
Cost Benefit Analysis of Options for a
National Smart Meter Rollout
Phase Two - Regional and Detailed Analyses
Consultation Regulatory Impact Statement

Submission to the Standing Committee of Officials
of the Ministerial Council on Energy



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1 Introduction

Western Power welcomes the opportunity to comment on the Regulatory Impact Statement associated with the cost benefit analysis of options for a smart meter rollout (Phase Two – Regional and Detailed Analyses) and released by the Standing Committee of Officials of the Ministerial Council on Energy (MCE) in April 2008.

Western Power's submission responds to the Regulatory Impact Statement (RIS) and related reports.

Western Power is keen to work cooperatively at a national and State level in support of the objectives for the use of smart meters.

1.1 Background

Electricity networks have a critical role to play in developing energy solutions in a carbon-constrained world.

Electricity networks are predominantly seen as passive infrastructure that transport energy from large power stations to consumers; but electricity networks of the future – smart networks – are the intelligent energy highway that will facilitate sustainable development.

Emerging technologies such as smart meters used by consumers in homes, commerce and industry will support change in demand and patterns of energy use that will open up greater value opportunities for customers and networks alike. Specifically, network technologies are being developed to better manage network systems and reliability of supply as more diversified forms of energy are connected to networks.

The greater use of price signals to manage the supply of diversified energies as well as the increasing demand for energy from consumers are strong drivers of innovation and research and development in the whole energy supply chain.

The spread of smart technologies, combined with improved price signals, will establish much improved flows of information between generators, networks and consumers that will open up opportunities for all stakeholders to develop energy solutions that contribute to sustainable development.

This includes providing consumers with a range of benefits allowing them to make purchasing decisions around electricity consumption, and decreasing the number of outages through improved reliability.

The role of networks in delivering energy solutions is critical – networks must be an integral part of the process to achieve a more efficient and sustainable energy industry.

Western Power has pursued the installation of advanced metering functionality in the Commercial and Industrial segment to support direct and indirect benefits for customers and all other market participants. The integration of a distributor-led rollout of smart meters to all direct connect meters in WA supports the progress made in the areas of energy solutions, smart grids and green edge environmental strategies.

The MCE consultants have advised that a smart meter rollout would have a positive net benefit on the basis of avoided metering costs and distribution business efficiencies alone. The net benefit of a smart meter rollout in WA remains positive even if costs are at the upper end of the estimated range and business efficiency benefits at the lower range. Any demand response benefits arising would represent additional benefits.

According to the consultants, the cost benefit analysis for WA shows that a smart meter rollout under the distributor-led scenario has the highest net present value across all the scenarios and can be justified solely by the resulting business efficiencies that are expected to accrue to distributors.

Western Power strongly supports a distributor-led smart meter rollout as the best alternative for WA.

2 Issues Considered in the Regulatory Impact Statement

2.1 Should the Home Area Network (HAN) (Functionality 16) be included in the national minimum functionality?

Western Power considers the HAN to be the way of the future, as it eliminates the requirement to retrofit facilities with appliance control enabled devices and supports its inclusion in the national minimum functionality as:

- Consumer access to vital information on their load profile and consumption, which will potentially have a direct influence on their usage pattern, can be enabled as an additional service (there is potential for in-house displays to communicate with smart meters and show load profiles); and
- Distributors will have increased ability to perform demand side management.

Opportunities to impact consumer behaviour are available via in-house displays as part of the HAN. Western Power understands that work currently undertaken by Standards Australia is leading towards fitting appliances with demand response enabling devices at the factory.

Western Power notes that the HAN is currently being discussed as a concept and that the choice of technologies enabling it is likely to depend on the application selected for its operation (e.g. Z-Wave, ZigBee, etc).

2.2 Would smart meters or Direct Load Control (DLC) alone best address the inefficiencies in electricity markets caused by accumulation meters?

Western Power strongly suggests that smart meters, or DLC, alone could not address electricity market inefficiencies caused by accumulation meters.

