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SwitchDin Pty Ltd
Suite 101, Level 1, 426 King Street
Newcastle West, 2302, NSW, Australia
ACN 154 893 857

CER Data Exchange Project Team,
AEMO

CER Data Exchange Industry Co-Design Consultation Paper Response

We at SwitchDin welcome the opportunity to participate in the industry co-design process and respond to AEMO's public consultation on the CER Data Exchange which could be a key element in achieving the promise of coordinated CER for the Australian power system.

Our response assumes the following context. There is widespread agreement that there are significant benefits to a future power system where coordinated DER plays a meaningful role in grid operation and enables optimisation of investments in grid infrastructure. Unfortunately, at this point in time there's no clear consensus about exactly what that future looks like, or how it will work.

There are, however, immediate needs (on the timescale of 1-3 years) for secure, reliable, trusted mechanisms for exchanging data. Work on these will lay the groundwork for a future where reliable and coordinated CER forms a crucial and productive element in our power ecosystem.

The lack of certainty about the specifics of the desired future state means any work done now should expect to adapt as the future unfolds, and ongoing evolution should be considered as a key design principle. Rather than expecting the first implementations to be perfect and comprehensive, the focus should be on building useful systems that will evolve to remain relevant no matter how the future emerges.

Given this context, we believe the most effective approach for a successful implementation that achieves the aims of this project is:

- Starting with implementing a small number of high priority use cases which deliver immediate value, and gaining widespread adoption for these priority use cases
- Using the learnings from this initial rollout to guide the expansion of the system as additional use cases are implemented, and processes are refined
- Consider Data Mesh architecture & principles as an effective model for robust Data Governance at scale
- Employing a small central capability to establish the framework for ongoing operation and evolution. A regulated body is a good fit to oversee this capability
- Encouraging broad industry participation by facilitating cross domain data exchange supported by data contracts defined by the relevant data owners & users

The current energy transition is the greatest change the grid has ever faced, and effective coordination of DER will be critical to successfully navigating it. Industry wide collaboration and data exchange is a fundamental requirement for this, and employing well documented best-practice techniques can ensure this project delivers the promised value. We are excited to be part of successfully navigating this transitional period and enabling coordinated DER to become a meaningful element in the grid of the future.

Sincerely,

Mario Vecchio
CEO
SwitchDin

1. Priority Use Cases

Do the identified priority use cases effectively address immediate data-sharing needs, and are there any additional use cases you would recommend prioritising?

The nominated "priority use cases" are a reasonable starting point and align well with the suggested roadmap. We further suggest that *Consistent CER Standing Data* and *Sharing Network Limits* be prioritised in Phase 1 of implementation (the *Foundational* Phase). If necessary, the *Supporting Local Network Services* use case could be addressed later in Phase 1 or in the next phase.

The *Consistent CER Standing Data* & *Sharing Network Limits* use cases deliver immediate value as they address needs which are evident in the day to day operation of regions of the NEM at present, consequently they are the highest priority.

Other, "non-priority", use cases will be implemented more efficiently by incorporating the learnings from these first two. Suggested phasing is discussed in Q16.

2. Strategic Use Cases

How do you view the long-term value of the strategic use cases and are there specific outcomes you would like these use cases to achieve in the future?

Also, do the strategic use cases sufficiently complement the priority use cases?

Do you have any feedback on when these use cases should be implemented?

We see some long term value in the nominated strategic use cases. However, implementing and adopting the priority use cases first will give insight into that value, along with any potential implementation issues, which might need to be managed to deliver that value.

Our suggestion is to implement the priority use cases and use the experience from this to define the processes for ongoing evolution of the data exchange. The strategic use cases can then be used to exercise that process and they will benefit from the experience gained in the implementation of the priority use cases.

We note that the paper identifies stakeholder-led use cases suggested by the CEC: *network limits standardisation*, *common CSIP-Aus testing/certification*, and a *national CSIP-Aus certification register*. We believe that these cases address immediate needs, and represent valuable additions to the priority use cases. Standardisation and consistency is a common thread running through these use cases — attributes which are critical to obtaining the full value from any data exchange system. These additions could be incorporated into the priority use cases, or implemented soon after.

3. Additional Use Cases

Are there additional or alternative use cases that would enhance the CER Data Exchange's outcomes?

We suggest keeping the target functionality narrowly focussed on immediate needs to ensure timely delivery, so there are no additional use cases to add beyond the identified priority ones. The stakeholder-led use cases put forward by the CEC are useful additions and address issues that are immediately valuable, so they would enhance the outcomes of the project. Rather than adding more use cases, adding a requirement to define the process and mechanisms for ongoing technical evolution of the platform would be valuable for delivering the functionality in a timely fashion and achieving the best outcomes over the lifetime of the system.

