Tranche 3A: Target State Industry Feedback

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

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AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Objective of Slide Pack

The objective is to present curated participant feedback from the 3A and 3B Target State Industry Consultation sessions and AEMO's responses. It aims to enhance all Participants' comprehension of the Target State by focusing on pivotal insights related to IDX, IDAM, and PC, deemed valuable to all.

While AEMO has responded to feedback beyond the scope of these topics separately, it has not been included in this particular presentation.

Additionally, AEMO has updated the 'IDX Target State – Outbound Data' slide based on the Industry feedback from the 3A and 3B sessions. This revised slide introduces the 'Publish and Subscribe' outbound data exchange pattern, an option discussed internally at AEMO, but previously unshared with the industry.

To access the original Tranche 3A and 3B presentations, visit the Focus Group webpage.

IDX Target State – Question 1 Feedback

Question 1: If your poll response in the workshop indicated that there are material gaps or concerns in the Target States presented on May 22, please provide additional information.

#	Participant Feedback	AEMO Response
01	The overarching principle of the IDAM, IDX and PC programmes is 'Taking Cost Out for Industry and Consumers'. This is suggested in the workshop objectives however it is not adequately addressed in the principles set out for each programme.	AEMO recognises that one of the fundamental objectives of the IDAM, IDX, and PC programs is to reduce costs for the industry and consumers. Indeed, this objective significantly shapes our principles and strategies. Nevertheless, the principles defined in the Target State Workshop are mainly designed to describe the architectural direction for the IDX target state solution. Unifying and simplifying IDX will inherently reduce operating and change costs for the industry, noting these will be measured against implementation costs in the business case. Therefore, while 'Taking Cost Out for Industry and Consumers' isn't explicitly stated in the principles, it is an underpinning philosophy that directs our design decisions. Additionally, we aim to ensure that the architecture we implement is not just cost-efficient but also effective, reliable, and scalable, further contributing to cost savings in the longer term
02	There is a very real risk that assumed requirements for 'modern standards' for proposed or future services will lead to the development of services which are underutilised, such as B2BMessagingSync\Pull & B2MMessagingPull, or even unfit for purpose because technology and industry develop different needs. The services and protocols we have today were all once 'modern standards.	AEMO agrees and acknowledges the potential risk of service underutilisation and the evolving nature of what is considered a 'modern standard'. However, aligning with technology advancements yields efficiencies and value for stakeholders. To minimise underutilisation risk, AEMO proposes a single channel and protocol per use case with a sunset arrangement for legacy capability, informed by the past's low adoption rates of multiple options. We learned from previous consultations, such as when Power of Choice resulted in various patterns for the same use case (B2BMessagingPush, B2BMessagingSync and MessagingPull), the importance of clearly defined IDX principles for selecting suitable methods; therefore, we must establish agreed-upon IDX Target State principles early.
03	The Participant question the assumption that new standards (business function schema) will improve the speed to market of regulatory changes as this needs to consider the intent of the consultation process, which is to allow participants to adequately consult and consider impacts to themselves and customers before implementation.	AEMO agrees. Modernising standards within IDX isn't designed to bypass this process but rather provide a more robust set of capabilities that allow for more efficient design, and minimise impacts to unaffected participants and testing requirements. While new standards aim to streamline Participant implementation, they do not intend to modify or fast-track consultation or governance.

