

Cost and method discussion – Session 5A

For combined Business and Technical Focus group members

- Industry Data Exchange (IDX)
- Portal Consolidation (PC)
- Identity and Access Management (IDAM)

16 November 2023



1. Welcome

We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture.

**We pay respect to their Elders
Past and present.**

Agenda

#	Time	Topic
1	1.00pm – 1.05pm (AEDT)	Welcome
2	1.05pm – 1.15pm	Introduction
3	1.15pm – 1.35pm	Context
4	1.35pm – 2.35pm	AEMO Implementation Cost
	2.35pm – 2.45pm	Break
5	2.45pm – 3.45pm	Industry Costs
6	3.45pm – 4.45pm	Options Assessment Framework
7	4.45pm – 5.00pm	Next steps & close

Supporting materials:

- Appendix A: Competition law meeting protocol
- Appendix B: Regulatory heads of power
- Appendix C: Costing Assumptions
- Appendix D: Extrapolated Industry Cost Details

"Please note that this meeting will be recorded by AEMO and may be accessed and used by AEMO for the purpose of note taking. By attending the meeting, you consent to AEMO recording the meeting and using the record for this purpose. No other recording of the meeting is permitted"

Objective of today's session

AEMO is working with the [FaSI Focus Group](#) to prepare a business case to determine feasibility of implementing Foundational and Strategic initiatives IDAM, IDX and Portal Consolidation.

Objective:

The preparation of the business case is underway. To support industry alignment, additional sessions focusing on cost and approach for AEMO and industry will be held in November, reflecting the high level of interest in the topic.

The objective of this session is to:

- Outline draft implementation costs and a proposed assessment framework for the business case
- Stimulate discussion and clarification on proposed approach

The ask of participants:

- Review the draft materials
- Consider areas that need clarification and your feedback on areas where AEMO seeks input
- Participate in the forum

2. Introduction

Industry Consultation Update

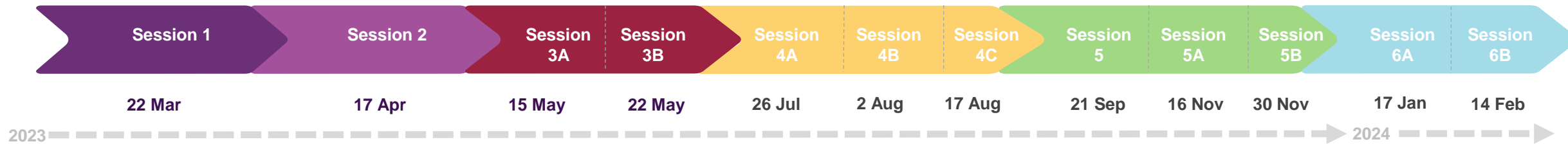
Preparation of business case continues.

- AEMO has received eleven stakeholder contributions to the costing exercise. Six detailed industry cost estimates, four high level estimates and one very high-level estimate received (as of 1 November).
- November industry workshops scheduled, allowing additional time and focus on cost and approach for AEMO and industry, reflecting the high level of interest in the topic.
- AEMO is aiming to distribute materials for Session 6A on 8 December to allow time for proper review.

Published information and materials:

- Focus Group webpage: <https://aemo.com.au/en/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/nem-reform-foundational-and-strategic-initiatives-focus-group>
- Any queries can be directed to NEMReform@aemo.com.au

Timing is indicative. Additional engagement with Executive forum members under assessment.



Session	Introduction	Discovery	Target State	Transition Strategy	Cost & Method	Business Case
Agenda	<ul style="list-style-type: none"> • Introduce initiatives • Outline workshop plan 	<ul style="list-style-type: none"> • Pain points and benefits • Survey 	<ul style="list-style-type: none"> • Concept walkthrough • Survey 	<ul style="list-style-type: none"> • Transition Strategy • Impacts & Benefits • Survey 	<ul style="list-style-type: none"> • Industry and AEMO costs • Assumptions, options and methodology 	<ul style="list-style-type: none"> • Walkthrough of draft business case • Assessment and completion

Actions

#	Topic	Action Description	Notes
1	Industry Data Exchange	What is the decision-making process and who has the authority to make decisions for these initiatives, given these are not regulatory-driven changes	Action closed. Response was provided to the focus group on 4 October. Inputs to this have been provided in Appendix B of this pack.
2	Business Case	As a part of the Business Case, provide an overview of three options to be assessed.	Action closed. To be presented in this session.
3	Business Case	As part of the Business Case, we will be assessing three options and exploring their potential implications for upcoming reforms. It's important to consider the potential consequences if we choose not to proceed with the target state option for these foundational initiatives.	Action closed. Agreed. To be presented in subsequent sessions.
4	Business Case	As a part of the Business Case provide a brief narrative around which upcoming reforms will leverage these initiatives	Action closed. To be presented in this session.
5	Business Case	Incorporate the governance process within the Business Case	Open. To be presented in subsequent sessions.
6	Transition Roadmap	Update to the Transition Roadmap to clarify which NEM reforms are the first candidates to leverage capabilities and align with the new NEM Reform Implementation Roadmap	Action closed. To be presented in this session.

3. Context

Problem Statements

Business Case Options

- Options Overview
- Comparing Options

Upcoming Reforms

AEMO high-level option assessment

Problem Statements

The current state of identity and access management, industry data exchange and multiple portals present specific challenges which need to be resolved to achieve strategic and initiative objectives.



Industry Data Exchange

Problem Statement: AEMO's existing data exchange systems have been variously acquired over the last 10-15 years, and use inconsistent standards, protocols and formats. AEMO's markets are also undergoing significant transformation, resulting in new data exchange needs. AEMO introducing new data exchange patterns without a unified target state and roadmap is inhibiting participants from modernising their systems and quantifying the benefits of their investments.



Portal Consolidation

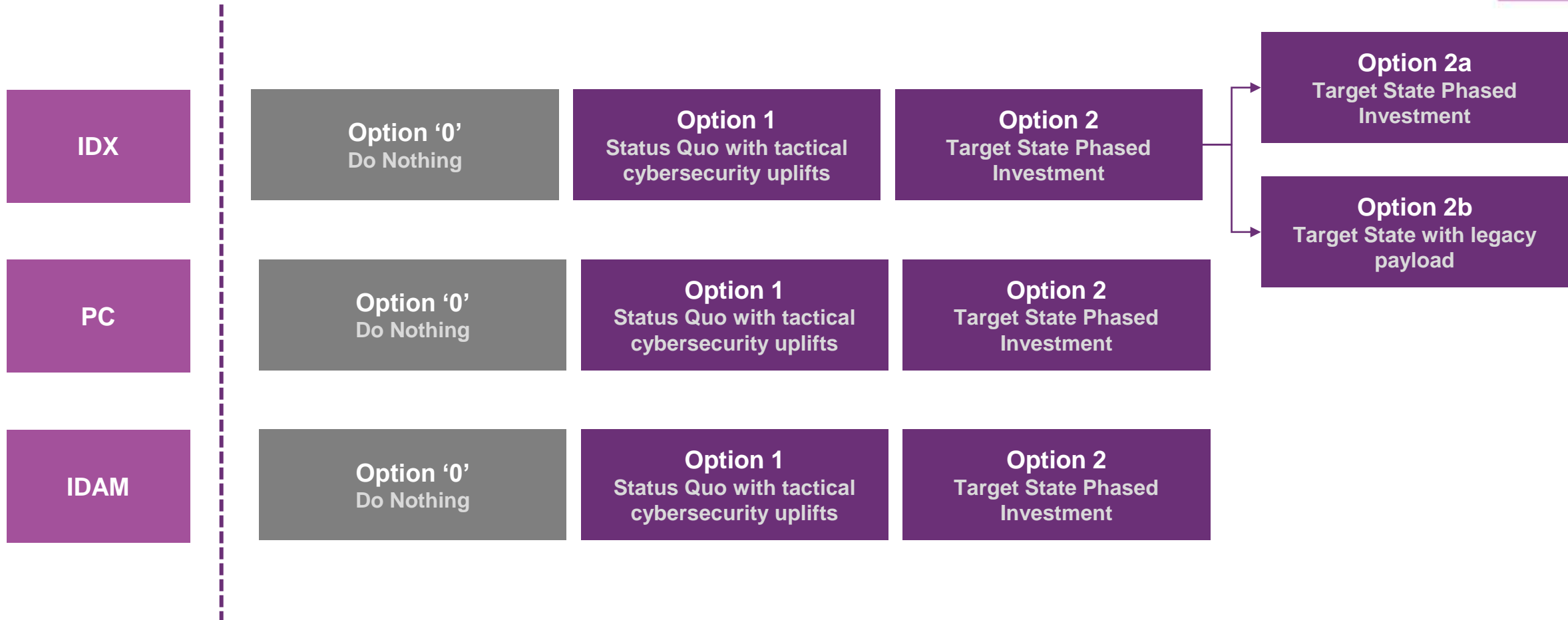
Problem Statement: AEMO browser services are exposed over a disparate range of end points and require multiple sets of credentials to consume these services. This results in a suboptimal user experience for energy stakeholders. The requirement to access browser services via private networks creates technical barriers to consuming these services.



Identity and Access Management

Problem Statement: AEMO's Identity and Access Management (IDAM) services are disparate, requiring users to retain multiple sets of credentials in order to access AEMO business services. The legacy IDAM services do not implement best practices in cyber security controls (e.g., multifactor authentication) and are insufficient to meet new industry obligations introduced under the SOCI Act.

Business Case Options Overview



Charting Future Success: Business Case Options

Discounted

Option 0: Do Nothing

The existing platforms will continue to be used in their current form.