4. Changes to Use Cases

Would you suggest any changes to the use cases presented? Please outline your reasoning

All use cases must be more thoroughly specified — for instance the latency and throughput requirements should be specified by defining the expected number & frequency of messages; how "fresh" messages need to be in order to be valuable; how quickly messages need to be actioned.

In addition, each use case should include a definition of the processes that will be used to ensure data remains accurate and current over the lifetime of the system, as a data exchange platform is only as valuable as the data within and an exchange filled with untrustworthy data doesn't hold much value. The best way to

ensure data validity is to have something using the data, along with processes for rectifying any identified issues. Ideally this would be automated as much as possible to ensure wide coverage & consistency, and wherever possible data should be validated against a second source for corroboration of recorded values — for example the *Consistent CER Standing Data* use case could define processes to perform initial validation at registration time, along with a process for ongoing validation of recorded values, perhaps using smart meter data as a second source of information.

Most importantly, creating common definitions and standardisation must be part of the use cases because a system for exchanging messages between multiple parties isn't useful unless those parties all have the same understanding of the meaning of those messages. The experience with differences in CSIP-AUS implementations for dynamic operating envelopes or emergency backstop measures between DNSPs show that it is not enough to have common protocol definitions, there also needs to be a shared interpretation of how the standard capabilities are applied to different use cases. The CEC use cases are a good example of including this kind of standardisation, and these improvements should be adopted in the core use cases.

5. Prioritisation

Do you agree with industry preference that the CER Data Exchange should be designed with narrow capability initially but have the flexibility to expand in the future?

Yes, a narrow focus on immediate needs is the best way to deliver a valuable system in a timely manner.

The landscape of widespread integration of CER into power systems is changing rapidly, and the future isn't yet certain enough to support large scale upfront design or implementation processes now. Instead, the dynamic nature of the current environment should be acknowledged by designing for change and ensuring that processes for adapting to change and ongoing evolution are defined as part of the initial design & implementation. It is not possible to build a future-*proof* system under such conditions, instead the goal is to be future-*ready* by creating a system that can adapt as the future unfolds.

6. Capability

Do the proposed data sharing capability discussed above support both current and future CER data sharing use cases?

Please nominate what essential data sharing capability would be required?

Many of the suggested capabilities are table stakes for any modern data exchange system — *Information Security*; *Format Standardisation*; *Data Governance*; *Access Management*; and *Platform Interoperability* all seem like foregone requirements, independent of use case. Other nominated capabilities such as *Real-time Processing* or *Advanced Data Validation* should emerge from the specific requirements of the use cases, e.g. it might be more fruitful to define the actual timing & throughput requirements of each use case rather than trying to classify into "batch" or "real-time".

The *Custom Data Formats* capability might detract from widespread multi-party interoperability. Standardisation and common definitions must be a core part of any system hoping to reduce the integration burden between many disparate entities. We suggest that *"Extensible Data Formats"* would be a more suitable capability. The core messages would be standardised, along with defined points for extension or customisation. This approach enables a degree of flexibility to adapt to any use cases or scenarios the initial standardisation didn't capture, along with a pathway for migrating broadly useful extensions back into the core standardised messages after a period of practical validation.

Perhaps the most important and valuable capability for the data exchange is *Data Governance*. This capability should enable parties using the exchange to cooperate with one another efficiently. It would allow, for example, the creation of data contracts and feedback loops to ensure the data being exchanged is of acceptable quality, and is only being used in appropriate ways by authorised parties. Given the criticality of effective *Data Governance*, the intended framework for governance needs to be described in much greater detail than presented in the consultation paper.

7. Additional Features

What additional features or capabilities could improve flexibility and scalability in the CER Data Exchange?

In general we do not suggest any additional capabilities, merely the refinements put forward in the response to Q6, along with recommending a tight focus on immediate needs for rapid implementation. However, many of the proposed capabilities of the system are already addressed by modern best practices such as the Data Mesh Architecture, and the outcomes of any implementation project would benefit from incorporating concepts such as data domains; data products; and data contracts from the Data Mesh architecture.

8. Ownership Preferences

Which ownership model do you believe is best suited for the CER Data Exchange: Industry-led consortium, AEMO-led, or a New Independent Government Agency?

Do you have feedback on the models in addition to those summarised in this paper?

Are there other ownership models not listed in this paper that you would like us to consider?

The analysis of the ownership options presented in the consultation paper identifies the major strengths and drawbacks of the ownership options along with the likely issues associated with each.

A more nuanced approach to ownership is outlined in the Data Mesh Architecture referenced in our answer to Q7. This allows central ownership of the core governance capability with a distributed ownership model for data domains. We recommend considering this alternative closely.