IDX Target State – Question 1 Feedback

#	Participant Feedback	AEMO Response
04	The Participant seeks clarity on the existing Outbound push (option 1) vs the Outbound with event notifications model. Moving to a pull event model may result in significant work on the participant side so this would need to be better understood before a final option is selected. Some additional information showing scenarios and how the proposed solution would support priority, timeliness and criticality of processing for these various scenarios would be helpful (e.g, same day reconnection, bids and offers etc).	AEMO seeks to underscore the potential benefits of the Outbound Pull with Event Notification Model. This model allows flexible, real-time adaptation of your prioritisation based on business needs without AEMO's intervention. To illustrate this, take the example of Time-sensitive connections: **API Push Outbound Pattern:** AEMO would push the Service Order Request Data (SORD) messages directly to the Participants hosted API endpoint in this scenario. All SORDs would be pushed out as they are available, with some limited priority configured based on values that the industry agrees to. Each participant must then process the incoming SORDs based on their internal logic and preferences. Let's assume the Participant is interested in prioritising same-day high-priority service orders. Under the API Push model, these SORDs would be mixed with all the others in the incoming data stream as AEMO cannot establish what constitutes a same-day order for the Participant based on message metadata alone. The Participant would have to sort through each incoming SORD to determine if it's a same-day order based on the variables such as the transaction's ScheduleDate and possibly the messageContextID and ServiceOrder number, then process it accordingly. This could delay the processing of high-priority SORDs if there's a large volume of incoming data. Also, since the priority determination is based on the participant's internal logic, any change in priority criteria would need to be adjusted on the participant's side. **Outbound Pull with Event Notification Model:** In contrast, under the Outbound Pull with Event Notification model, the event notification gives an overview of the transaction payload data (as metadata) without needing the participant to process the entire payload. The Participant can consume and pull the whole data payload based on their prioritisation rules applied to the received metadata. In the context of SORDs, participants would receive an event notification for each new SORD. They could then decide whether to pull the full SORD based on the payload metadata provided in the event notification. For example, Participant seeks to prioritise same-day service orders. In that case, the Participant can structure their system to pull those SORDs first based on the information provided in the event notifications (e.g., ScheduleDate or LifeSupport). This model offers a more efficient and flexible approach to prioritising and processing data. Instead of processing all incoming data, the Participant can selectively pull and process only the necessary data at any given time. However, as noted, this requires the Participant to manage data pulling based on its logic and needs, which can add complexity on Participant's end.

IDX Target State – Question 1 Feedback

#	Participant Feedback	AEMO Response
05	The Participant sees value in publish/subscribe models that can easily be established for participants that would help promote innovation and flexibility for vendor SaaS models that do not require changes to the participant's core market gateway.	AEMO internally evaluated a publish and subscribe model when developing its decision tree for outbound delivery but did not present this to the industry. Publish and subscribe (Pub/Sub), and Outbound Pull with Event Notification models allow stakeholders to subscribe for real-time message reception. Yet, they differ in their approaches to prioritisation and message transformation. **Outbound Pull with Event Notification Model:** This model is based on event-driven integration, where stakeholders subscribe to messages for real-time reception, thus eliminating the need to poll the AEMO-hosted outbound data endpoint. The main advantage of this model is its support for real-time messaging, asynchronous responses, and the flexibility it offers stakeholders in prioritising data delivery. Metadata is provided at the business content level, allowing stakeholders to use their prioritisation logic. In terms of future expansion, stakeholders can independently configure new prioritisation requirements. This model also transforms on-demand content, enabling stakeholders to specify their preferred schema version, making the park box process redundant for schema upgrades. **Publish-Subscribe (Pub/Sub) Model:** In this model, stakeholders subscribe to a message queue for real-time reception of messages. This model has a similar speed to the event notification model but lacks its dynamic prioritisation capabilities. Metadata is provided at the protocol level and priority is assigned by the publisher. Industry-wide prioritisation parameters could be set to determine when to publish to a specific queue. However, each time a new prioritisation requirement is identified, a new queue would need to be created and subscribed to, making this model less flexible in expansion. On-demand content transformation in this model requires AEMO to store participant schema preferences and transform messages before publishing them to the outbound queue. This necessitates the park box process for schema upgrades. Overall, the Outbound Pull with Event Notification Model offers more flexibility and less maintenance overhead, making it more adaptable to future requirements. On the other hand, the Pub/Sub Model may be more straightforward to implement but introduces a new channel and protocol (AMQP) for asynchronous message exchange and could incur more overhead in terms of future expansion and content transformation. *AEMO has included the Pub/Sub option in the 'IDX Target State – Outbound Data' options analysis in the Appendix A of this slide pack.*

