

# **ASX's Replacement of CHES for Equity Post-Trade Services: Business Requirements**

CONSULTATION PAPER

SEPTEMBER 2016



### Invitation to comment

ASX is seeking submissions on the proposals in this paper by **28 October 2016**. Submissions should be sent to:

E: [regulatorypolicy@asx.com.au](mailto:regulatorypolicy@asx.com.au)

**M:** Office of General Counsel  
ASX Limited  
20 Bridge Street  
Sydney NSW 2000  
Attention: Diane Lewis  
Senior Manager, Regulatory and Public Policy

ASX prefers to receive submissions in electronic form.

Submissions not marked as 'confidential' will be made publicly available on ASX's website.

If you would like your submission, or any part of it, to be treated as 'confidential', please indicate this clearly in your submission.

ASX is available to meet with interested parties to discuss the proposals in this consultation paper.

### Contacts

For general enquiries, please contact:  
**Diane Lewis**  
Senior Manager, Regulatory and Public Policy  
T: +61 2 9227 0154  
E: [diane.lewis@asx.com.au](mailto:diane.lewis@asx.com.au)

For media enquiries, please contact:  
**Matthew Gibbs**  
General Manager, Media and Communications  
T: +61 2 9227 0410  
E: [matthew.gibbs@asx.com.au](mailto:matthew.gibbs@asx.com.au)

## CONTENTS

|                                                                 |           |
|-----------------------------------------------------------------|-----------|
| <b>Introduction</b>                                             | <b>3</b>  |
| <b>Scope of CHESS replacement</b>                               | <b>6</b>  |
| <b>Introduction of ISO 20022 message standards</b>              | <b>11</b> |
| <b>CHESS replacement roadmap</b>                                | <b>14</b> |
| <b>Other requirements and considerations</b>                    | <b>17</b> |
| <b>This consultation</b>                                        | <b>18</b> |
| <b>Next steps</b>                                               | <b>18</b> |
| <b>Appendix A: Overview of ASX's Equity Post-Trade Services</b> | <b>19</b> |

## Introduction

ASX is planning for the replacement of the system that underpins the post-trade processes of Australia's cash equity market, known as CHESS (the Clearing House Electronic Subregister System). The purpose of this consultation is to seek the views of stakeholders on their requirements for the system to replace CHESS.

The development of CHESS by ASX over 20 years ago enabled the successful dematerialisation of the cash equity market (the conversion of physical shares into an electronic format); a move to T+5 settlement (which was lowered to T+2 in March 2016); and improved the general efficiency and effectiveness of post-trade processing in Australia. CHESS was world-leading and led to the development of a proprietary electronic messaging standard because existing standards lacked the message sophistication to accommodate CHESS's functionality.

Today, CHESS is the core system that performs the processes of clearing, settlement and asset registration, which are critical to the orderly functioning of the market. CHESS continues to be stable and to effectively deliver these services. This is demonstrated by CHESS's average monthly service availability over the last five years of 99.99%. While there is nothing to indicate that CHESS will not continue to provide this service level, ASX is evaluating whether replacing CHESS with more contemporary technology will provide a broader range of benefits to a wider cross-section of the market. While ASX assesses the requirements and potential technical solutions for the replacement of CHESS, it will continue to support and invest in maintaining the high performance and availability of CHESS.

### CHESS functions

ASX's licensed clearing and settlement facilities for the cash equity market (ASX Clear and ASX Settlement) use CHESS to perform the following three key post-trade functions that support orderly markets and reduce systemic risk in the Australian financial system:

- **central clearing:** ASX Clear accepts responsibility for settling with buyers and sellers all transactions that are submitted and accepted for clearing, so to protect buyers and sellers from the risk of default by their market counterparty
- **DvP settlement:** ASX Settlement coordinates the simultaneous and irrevocable exchange of cash and financial products (Delivery versus Payment, or DvP) between buyers and sellers on a net basis, two business days after execution (T+2)
- **asset registration:** ASX Settlement maintains a 'subregister' of owners of financial products that are listed or admitted to trading status on an approved listing market, and updates the subregister to reflect transfers between buyers and sellers and entitlements resulting from corporate actions.

An overview of ASX's current cash equity post-trade services is provided in Appendix A.

ASX performs these post-trade functions on transparent and non-discriminatory terms of access, under the supervision of the Australian Securities and Investments Commission (ASIC) and the Reserve Bank of Australia (RBA).

Notwithstanding CHESS's high standard of performance in delivering these post-trade services since 1994, its replacement with contemporary technology and global messaging standards provides a significant opportunity to deliver greater operational efficiency, cost savings, access to data and service enhancements to customers.

## Distributed ledger technology

ASX commenced a process of evaluating replacement options for CHESS in 2015. In January 2016, ASX selected Digital Asset Holdings LLC as a technology partner to develop, test and demonstrate to ASX a working prototype of a post-trade platform for the cash equity market using distributed ledger technology (DLT, an example of which is commonly referred to as 'blockchain'). This initial phase of work was completed in mid-2016. From this work, ASX concluded that DLT:

- has met initial capacity tests for ASX's scalability, security and performance requirements for a replacement system when deployed in a permissioned private network. Further testing of the technology will be conducted as part of the next phase of development
- offers potential benefits for issuers, investors, intermediaries and regulators through improvements and innovations in operational processes.

## Timeline

ASX has commenced a further phase of work to formulate the business requirements for the system that will replace CHESS and to build the working prototype to an 'industrial scale' post-trade platform using DLT over the next 15 months. ASX expects to make a decision towards the end of 2017, in consultation with stakeholders, on whether to implement a DLT-based replacement system.