Option “0” is not tenable as there are **mandatory legislative and security requirements** that AEMO and the Industry must meet

Option 1: Status Quo with tactical cybersecurity uplifts

IDX:

- Enhance data exchange cyber controls, addressing legislatively-driven requirements

Portal Consolidation:

- Integrating IDAM MVP to address legislatively-driven requirements

IDAM:

- MVP focused on addressing legislatively-driven requirements such as SOCI and AESCSF to enhance the security posture

Option 2: Phased Investment

Establish Foundational capability for energy transition and industry-driven priorities

IDX:

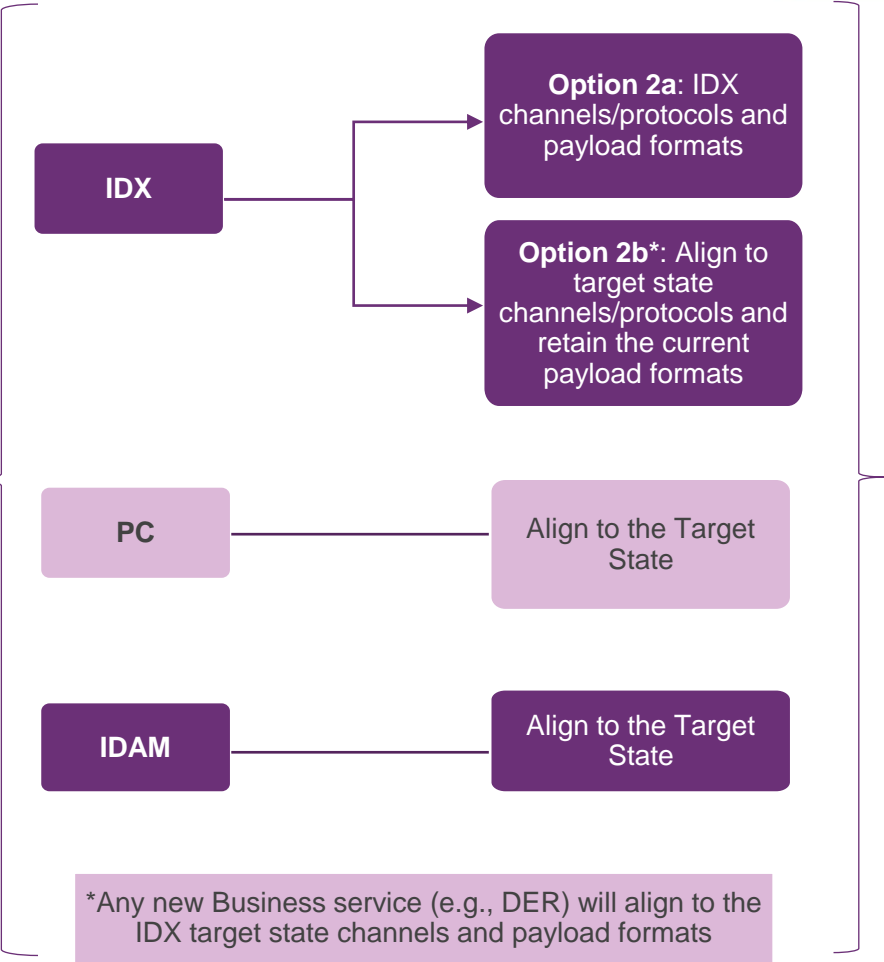
- Option 2a:** A phased investment approach delivering IDX channels/protocols and payload formats as defined in an agreed target state.
- Option 2b:** A phased investment approach delivering IDX channels/protocols and retain current payload formats for the legacy services.

Portal Consolidation:

- A phased investment approach delivering a holistic Portals functionality as defined in an agreed target state.

IDAM:

- A phased investment approach delivering a holistic IDAM capability as defined in an agreed target state.



IDX Capabilities – Comparing Options

Key Capabilities	Option 1	Option 2a	Option 2b
Enhanced cyber controls (e.g. API AuthN/AuthZ mechanisms, secured data transfers)	✓	✓	✓
Define Target State Channels, Protocols, Patterns & Standards		✓	✓
Uplift AEMO Data Exchange Environment		✓	✓
Enhanced AEMO Gateway Software implementing IDX Target State Patterns		✓	✓
Define Business Endpoints for transitioning the current Business Functions		✓	✓
Define & Build Target State Payload Schemas & Transformations for current Business Functions		✓	
Transition Wholesale Business Functions to Target State		✓	✓
Transition Retail & Non-Retail B2B Business Functions to Target State		✓	✓
New Reforms and/or New Business Functions	Projects Define Patterns	Implements IDX Target State Patterns and payload formats	Implements IDX Target State Patterns and payload formats
Future unification across fuels and markets		✓	Partial

Considerations

Option 1

- Option 1 will enhance Data Exchange **cyber controls**, addressing legislatively-driven requirements.
- **No other industry pain points** will be addressed.
- No foundational framework will be established for the upcoming reforms leading to increased **siload** Industry Consultation, Design, Build and Testing times

Option 2a

- Option 2a will address key industry pain points aligning them to target state **channels/protocols, standards, patterns and payload formats**
- **Reduced complexity** by limiting the diversity of the payload formats for data exchange

Option 2b

- Option 2b will address key industry pain points aligning to target state **channels/protocols, standards and patterns, but will not** address pain points relating to the **legacy monolithic schema**
- **Increased complexity** by retaining legacy payload formats in existing business services

Portal Consolidation Capabilities – Comparing Options

Key Capabilities	Option 1	Option 2
Enhanced cyber controls	✓	✓
Enhanced self-service features		✓
Enhanced personalisation features		✓
Internet enabling selected browser services		✓
Future unification across fuels and markets		✓
Single user identity for browser services		✓
Consolidated browser and device standards		✓
Unified user experience standards		✓
Enhanced user documentation		✓

Considerations

Option 1

- Option 1 will **only integrate IDAM MVP** to individual browser services endpoints to address **legislatively-driven requirements**.
- No **other industry pain point** would be addressed

Option 2

- Option 2 will address **key industry pain points** and enhance security posture by **enabling the agreed target state capabilities**
- **Enable single pane of glass** by providing a pathway for future **unification across fuels and markets**

IDAM Capabilities – Comparing Options

Key Capabilities	Option 1	Option 2
Enhanced cyber controls	✓	✓
Advanced cyber controls		✓
Organisation based (Establish Organisation Hierarchy)		✓
Enhanced Identity Management (e.g. de-duplicate person accounts)		✓
Enhanced Entitlement Management (e.g. Assign roles to multiple PIDs)		✓
Self-Serve		✓
Federated Identity		✓
Data sharing extensions		✓
Enhanced identity and entitlement assurance processes		✓
Future unification across fuels and markets		✓

Considerations

Option 1

- Will address **only legislatively-driven security requirements** and no other industry **pain point** would be addressed.
- **No foundational framework will be** established for the upcoming reforms leading to increased **siloes** Industry Consultation, Design, Build and Testing times

Option 2

- Option 2 will address **key industry pain points** and enhance security posture by **enabling the agreed target state capabilities**
- **Reduce complexity** by providing single credential access, which in turn will pave the way for future unification across fuels and markets.

Upcoming Reforms

Foundation Phase

Core Platform
build completed

Known Related Upcoming reforms

DER Data Hub

The DER Data Hub is a *new* data exchange mechanism for DER-related transactions (e.g. DOEs, network constraints). Regardless of its exact form and timing, industry will need a modern and secure exchange mechanism for this

Metering Services
Framework

As an outcome of the metering services framework review, a number of retail transactions are likely to be *significantly updated* and *new* transactions created (e.g., power quality data from MDPs to LNSPs).

There are upcoming reforms that will introduce new data exchange requirements, most notably DER.

The intent is to have the core platform in place to support these reforms to avoid re-work, additional costs and inefficient delivery.

Likely Related Upcoming reforms

Integrating Price
Responsive
Resources
(Scheduled Lite)

Unlocking CERs
through flexible
trading (FTA2)