IDX Target State – Question 1 Feedback

#	Participant Feedback	AEMO Response
06	The IDX target state feels like a technical solution looking for a business problem to solve, perhaps because of the adaptive approach via the decision trees. As a user the pattern and the payload size don't affect how I think about data. I care about consistency, getting the data I need to make decisions in a timely manner (latency and frequency).	The IDX target state might seem majorly inclined towards a technical solution. However, it's crucial to understand that this initiative is fundamentally designed to enhance data transfer reliability, efficiency, and consistency to support your business processes better. Let's illustrate this with use cases associated with the decision tree branches, which reflect the nature and timing of data available for your business needs. For example, the synchronous data exchange branch is designed for real-time, sequentially ordered market workflows. Here, the sender waits for the response from the receiver before proceeding. This is evident in scenarios like NMI standing data queries, where responses are provided almost instantaneously, supporting real-time decision-making. On the other hand, some workflows cater to procedural asynchronous business functions. These workflows allow tasks to be executed by Participants in an independent and non-sequential manner, enabling parallel processing and reducing dependency on immediate follow-up actions. An excellent example is a registered Participant submitting a SORD Service Order Request and waiting for an asynchronous Service Order Response. The technical concepts of latency and frequency refer to data transfer speed (in milliseconds) and the number of transactions per second (1-100 per second), respectively, which are critical considerations in the IDX target state design. While they primarily concern the machine-to-machine interface, they directly impact the timeliness and reliability of data available to business users. The IDX initiative aims to improve these aspects of data exchange, ensuring that your business has access to the accurate and timely data it needs for efficient decision-making. The adaptive approach of the decision trees ensures that the IDX framework remains flexible and responsive to various business scenarios, ultimately driving improved operational and industry efficiency.

IDX Target State – Question 1 Feedback

#	Participant Feedback	AEMO Response
07	There was a single slide dedicated to AEMO supplied data exchange software. Is this intended to be an 'invisible' pane of glass solution that handles all these mechanisms to make data exchange seamless for an end user to get the right data at the right time? If so, more information about how this will enable users to build applications around it. If not, we need to understand how we segregate the things this software will do from the things we want to do ourselves. If this is a all or nothing solution that probably doesn't help the value proposition.	The vision for the AEMO-supplied data exchange software, in the broader perspective of the IDX target state architecture, is primarily aimed at offering an optional, flexible technical solution that can either replace or interface with your current participant gateway. This is by no means an all-or-nothing proposition but a value-adding extension to your existing setup. The software would manage API connectivity to the AEMO environment while adhering to the target state IDAM authorisation and authentication patterns. It would also support the inbound and outbound data patterns, including the new Outbound Pull with Event Notification patterns, and utilities. Utilities would include tools for converting FTP to API and aseXML to JSON and validating B2B and B2M transactions.

The objective is to provide software that Participants can integrate within their existing infrastructure to bolster data exchange capabilities while reducing complexity. Historically, AEMO-supplied software has been a core component of the NEM wholesale solution and has broad adoption (90%) by NEM wholesale participants. Our goal with the IDX initiative is to extend these proven benefits to the NEM retail sector and cater to transition-specific use cases.

We understand that the information provided so far has been brief. We encourage you to participate in the upcoming Transition Strategy workshop, where we will delve into greater detail about this software's capabilities and potential applications. |
| 08 | GraphQL -Potentially high risk - consult actual industry experience. However, in terms of R/O across disparate data sets, it's a reasonable option. Significant implementation concerns around security and performance | We acknowledge the potential risks of GraphQL in terms of security and performance, as indicated in your feedback. AEMO will undertake a Proof of Concept to manage these challenges. Security-wise, GraphQL's established community offers robust security guidelines. These and standard encryption and authentication measures enable a robust security infrastructure. Regarding performance, GraphQL's key strength lies in its ability to specify data needs, fostering efficiency precisely. Over-fetching and under-fetching issues can be mitigated through effective schema design, batching, and caching requests. AEMO recognises that adopting GraphQL involves balancing these considerations. |

IDX Target State – Question 2 Feedback

Question 2: With these Target State definitions, can you identify further benefits or impacts for industry from the proposed target states?