ASX's pathway for the replacement of CHESS is outlined below.

| Milestones                                                                                                                                                               | Timeline                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Develop a prototype platform using DLT technology                                                                                                                        | January 2016 – July 2016                                                                                       |
| Formal gathering of business requirements for a replacement system – to perform all current core functions of CHESS, with limited introduction of new features initially | Commenced August 2016                                                                                          |
| Build the prototype to an 'industrial scale' platform using DLT technology                                                                                               | End-2017                                                                                                       |
| Key decision point: commitment to implement DLT or alternative technology for the purpose of replacing CHESS                                                             | End-2017                                                                                                       |
| Implement replacement system                                                                                                                                             | Following a positive decision at end-2017, ASX will provide further information on the implementation schedule |
| Investigate opportunities for leveraging technology to further increase operational efficiency                                                                           | Ongoing consultation with stakeholders                                                                         |

CHESS is a functionally rich platform to which ASX's customers have aligned their own processes and bespoke technologies. CHESS is also critical financial market infrastructure, and ASX must ensure that the current post-trade processes of Australia's equity market can be performed by the replacement system to at least the same standards of reliability and resiliency as CHESS. For these reasons, further work is necessary to be undertaken before an implementation schedule for replacing CHESS can be formulated. ASX will provide further details following the end-2017 decision point on choice of system. In the meantime, ASX will continue to support the smooth functioning of CHESS in the lead-up to its replacement.

## Feedback sought and submission process

This paper sets out a detailed description of the clearing, settlement, asset registration and related post-trade processes performed by CHESS today. It outlines ASX's plans to introduce ISO 20022 messaging standards with the system that replaces CHESS. It also seeks feedback on a suite of enhancements to current functionality that could be introduced as part of the development of a replacement system. ASX invites all stakeholders to:

- provide feedback on their requirements for the system that replaces CHESS, and their views on the relative importance of existing CHESS functions that could be carried forward into the replacement system
- identify existing functions or processes in CHESS that may not meet their needs and identify alternative solutions. Where possible, provide information on the expected costs and benefits of pursuing those alternative solutions.

Submissions should be made by 28 October 2016.

ASX will consider all feedback received in formulating its business requirements for the replacement system, and continue to consult stakeholders formally and informally throughout the CHESS replacement process.

## Scope of CHES replacement

ASX is proposing that the project to replace CHES will involve the implementation of a new system that provides the core functionality and services that are currently provided and, potentially, some service enhancements. ASX is giving consideration to the inclusion of a suite of service enhancements that may be of value to customers. Feedback is sought on such service enhancements below.

### Guiding principles

The guiding principles underpinning the development of a new system to replace the core functionality of CHES are set out below. These eight principles will provide a framework for ASX's consideration and assessment of the business requirements, specification and design activities.

#### GUIDING PRINCIPLES FOR THE REPLACEMENT OF CHES

##### **Operate for the benefit of issuers and end investors**

Provide issuers and end investors with greater control over, and enhanced confidence in, their market activities through timely, secure and simplified access to the register of holders (for issuers), financial assets (end investors) and associated information.

##### **Take future needs into account**

Meet and respond to changing local and global markets, and promote further innovation through new levels of functionality, open standards and flexible technology.

##### **Accessibility**

Be readily available to those who are authorised to use it in a non-discriminatory manner.

##### **Ease of integration and global interoperability**

Ensure capacity to integrate with upstream and downstream business systems, and embrace global standards and openness to competition through interoperability in a cost-efficient way.

##### **Availability, reliability and performance**

Provide users and regulators with confidence that the solution will be available and transactions performed as and when expected.

##### **Privacy and security**

Provide users with confidence that the system is traceable and secure, and that it won't expose them to new risks as a result of information being fraudulently obtained or corrupted.

##### **Operational efficiencies**

Streamline functions and workflows, remove embedded paper-based processes and mitigate manual errors, and be effective and cost-efficient to operate, support and enhance.

##### **Compliant**

Comply with relevant laws, regulations and licences relating to the operating entities.

### Business requirements – existing business functions to be provided by the new system

ASX is proposing that the following key business functions currently provided by CHES will continue to be supported by the new system that replaces CHES.

- **Trade registration:** the registration of trades submitted by Approved Market Operators (AMOs) for clearing and settlement services. Trades will be treated in the same way for purposes of registration, clearing and settlement irrespective of the AMO on which they were executed.

- **Novation:** trades provided to the clearing facility will be deemed to be novated as at the time the orders are matched.
- **Account structure:** single cash market account for all novated cash market transactions maintained by ASX Clear for each clearing participant.
- **Netting:** reported trades will be netted and all scheduled settlement transactions will be aggregated to provide market efficiency in both transaction volume and value settled.
- **Settlement process:** a Model 3 Delivery versus Payment (DvP) multilateral net settlement mechanism, which exchanges cash for securities irrevocably.
- **Settlement timing:** T+2 as the default settlement timeframe.
- **Non-novated settlements:** settlement of non-novated transactions will be supported via dual entry, as per the current functionality.
- **Payments:** DvP settlement payments will continue to occur in central bank money through the RBA's interbank transfer system. Other payment processes (e.g. margin payments) will remain the same.
- **CHESS Subregister:** legal title for security holders on the register ('name on the register') will be provided given the benefits to issuers and investors, and that these processes are already embedded in the back office processes of brokers. Share registries will also be provided with access to authorise (via specific messages) security conversions and transfers between the Issuer Sponsored Subregister and the CHESS Subregister.
- **Diary adjustments for corporate actions:** buyer protection of unsettled cum transactions at record date will be provided through diary adjustment processes for corporate actions.
- **CHESS holding statements:** security holders will be updated on their holdings in electronic form, unless the holder requests the receipt of paper-based statements. ASX will need to collect and record holders' contact details for these purposes.
- **mFund:** the application and redemption settlement service provided to unlisted funds through mFund will continue to be provided.
- **Non-discriminatory access by AMOs:** all AMOs, including ASX-affiliated AMOs, will be provided with non-discriminatory access to clearing, settlement and issuer administration arrangements under the new system. As all AMOs will access these arrangements in the same way, the existing Trade Acceptance Service for AMOs other than ASX will no longer be required.
- **Settlement Facilitation Service:** providing Approved Listing Market Operators (ALMOs) with non-discriminatory access to settlement arrangements.
- **Operating hours and supportability:** at a minimum, the existing operating hours of 6.00am to 7.00pm AEST and operational support provided between 8.00am and 6.00pm on business days will be matched and may be exceeded.

