

**Energy Market Information Technology  
Strategic Plan  
March 2011**

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# EM Information Technology Strategic Plan

## 1.1 List of Abbreviations

ACCC	Australian Consumer Competition Council
AEM	Australian Energy Market
AEMC	Australian Energy Markets Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AMI	Automated Metering Infrastructure
BLAST	Balancing Load Allocation Settlements Team (S.A.)
BRIC	Business Rules Industry Committee
DI	Data Interchange
ERAA	Electricity Retailers Association of Australia
ENA	Energy Networks of Australia
EM ITSC	Energy Market Information Technology Steering Committee
ESAA	Energy Supply Association of Australia
ESCOSA	Essential Services Commission of South Australia
ETNOF	Electricity Transmission Network Owners Forum
EUAA	Energy Users Association of Australia
FRC	Full Retail Competition
GIP	Gas Interface Protocol
GMCC	Gas Market Consultative Committee
GMCo	Gas Market Company
IEC	Information Exchange Committee
IMO	Independent Market Operator
ITDF	Information Technology Development Forum
ITSC	EM IT Steering Committee
MCE	Ministerial Council on Energy
MMS	Market Management Systems
MSATS	Market Settlement and Transfer Solution
MSRG	Market Systems Reference Group
NEO	National Energy Objective
NEL	National Electricity Law
NEM	National Electricity Market
NER	National Electricity Rules
NEMMCO	National Electricity Market Management Company Limited
NGF	National Generators Forum
NGL	National Gas Law
NGR	National Gas Rules
PAC	Participant Advisory Committee
REMC <sub>o</sub>	Retail Energy Market Company (SA and WA)
REMC	Retail Market Executive Committee
RMCC	Retail Market Consultative Committee
SaaS	Software as a Service
SOA	Service Oriented Architecture
STTM	Short Term Trading Market
TNSP	Transmission Network Service Provider
TWG	Transaction Working Group

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VENCorp	Victorian Energy Networks Corporation (VIC)
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## 2 Executive Summary

The EM IT Steering Committee (previously known as the NEM IT Steering Committee) initially came into existence in mid 2007, following industry support for the need for a body to guide IT directions and investments across the EM, covering both NEMMCO and participant-related (non competitive) EM Systems. With the subsequent decision to establish AEMO, subsuming the functions of the existing electricity and gas market operators the name and scope of the Steering Committee has been amended to reflect a broader national *energy* market focus, encompassing the electricity and gas markets.

The major initial focus of the Steering Committee has been to establish an EM IT Strategy which outlines a 10 year vision and 5 year rolling plan for IT systems supporting the Australian energy market. This market covers both gas and electricity, but currently excludes WA and NT jurisdictions. This strategy covers IT systems and services associated with operation and support of wholesale and retail markets in the electricity and gas industries. A roadmap is established for the delivery of a core set of strategic initiatives, and their periodic review.

The current environment is best summarised as one experiencing significant change from both the industry and technology perspective. The current state of the industry is also characterised by the use of different technology and management strategies, which have been implemented in different segments of the industry and are at different levels of maturity and points in the investment cycle.

A number of drivers have been identified that impact the strategy, covering supply constraints, customer demand, climate change, governance, market structure, regulatory change, technology innovations and government policy.

Industry CIO Forums have also identified opportunities to improve the definition of EM - related IT processes and the management of the data that is needed for these processes.

Following the CIO consultation, the environmental scan and SWOT analysis outlined in this Strategy, four areas of initial focus have been established to address the above drivers:

### **Common Architectural Reference Models**

Appropriate technical architectures and standards will be developed and shared which will support consistent and compatible solution designs for common components and where interoperability is required, based on a library of reusable architecture assets.

### **Data Management**

A data management and governance initiative will help drive improvements in data quality, addressing a common problem of varying standards amongst participants and costly re-work. Better data interchange and access mechanisms will also support process improvements. Shared data repositories will be established to reduce the impact of future data volumes and network load and the need for all to create infrastructure to store the same information.

## **Identity and Security Management**

This initiative will support a unified approach to secured information exchange, covering data access, usage and manipulation, and the management of industry contacts, roles and Industry authorisations. A common approach for identity technology will be promoted, supporting new market roles, and requirements arising from finer SCADA and interval metering data. This will also address new challenges in data privacy, integrity and security arising from National Critical Infrastructure IT requirements.

## **Knowledge and Experience Sharing**

Technology-assisted knowledge and experience sharing mechanisms will be established to reduce the duplication of effort and increase opportunities to learn from the previous experiences of others.

In addition to the above four initiatives, the EM ITSC will monitor and assist the implementation of current technical initiatives underway for improved participant data access and sharing.

It is expected that industry bodies and market operators will support the implementation of the strategy by incorporating major elements in their own work programs, and participating in workgroups to progress initiatives.

The current governance structure for the development and implementation of the IT strategy is a federation model with representatives from industry groups (ERAA, ENA, and NGF) and the market operator (AEMO).

## **3 Industry Context**

This strategy covers IT systems and services associated with operation and support of wholesale and retail markets in the electricity and gas industries, requiring interfaces between industry participants and the market operator (AEMO). The gas and electricity markets covered by this document are referred to as the Energy Market (EM).

“Industry participants” means all parties in the gas and electricity industry (including consumers) requiring interfaces with the market operators’ IT systems.

### **3.1 Background**

Historically IT services and their implementation in the Energy Industry has been segmented within industries.

#### **3.1.1 Electricity Market**

Information Systems and technology have always been a key aspect to the market. In the case of electricity markets, at NEM market start in 1998, a number of difficulties in deploying information systems led to a strong desire to create an oversight committee that would assist NEMMCO to deploy market wide solutions for the betterment of the industry. When implementation delays in the Frequency Control Ancillary Services markets and 5 minute Pre-dispatch projects occurred in the years after market start, the NGF worked with NEMMCO to form the Market Systems Reference Group (MSRG) in late 2003.