Western Power suggests that the regulatory framework, tariff structures and rebate schemes require further consideration and development in order to create incentives for consumers and encourage the uptake of demand response enabled appliances.

2.3 If so, which party should be responsible for the smart meter or DLC rollout?

Western Power strongly suggests that smart meters, or DLC, alone could not address electricity market inefficiencies caused by accumulation meters.

Moreover, distributors are ideally placed for a smart meter and/or DLC rollout, as:

- Distributors typically own current meters and have an existing capability to manage meter installation, meter information, and the systems required to manage meter populations.
- Distributors are indifferent to throughput (i.e. sale of energy) and are driven by their regulatory frameworks to focus on demand reduction to achieve the lowest long-term cost of the network.
- Distributors facilitate the maximum distribution of benefits to the end consumer, through relationships with all retailers and customers.

As the sole distributor in the SW of WA, Western Power performs both functions exclusively in the SW of WA.

2.4 In what regions would the benefits of a smart meter or DLC rollout outweigh the costs?

Western Power supports the consultants' analysis for WA indicating that a smart meter rollout under the distributor-led scenario has the highest net present value across all scenarios and can be justified solely by the resulting business efficiencies that are expected to accrue to distributors.

Western Power suggests that there may be a higher correlation between the benefits of smart meters and DLC and areas of higher population density, and higher use of electrical appliances, as there is a higher potential load to control.

In addition, targeted application of these technologies may prove advantageous to avoiding significant capital investment for infrastructure.

3 General questions pertaining to the Regulatory Impact Statement

3.1 Do stakeholders agree with the problem definition in the RIS?

Western Power generally agrees with the problem definition in the RIS.

3.2 Do stakeholders wish to comment on the benefits, costs, risks and/or impacts outlined in this RIS or wish to provide any others?

Western Power suggests that costs presented in the RIS for all communications options appear to be unrealistically low. PLC costs are examined as it is the only option where an actual installation cost is available instead of a present value and as PLC figures so prominently in EMC^a's recommendations adopted in the RIS for rural and remote areas.

Western Power is concerned by these figures, as:

- EMC^a's equipment and installation costs are significantly less than experience indicates for works at rural and remote WA zone substations;
- EMC^a makes no provision for backhaul and assumes that all zone substations already have adequate communications bearers back to the System Control Centre; and
- EMC^a's present value for transitional costs implies more connected meters than PLC can support.

Western Power notes that EMC^a states PLC can communicate to all smart meters in rural and remote areas. In accordance with core functionality, half-hourly interval meter reads are required. In order to achieve the present value transitional cost figures, even based on unrealistically low infrastructure hardware costs, each PLC system at each zone substation has to communicate with an average of 1200 remote meters. In order to provide interval reads, this communication has to occur every 30 minutes.

This is clearly impossible at the available data rates, in light of EMC^a's admission that PLC data rates vary from 12 to 300 bits per second based on the number of meters connected in parallel, as no more than 1.5 seconds would be available for each successful transaction, and considering that each transaction has to allow for the poll, response, and retries. This probably also explains why none of the publicised trials have been successful.

Western Power suggests that in the event EMC^a's transitional present value per meter costs are correct, the system will not work with the implied number of meters. If the costs are underestimated, the transitional present value will increase and the RIS cost benefit analysis results will have to be recalculated.

Western Power suggests that if EMC^a's transitional present value per meter costs are correct PLC is not technically viable and if the costs are underestimated it is unlikely to be economically viable for WA's rural and remote electricity network.

3.3 Can stakeholders suggest any measures to maximise the benefits and/or minimise the costs and risks of a smart meter or DLC rollout?

Western Power suggests that a crucial part of the equation requiring further development is the incentive for electrical appliance manufacturers to develop demand response enabled devices and for consumers to invest in them for DLC.

Western Power also suggests that the entity incurring the costs of the rollout of smart meters and/or DLC should have the ability to capture the full benefits.