In due course, ASX will provide the market with updated procedure guidelines and message specifications that reflect any changes to system functions, business processes, and incoming and outgoing reporting.

## Business requirements – new functionality and services to be provided by the new system

### Access to the settlement infrastructure by a second Central Counterparty (CCP)

In accordance with the announcement by the Treasurer, the Hon Scott Morrison, on 30 March 2016 about the Government's policy approach to competition in cash equities clearing, the system that replaces CHES will be configurable to provide a second licensed central counterparty (CCP) with non-discriminatory access to settlement services.

The Treasurer said the Government is committed to putting in place the regulatory arrangements required for 'safe and effective' competition in cash equities clearing. Further information is available in the [Treasurer's announcement](#).

### International standard messaging protocols

ASX will provide International Standards Organisation 20022 (ISO 20022) messaging as part of the replacement of CHES. ASX is assessing whether there is demand for CHES messaging to be provided for a period of time to allow the smooth transition to ISO 20022. In this case, ASX could offer a translator service to enable both messaging formats to run in parallel. The introduction of ISO 20022 will assist in standardising technology infrastructure and managing technology support and maintenance costs, particularly for participants that operate in multiple markets, as it would allow them to operate a common set of systems, servers and software. Further discussion on the introduction of ISO 20022 is provided in a separate section of this paper.

### Potential service enhancements

While seeking to manage the impact of the replacement of CHES on customers and other market participants, ASX is considering implementing a suite of service enhancements expected to provide benefits to the market. A decision to include any service enhancements will be guided by feedback from customers and other stakeholders regarding the potential benefits and costs. ASX has identified the following service enhancements that may be within the scope of the implementation phase.

#### Legal name on title throughout settlement and remove the need for a settlement accumulation HIN

There is potential for the new system to be designed such that the securities remain in the legal holder's name whether held on the CHES or Issuer Sponsored subregisters until the point of settlement and, at the same time, mitigate settlement preparation risk for participants. This service enhancement is expected to provide greater protection of client assets throughout the settlement process and greater back office efficiencies to settlement participants.

Currently, most settlement participants mitigate settlement risk through the temporary ownership transfer of the securities from the seller to an omnibus account held by the settlement participant or a nominee (i.e. an accumulation/settlement entrepot) in preparation for future settlement cycles. Preserving the legal name on title through the entire life cycle of clearing and settlement will not only provide greater protection for client assets throughout the settlement process, it will make it easier to move a client's unencumbered securities from a defaulting participant. The difficulties created by the use of omnibus accounts with co-mingled assets in the settlement process and the need to improve the portability of securities, was highlighted in the aftermath of the default of BBY Limited in May 2015. There would also be benefits of maintaining legal title where the settlement preparation period coincides with timetables for corporate action entitlements, as it removes the need for processing of a client's entitlements from an omnibus account and the subsequent delays to distribution of entitlements to investors.



### Expand security encumbrance (non-transferable state) capability

The new system is expected to have greater capacity to put in place holding locks over securities to ensure that they cannot be transferred unilaterally. This capability could be utilised to guarantee that particular securities are held for a specific purpose, for example, settlement or corporate action processing. This expanded functionality will eliminate the need for securities to be transferred to another holder's HIN to affect an interest in a holding. It also has the potential to be utilised for broader business purposes, including collateral management, securities lending and margin lending.

### Provide settlement period choices

While ASX will maintain T+2 as the default settlement period in the replacement of CHESS, the system will have the capability to offer customers shorter settlement periods. Market participants could be offered the ability to choose to settle their trades intraday, end of trade date or T+1. Settlement optionality may provide participants with greater ability to reduce exposures and associated margin. The potential implications for holding capital at a participant level are yet to be determined.

The significant benefits delivered with the introduction of T+2 in March 2016 illustrate the potential benefits that could be derived from the take up of shorter settlement periods if the optionality was provided. The reduction in the settlement period by one day with the introduction of T+2 has resulted in a reduction in the daily cash market margin of between 25 to 30%. This equates to approximately \$80 to \$85 million in total margin payments for the market.

### Real-time data and service access via an application programming interface (API)

The new system is expected to have the ability to interrogate system data and to access some functions via an industry standard application programming interface (API).

The ability to retrieve data in real time affords the opportunity to proactively monitor data and to calculate thresholds and other events for the purposes of reporting, analytics and alerting, which are not available with many batch-based systems existing today.

#### Consultation questions

Q1. Are there any other key business functions provided by CHESS that have not been identified in this paper that should be supported by the system that replaces CHESS? Explain the importance and value of any such business functions to you.

Q2. What are your views on ASX implementing only a limited suite of business function and service enhancements in the replacement of CHESS, in order to minimise risk and disruption to the market?

Q3. What are your views on each of the potential business functions and service enhancements identified in the paper for implementation with the replacement of CHESS?

Q4. Would you expect the business functions and service enhancements identified in the paper to provide a net benefit to your organisation, and if so, how would you categorise the significance of the net benefit - small / medium / large? If possible, please provide a quantification of any net benefit.

Q5. Are there other business functions and service enhancements that are consistent with ASX's guiding principles that have not been identified and which you think should be considered as part of the replacement of CHESS?

### Non-functional requirements

Recognising the high regulatory, operational and security standards that apply to Australia's financial markets, the new system will meet or exceed the following non-functional requirements currently delivered by CHESS.

- **Availability, reliability and performance:** the new system will meet ASX critical system availability requirements of 99.95%, minimise or eliminate single point of failure, and support automatic failover where relevant. It will be recoverable without loss of data in the event of failure. It will also provide extensive logging and alerting, and be horizontally scalable with a minimum of 100% performance headroom.
- **Privacy and security:** all access to data will be controlled by modern encryption and authentication technology. Perimeter data security measures will be implemented such that it is only accessible by authorised parties. Privacy and security measures that are implemented will be equal to or better than those available today.
- **Compatibility:** the system will support the migration of existing CHESS reference, transaction and history data. It will also support current CHESS business functions and processes, where such processes are continued.
- **Regulator access and surveillance:** regulators will be provided access to reference and transaction data, and the system will provide for the retrieval of historical transaction data.