Adopting a cross industry representation and reference network for NEMMCO, the MSRG provided a forum for the informed discussion and collaborative development of industry wide strategies, standards, planning of future direction and the implementation of NEM Wholesale Market Systems enhancements.

The MSRG focused on identifying current and emerging issues within the NEM wholesale market systems, industry wide strategies to address identified issues and technical standards and frameworks for industry wide IT systems.

The MSRG was not a decision making body with NEMMCO maintaining accountability for decisions in accordance with the NER following due consultation and process, nor did the MSRG meetings replace formal consultation with participants. NEMMCO used the input from reference group members in developing proposals for wider relevant consultation with all participants.

Following the successful scoping and requirements establishment associated with the Data Interchange Project, the MSRG moved into a holding state in late 2006 as the Data Interchange Working Group implemented the DI project outcomes.

Post a CIO Forum in July 2006, Industry CIOs and Industry bodies endorsed the need for a NEM IT Strategy to facilitate IT directions, and provide a roadmap of change which would guide Industry IT investments.

### **3.1.2 Gas Markets**

The gas markets operating in Victoria, Queensland, SA, WA and NSW developed to an extent in isolation from each other. Each market had a market operator responsible for the development and implementation of market systems and rules for interacting within each of the markets. The initial market developments occurred largely concurrently in NSW and Victoria with SA, WA and Queensland markets being developed at a later stage and each leveraging off different aspects of both the pre-existing Victorian and NSW arrangements. Industry consultation and IT developments in each of these markets therefore focused on the jurisdictional nature of each. The centralised market operator systems in SA, WA and NSW used a model of outsourced service provision based on similar market designs and these systems are both now managed by the same service provider. The Victorian and Queensland wholesale markets use systems designed and operated by VENCORP and are specific to each of these jurisdictions. The retail market arrangements developed in Victoria was used as the model for common interactions between retailers and network operators in WA, SA and Queensland. These interactions are defined in a set of technical standards known as the Gas Interface Protocol (GIP) and are largely the same across the four jurisdictions. A jurisdictional specific implementation has been used for the retail market interactions in NSW.

IT issue resolution /co-ordination in the gas markets was initially managed by separate bodies in each jurisdiction; the ITDF for Victoria, the TWG for SA and WA and the BRIC for the NSW jurisdiction. In July 2007 VENCORP assumed the commercial delivery of market support services to the SA and WA markets. As a consequence, VENCORP negotiated the concurrent operation of the ITDF and TWG with the aim of covering the Vic, SA, Queensland and WA market IT issues. With the advent of AEMO the NSW IT issues will also be managed under the one umbrella.

In terms of IT governance in each of the gas markets, the issues resolved in the ITDF/TWG that need endorsement/approval at a Rule or industry co-ordinated implementation level are progressed in Victoria through the GMCC/RMCC industry consultative committees and endorsed by the VENCORP Board. In some cases these changes are also progressed through a regulatory approval process managed by the Essential Services Commission of Victoria. In SA and WA the process for approvals is managed via The BLAST/RCC industry consultative committees and again in some cases approved by ESCOSA for SA and the Ministry of Energy in WA. In Queensland Changes are endorsed by the QGIAC committee and in some cases approval is sought from the Queensland Regulator (QCA). A similar process is used in NSW and is managed by the BRIC Committee.

### **3.1.3 EM IT Steering Committee**

The EM IT Steering Committee came into existence in mid 2007 following the recognition that the industry supported the need for an IT body to guide IT directions and investments across the EM covering participant to participant and/or participant to market related (non competitive) EM Systems. The major initial focus of the steering committee was to establish an EM IT Strategy.

## **3.2 Purpose**

The purpose of the IT strategy is to develop a 10 year vision with a 5 year rolling plan for IT systems supporting the national energy markets (gas and electricity) and a roadmap for its periodic review and delivery. This vision needs to strike the right balance between rigidity in order to be actionable and flexibility to ensure technological innovation and industry changes can be embraced. The overarching requirement is that the IT strategy should support the achievement of the National Electricity and National Gas objectives.

The National Electricity and National Gas objectives as stated in the National Electricity Law and National Gas Law respectively are to promote efficient investment in, and efficient operation and use of, electricity/gas services for the long-term interests of consumers with respect to—

- price, quality, safety, reliability, and security of supply of electricity/gas; and in the case of electricity
- the reliability, safety and security of the national electricity system.

Information systems and technology are essential to the functioning of the energy markets. The purpose of the IT strategy is to foster efficient investment of technology to support the National Electricity and Gas Rules objectives, in particular, by seeking to optimise overall industry costs, increase security and flexibility, and reduce barriers to entry. The strategy needs to have a high degree of buy-in from participants, and the market operator. This is achieved through a governance process described in section 6 of this document.

## **3.3 Mission**

Support energy markets by developing and maintaining a framework for targeted long-term systems investment.

## **3.4 Vision**

IT investment in the EM is undertaken in a coherent, timely and unified manner for the benefit of the industry as a whole.

## 3.5 Current Environment

The current environment as examined from both industry and technology perspectives on a national basis, is experiencing significant change. The current state of the industry is also characterised by the use of different technology and management strategies, which have been implemented in different segments of the industry and are at different levels of maturity and depreciated value. This section explores the current environment and draws some conclusions as to the implications. It is also important to assess the maturity of the current environment versus what maturity is desired to understand the quantum of change the IT Strategy must support.

As part of reviewing the environment the national energy market needs to be viewed through a number of lenses to understand what influences there are on an appropriate strategic technology response.