Extension to other markets

WEM Reform

























East Coast Gas
Reforms

Unknown future reforms

e.g. ICF's requesting
modifications to retail
transactions

Rule changes
resulting in changes
to EMMS

Business Case high-level observations

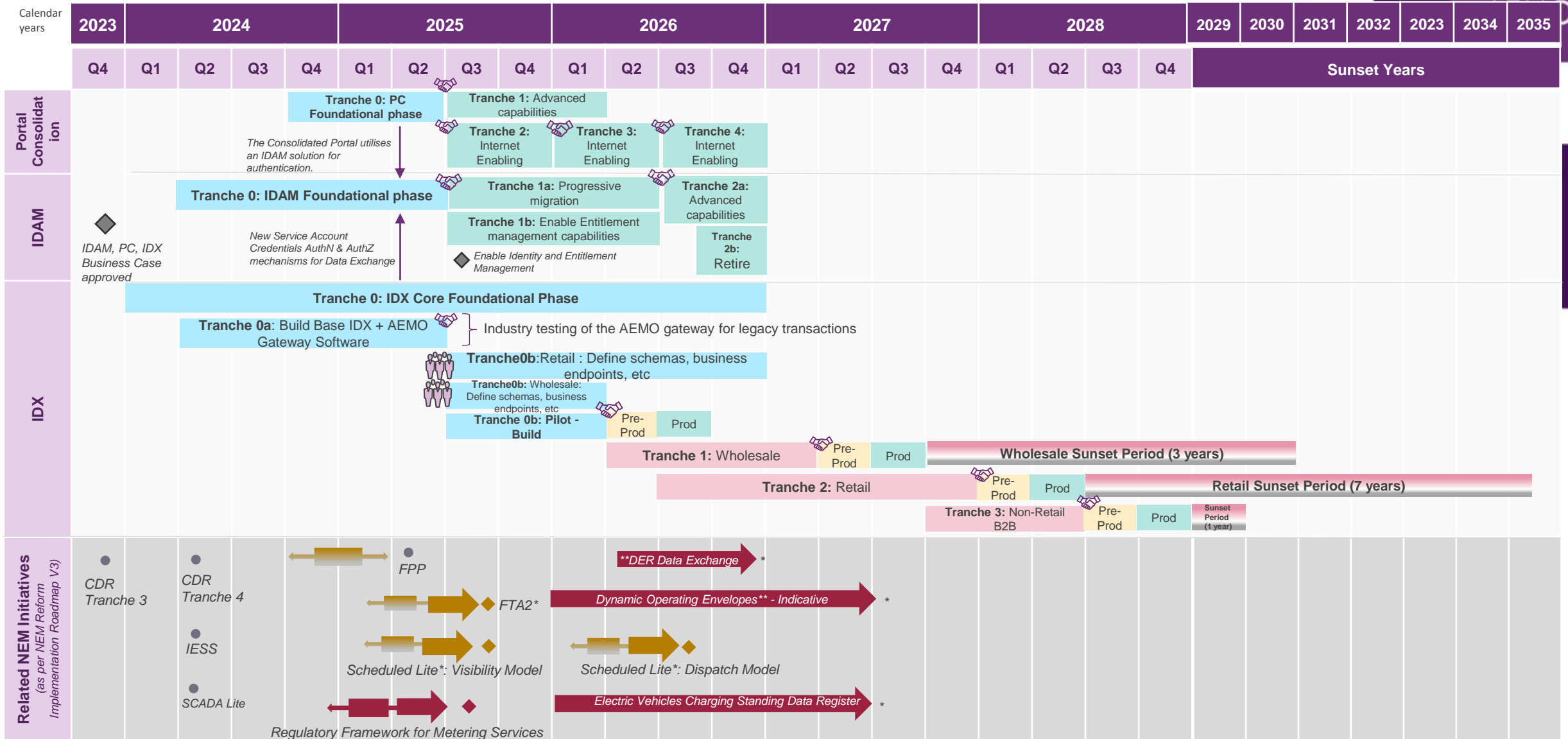
Dimension	Option 1	Option 2a	Option 2b	Notes
Cost to Deliver - AEMO				AEMO estimates indicate Option 1 represents < 15% of the cost of Option 2a, while Option 2b represents ~ 90% of the cost of Option 2a
Cost to Deliver - Participants				Participant estimates indicate Option 1 represents <10% of the cost of option 2a, while Option 2b represents ~ 75% of the cost of Option 2a
Operational Cost - AEMO				Options 2a and 2b consolidate existing platforms hence reducing ongoing cost vs Option 1. Option 2b requires continued support of aseXML.
Operational Cost - Participants				Options 2a and 2b provide the greatest opportunity for consolidation, standardisation and simplification across energy markets
Pain points				Option 1 does not address pain points. Option 2b will not address aseXML pain points, otherwise 2a and 2b address all other pain points.
Residual Security Risk				Option 1 retains the greatest attack surface area and reflects a reactive rather than secure by design approach to meeting security requirements.
Deliverability of Future reforms Agility – new business services				Options 2a and 2b provide the foundational capability to support new reforms. Option 1 will impose a 'premium' on new reforms in the absence of this foundation.
Deliverability of Future reforms Agility – existing business services				While Options 2a and 2b provide the new transaction protocols, Option 2b will not address pain points related to aseXML and inflexibility to support change.

4. AEMO Implementation Costs

Consolidated Strawman Roadmap
Estimation Approach for different Options
Scope Inclusion and Exclusion for Costing
Option 2 Implementation

- Summary
- IDX Cost
- Portal Consolidation Cost
- IDAM Cost

Consolidated Strawman Roadmap (in collaboration with the Industry)



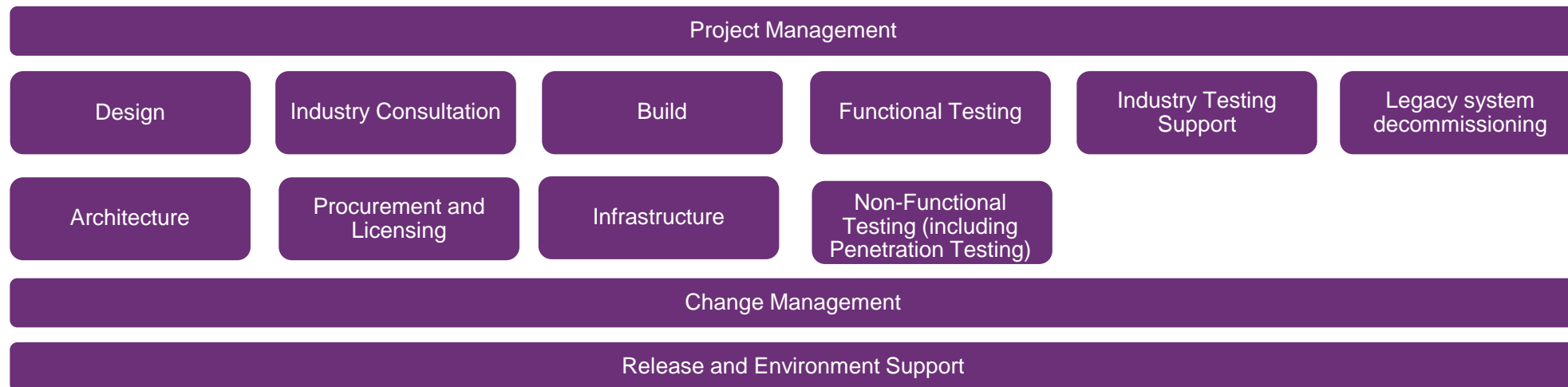
Foundational Tranches - based on the assumed timeline | IDX Tranche Build | Industry Testing | T3A Milestone | **New Service | Working group | Committed effective date | Estimated effective date | Industry testing and trials | Strong linkages to IDX, IDAM and/or PC | * Indicative timeline likely to be pushed out from what is assumed within V3 NEM Reform Roadmap

Timelines for the related NEM Reforms have been taken from V3 of NEM Reform Implementation Roadmap

AEMO Cost Estimation Approach - Option 2

The **AEMO Implementation Costs** (Investment Costs) for the IDX, PC and IDAM initiatives are based on the agreed scope for Option 2. We completed a bottom-up estimate for each component and validated against (where available) comparable internal and international projects.

Scope of implementation estimate



AEMO Cost Estimation Approach - Option 1

For Option 1 the **AEMO Implementation costs** (Investment Costs) for the IDX, IDAM and PC initiatives have been estimated using a scaling of the Option 2 estimate based on the following assumptions:

IDX

Tranche 0a
Tranche 0b
Tranche 1
Tranche 2
Tranche 3

Cost scaling	Assumption
20% (of AEMO Gateway cost)	To enhance existing PdrBatcher/ Participant batcher.
10%	Security design and transition planning
15%	Move to sFTP, regression and industry testing
15%	Move to sFTP, regression and industry testing
0%	No change

PC

Tranche 0
Tranche 1
Tranche 2

Cost scaling	Assumption
15%	Security updates only
0%	No change
0%	No change

IDAM

Tranche 0
Tranche 1a
Tranche 1b
Tranche 2a
Tranche 2b

Cost scaling	Assumption
30%	Definition of patterns and potential build/license of capability of existing products
0%	User accounts remain in existing identity stores
0%	No new entitlement capabilities deployed
0%	No advanced capabilities deployed
0%	No decommission

AEMO Implementation Costs Summary



These estimates have an uncertainty range of +/- 40%.

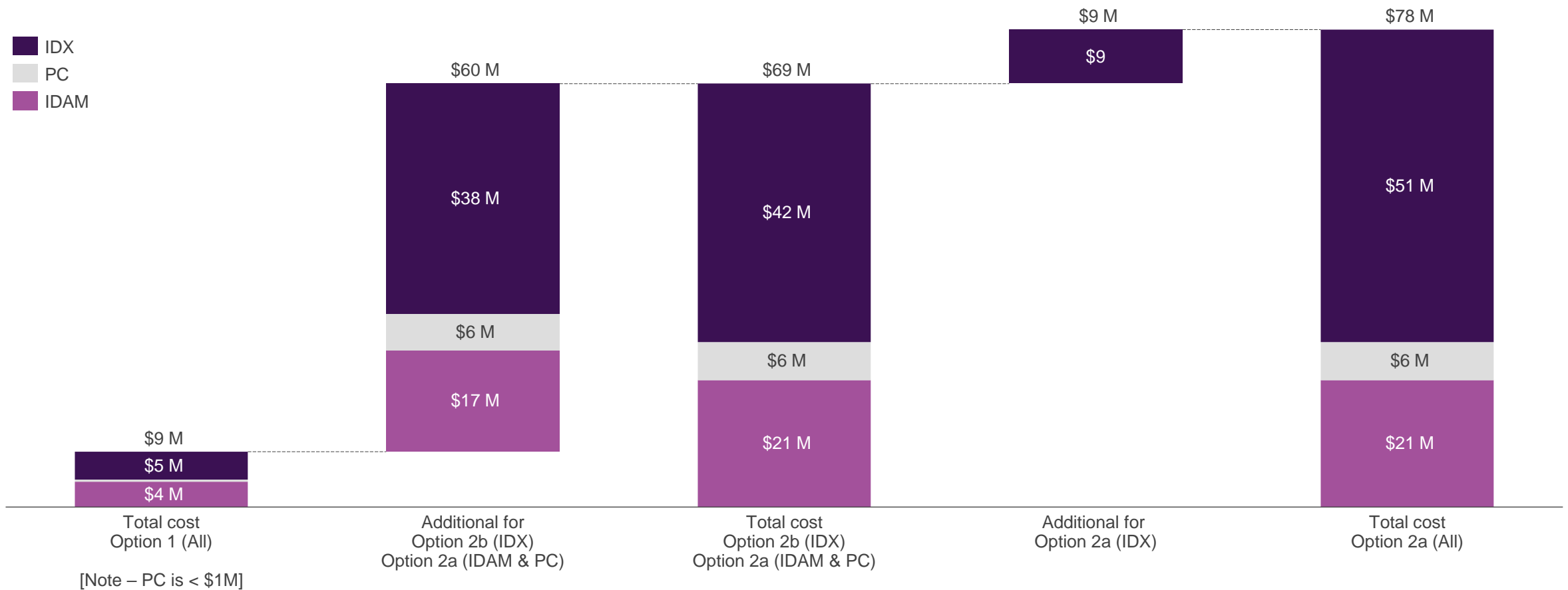
	IDX			PC		IDAM	
	Option 1	Option 2a	Option 2b	Option 1	Option 2a	Option 1	Option 2a
Estimate (mid-point)	\$5M	\$51M	\$42M	< \$1M	\$6M	\$4M	\$21M
High-low range	\$3-6M	\$31-72M	\$25-59M	< \$1M	\$4-9M	\$2-6M	\$13-29M