### Consultation question

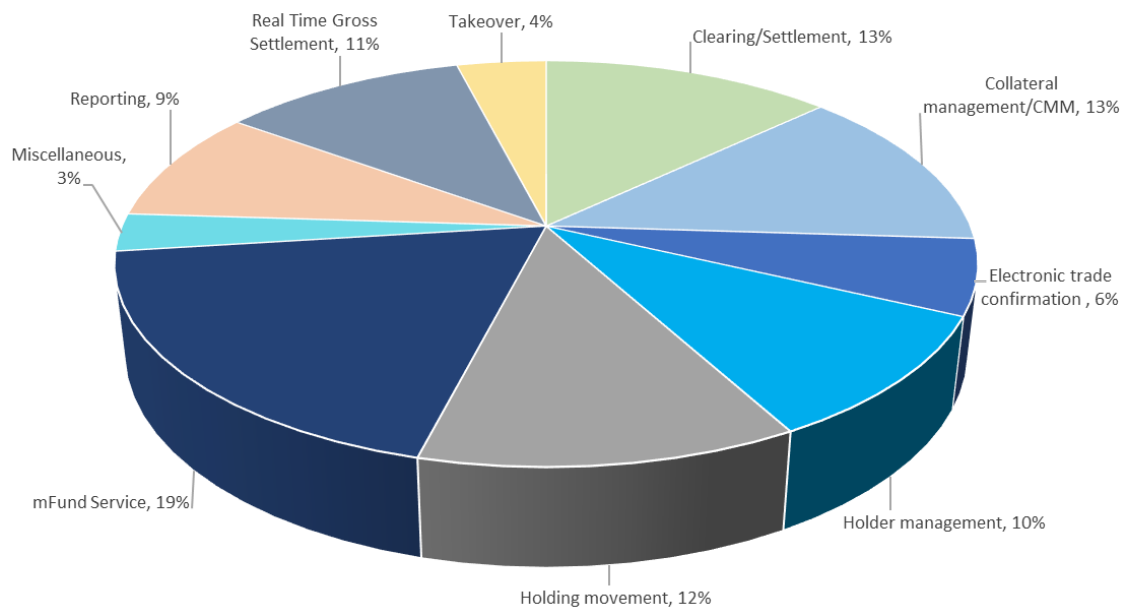
Q6. Are there any non-functional requirements or connectivity models you would like ASX to consider for the replacement of CHESS?

## Introduction of ISO 20022 message standards

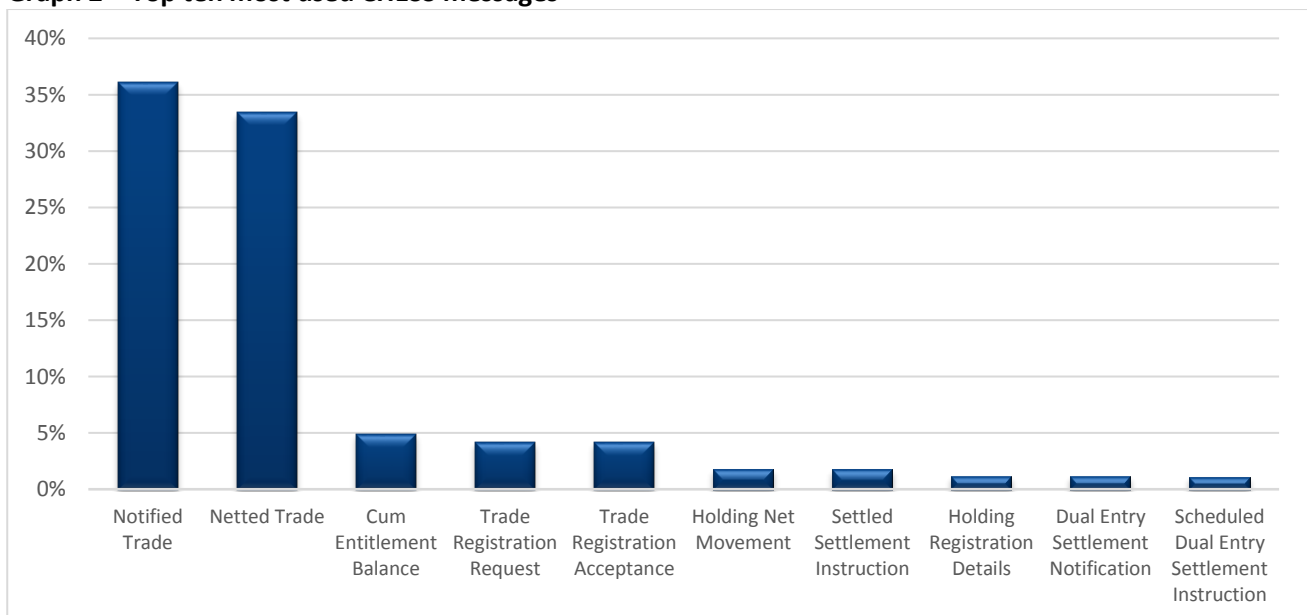
Fast, secure, reliable and data rich electronic messaging is critical to facilitate business in a post-trade environment. It enables participants to communicate efficiently with each other and for two-way communication with the clearing and settlement facilities. For financial infrastructures, it is a core driver in mitigating processing risk by enabling automation and straight-through-processing of complex work flows.

CHESS operates as a computer-to-computer system that relies on an electronic message exchange between CHESS and ASX's customers' own systems over a communications network. CHESS messages utilise a proprietary format that is not used in any other market. The current CHESS message suite has in excess of 500 prescribed messages aligned with key business functions. The key business functions supported by CHESS messages are represented in Graph 1. The top ten CHESS messages used as a percentage of total messages are set out in Graph 2.