Those lenses are illustrated in Figure 1 and are:

### Supply Constraints:

- The constraints the market place has in delivering safe reliable energy to consumers

### Customer Demand:

- The ever increasing demand for energy and the information relating to its use in powering today's society

### Climate Change:

- The impact of society responding to this challenge is shaping customer behaviour and forcing political focus on 'cleaner' generation technologies and interest in demand side response mechanisms

### Governance:

- Pressure on markets to become more efficient and effective driving market reforms such as deregulation of the market place both locally and internationally.

### Market Responses:

- The splitting and selling of government and privately owned organisations has resulted in significant merger and acquisition activity in the energy industry in Australia and foreign ownership occurring. This has also generated new business models emerging as private companies determine the optimal structure to deliver profits within a highly regulated industry
- The potential formation of a National Emissions Trading scheme that will introduce new requirements into the Market that may have an IT implication.

### Regulatory Responses:

- Jurisdictional regulators are merging into a central regulatory body for market consistency, whilst at the same time altering their approach to regulation with the advent of different business models.

### Knowledge Management

- The ageing of workforces and the loss of knowledge

### Technological Innovations:

# EM Information Technology Strategic Plan

- The development of technologies including,
  - global pursuit of smart metering/smart grid, embedded, renewable and clean energy technologies and
  - other significant trends in the IT industry technologies such as wireless, services oriented architecture (SOA), the use of internet, and software as a service (SaaS) all are notable innovations needing to be considered

## Government Policies:

- The nature of and the extent that technology is available, such that technological innovation can be implemented across the customer base (particularly in rural areas).

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Figure 1 – Influences on IT Strategy

## Supply Constraints

- Changing roles of primary fuel sources

- Long lead times, higher risk in investing in busload generating capacity
- Hydro constrained by drought
- Increased use of gas for electricity generation

- Electricity v gas transmission
- LNG exports/greater competition increasing fuel prices
- Ageing infrastructure

## Knowledge Management:

- \* Ageing workforce
- \* Skills shortages

## Regulatory Responses

- Regulatory Policy e.g. AMI, drought relief, security & privacy, etc.
- Structure Consolidation/harmonization

## Climate Change

- Emissions trading
- Renewables

## Deregulation

### Changes in Governance Models

## Global competition in Energy & Utilities Markets

## Customer Demands

- Increasing demand
  - e.g. air conditioners
- Customer sophistication
  - On-line
  - Access to information

- Driving churn

- Demand management solutions
- Home area networks

- Customer insight
- New products

## Technology Innovations

- Mobile technologies (WiFi)
- Intelligent Grid
- SMART Meters
- Communications convergence
- RFID
- Outsource services, SaaS

## Market Responses

- Structural (M&A)
- New Business Models

## National Energy Market

Figure 1 depicts the environment, yet doesn't address the state of the information technology being used to operate in National Energy markets. This environment has resulted in fairly intensive time-focussed change which, with the absence of an agreed strategy moving forward, has resulted in point solutions to respond to immediate requirements and issues without reference to any future planning framework. Investment decisions, by virtue of the structure of the markets, have often been made individually by market operators and participants and consequently are driven by different objectives and constraints. The resultant is disparate solutions to provide the same functionality for the various participants and sectors, coupled with systems designed with different criteria for longevity, flexibility or scalability as key drivers.

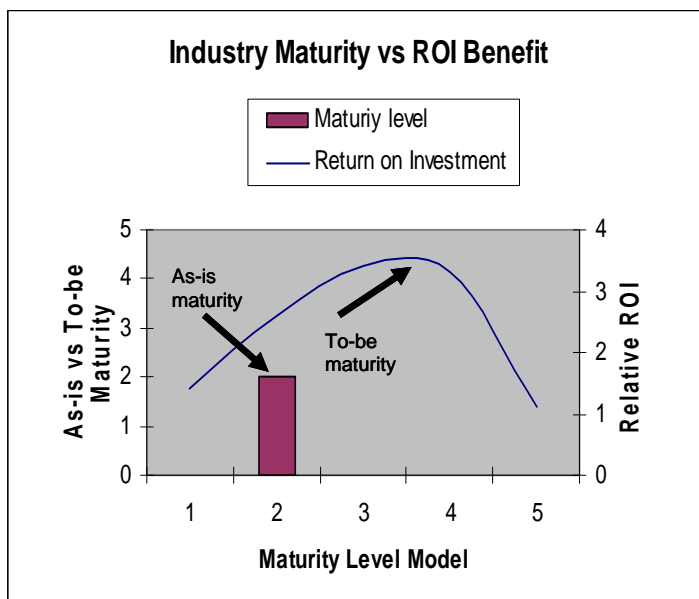
There is a strong externality (policy initiatives by the government) that impacts the establishment of IT solutions e.g. introduction of smart metering, gas bulletin board and FRC. This external influence drives a requirement to implement a significant market reform which may occur at shorter than desired timeframes thereby requiring an adaptable collaborative environment.

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Recent industry CIO Forums have identified opportunities to improve the definition of processes and the management of data that is needed for these processes. Whilst deficiencies are widely understood and agreed there are uncoordinated approaches to resolving this across the market both between the wholesale and retail markets in each commodity and even within those domains. Looking at the market from a classical IT capability maturity model perspective it could be argued that segments of the energy markets are only at level 2 maturity out of a possible level 5. Consequently the systems will reflect that maturity.

Gartner and other IT industry analysts point out that the highest level of maturity is rarely achieved or aimed for because of the tradeoffs that occur between cost efficiency and effectiveness. In achieving a balance, a desired level would be at minimum 3 and arguably 4 based on cost versus benefit, as depicted in Figure 2 below.

