MEUG
E3	Increase inter-change with international experts	● 2	ERANZ, Genesis, Mercury, Meridian, Neil Walbran, Nova, NZWEA, SolarZero, Vector		MEUG
E4	Enhance monitoring with more autonomy	● 2	ERANZ, Genesis, Haast & indep. Retailers, Mercury, Meridian, Neil Walbran, Nova, NZWEA, Transpower, Vector	SolarZero	MEUG
E5	Periodic warrant of fitness review for independent regulatory agencies	● 2	ERANZ, Genesis, Haast & indep. Retailers, LMS Energy, Mercury, Meridian, Neil Walbran, Nova, NZWEA, Vector	MEUG, SolarZero	

Initial MDAG discussion

MDAG discussion –

Gauge scope of key points to be addressed in seeking to reach agreement among MDAG members

Options Paper package:
Suggested changes in timing



Possible final package

2023

2024

2025

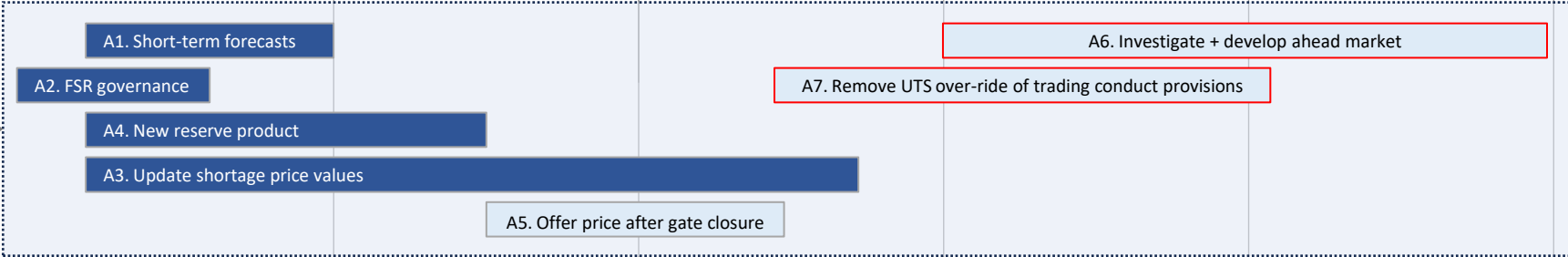
2026

2027

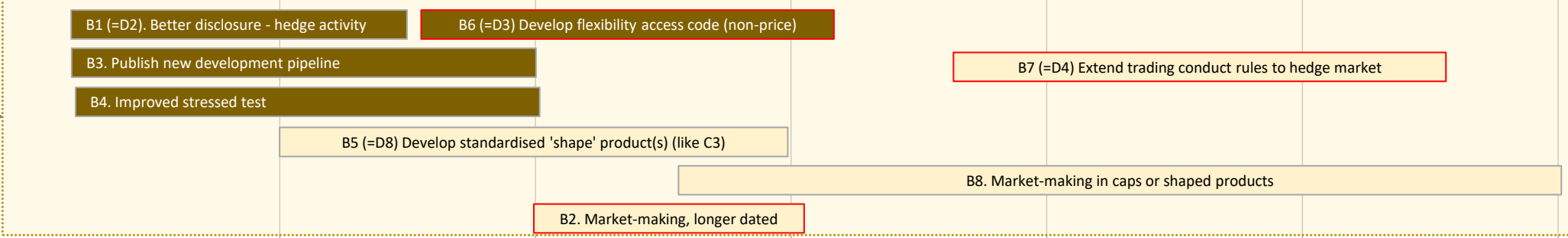
2028

= change in timing

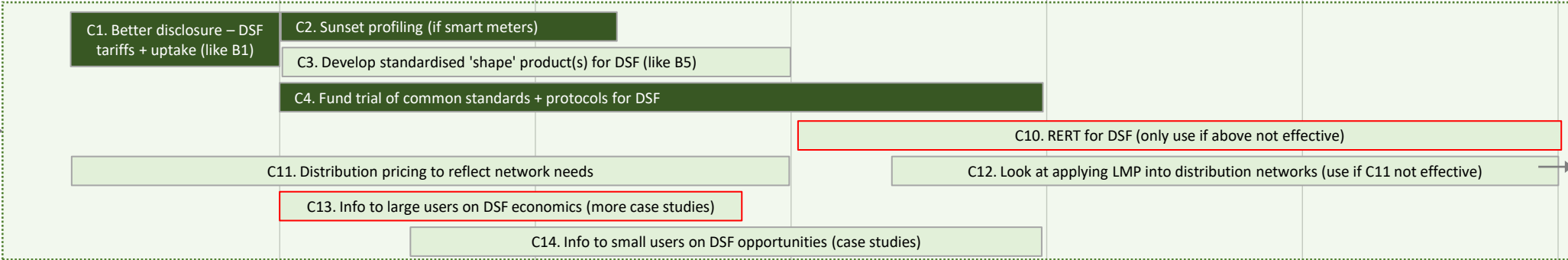
Operational co-ordination



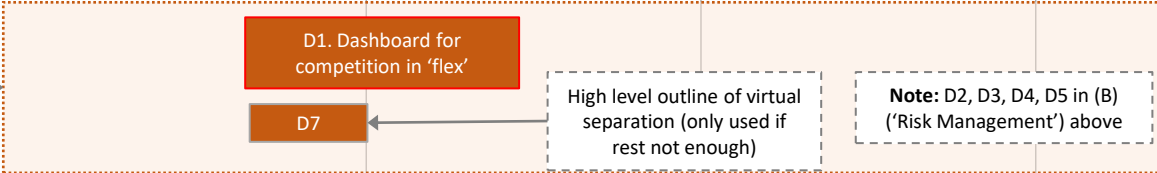
Risk management



DSF



Competition



Additional public confidence