AEMO Implementation Costs Summary



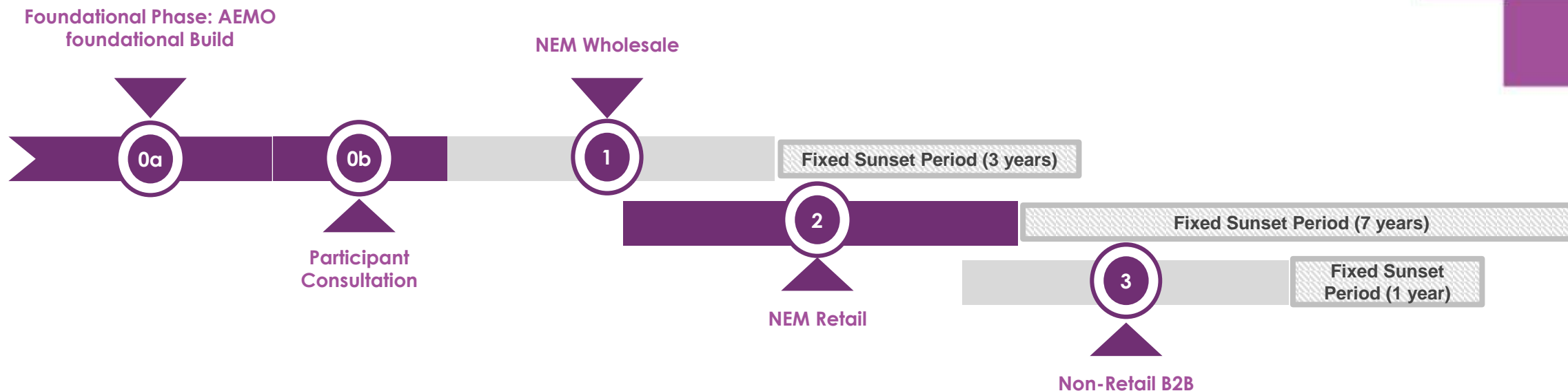
Key points for discussion:

1. Option 1 implementation cost is non-trivial
2. Option 2b implementation costs are not significantly different to Option 2a



These estimates have an uncertainty range of +/- 40%.

AEMO IDX Implementation Cost

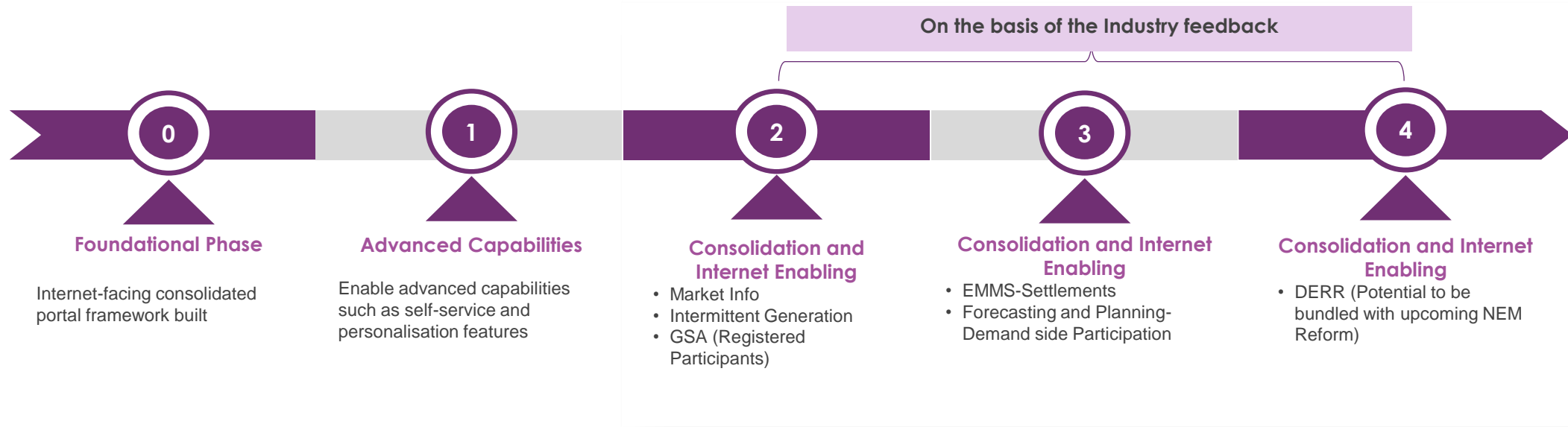


Implementation Cost by Tranche*

Option	Tranche 0a	Tranche 0b	Tranche 1	Tranche 2	Tranche 3	TOTAL
Option 1	< \$1M +/-40%	\$1M +/-40%	< \$1M +/-40%	\$2M +/-40%	-	\$5M +/-40%
Option 2a	\$16M +/-40%	\$13M +/-40%	\$5.4M +/-40%	\$14M +/-40%	\$2.2M +/-40%	\$51M +/-40%
Option 2b	\$16M +/-40%	\$10M +/-40%	\$4.4M +/-40%	\$11M +/-40%	\$1.5M +/-40%	\$42M +/-40%

*Excludes ongoing costs post implementation and establishment of new Business Services for NEM Reforms

AEMO Portal Consolidation Implementation Cost

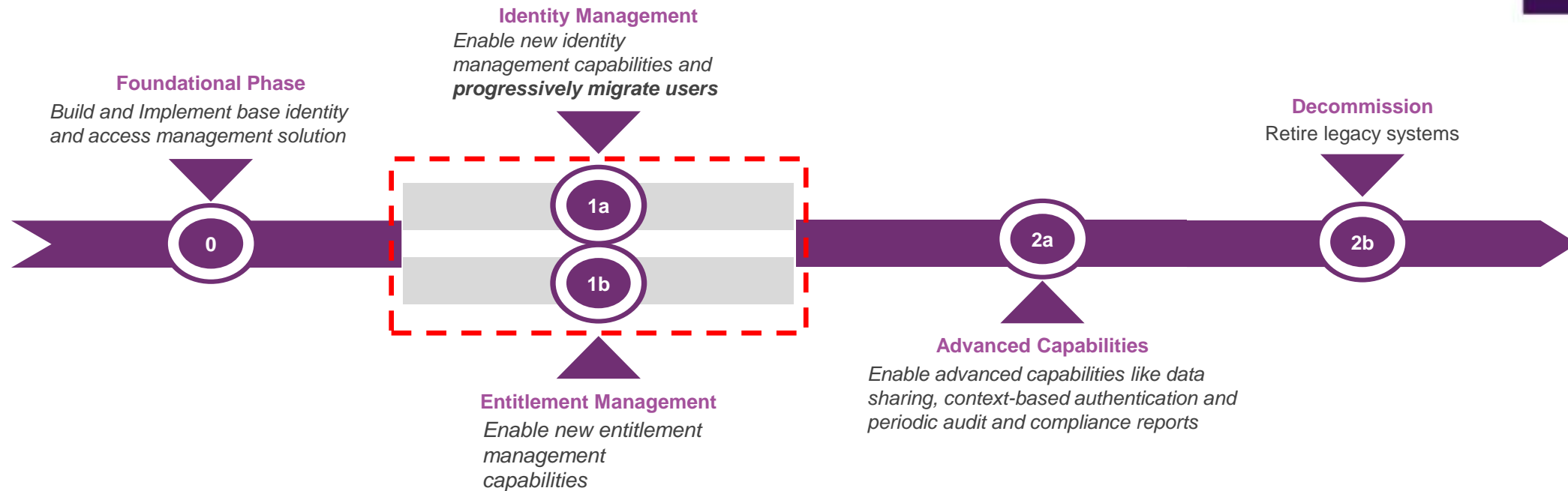


Implementation Cost by Tranche*

Option	Tranche 0	Tranche 1	Tranche 2	Tranche 3	Tranche 4	TOTAL
Option 1 Estimate	< \$1M +/-40%	-	-	-	-	< \$1M +/-40%
Option 2 Estimate	\$2M +/-40%	\$1M +/-40%	\$1M +/-40%	\$1M +/-40%	< \$1M +/-40%	\$6M +/-40%

*Excludes ongoing costs post implementation

AEMO IDAM Implementation Cost



Implementation Cost by Tranche*

Option	Tranche 0	Tranche 1a	Tranche 1b	Tranche 2a	Tranche 2b	TOTAL
Option 1 Estimate	\$4M +/-40%	-	-	-	-	\$4M +/-40%
Option 2 Estimate	\$14M +/-40%	< \$1M +/-40%	< \$1M +/-40%	\$6M +/-40%	< \$1M +/-40%	\$21M +/-40%