Figure 2 – Industry Maturity vs. ROI benefit



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## 3.5.1 SWOT

All of the above factors mentioned in the Current environment section can best be summarised in a classical SWOT analysis outlined in the table below.

Strengths	Opportunities
<ul style="list-style-type: none"> <li>• Current systems generally deliver reliable, secure and fit for purpose market and operational systems to stakeholders</li> <li>• Current markets in operation for some time so significant 'collateral' to leverage is available</li> <li>• Agreement to view energy market as a national market and pursue standards to drive efficiencies</li> <li>• With the formation of AEMO, one organisation responsible for the provision of centralised gas and electricity Market IT Systems and processes.</li> <li>• Some consistent IT standards exist across all markets (e.g. aseXML)</li> <li>• GIP provides governance structure to ensure common standards used in gas segment.</li> </ul>	<ul style="list-style-type: none"> <li>• Utilise emerging technology to optimise market operations and participation.</li> <li>• Enable new services to be offered in the market</li> <li>• Significant market changes provide the catalyst for a national approach for technological investment.</li> <li>• To provide leadership to influence technology development to suit the needs of the Australian energy market.</li> <li>• To establish non competitive infrastructure whereby participants are able to share knowledge and experience to provide benefit to all by making the market more efficient</li> <li>• Provide common frameworks for reducing inconsistencies and improving efficiencies (e.g. shared data, ownerships and accountabilities) as well as reducing the duplication of industry efforts.</li> <li>• Government pursuing market reform (e.g. merging of Gas and Electricity market operations) and centralising market operation and regulation</li> <li>• The formation of a common governance structure (i.e. AEMO) enhances the ability to deliver on synergies arising from a common framework.</li> <li>• The gas STTM provides a "point of change" in gas to enable improved common infrastructure.</li> </ul>
Weaknesses	Threats
<ul style="list-style-type: none"> <li>• No true national market – still some different processes and rules dependent on jurisdiction</li> <li>• No strategy/framework in place guiding IT investment as an industry leading to divergent and fragmented solutions</li> <li>• Lack of coordination between all Industry working groups and no overarching direction to guide those</li> </ul>	<ul style="list-style-type: none"> <li>• Time pressures drive investment (e.g. FRC) due to significant change events such as AMI and establishment of AEMO reducing opportunity to implement the IT Strategy.</li> <li>• The EM IT Industry Governance framework does not provide any mandating mechanisms to force the adoption of the strategy.</li> </ul>

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<p>working groups</p> <ul style="list-style-type: none"><li>• Differing approach to governance within and across the energy industry</li><li>• Industry knowledge is mainly resident in individuals not as accessible information that can be leveraged</li><li>• Segmented development and limited interoperability between a range of IT systems</li></ul>	<ul style="list-style-type: none"><li>• Continued Merger and Acquisition and vertical integration may reduce the desire for co-operation around these initiatives.</li><li>• Competition (between the operational and the Strategic EM requirements) preventing available resources to develop the required frameworks and drive initiatives.</li><li>• National Security requirements for protection of Energy Infrastructure may impact investment options</li><li>• Misconception that the development of an EM IT strategy will deliver a lower cost solution rather than improved ROI</li></ul>
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## 3.6 Implications

The implication of the above assessment can be summarised into some key issues that need addressing.

**Governance:** A lack of National Energy Market IT governance driving IT investment for both the market operators and participants; this deficiency includes both WHAT is invested in, and HOW it is built and funded

**Rate of Change:** The rate of change necessitates a more disciplined and structured approach to identification and implementation of IT to support market requirements in order to reduce time and cost

**Technology Innovations:** The introduction of new technologies can result in new paradigms for the delivery of business objectives.

**Evolving Market Dynamics:** Initiatives such as AMI are opening up the potential for new services to be provided to the consumer. Participants need to define and adopt good IT industry practice to respond to these significant challenges to ensure their full potential is realised.

The gas STTM introduces a new common set of IT infrastructures to be integrated with existing FRC systems in gas and potentially with FRC in the Australian Energy Market.

**Knowledge Shortage:** Intellectual property needs to be shared rather than being invested in individuals.

## 3.7 Timeframe

The Information Technology Strategy maintains a 10 year vision with a rolling 5 year strategy and is used to guide an ongoing / rolling activity program towards the delivery of the strategic objectives.

The initial timeframes need to be cognisant of the different status of depreciation of current systems and infrastructure as a guide to significant change opportunity points in time.

## 4 Principles

In supporting the EM Objectives - new Information Systems should:

- Enable competition, open access and allow for new entrants in the long term interest of consumers.
- Ensure customer and participant privacy is maintained (fundamental / legal / compliance).
- Ensure cost effectiveness throughout the market through efficient information systems to the benefit of consumers and suppliers.
- Ensure valid and timely information to ensure the safe, reliable delivery of energy to consumers in a way that promotes efficient investment at all levels of the supply chain.
- Focus on non-competitive areas.

## 5 Strategic Response

Industry CIOs and Industry bodies have endorsed the need to respond as a combined market (as compared to individual participants) to the need for an EM IT Strategy. The following has been progressed:

- The NEM IT Steering Committee was formed (nucleus of the MSRSG)
- The NEM IT Steering Committee Terms of Reference (including governance) was developed and approved by NEMMCO and Industry Bodies (NGF, ERAA, ENA, RMEC/IEC). The NEM IT Steering Committee Membership was revalidated by NEMMCO and the Industry bodies in line with the approved Terms of Reference.
- NEM IT Steering committee workshop held to identify areas of strategy focus nominated by industry bodies.
- CIO Forum held late 2007 to gain support / prioritisation on the identified areas for strategic focus.
- The prioritised areas have become areas of focus in this strategy and are discussed in detail in section 7.
- The NEM ITSC was restructured to EM ITSC to include Gas given the pending establishment of AEMO.