**Graph 1 – Number of CHESS messages by business function**



**Graph 2 – Top ten most used CHESS messages**



While CHES messaging represented best practice when it was introduced and still provides communication efficiency and rich data content, its value has diminished over time with the globalisation of capital markets and as the demand for globally interoperable systems and processes has grown. CHES messaging has required bespoke and often comparatively costly implementation by participants operating in the Australian market.

In 2014, the Forum and Business Committee, advisory forums established under ASX's Code of Practice (CoP) for Cash Equities Clearing and Settlement, discussed the costs and benefits of CHES messaging and made a recommendation to the Boards of ASX Clear and ASX Settlement that ISO 20022 standard messaging be introduced with the replacement of CHES. In response to the recommendation from the Forum, the Boards of ASX Clear and ASX Settlement have committed to introduce ISO 20022 with the replacement of CHES.

### Why ISO 20022?

ISO 20022 is a globally interoperable data and messaging standard for the financial services industry. There has been a steady adoption of ISO 20022 in recent years. Market infrastructures have led the adoption of ISO 20022 messaging in many countries, with a growing depth and breadth of message definition and market practice. ISO 20022 has been adopted by TARGET2-Securities (T2S) in Europe, the Depository Trust Clearing Corporation (DTCC) in the United States, the JASDEQ Securities Exchange in Japan, the Singapore Exchange (SGX) and for the New Payments Platform (NPP) in Australia, which facilitates real-time payments between bank accounts. In 2014, ASX introduced ISO 20022 format messages for the notification of listed issuer corporate action events.

The key advantages of adopting ISO 20022 include its global interoperability, its messages are uniform and reusable, it is low cost to maintain after the initial investment, it enables a wider selection of software providers and tools, it provides for greater automation and straight-through-processing, and it provides a platform for greater innovation. ISO 20022 is not rigid and prescriptive in its design, and allows the use and reuse of messages and fields in different ways to support different business processes. The introduction of ISO 20022 would benefit participants and their suppliers by providing the opportunity to operate a standardised and centralised set of systems, servers and software, with centralised support and reporting.

### Transition to ISO 20022 message standards

ASX will provide ISO 20022 messaging in the replacement of CHES. ASX is assessing whether there is demand for CHES messaging to be supported for a period of time following the replacement of CHES. If both ISO 20022 and CHES messaging were initially supported, ASX could provide a translator service to enable both messaging formats to run in parallel.

Stakeholder feedback will be important in informing ASX's decision-making about the approach to migrating to ISO 20022 messaging, including the timeframes that may be required to transition to ISO 20022 as a mandatory standard. The transition period required will partly depend on the scope of any changes to current post-trade business processes that result from the introduction of ISO 20022. Greater insight on the scope of changes required will be obtained as the work to map CHES messaging to equivalent ISO 20022 messaging is progressed. This initial analysis is expected to be completed by the end of 2016.

### ISO 20022 message specification and network connectivity

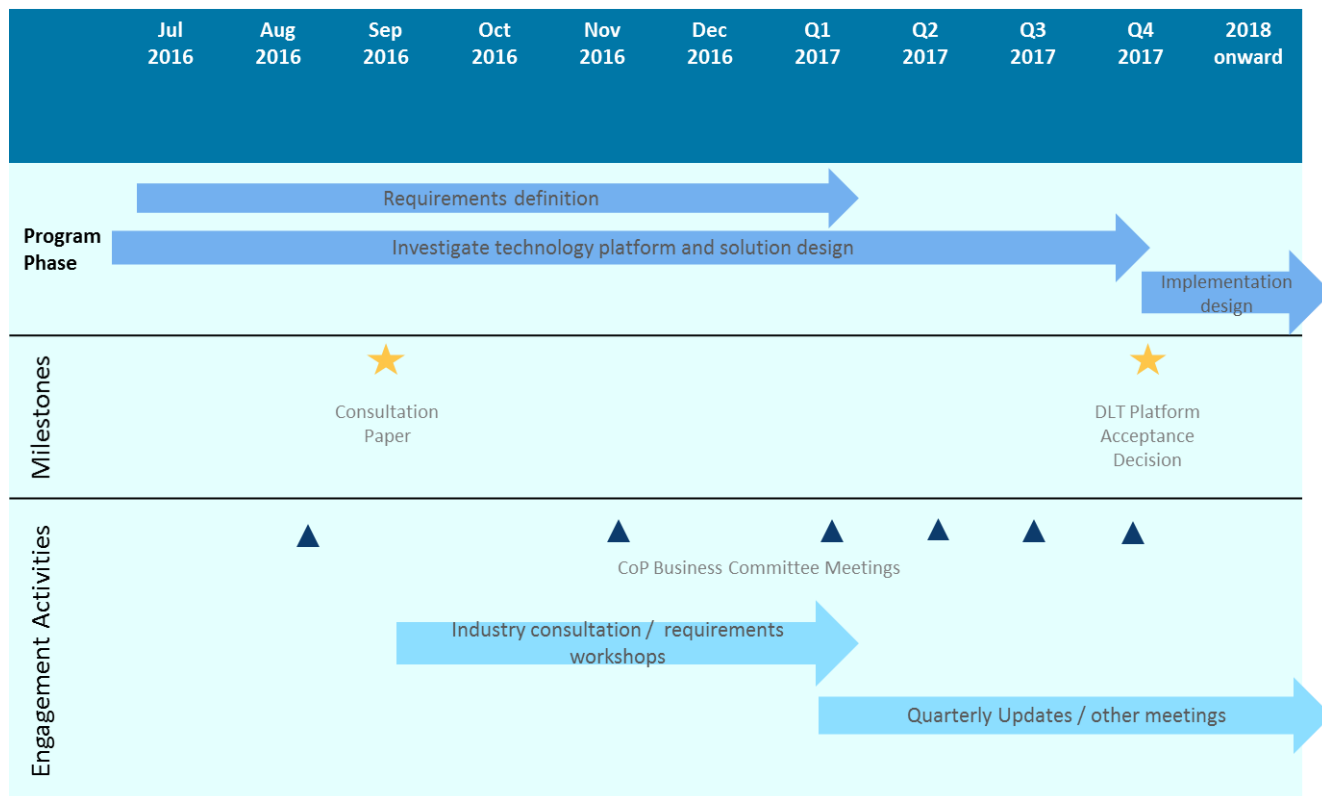
ASX has engaged SWIFT to assist with mapping the functionality, technical requirements and business processes of the suite of current CHES messages to the equivalent ISO 20022 messages during the requirements definition phase of the project. ASX will also engage with customers via existing securities market practice groups and CHES replacement working groups to share proposed message schemes.