*Excludes ongoing costs post implementation

Break

We'll be back at 2.45pm AEDT

5. Industry Costs

Summary of Responses

Extrapolation Methodology

Strawman Scaling Factor for Option 1 and Option 2b

Extrapolated Industry Implementation Cost

Industry Cost by Tranche

Discussion

Summary of responses

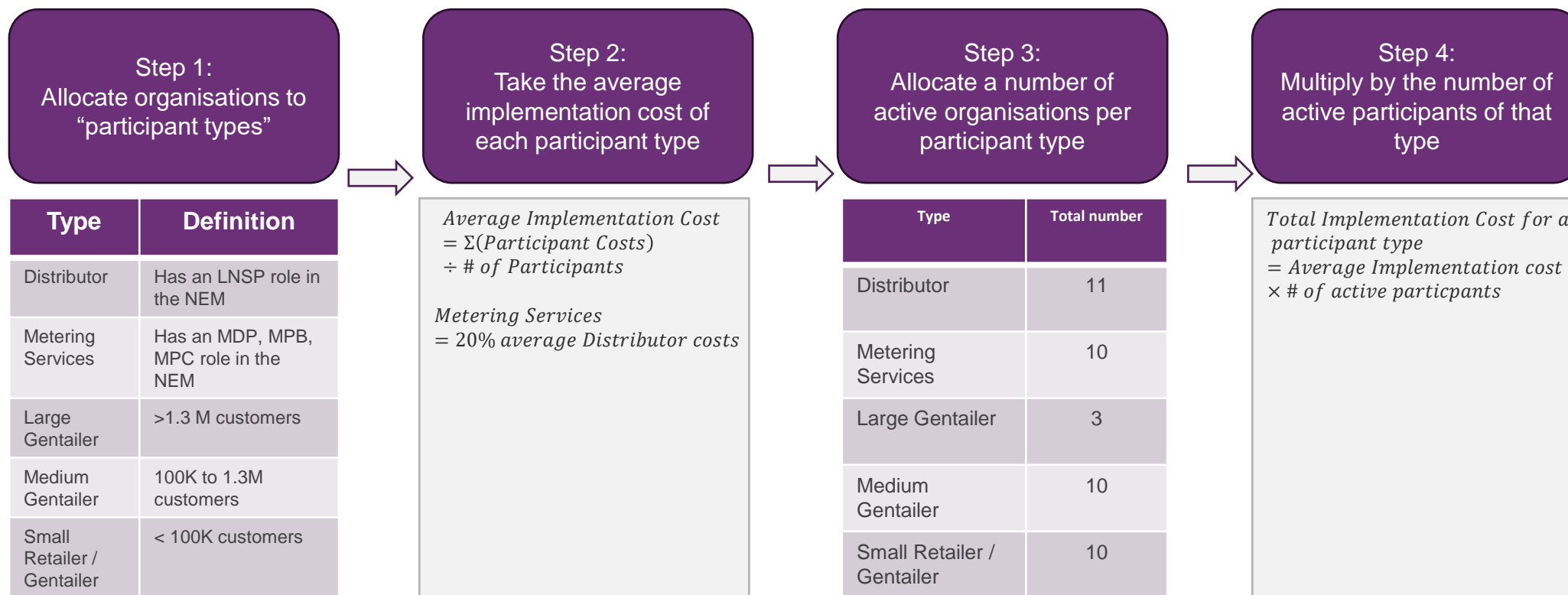
- Responses were received from **eleven** organisations, however, **two** of those did not have sufficient information to be included in a cost extrapolation.
- Option 2/2a implementation cost coverage for all industry participant types, except metering services.
- Particularly positive responses from distribution businesses
- Extremely limited responses for IDX Option 2b
- No response on quantitative operational cost avoidance
- For IDX, one of eleven responses indicated an intent to leverage the AEMO gateway software.

Participant cost – proposed extrapolation methodology



AEMO acknowledges that each business has its own cost profile. However, a method is needed to estimate total participant costs from the limited available data.

The following strawman methodology has been proposed for consideration:



Participant Cost Estimation Approach - Option 1 and 2b

Option 1 Scaling Methodology

		Cost scaling	Assumption
IDX	Tranche 0a	5%	To configure latest version of PdrBatcher/Participant Batcher. Industry Consultation
	Tranche 0b		
	Tranche 1	20%	Move to sFTP, regression and industry testing
	Tranche 2	20%	Move to sFTP, regression and industry testing
	Tranche 3	0%	No change

		Cost scaling	Assumption
PC	Tranche 0	15%	Security updates only
	Tranche 1	0%	No Portal movement
	Tranche 2	0%	No Portal movement

		Cost scaling	Assumption
IDAM	Tranche 0	20%	Industry Consultation for defining patterns and protocols
	Tranche 1a	0%	User accounts remain in existing identity stores
	Tranche 1b	0%	No new entitlement capabilities deployed
	Tranche 2a	0%	No advanced capabilities deployed
	Tranche 2b	0%	No decommission

Option 2b Scaling Methodology

Step 1:
Calculate Scaling factor

$$\text{Scaling factor} = \frac{\Sigma(\text{Response to } 2b)}{\Sigma(\text{Response to } 2a)}$$



Step 2:
Calculate Scaling factor

$$\text{Total 2b Cost} = \Sigma(\text{total } 2a) * \text{Scaling factor}$$

This is a strawman proposal for which we invite feedback.

Request for industry:

- provide feedback on scaling factors; OR
- provide actuals

Submissions received will be incorporated into the model.



Participant Implementation Cost Extrapolation*

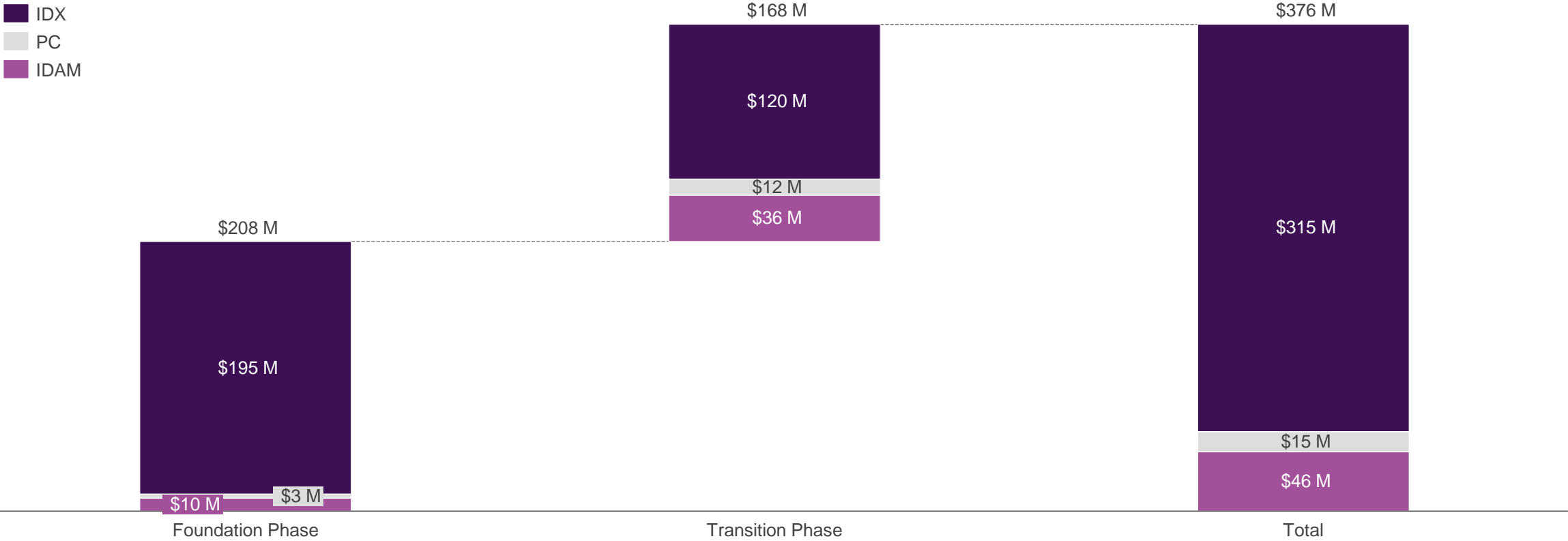
Initiative	Option 1	Option 2a	Option 2b (IDX only)
IDX	\$34 M +/- 40%	\$315 M +/- 40%	\$220 M +/- 40%
PC	< \$1 M +/- 40%	\$15 M +/- 40%	\$15 M +/- 40%
IDAM	\$2 M +/- 40%	\$46 M +/- 40%	\$46 M +/- 40%

* Detailed calculations are in Appendix D

Participant Implementation Costs by Phase



Participant implementation costs are split fairly evenly between Foundation (55%) and Transition (45%) phases



Participant costs by phase – Option 2a (+/- 40%)