There are common processes that are not unique to any participant and thus can be addressed collectively to determine the optimum activities, information flow and responsibilities to the benefit of all. However it is noted that there is a significant hurdle in the absence of a holistic, agreed, process model covering the market operations in order to easily identify candidate processes. It is also acknowledged that this absence also exacerbates the skills shortage in the industry as new entrants have to learn on the job rather than having any reference model to put the market into perspective.

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Having a common view of the processes is only one part of the puzzle in order to be effective in determining the optimal investment in IT. Processes consume data and turn that into information and therefore it is equally important to ensure we understand what information is needed to operate the market, and to define that so a common language is available for all to use.

This approach generates a drive towards standards which can also be driven down into the technology layer to provide standards around data definitions, standards pertaining to communication protocols and also standards regarding who is permitted to access and use that information. The last aspect around ensuring appropriate identification and authorisation will be increasingly vital as the volume of data increases and the complexity of services starts to hit the industry as we drive towards a common energy market and pursue initiatives to provide consumers more information to make choices in their supply and use of energy.

Addressing IT investment as a market necessitates governing that investment as a market, and ensuring appropriate governance is implemented. It is considered that the current governance in place does not support a holistic market driven approach that supports the other aspects outlined above.

Lastly it is important to address the skills deficiency in the market. The use of frameworks and standards can go part way to resolving this but the most effective mechanism is to enable sharing of knowledge and enabling collaboration amongst the participants. In this way skills can be leveraged across the market as a whole to the benefit of all.

Therefore the outcome of the steering committee workshop and the CIO forum determined that the strategic initiatives that should be pursued are:

- Developing and evolving an **Architecture Framework** which provides for reference models for process, information, technology and solutions.
- Addressing **Data Management** as an industry and it is considered that current work conducted by NEMMCO in this area should be supported and expanded to the wholesale market.
- Addressing **Identity and Access Management** to better define how to identify participants and other actors in the market and ensure that appropriate authorisation occurs to protect the privacy and confidentiality of data
- Establishing a **Knowledge Sharing and Collaboration** mechanism for the market
- Reviewing and determining appropriate **Governance** models to support all of the above initiatives

## 6 Governance of the Strategy

An annual status report of the EM IT Strategy will be provided to Industry Bodies to:

- Report on development and implementation of the Strategy
- Advise on any changes to the existing strategy
- Consult on the future focus of the strategic program

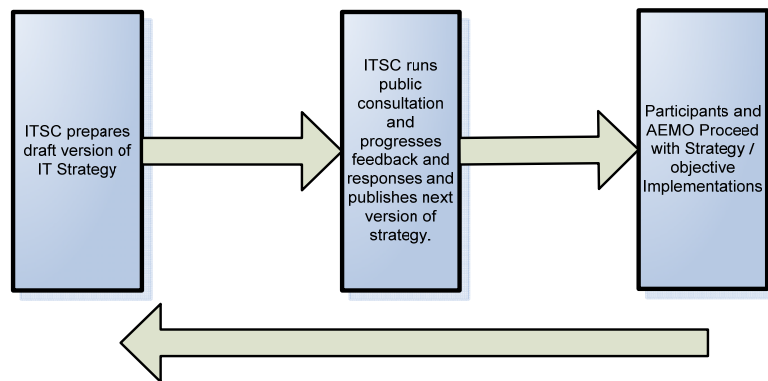
### 6.1 Governance / Approval Process

Addressing IT investment across the national energy market necessitates appropriate governance. Figure 3 provides an illustration of the governance structure with the EM IT Steering Committee positioned as an advisory group to the EM. The EM ITSC will be responsible for running public consultation on the proposed strategies prior to forwarding to the Industry Bodies for input into decision making mechanisms of the various industry forums.

Figure 3 – Governance Structure

ITSC prepares draft version of IT Strategy

Figure 4: Approval Process



### 6.2 Review Process

Yearly reviews of the EM IT Strategy are to be conducted by the EMITSC and where appropriate amendments or further advice is to be provisioned by the EMITSC.

EM IT Steering Committee members, with input from their constituents, are to provide formal feedback on progress/ objections/ issues at the half yearly reviews.

Outcomes of the reviews will be included in the Strategy and reported back to industry via the half yearly review process.

## 6.3 Implementation Process

The EM IT Strategic Plan, Implementation Roadmap and supporting material will be distributed to the Market Operator and Industry bodies for dissemination to their participant representatives.

It is expected that Industry Bodies will support the implementation of the strategy by:

- Encouraging major elements of the strategy to be implemented in their own participant work programs.
- Encouraging participation and resources (and funding where required) in workgroups and other forums to progress initiatives.

It is expected that the market operator will support the strategy by:

- Developing central systems in alignment with the strategy
- Justifying any central changes that do not support the strategy.

## 6.4 Measurement Process

The true measurement of the effectiveness of this Strategy will emerge over the longer period. With this in mind, indicators of progress will be measured through CIO and other stakeholder engagements and feedback as to their use / implementation of the strategy, the half yearly review process, and the adoption of the strategy by the market operators.

### 6.4.1 EM IT Strategy

An annual forum for Industry CIOs will be held to provide update/progress on EM IT Strategy directions.

Attendees at the forum will be requested to provide feedback to enable the EM ITSC to ascertain Industry support for the content and implementation / execution of the EM IT Strategy and industry alignment with the EM IT Strategy.

Existing forums and interest groups will be encouraged to participate in the initiatives/working groups and provide feedback on the strategies and their implementation.

An annual summary of progress against strategy and proposed changes will be made available to the industry.