Following the mapping process, an assessment will need to be made regarding the need and value of retaining each message and associated business process. While the full suite of CHESS messages may not require migrating to ISO 20022, it is likely that ASX will need to make submissions to the International Standards Organisation for change requests to existing ISO 20022 messages and/or seek approval for the introduction of new ISO 20022 messages to accommodate some of the technical requirements and business processes for the Australian market.

| Consultation questions                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q7. Would you expect the adoption of ISO 20022 messaging standards to provide a net benefit to your organisation? If so, how would you categorise the significance of the net benefit – small / medium / large? If possible, please provide a quantification of the expected costs and benefits of the implementation of ISO 20022 messaging standards. |
|                                                                                                                                                                                                                                                                                                                                                         |
| Q8. How important is it to your organisation that ASX continues to support CHESS messaging for a period of time to allow for your organisation's transition to ISO 20022 standards?                                                                                                                                                                     |
|                                                                                                                                                                                                                                                                                                                                                         |
| Q9. ASX currently supplies and supports two client-side CHESS messaging gateways – CHESS PC and CHESS Access. Are you a user of either of these services? If so, which gateway do you use?                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                                                         |
| Q10. If you are a user of CHESS PC or CHESS Access, would you be seeking continuation of this gateway service from ASX (for either CHESS or ISO 20022 message suites)?                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                                                                                                                         |
| Q11. Does your organisation have the capability to support and migrate to ISO 20022 messaging now? If yes, what business categories do you use? If your organisation does not currently have this capability, does it have plans to implement it in the near to medium term?                                                                            |
|                                                                                                                                                                                                                                                                                                                                                         |
| Q12. If ASX was to mandate the use of ISO 20022 securities messaging, how long would your organisation need to migrate to ISO 20022?                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                                                         |
| Q13. Do you have a preference about the approach to the implementation of ISO 20022 messaging - for example, a big bang approach or per business function or other?                                                                                                                                                                                     |
|                                                                                                                                                                                                                                                                                                                                                         |
| Q14. Does your organisation have a preference for the network used for ISO 20022 messages - for example, SWIFTNet, ASX Net or other?                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                                                         |

## CHES replacement roadmap

ASX will work with customers through distinct program phases to implement the new system to replace CHES. ASX's focus over the next 15 months is to define the requirements for the first phase of the replacement of CHES, and to investigate the feasibility of potential technical solutions for the replacement, including the use of DLT. ASX expects to make a decision on the technology solution in the fourth quarter of calendar year 2017. The timeline for the next 15 months is set out below.



### Stakeholder engagement process

ASX has commenced the requirements documentation phase of this project and a process of industry consultation to inform the definition of the requirements, including through a series of workshops with customers.

Stakeholder engagement forums and communication media will include:

- This public consultation paper
- Demonstrations of the CHES replacement software prototype in ASX's acceler8 space
- Business requirement workshops between ASX and CHES user organisations
- Technical Committee meetings between ASX and CHES user organisations
- Webinar industry updates
- Website ( [www.asx.com.au](http://www.asx.com.au) ), email and market notice updates, where necessary.

While ASX will keep customers and industry stakeholders updated throughout the project, there will be times where greater engagement will be important to ensure the new system is developed in a way that

meets the needs of the market and is implemented smoothly. ASX will notify customers when this is required.

### Technology solution

As part of the CHESS replacement project, ASX is evaluating the use of DLT.

DLT uses an append-only database of transactions that has two key elements: 1) a shared, replicated ledger and 2) a distributed database synchronising mechanism. Each transaction must reference a balance received from a previous transaction and must be cryptographically signed by the legal approver of the transaction. The solution forms an exact chain of title over time.

ASX will be implementing a DLT solution that is not open or public. This is because regulated markets require participants to be appropriately licensed and known to regulators - for there to be rights of reversal and error correction, and high levels of privacy and security; and for the operational benefits of net settlement to be retained in a system in which legal entities are responsible for the perfection of title to, and legal standing of, financial assets.

The replacement of CHESS with any DLT solution would be within ASX security perimeters on a private, permissioned, secure network where only known, licensed participants would be authorised to access the system, much like today. Private contractual information will be segregated and will *not* be shared with all participants, encrypted or otherwise. The shared and replicated aspect of the solution serves as a transaction notification and synchronisation mechanism and includes only hashes (one way cryptographic functions). This is very different to the open Internet-based, 'permissionless' blockchains such as Ethereum and Bitcoin.

**Table 1 – Public blockchain versus ASX private permissioned ledger**

| Public Blockchain                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ASX Private Permissioned Ledger                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Not applicable to highly regulated markets</b></p> <ul style="list-style-type: none"> <li>• Unregulated                             <ul style="list-style-type: none"> <li>– No restrictions on ability to join and transact</li> <li>– Users are anonymous or pseudonymous</li> <li>– Limited rules and regulatory oversight</li> </ul> </li> <li>• Operated on the public Internet                             <ul style="list-style-type: none"> <li>– Access gained through downloading software</li> <li>– Exchange and user security not subject to scrutiny</li> <li>– If compromised, holder can unilaterally transfer cryptocurrency anywhere in a public network</li> </ul> </li> <li>• Data integrity                             <ul style="list-style-type: none"> <li>– Access to cryptocurrency controlled by private keys</li> <li>– Underlying technology has inspired new applications tailored for financial markets</li> </ul> </li> </ul> | <p><b>Similar to today, but an enhanced database architecture</b></p> <ul style="list-style-type: none"> <li>• Highly regulated market                             <ul style="list-style-type: none"> <li>– Infrastructure providers with licences to operate</li> <li>– Rule book defines market operation</li> <li>– Participants identified and meet regulatory standards (e.g. KYC and AML)</li> </ul> </li> <li>• Operated on a system within a private network                             <ul style="list-style-type: none"> <li>– Technology controls retained</li> <li>– Securities exist digitally only within the ASX register</li> <li>– Cash remains within banking system</li> </ul> </li> <li>• Enhanced data integrity                             <ul style="list-style-type: none"> <li>– Equivalent or better security of data (cryptography)</li> <li>– Multiparty authentication and authorisation</li> <li>– Creates a secure single source of truth</li> <li>– Could provide significant benefits to the industry</li> </ul> </li> </ul> |