#	Participant Feedback	AEMO Response
09	Transitioning from existing to business function-specific standards will require development of systems, gateways and translation layers. The cost to deliver these needs to be considered carefully when the objective of these programmes is 'Taking Cost Out for Industry and Consumers'.	AEMO recognises the need for careful cost consideration when transitioning to business function-specific standards and will take your feedback to 'Taking Cost Out for Industry and Consumers' when developing the Transition strategy. AEMO aims to articulate how it can assist Industry in offsetting costs related to schema validation, gateway connectivity, authorisation, and aseXML to a business function-specific standard in a manner that respects participant autonomy, promoting a flexible, participant-centric approach.
10	We want further concepts regarding using Service Principals vs Marketnet vs URM accounts for API or other integrations. How to utilise levels of assurance as applied to identity and access are split into three categories – Identity Assurance Level (IAL), Authenticator Assurance Level (AAL) and Federal Assurance Level (FAL).	The proposed model will be based on OAUTH 2.0 standards to ensure they are compatible with various identity and access management platforms. However, if you have AEMO will define IAL, AAL, FAL will be defined during the design phase

IDX Target State – Question 3a Feedback

Question 3a: AEMO believes that a move to business function specific end points and schemas has clear advantages. To support this, slide 56 has two options. Option 1 is aligned with the target state principle but would benefit from an industry perspective on the specific impact on stakeholders' systems. Which is your preferred option and why?

#	Participant Feedback	AEMO Response
11	The change to JSON from aseXML would require a significant redevelopment and cost.	AEMO acknowledges this significant undertaking and is committed to facilitating a smooth transition. In response to these concerns, AEMO is exploring various ways to aid industry participants during the transition. One such initiative is the potential provision of an AEMO-supplied software, including a utility for payload transformation, converting aseXML and legacy CSV to business function-specific formats (B2M/B2B). This would simplify the conversion process, minimising redevelopment needs and reducing costs. The capabilities of these utilities are currently under consideration as part of the definition of the Transition Strategy.
12	For API's consider a better schema than JSON - it has weak validation and guarantees even though it is widely adopted.	AEMO is looking to provide schema validation capabilities as a .jar file that can be called from the AEMO-supplied software or your gateway. This, along with payload transformation capabilities (AEMO CSV to JSON, AEMO CSV to aseXML, JSON to aseXML, JSON to AEMO CSV) included with the AEMO-supplied software will be present in more detail in the upcoming Transition Strategy workshop.

IDX Target State – Question 4 Feedback

Question 4: AEMO presented potential data flows that may fulfil future use cases. We would like to know if the industry sees any merit in considering these potential data flows within the design of the IDX target state.

#	Participant Feedback	AEMO Response
13	Yes we would be supportive of exploring further use cases and would like to understand a more about how secure B2B messaging could be supported. A secure solution that helps us move away from email based messaging between partners would be welcomed. We would like to understand some use cases and how this model could be kept secure (e.g. registered users, multifactor authentication, password standards etc).	AEMO's B2B non-regulated data exchange proposal integrates our IDAM solution for secure authentication and authorisation. Expanding beyond the current registered Participant user base, the Target State IDAM solution would enable AGL to interact with any IDAM registered energy stakeholder. The standards for multifactor authentication, password security, etc., would align with the industry-agreed standards. As messages traverse AEMO's transport security and policy enforcement layer, AEMO can ensure additional layers of protection, such as non-repudiation, archiving, and transaction logs, thereby boosting overall security and trust in the B2B non-regulated communication model.