### 6.4.2 Steering Committee

The Terms of Reference and performance of the Steering Committee will be formally tabled annually by the Steering Committee with relevant industry bodies to ascertain the Steering Committee's effectiveness and the need to continue.

## 6.5 Funding and Resourcing

In order to progress EM IT Initiatives:

- Initiatives that align with existing Market Operator responsibilities / work will be handled as normal.
- Initiatives to be funded by EM Participant fees will need to follow the Market Operators change and funding approval processes. The industry will be expected to provide advice to AEMO.

- Other initiatives will either be handled on a "fee for service" basis or be approved by industry to be collected as fees. The Market Operator's board must approve initiatives where the Market Operator is nominated to progress initiatives.

## 7 Initial Strategic Focus Areas

As a result of the input from the CIO forums, environmental scan and SWOT analysis outlined in section 3.5.1 above, five key impacts on IT have been identified, and four areas of focus have been established to address the impacts. These are summarised in figure 5 below.

Figure 5 –EM IT – Focus Areas & Impact

Impacts Focus Area	Governance	Rate of Change	Evolving Market Dynamics	Need to Innovate	Knowledge Shortage
Architectural Reference Model	✓	✓	✓	✓	✓
Data Management	✓	✓	✓	✓	✓
Identity/Access Management	✓	✓	✓		
Knowledge Sharing	✓	✓	✓	✓	✓

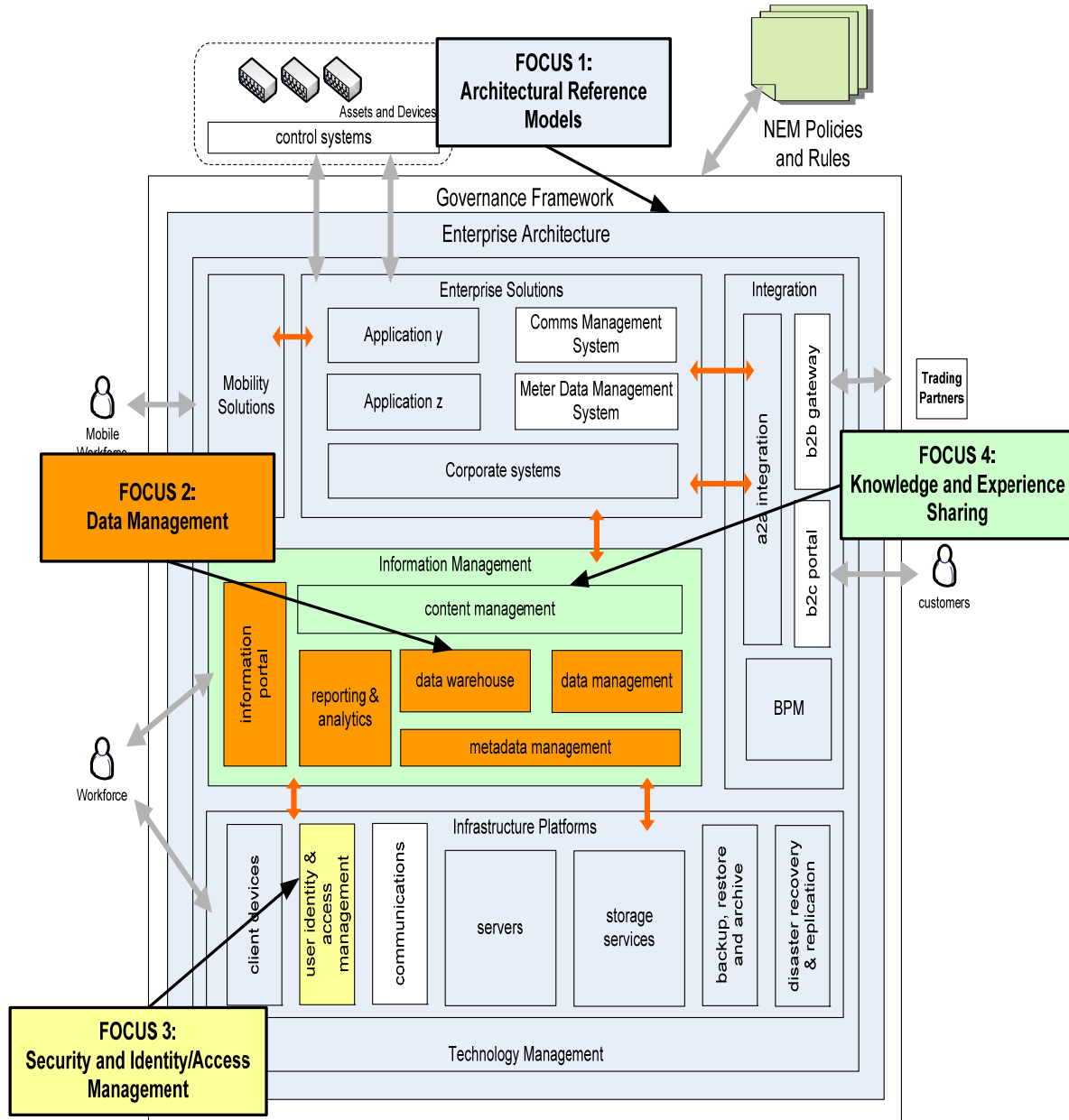
Figure 5 outlines where these focus areas fit into a broad framework, the development of which is a focus point in itself. The remainder of section 7 looks at each of these focus areas and outlines for each of them the:

- Objective;
- Imperative;
- Principles;
- Approach;
- Near and long terms activities, and
- Definition of success.

The relationships between these focus areas are shown in figure 6, over.