ASX's use of a DLT solution would be in conjunction with other 'traditional' technologies to ensure that the most appropriate technical solution is applied.

## Upgrades to the existing CHES platform

Typically, ASX undertakes CHES service releases twice a year - as agreed with customers and other stakeholders. In the lead up to the replacement of CHES, service releases for CHES will only be undertaken in very limited circumstances - for example, for regulatory or other mandatory purposes. This is to minimise costs for the market given the planned replacement of the existing system.



## Other requirements and considerations

The purpose of this consultation paper is to discuss the requirements for the replacement of CHESS, with a focus on the continued provision of the core post-trade services and the introduction of a limited suite of enhancements considered beneficial to the cash equities market.

The replacement of the technology and the associated review of services provide significant opportunities to build a system that will enable other enhancements and new services. ASX has had preliminary discussions with the Forum and Business Committee on the key design principles for the replacement of CHESS. The introduction of ISO 20022 standardised messaging, which will be provided as part of the replacement of CHESS, was one of the key system requirements discussed.

Consideration is also being given to providing the following system capabilities in a further phase of development after the delivery of the replacement system.

- The introduction of multi-currency capability, facilitating full trade life cycle processing of non-AUD denominated instruments.
- The introduction of multi-asset class capability. This would create the potential to consolidate Austraclear (ASX's platform providing depository, registration, cash transfer and settlement services for debt instrument securities) and the platform that replaces CHESS in the future. As a result, customers of both platforms would need to connect to one interface only.
- The centralised capture and storage of information that could be used for regulatory reporting purposes, such as Know-Your-Client (KYC) obligations. This could extend to other stores of information currently duplicated across the industry for regulatory reporting purposes, such as that required under the Anti-Money Laundering and Counter-Terrorism Financing Act (AML/CTF), the Foreign Account Tax Compliance Act (FATCA), and Common Reporting Standards (CRS).

### Consultation questions

Q15. Please provide your views on the potential enhancements and new services identified in this paper. Would these enhancements and new services be beneficial to your organisation?

Q16. Please outline any additional significant functional enhancements and new services that your organisation thinks should be considered.

Q17. Do you have any other comments on the matters discussed in this paper?

## This consultation

This consultation document seeks market feedback on the requirements for the replacement of CHESS by **28 October 2016**.

Submissions should be sent by email to:

regulatorypolicy@asx.com.au

or by post to:

Office of General Counsel

ASX Limited

20 Bridge Street

Sydney NSW 2000

Attention: Diane Lewis

Senior Manager, Regulatory and Public Policy

ASX prefers to receive submissions in electronic form.

Submissions that are not marked confidential will be made publicly available by ASX. If you would like your submission, or any part of it, to be treated as 'confidential', please indicate this clearly in your submission.

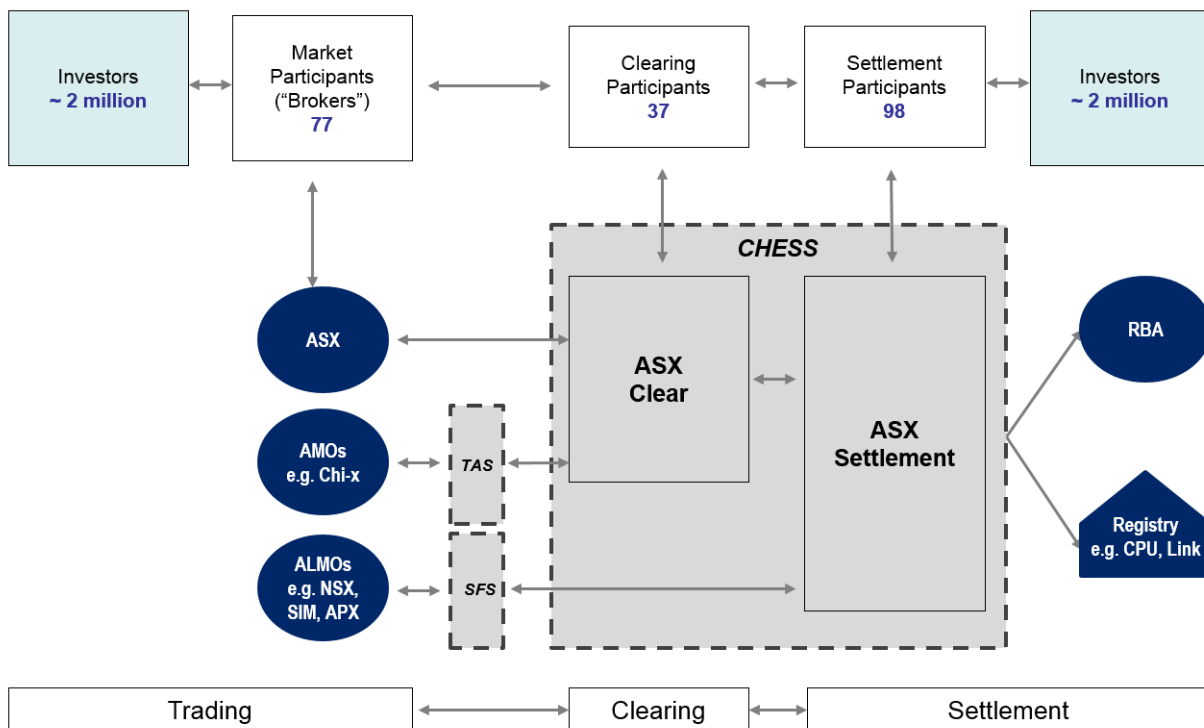
## Next steps

ASX will consider the feedback it receives in this consultation as part of its definition of requirements for the replacement of CHESS.