Unit: AUD \$M

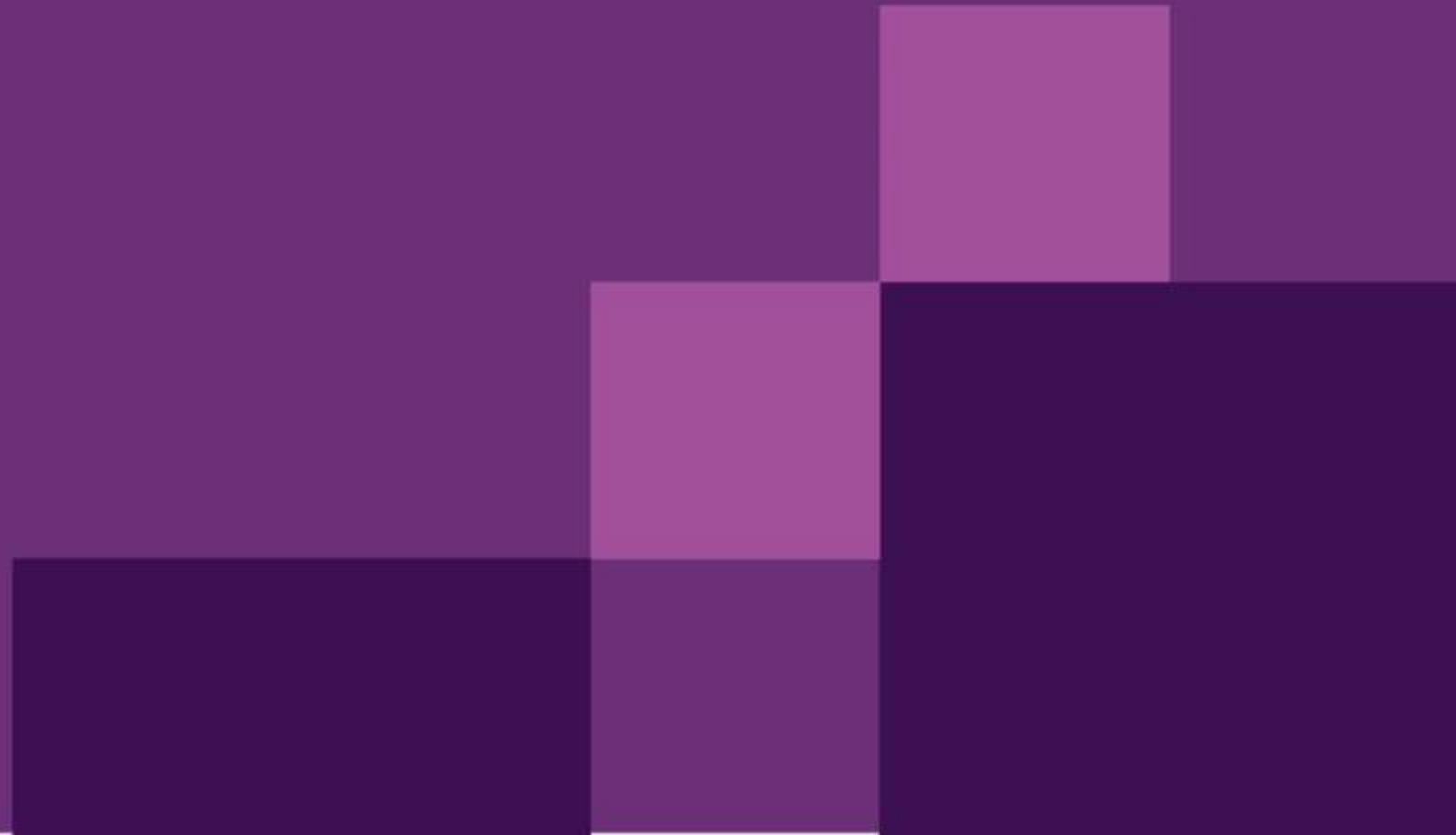
Discussion

- Do you agree with the extrapolation methodology?
- Does anyone want to submit more data? (e.g., metering businesses)?
- Does anyone have comments on the calculated outputs for implementation costs?



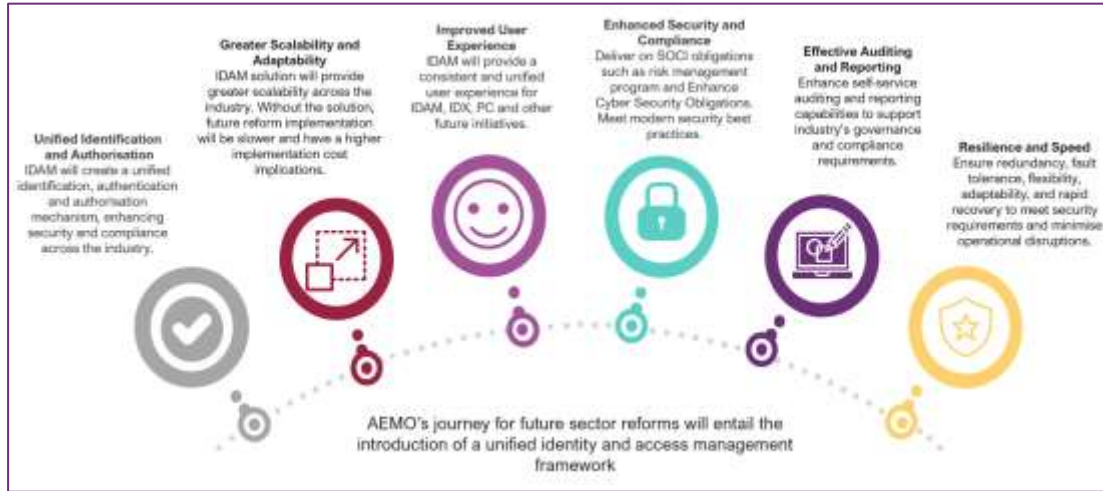
6. Options Assessment Framework

Assessment Categories
Assessment Framework



Assessment Categories

AEMO has defined the following categories for assessing the Business Case options. These categories have been defined in line with the Objectives defined and agreed with the Industry for IDAM, IDX and PC



- Residual Security Risk
- Deliverability of Future reforms
- Cost to Deliver
- Operational Cost

Framework for Assessing Business Case Options



Assessment Categories	Description	Assessment Metric
Decreased Residual Security Risk - Attack Surface Area	Higher levels of integration across the value chain have increased the complexity of the overall security landscape, as well as the impact of a potential cyber-attack. Fragmented security landscape, built over time have level of risk or potential security threats after security measures, controls, and safeguards have been implemented.	Maturity Scale 1-5
Deliverability of Future reforms - Speed to Market - Realisation of Benefits - Flexibility and Innovation	The highly fragmented and complex technology environment creates barriers to future reforms. It slows the speed of change, increases complexity, and incurs higher costs to transition to new fit-for-purpose solutions while supporting legacy systems through a sunset period	Maturity Scale 1-5
Cost to Deliver - Immediate Implementation Cost - Cost of delivering future reforms	The cost to implement the different options will be assessed along with the cost to deliver future reforms	\$\$
Operational Cost - Support and Maintenance - Participant operational cost differential - “Black Swan” Events impact and recovery	The operational cost for the different options would be assessed	\$\$



Are you aligned with the categories? Are there other categories you want us to include?

7. Next steps & close

Proposed actions



Activity	Responsibility	Timing
Take the draft costs and methodology for business case (this pack) back to your organisations for review – any key areas requiring clarification and / or opportunities for improvement. <ul style="list-style-type: none"> • Draft AEMO implementation costs (section 4) • Strawman proposal - scaling participant costs (section 5) • Options assessment framework (section 6) 	Focus Group members	24 November
Assess and reach out if you want to provide further submissions: <ul style="list-style-type: none"> • Costs for your organisation • Benefits (focus of next workshop) 	Focus Group members	24 November

See you next at:

30 November for Session 5B: Business case discussion for Business and Technical focus groups

Please reach out



NEMReform@aemo.com.au



[AEMO | NEM Reform Foundational & Strategic Initiatives Focus Group](#)