# EM Information Technology Strategic Plan

Figure 6 – EM IT – Initial Strategic Focus Areas



## 7.1 EM Architectural Reference Models

### 7.1.1 Objective

The objective for the EM Architectural Reference Model initiative is to maximise return on investment (ROI) and reduce risk through the application of appropriate technical architectures and standards which will achieve:

- Consistent and compatible solution designs for common components and where interoperability is required;
- Reduced time and effort associated with analysing and understanding of EM information processes by providing a library of reusable architecture assets;
- Identification of areas of common interest where collaboration will lead to improved outcomes, lower cost and lower risk for all participants and the industry as a whole.

### 7.1.2 Imperative

The industry environment is dynamic and complex. The industry lacks agreed viewpoints on the information management frameworks that are collectively supported.

Efficiently dealing with the issues requires a common view of the EM and a common set of representations (models). Such models will assist understanding the issues, facilitate collaborative initiatives and support future planning. Without such a common framework there is a risk of wasting significant time and energy as a result of misunderstandings due to the lack of a common shared point of view of the EM IT environment

### 7.1.3 Principle

Principles supported by the framework:

- Takes into account multiple industry viewpoints
- Technology-neutral framework
- Shared information and data models
- Support interoperability
- Service and component-based
- Supports interaction between stakeholders
- Open standards based
- Supported by a repository driven toolset.

### 7.1.4 Approach

- Establish a governance framework to oversee the development.
- Establish a reference group from the industry to collaborate on the development of the artefacts/models.
- Establish the process and tools required to support the objective.
- Agree priorities and roadmap and commence the journey.
- Publish the outcomes to the intended audience.

### 7.1.5 Near Term

- Establish/agree on a governance process to manage the EM reference architecture.

- Find an appropriate opportunity area (e.g. Data Interchange requirements) to provide a tangible focus for the activity.
- Establish a working group or collaborate with existing working groups (maybe an existing working group with an architectural focus)
- Agree on the principles, policies and standards to be adhered to, these will provide the necessary contextual framework for the reference architecture.
- Agree on any tools to be employed to facilitate the process (e.g. architecture tools).
- Collect and review existing available models and artefacts (aseXML, EM process maps, and systems architecture diagrams) that are already available and could be used as a starting point.
- Develop initial framework (reference models) focussing first on the data and process models. The framework binds together the agreed principles, policies and standards to deliver an actionable vision for the intended future state, this then provides the basis for the change roadmap required to achieve that end state.

## **7.1.6 Long Term**

- Set up an EM architecture reference group for continued collaboration. This could potentially involve industry participants, technology suppliers and possibly academics.
- Create a website portal to support the collaboration and publishing of the architecture. (Note: This links with our fourth initiative “Knowledge & Experience Sharing”).

## **7.1.7 Definition of Success**

- An EM IT Reference Architecture exists and is accessible to stakeholders.
- The Reference Architecture is being actively developed and managed according to agreed standards.
- The Reference Architecture is being used throughout the industry for a wide range of internal and external uses.
- Canvassing of the intended users throughout the industry results in a high satisfaction rating.

## 7.2 EM Data Management

### 7.2.1 Objective

The objective for the EM Data Management initiative is to maximise return on investment and reduce risk through the effective management of data via optimal processes and shared capabilities under the oversight of an EM Data Governance Model.

The EM Data Governance Model will help drive improvements in data quality and provide opportunities to maximise process improvements by providing the information required to EM participants. Data Governance will also align to strategy and leverage the Architectural Reference models and drive consistent terminology and processes across the EM.

In areas of data storage, shared repositories will be established to reduce the impact of future data volumes and network load and the need for all to create infrastructure to store the same information.

### 7.2.2 Imperative

Without Data Management the quality of data in the EM will continue to deteriorate and as processes evolve and develop they will become less efficient for all EM stakeholders. New initiatives will continue to cost more and effort will be duplicated across all participants resulting in diluted business benefits. The outcome will be a less efficient and effective market, lost opportunities for improvement, and additional costs and risks that will be passed through to consumers.

### 7.2.3 Principles

- Data is an asset and will be organised and managed to ensure that its value to the EM is maximised.
- A data governance council will be established to collaborate and establish the rules and guidelines for owners to follow and provide a channel to drive data quality.
- EM data will be made readily available, so as not to delay processes, and will enable appropriate sharing across the EM.
- EM data governance requires an identified data governance champion, data owners, data custodians and data users within each realm of the market.
- Where data does not provide competitive advantage, shared data stores should be considered.

### 7.2.4 Approach

Define the structure and representation on the data governance council and appoint a working group for data governance across the EM. The council represented by key data owners will define processes that drive data improvements and policies. Owners will also table and suggest changes that have been identified by data custodians in their day to day stewardship of data. The council will drive and schedule the changes that improve data quality and process efficiencies across the EM.

## 7.2.5 Near Term

- Establish/agree on data governance process, focusing on managing the quality, consistency, usability, security, and availability of information to enable improvements in data quality and availability in the EM.
- Find an appropriate opportunity area (e.g. Data Interchange requirements) to provide a tangible focus for the activity.
- Recommend linking this with the Architectural Reference Models initiative in order to attack both the need for an architectural approach and data governance related to a practical and pragmatic requirement.

## 7.2.6 Long Term

In the longer term align processes and governance to the Architecture blueprints established in the Architecture reference model. Drive data quality initiatives across the EM using the new governance model.