The consultation will form one part of a broader stakeholder engagement plan through the life of the project, from defining requirements through to implementation.

## Appendix A: Overview of ASX's Equity Post-Trade Services

The clearing and settlement of equities performs a critical role in the operation of Australia's financial markets, helping to reduce counterparty and systemic risk, and providing transaction efficiency and certainty for end investors. The following diagram demonstrates the core services provided by ASX Clear, ASX Settlement and the interaction with various market stakeholders<sup>1</sup>.



### Clearing

ASX Clear services are provided to clearing participants, who are typically brokers or clearing and custody service providers. ASX's clearing services reduce counterparty and systemic risk, and provide transaction efficiency and increased certainty for the protection of end investors. The clearing process is largely invisible, but the benefits are shared by all financial market users.

During the 2015-16 financial year, ASX Clear demonstrated an average netting performance of 99% on trade volume and 62% on trade value.

Trades executed on an Approved Market Operator (AMO<sup>2</sup>) are submitted to ASX Clear for registration. Once accepted by ASX Clear, by way of novation, each cash market trade between AMO participants is replaced with a cash market clearing central counterparty transaction between each clearing participant for that trade and ASX Clear. Novation does not take place for crossing trades and the participant receives optional notification of the trade for their information only.

On the evening of Trade Date ('T'), ASX Clear replaces all eligible novated settlements with one net settlement per settlement date, per participant, and per security.

<sup>1</sup> Statistics at 29 July 2016

<sup>2</sup> Approved AMOs that currently submit trades are ASX Limited and Chi-X Australia Pty Limited

Generally, where a stock is undergoing a corporate action event, the netting facility is turned off and the gross transaction is retained through to the settlement cycle. This enables ASX Settlement to apply high levels of automated buyer protection.

The resulting gross or net settlement lines are then subject to scheduled settlement by ASX Settlement.

## Settlement

Australian cash equity market securities transactions are settled on a trade date plus two business days (T+2) settlement discipline. Securities settled in CHESS include shares, warrants, units of listed trusts, units in exchange-traded funds (ETFs), managed fund units, CHESS Depository Interests (CDIs), unsecured notes, convertible notes, Australian Government Bonds (AGBs) and other interest rate securities. Under a T+2 settlement cycle, the seller has an obligation to deliver 'sold' securities on the second business day after the transaction, and the buyer has an obligation to pay for those securities on that same day.

Securities transactions settle on a net basis in a single daily batch cycle. Batch settlement starts at 11.30am each business day and generally completes at around 12.30pm. It involves locking securities scheduled for settlement and the determination of each participant's net funds and security delivery obligations, and the net funds obligations of all participants' banks. Funds settlement occurs across the Exchange Settlement Accounts of those payment providers in the RBA's Information and Transfer System (RITS). Once completed, this triggers the movement of securities from delivering to receiving settlement participants within CHESS. These multilateral payment netting arrangements, which are key to the settlement efficiency of the system, are approved and protected under the Payment Systems and Netting Act 1998.

To facilitate the settlement of delivering market transactions, participants ensure their settlement entrepot HIN has sufficient units to deliver to the settlement cycle and reduce the risk of failure. This function of priming for settlement occurs via multi-step procedures:

- transfer of units from CHESS Sponsored holdings
- convert of units from Issuer Sponsored holdings
- contra of offsetting transactions, and
- schedule of supporting bilateral transactions.

CHESS effects settlement of transactions by transferring the title or legal ownership of the securities while simultaneously facilitating the transfer of money for those securities between participants via their respective banks - i.e. Delivery versus Payment (DvP).

Investors can choose to have their holdings registered in one of two ways:

- on the CHESS Subregister, or
- on an Issuer Sponsored Subregister.

The two types of subregister provide alternate forms of registration for security holders and the securities they own. Every listed issuer manages its own Issuer Sponsored Subregister for the registration of securities in their company alone. This form of registration is also referred to as being 'Issuer Sponsored', and the Issuer Sponsored Subregister is typically managed by a share registry.

Alternatively, securities in any listed issuer can be registered on the CHESS Subregister. This form of registration is held within the CHESS system and allows brokers to manage their sponsored clients' security holdings, while the client retains legal title to those security holdings. This form of registration is also referred to as being 'Broker Sponsored'. CHESS facilitates communication between participants and share registries to maintain and update holder information on the CHESS Subregister. Ninety-five per cent of all listed security holdings (by value) were held on the CHESS Subregister as at 31 July 2016.

CHESS also facilitates:

- The provision of monthly CHESS Holding Statements to holders to notify any changes to holdings on the CHESS Subregister.
- Support for corporate action events by providing (as needed) establishment of a CHESS Subregister, suspension of processing on a CHESS Subregister for a reconstruction, cum entitlement daily balances, and adjustments and accruals for dividends, rights issues or other corporate action benefits owed or owing (diary adjustments). Diary adjustments provide corporate action protection by placing an unregistered buyer in the same position, or as close as possible, to a registered holder in the event of non-delivery of financial products by a seller.
- Settlement of managed funds via the mFund Settlement Service, which enables investors to subscribe for and redeem units in selected unlisted managed funds directly with the mFund issuer via a stockbroker or advisory services used to transact shares or other products.
- Clearing and settlement access for AMOs to register their trades via the Trade Acceptance Service (TAS) or transfer title of their own listed products via the Settlement Facilitation Service.

### **Connectivity**

CHESS uses CHESS messaging for connectivity between ASX and its customers. Both the message format and the protocol used to securely deliver them are proprietary to ASX. CHESS messaging is currently available over a range of connectivity options including ASX Net, the Internet and others.