9. Oversight – prescription vs discretion

What level of oversight should apply to the CER Data Exchange? Should its operation be heavily prescribed, or should it be provided with operational discretion?

In general operational discretion is preferable to enable efficient operation, however certain key aspects will require more prescriptive oversight to ensure the system as a whole is effective and meets the desired goals with equitable access.

In a Data Mesh architecture the more prescriptive oversight would be applied to the centralised aspects. This would include, for example, defining ownership of data domains, providing the governance approach for resolving disputes, and establishing facilities for data domain owners to contract data sharing with one another.

In other aspects, there should be operational discretion to ensure the system can be implemented in the most effective manner, as determined by the parties actually using it. In these cases a review framework, which might be more prescriptive, should ensure that key objectives of the data exchange are achieved for the common good and in an equitable fashion.

10. Oversight body

Who should be responsible for overseeing the CER Data Exchange's operation?

Are there other models of oversight that you would like considered?

How important is regulatory independence in overseeing the CER Data Exchange, and would a new dedicated oversight agency or body better support transparent, impartial governance?

For an *effective* data exchange platform there must be some central oversight authority to facilitate the whole system & ensure smooth interactions between participants. However, for *efficient* system operation the participants should have the operational flexibility to defined & implement fit-for-purpose data contracts for data exchanges.

The central component is best led by a government-authorised entity and we see that this could be *AEMO-led* (Model 2); *New Independent Government Agency*

(Model 3); or, a transition from one to the next. We suggest that *industry-led* components (the aim for Model 1) should be focused on distributed data ownership and cooperation on data sharing contracts.

11. Data Governance Preference

Which data governance model best aligns with industry's desire for trust, compliance, and flexibility?

The models described in the paper do not describe a data governance model, merely options for the authority/body responsible for enforcing it. A complete data governance model includes the process and frameworks the authority would use to ensure the data is accurate, reliable & trustworthy.

The Data Mesh architecture defines a data governance model based on distributed ownership & responsibilities, but with a central authority for defining and enforcing a unified set of policies & processes. With this approach that central authority should be a regulated entity (corresponding to options A, C or D in the paper). Industry participation in the central body should be encouraged. However, as described in our response to Q9, the data exchange participants should have the operational discretion in defining the transactions on the exchange to ensure their use cases are being met. This addresses the aims implied in the industry participation of model B.

12. Adaptability

In your view, how should the data governance model support the integration of new use cases as CER technologies and industry demands evolve?

The ability to adapt to emerging needs over time should be a core design principle of the CER data exchange, as some future needs won't be obvious yet, and upfront design doesn't work well in rapidly changing environments. Therefore, the data governance model should accommodate ongoing evolution. The data mesh architecture provides a good example of a data governance model that can readily adapt to evolving requirements.

In this model there is a central authority that defines and enforces the overarching principles & rules, and encourages distributed participation in governance with

regular feedback cycles. The data contract framework empowers individual participants to define fit-for-purpose data exchanges as needed and systematically record the interface definitions as they do so. Reuse of these data contracts is encouraged amongst participants with similar use cases, and the data contracts provide input to standardisation processes as common use cases emerge and it makes sense to do so.

This ongoing participation-driven evolution, with regular feedback cycles, enables valuable use cases to emerge and be made available to all in a standardised way, enabling adaptability while managing the risks of fragmentation.

13. Stakeholder Engagement

How frequently and in what format should the data governance framework engage stakeholders on changes to standards, compliance requirements, or new use cases?

The industry landscape is changing much faster than current regulatory cycles — over the past 5 years: rooftop PV capacity in Australia has increased ~4x; the occurrence of negative wholesale electricity prices has increased more than 5x; and minimum demand continues to fall across the NEM. All of these trends are likely to continue (perhaps even accelerate), so the ability of the CER data exchange to respond to external changes should not be restricted to the 2-5 year horizons of the current regulatory processes.

In such a highly dynamic environment an asynchronous change review process is more responsive than periodic reviews, however, if periodic reviews are required then they should happen at least as frequently as once every 6 months.

Our proposed model of governance, based on data mesh, has a small centralised governance capability that supports wider participation by industry players who are exchanging data regularly. The standardised components managed by the centralised governance authority will be slower to change. We expect that the governance team would meet every 6 months or more often (ad hoc) if required.

However the distributed components should adapt more rapidly, as necessary, so long as established data contract mechanisms are preserved. This enables new use cases to be immediately addressed with a participant-driven implementation

of new data contracts. Common elements of data contracts (including exchange of similar data types) should be fed back into the standardisation process to be incorporated into future revisions of the central and shared components.

14. Data Quality

Whilst not included in the scope of the CER Data Exchange, do you have feedback or key considerations for ensuring data quality in a manner which compliments the Exchange?