## 7.2.7 Definition of Success

- Data governance Council driving continued data quality improvement across the EM utilizing:
  - A champion of Data Governance
  - Data Owners
  - Data Custodians
  - Data Users
- All initiatives align to industry reference models and blueprints
- Data quality to the same standard across the EM and all users drive data quality
- Shared and public data in repository for all authorized users to access

## 7.3 EM Identity and Security Management

### 7.3.1 Objective

The objective for the EM Identity and Security Management Framework initiative is to maximise return on investment and reduce risk through the support of a unified approach to:

- secured information exchange ( e.g. access, usage, data manipulation); and
- the management of Industry Contacts, Roles and Industry Authorisations
  - tracking who is in the industry (e.g. name, contact details and roles); and
  - what individuals are authorised to do (e.g. sign contracts, access systems and data, issue instructions or directions).

### 7.3.2 Imperative

With changes in the energy markets, involving new services around new energy types, new participant roles are emerging. Some are not covered by existing EM definitions, or guidelines around the ownership and sharing of information.

- e.g. role changes resulting from merger and acquisition activities can be dynamic, contact databases ever-changing, and sub-contracted responsibilities may lead to privacy and information ownership issues

Increasing demands for finer SCADA and interval metering data in particular bring new challenges in data privacy, integrity and security.

Consumerisation of data, arising from new commercial uses of data, and personal usage data management services will drive new requirements for identity and security.

The EM also exists in a wider environment where Infrastructure Security is of National concern, and will increasingly be required to conform to National standards.

### 7.3.3 Principles

- Participants will use a common identity technology approach
- Participants will manage their own adherence to an agreed common security standard.
- Standards will support non-competitive data exchange and privacy.
- The actions associated with an identifier will be auditable.
- A user-assignable access regime will be supported rather than a static system-mandated set of roles.

### 7.3.4 Approach

There is an immediate need to discover best practice amongst participants to agree on a common approach and to implement longer term initiatives.

- AEMO owns the aseXML standard for data exchange. This coding scheme is extensible, and a working group should develop information types in the domains of identity, supporting wider market roles, and based on participants' trusted internal organisational roles and delegations.
- There should also be allowance for emerging small market new technology participants, with distributed generation, researcher and even consumer secured access.
- In terms of the technologies adopted to support identity authentication, cooperation with leading Identity Management service providers should be sought in order to set up a pilot with a few pathfinder participants agreeing a common registration process, based on the findings of a Participant Survey and IT industry best practice.
- Current EM discovery mechanisms supporting NMI, DPI & customer standing data should be progressively migrated to a new process and standard.

### 7.3.5 Near Term

- Establish an IT Identity & Security Working Group (or leverage from existing group)
- A survey of current participant practice and proposals will be undertaken by the IT Identity & Security Working Group.
- Findings will be reported on late in 2008, with recommendations for CIO and stakeholder endorsement and implementation.

## 7.3.6 Long Term

- An extended security model should also be developed for data types, and standards agreed or developed in conjunction with suppliers for data encryption, and transport via internet links and private links for resilience. Current models of file shares, unsecured ftp, weak password access and unsecured SCADA protocols need replacing.
- Relevant IT security management standards such as ISO 27001 and technical standards for including encryption, location, and privacy will be reviewed and adhered to where necessary.
- There is the opportunity for a significant number of participants to test their internal processes by participating in the 2010 Cyberstorm simulation for Government and Critical Infrastructure organisations including banking and utilities.

## 7.3.7 Definition of Success

- There are agreed, trusted identifiers for Market-2-Business-2-Customer transaction initiators and receivers
- Security and reliability of information exchanged is auditable via incident management processes
- There is common use of open Directory services to locate people and services, also holding the extended Security model
- Single sign-on supports access to multiple EM systems

Targeted Timing (subject to working group consideration)

- A pilot in operation by 2010, based on a subset of requirements.
- Cyberstorm participation by a majority of participants in 2010.
- Agreed new aseXML standard and common identifiers implemented by major participants over 2012.
- New Energy market Identity & Security participant model in operation, replacing legacy approaches by 2015.

## 7.4 EM Knowledge and Experience Sharing

### 7.4.1 Objective

The objective for the EM Knowledge and Experience Sharing initiative is to maximise return on investment and reduce risk through the effective sharing of knowledge and experience within the energy industry.

### 7.4.2 Imperative

Without effective knowledge and experience sharing, the result will be duplication of effort, and lost opportunities to learn from the previous positive and negative experiences of others. The outcome will be a less efficient and effective market, lost opportunities for improvement, and additional costs and risks that will be passed through to consumers.

## 7.4.3 Principles

- The knowledge sharing process is not to be used to facilitate anti competitive behaviour.
- Sharing of knowledge is encouraged and is voluntary
- The knowledge sharing process is open to any industry players including researchers, industry participants, and participants in other markets including the Western Australian Energy Market and overseas markets, and suppliers.
- The source of the knowledge is to be recorded along with contact point for follow up requirements.
- Any vested interests (such as vendor affiliations) will be clearly identified.

## 7.4.4 Approach

An environment is established along the lines of Wikipedia which can be used to seek input and to provide experiences to others.

Encourage the establishment of special interest groups (electronic and / or physical).

## 7.4.5 Near Term

Within 6 months of IT strategy endorsement complete a trial with EM IT Steering Committee and Observers of the proposed mechanisms and tools, and assess the value of the initiatives.

## 7.4.6 Long Term

Within 12 months of IT Strategy endorsement, establish a mechanism for a knowledge portal with broader access to industry community.

## 7.4.7 Definition of Success

An EM-wide culture which encourages the sharing of information and experience in areas not considered to be of competitive advantage. This will be done in a way which:

- Does not cause an issue with the ACCC in terms of anti competitive behaviour.
- Results in a reduction in duplication of effort as identified through a survey of the industry
- Increases the degree of standardization of approach in identifying and addressing issues in the EM.
- Results in the establishment and maintenance of a knowledge base of information and experiences of relevance to the industry.
- Reduces the time and effort involved in building expertise in EM related activities for new resources involved in the EM.