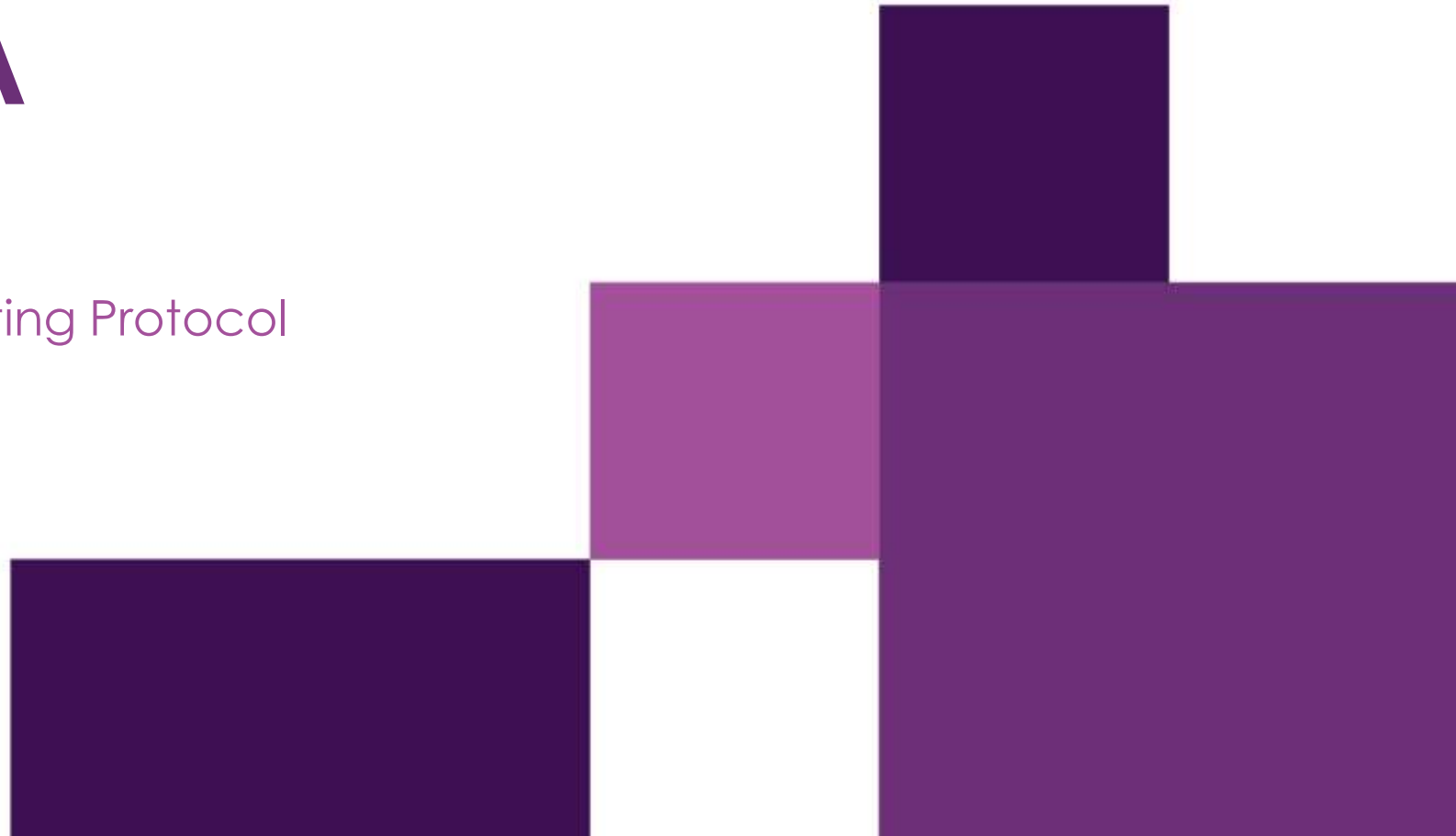


For more information visit

aemo.com.au

Appendix A

AEMO Competition Law - Meeting Protocol



AEMO Competition Law - Meeting Protocol



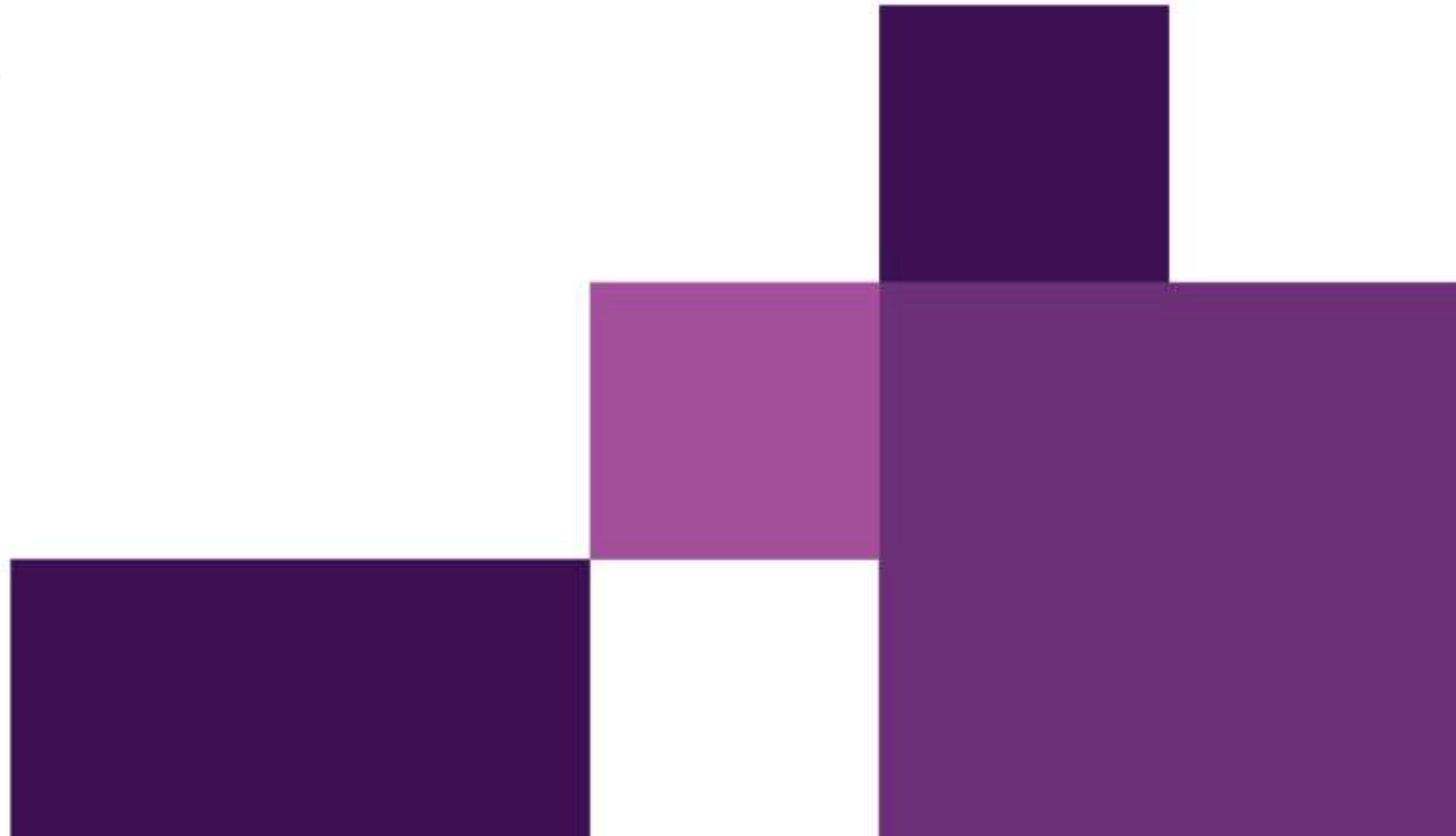
AEMO is committed to complying with all applicable laws, including the Competition and Consumer Act 2010 (CCA). In any dealings with AEMO, all participants agree to adhere to the CCA at all times and to comply with appropriate protocols where required to do so.

AEMO has developed meeting protocols to support compliance with the CCA in working groups and other forums with energy stakeholders. Before attending, participants should confirm the application of the appropriate meeting protocol.

Please visit: <https://aemo.com.au/en/consultations/industry-forums-and-working-groups>

Appendix B

Head of Power



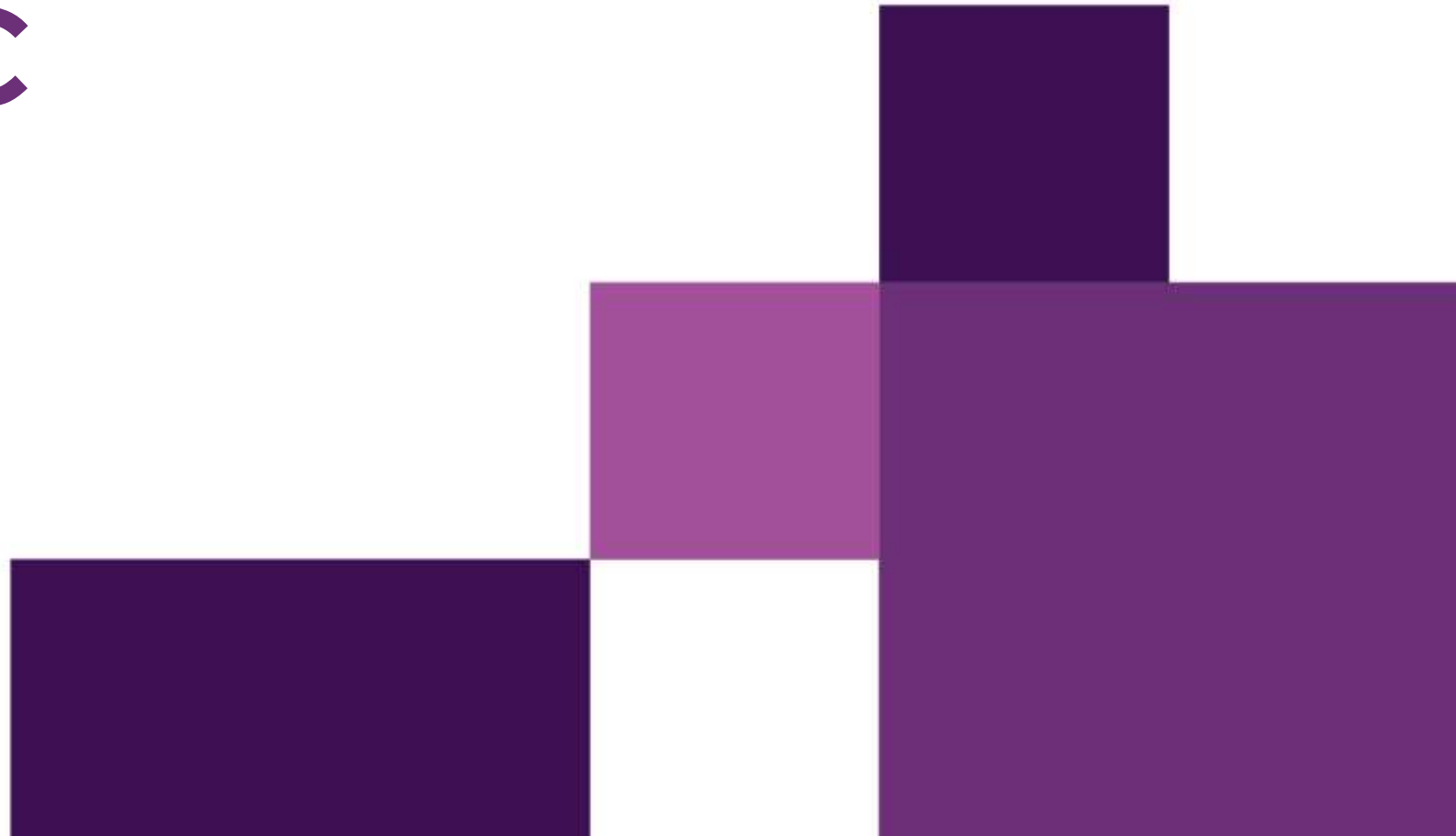
Heads of power



- Reform initiatives sit with the AEMC or Energy Ministers
- Strategic and Foundational initiatives sit with AEMO.
- IDX, IDAM and PC have been identified as Strategic and Foundational initiatives.
- AEMO have committed to engaging with industry for assessment, including the development of business case, prior to proceeding in accordance with the governance framework established for the Program available at the following link: [NEM Reform Implementation Roadmap Governance \(aemo.com.au\)](https://aemo.com.au/nem-reform-implementation-roadmap-governance)

Appendix C

Costing Assumptions



Option 1: Assumptions

- IDX: All existing services will retain their current payload formats, channels and protocol endpoints
- IDX: Any new reform initiatives will be required to define and implement channels, patterns, protocols and payload formats on a case-by-case basis (given no foundational capability)
- IDX: AEMO supplied software for participants will continue with separate wholesale (Pdrbatcher) and retail (participant batcher) data exchange products.
- IDX: Sunset periods associated the transition to security uplifted endpoints will be agreed with industry in the design phase
- PC: All existing portal endpoints will be retained and there will be no new internet enablement of browser services.
- IDAM: All existing person and non-person accounts will remain in the existing identity repositories

Option 2a & 2b: Common Assumptions

- The operating model of markets will retain centrally managed identity and data hub services.
- A High-level conceptual design is sufficient detail to inform the business case, detailed design will be factored into tranche delivery plans
- Foundational tranches will make target state capabilities available for up-coming NEM reforms initiatives to leverage these capabilities.
- New NEM services delivered post the completion of the IDX foundation will leverage the new protocols, patterns and payloads. Services in this context are the equivalent of introducing a new transaction group (such as DER). Change within a transaction or addition of a transaction to an existing transaction group would be enabled on legacy protocols within the sunset period as well as on the new protocols once the associated tranche is delivered.
- NEM reform initiatives may change their timeline, could be removed or new reforms could be added. Where this occurs, an assessment will be made for impact to the roadmap for these 3 initiatives

Option 2a & 2b: Common Assumptions



- AEMO gateway software will still consolidate wholesale (Pdrbatcher) and retail (Participant batcher) data exchange products
- NEM reform initiatives may change their timeline, could be removed or new reforms could be added. Where this occurs, an assessment will be made for impact to the roadmap for these 3 initiatives
- Governance process for procedures and protocols will remain with their existing governing bodies with regard oversight and coordination of updates to enable the transition
- Opportunities for further procedural improvement and / or transactional enhancement in NEM Retail would be assessed in detailed design, the business case will remain conservative and not assume these outcomes.