A data exchange which simply facilitates message transfer between participants with no mechanisms for ensuring adequate data quality for the content of the messages holds very little value. Processes for ensuring data quality are a key part of effective data governance and *should* be in scope of the CER Data Exchange — the exchange will only be as valuable as the data within it.

Much guidance is available about modern best practices for effective data exchange systems — see the data mesh architecture for example. It describes many useful approaches including: data as a product; data contracts between data producers & consumers to manage change while avoiding breakage; charging data owners with the responsibility for publishing high quality data; and continuous review processes to manage change.

15. Alternative Preferences

Are there any data governance models not listed in this paper that you would like us to consider?

As explained in earlier responses the Data Mesh architecture is a modern best practice approach to the overall architecture of a data exchange system, including a comprehensive data governance model.

16. Phased Implementation Roadmap

Do you agree with the proposed phased approach for the CER Data Exchange implementation?

What adjustments or considerations would you suggest to better align the phases with the needs of your organisation?

A phased approach is best, however it may be more effective to employ only 2 phases by combining the proposed 2nd & 3rd phases into one ongoing iterative cycle.

In this instance the *Foundational* phase would implement functionality for the priority use cases, along with defining the essential processes for data governance and ongoing adaptation.

The 2nd phase would be *Ongoing Operation, Scaling & Optimisation*, and see all remaining use cases implemented using the processes defined in the *Foundational* phase — starting with the most important strategic use cases, but also allowing for addressing any unforeseen use cases that might emerge over the operation of the system, or revising existing use cases based on operational feedback.

This approach allows experiences gained from implementing the Priority use cases to guide the implementation of all remaining use cases to increase efficiency, and also facilitates realising the value of the exchange as soon as possible by focusing on gaining widespread adoption of the Priority use cases which address immediate needs before working on the longer term strategic use cases.

17. Cost Recovery Model Preferences

What are your preferences regarding cost recovery for the CER Data Exchange?

Would a direct, shared, or government-supported model be preferred, and why?

The centralised components and governance authority are natural fits for government funding as they are the core functions that provide the common good of the CER data exchange. However, these centralised elements should be kept small for efficient operation.

To ensure the continued relevance of the platform, any funding model must include provision for funding ongoing *development* not just *operation*, especially if a phased implementation approach is taken. This ensures the system can continue to adapt to new use cases over time without needing major funding injections. One possible approach would be to fund additional use case development on a case-by-case basis. This could be done by the participants who gain the most value for the use cases. And there should be an option to apply for public funding to support innovative use cases, or to support smaller participants with fewer resources. A critical element in the success of such a model would be ensuring that all new data products and functionality developed in this manner would be made available to all participants at no (or low) cost once implementation is complete. Equity of access should be preserved by making all data products available to all participants as required.

18. Regulatory and Policy Reforms

Which areas of policy or regulatory reform do you believe are most critical to support the CER Data Exchange?

How should these reforms balance compliance with operational flexibility?

Given that this system would be exchanging a large volume of consumer data, privacy and consumer protections are going to be critical policy & regulatory elements to its successful implementation.

The implementation should consider closely the ongoing reforms of Australian privacy and AI regulation to ensure that it remains in line with these.

19. Technical and Operational Challenges

What technical or operational challenges do you foresee in integrating your systems with the CER Data Exchange?

Are there specific support mechanisms that would facilitate smoother adoption for your organisation?

Without a detailed (or even draft) design it is too early to accurately assess the potential impacts and challenges, however there are a number of things that could help minimise the impacts.

Testing and simulation environments should be available for all participants to perform their own development and integration testing against. Ideally these would include both isolated & shared environments to enable participants to first test integration with their own systems, followed by testing exchanges between participants.

A clear, robust technical design based on modern software design best practices will also minimise integration issues. For example the Event Driven Architecture and Data Mesh approaches provide useful design frameworks for similar systems, and common standards such as OAuth and OIDC for authentication & authorisation, or JSON, CSV and Parquet/delta data formats all minimise the need for bespoke development.

Finally good documentation around APIs and processes is essential, along with access to support staff to help with diagnosing any integration issues can significantly reduce the development and operational burdens.

20. Impact on Stakeholders

What technical, regulatory, operational, or commercial impacts would you anticipate from implementing the CER Data Exchange in your organisation, and how could the roadmap or cost recovery model alleviate these impacts?

SwitchDin works with many players of different types in the Australian energy industry. Our business is greatly enhanced when these players are consistent in their approach, so standardisation of data exchange is especially valuable. So the Data Exchange should encourage evolution to standardisation and consistency of data.

SwitchDin is also working on the forefront of software technology, so a flexible approach to trial and introduction of new systems (including exchange of new data and data types) is vital. The ability to experiment with new forms of data exchange among the industry players, while adhering to some consistent principles, would also be of great benefit.