IDAM Target State – Question 1 Feedback

#	Participant Feedback	AEMO Response
14	**Management of Service Accounts** During the Target state industry workshop, for management of Service Accounts, AEMO introduced the concept of short-lived tokens based on Oauth2.0 client credential flow to replace the current basic authentication, eliminating the need for frequent password rotation. Some of the participants suggested to introduce a federation concept for the service accounts as well like person-based identities.	AEMO has addressed the feedback and evaluated the technical feasibility; service accounts can be managed using Participants' IdP in the target IDAM solution. Further evaluation is required to ascertain the significance of this change. If AEMO determines in the subsequent phases that the cost of providing this additional capability will be substantial, we will get back to the industry participants for additional discussion
15	**Identity Federation** During the Target state industry workshop, AEMO introduced the concept of Federated person identities to eliminate the need for multiple credentials and to enable the participants to leverage their existing enterprise identity provider. Many participants expressed interest in Federation and details were sought regarding the assurance levels	AEMO will define IAL, AAL, FAL during the design phase and the industry would be engaged at that time to gather feedback
16	**Automatic role sync-up** Request was raised to explore a capability for automatic role synchronisation between the participant's organisation and AEMO, once federated identity is established.	AEMO has addressed the feedback and evaluated the technical feasibility – it is possible to support this in the target IDAM solution. Further evaluation is required to ascertain the significance of this change. If AEMO determines in the subsequent phases that the cost of providing this additional capability will be substantial, we will get back to the industry participants for additional discussion

Portal Consolidation Target State – Question 1 Feedback

#	Participant Feedback	AEMO Response
17	No major concern raised, or feedback provided for Portal Consolidation	

IDAM Data sharing - Questions 5a and 5b Feedback

Question 5a. Should data sharing capabilities be extended to other markets beyond NEM wholesale?

5b. Should data sharing capabilities be extended to offer asset-level granularity, e.g., DUID level, to support power purchase agreements?

#	Participant Feedback	AEMO Response
18	• Majority of the participant expressed interest in having data sharing capabilities be extended to other markets beyond NEM wholesale • Majority of the participant expressed interest in having Asset Level data sharing capabilities • Interest was raised for several use cases including getting confidential data to third-party service providers	• IDAM target state would be flexible by design to cater to future needs and capabilities. AEMO would engage with participants in the next phases to understand the data sharing use cases in more detail and extend the target state based on the requirements identified. • The legal arrangements and the Consent Management framework needed to support the data sharing capabilities securely will be explored in detail in the next phase. The data sharing capability would be optional, and participants may choose not to opt for it.

Appendix A

IDX Target State – Outbound Data

IDX Target State – Outbound Data

Capability	Publish/Subscribe	Outbound Push (current)	Outbound Pull (current)	Outbound Pull with Event Notification
Definition	AEMO delivers outbound data through pub-sub model (push pattern)	AEMO delivers outbound message to Recipient's endpoint.	Recipient pulls outbound message from AEMO (polling for new messages)	AEMO sends event notification when an outbound message is available. Upon receipt of event, Recipient pulls the message from AEMO.
Diagrammatic representation				
Speed of Data Delivery	●	●	◔	◕
Prioritise Order of Data Delivery [1]	◐	○	●	●
Flexibility for Participants to configure the order of processing outbound data [2]	○	○	●	●
Operational Overheads	◐	◔	◔	◐
Cost to Industry	◐	◔	◔	◐
Increased cyber security controls	◔	◔	◔	◔
On-demand transformation of outbound content [2]	○	○	●	●

1 – Ability to prioritise the order of data delivery based on the meta data of the outbound message

2 – Ability to determine the order of the messages that are already ready to be delivered in runtime

3 – a) Ability for Participants to nominate the schema version at runtime when pulling the message b) Move away from Parkbox process when upgrading the schema