Option 2a: Assumptions

- JSON will leverage strong types to provide transactional validation. AEMO will continue to provide validation extensions (as currently available in EVM) to capture procedural level transactional compliance (not involving data look up). The combination of these validations will be equivalent to the current aseXML schema validation and EVM validation capabilities provided to participants.
- All non csv based B2B and B2M transactions will move from aseXML to JSON involving definition of new JSON schema on a broadly 'like for like' basis to simplify support for backwards compatibility across the sunset timeframe.
- NEM13 CSV will be maintained however delivered using the IDX protocols and patterns (not embedded in aseXML) given the die on the vine approach in the market to basic metering. All other CSV payloads will move to the new AEMO CSV to be defined within the detailed design phase. Note the AEMO supplied gateway will provide conversion capability for all NEM Retail and Wholesale transactions within the sunset period and the conversion routines as at the end of the sunset period will be available should a participant wish to continue to maintain these if there was a subsequent timepoint. Changes are assumed to be confined to aligning to the new payload format on a 'like for like' basis to simplify support for backwards compatibility across the sunset timeframe. Opportunities for improvement beyond this would be assessed in detailed design however not accounted for at this time.
- Existing JSON payloads may require minor refactoring to comply with industry-agreed payload standards and schemas.

Option 2b: Assumptions

- Existing NEM Retail and Wholesale services will be made available under the new foundational IDX channels and protocols. Existing payloads will be retained with no change
- IDX channels and protocols and IDAM identity patterns in alignment with an IDX target state presented to the industry



IDX Options 2a & 2b

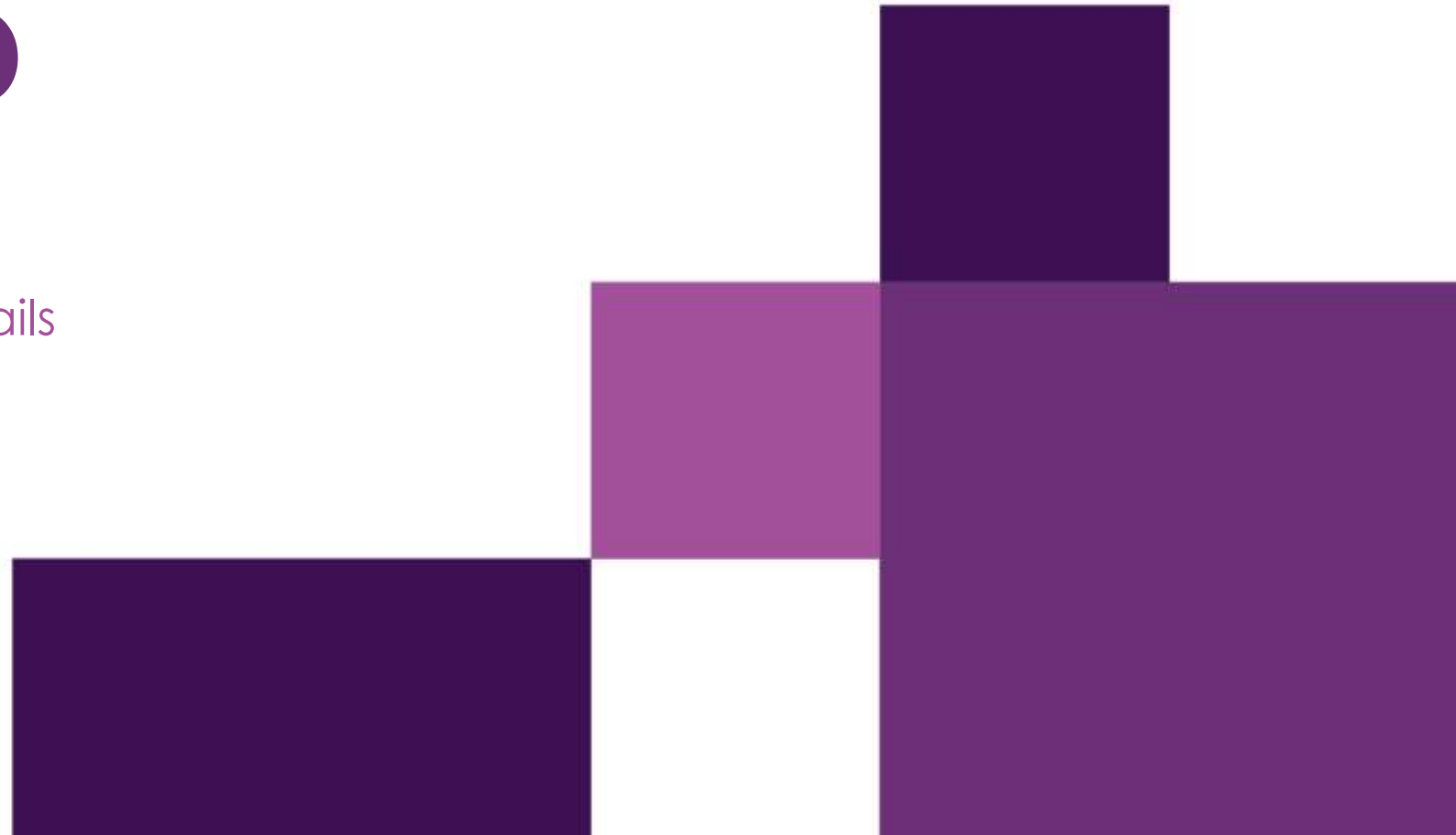
For the transition of the legacy interfaces, below are two target state options proposed for costing.

Characteristics	Option 2a: Align to target State channels/protocols and payload formats		Option 2b: Align to target state channels/protocols and retain the current payload formats	
	Retail	Wholesale	Retail	Wholesale
Market	Retail	Wholesale	Retail	Wholesale
Definition	<ul style="list-style-type: none"> Adopt business-function-specific schemas and endpoints. Transitioning Retail B2B and B2M to modular schemas aligned with modern payload standards. Implementing unified IDX schemas across all AEMO fuels, markets, and domains. Transition the wholesale AEMO CSV formats to the target state payload standards and formats 		<ul style="list-style-type: none"> Adopt business-function-specific endpoints (to be further assessed during design phase) Continue using the aseXML (Retail) and AEMO CSV (Wholesale) schema concepts as it is in production today n & n-1 transformation managed at the time of the Participant pulling the message from outbound queue based on request header parameters 	
Transactional Message Format	JSON (New)	JSON (New)	Existing aseXML	Outbound: Existing AEMO CSV Inbound: Existing JSON
Bulk Data Format	AEMO CSV (New)	Existing AEMO CSV	Existing Miscellaneous CSV formats	Existing AEMO CSV
Inquiry Services	Use a modern open-source query language such as GraphQL services using JSON format.	Use a modern open-source query language such as GraphQL serviced using JSON format.	<ul style="list-style-type: none"> No inquiry services introduced for existing services Opportunities to support GraphQL for new services in Retail 	Opportunities to support GraphQL for Wholesale current business functions
MDMF	Retired (Deprecated)	N/A	Retained	N/A
MDFF Interval	AEMO CSV (New)	N/A	Existing NEM12	N/A
MDFF Basic	Existing NEM13	N/A	Existing NEM13	N/A

For both options, any new business service (e.g. DER) will align to the industry agreed IDX target state channels and payload formats

Appendix D

Extrapolated Industry Cost Details



Extrapolated Industry Costs (all figures are +/- 40%)

Scaling factor calculation

Initiative	Type	Size	# of organisations	Average	Total- 2A	Total - Option 1	Total - 2B (IDX only)
IDX	Distributor	N/A	11	\$16.3M	\$179M	\$22M	\$125M
	Metering Provider	N/A	10	\$3.3M	\$33M	-	\$23M
	Gentailer	Large	3	\$24.0M	\$72M	\$7M	\$50M
	Gentailer	Medium	10	\$2.8M	\$28M	\$5M	\$20M
	Retailer	Small	10	\$ 0.3M	\$3M	<\$1M	\$2M
	TOTAL:					\$315M	\$34
PC	Distributor	N/A	11	\$1.0M	\$11M	\$0.3M	NA
	Metering Provider	N/A	10	\$0.2M	\$2M	-	
	Gentailer	Large	3	-	-	-	
	Gentailer	Medium	10	\$0.2M	\$2M	\$0.1M	
	Retailer	Small	10	\$0.01M	<\$1M	<\$1M	
	TOTAL:					\$15M	
IDAM	Distributor	N/A	11	\$ 2.8M	\$31M	\$2M	NA
	Metering Provider	N/A	10	\$0.6M	\$6M	-	
	Gentailer	Large	3	-	-	-	
	Gentailer	Medium	10	\$0.9M	\$9M	<\$1M	
	Retailer	Small	10	\$0.01M	<\$1M	<\$1M	
	TOTAL:					\$46M	

Initiative	Option 1	Option 2a	Option 2b (IDX only)
IDX	\$34M	\$315M	\$220M
PC	<\$1M	\$15M	N/A
IDAM	\$2M	\$46M	N/A