3.4 Do stakeholders have comments on the implementation issues or wish to raise any others?

Western Power suggests that smart meters and DLC are components of the overall network architecture:

- Enabling dynamic control of loads, generation and network assets to optimise the utilisation, efficiency and reliability of the entire power system; and
- Facilitating improved information flows to end customers.

Implementation requires consideration be given to the integration of smart meter and DLC technologies into the overall operation of the power system. This includes consideration of support systems (e.g. communications). These systems are crucial to ensure that a smart meter rollout effectively provides consumers with the full range of available benefits.

Western Power suggests that a rollout of smart meters, including public education, will enable increased energy efficiency by customers and should also have a positive impact on the reduction of greenhouse gas emissions.

Another key implementation consideration is related to interoperability and scalability, given that technologies will continue to develop and change. However, new technologies will require the ability for easy integration into existing networks to enable seamless transitions as far as practicable, and minimise the cost of redundancy.

Western Power also suggests that each jurisdiction will need to consider resourcing as a key determinant of the timetable agreed for rollout completion.

4 Specific questions pertaining to the Regulatory Impact Statement

- 4.1 Do stakeholders agree with the problem description, including the fact that the split-benefits problem inhibits businesses from rolling out smart meters of their own accord?

Western Power generally agrees with the problem description and, more particularly, supports the notion that given the jurisdictional disaggregation that has occurred in Australia, it would be difficult to obtain a nation-wide scenario consensus allowing for the economies of scale necessary to achieve the full benefits resulting from a smart meter rollout.

It is important that the Ministerial Council on Energy (MCE) considers jurisdiction-specific information provided by stakeholders before making a decision on a smart meter rollout.

- 4.2 Do stakeholders have a view on the consultant's recommendation to include the HAN in the national minimum functionality?

As per the discussion under section 2.1, Western Power supports the consultant's recommendation to include the HAN in the national minimum functionality.

- 4.3 Can stakeholders suggest any other options that could achieve the MCE objectives more cost efficiently than the scenarios presented?

Western Power strongly supports a distributor-led rollout as being the best option to achieve MCE objectives in the most cost efficient manner.

- 4.4 Do stakeholders think the status quo (i.e. a mix of accumulation, interval and smart meters) is sustainable?

Western Power does not think the status quo is sustainable, as it does not allow for the universal provision of benefits associated with smart meters.

A staged rollout where consumers could access the benefits in smart meter enabled areas is conceivable. However, this would extend the completion timetable of a total rollout, and have systems implications upon introduction of full retail contestability if it occurs before completion of the rollout.

- 4.5 Do stakeholders agree with the overall finding of the consultation reports suggesting that, for a general national case, a smart meter mandate provides higher net benefits than a DLC only scenario?

Western Power agrees with the overall finding of the consultation, as it avoids potentially significant retrofit costs.

DLC could be implemented without the introduction of smart meters, however this would require the implementation of another infrastructure layer (i.e. communications and demand response enabling devices)

Western Power suggests that DLC alone would be too restrictive, as it does not offer the array of functionalities available with smart meters and provides for less flexibility for consumers.

4.6 What impact do stakeholders think the different proposed rollout scenarios would have on competition for:

Western Power is only considering the distributor-led rollout in its response to this question, as it does not support any of the other scenarios proposed by the consultants.

4.6.1 Metering manufacture

Western Power currently uses an Australian meter manufacturer as its sole source of supply and suggests that a smart meter rollout could adversely impact the Australian meter manufacture industry if a decision was made to open the market to overseas manufacturers.

Meter acquisition is and would continue to be subject to a tendering process, with required quantities of metering equipment and infrastructure being the main competition driver for providers.

However, Western Power suggests that the introduction of interoperability is required to stimulate further competition in the metering manufacture industry.

4.6.2 Metering installation

Western Power is the nominated metering services provider in accordance with clause 2.1.1 of the *WA Electricity Market Metrology Procedure* for the South West Interconnected System (SWIS), and supports the continuation of this provision during and after a smart meter rollout.

4.6.3 Meter data services

Western Power is the nominated metering data agent in accordance with clause 1.4.1 of the *WA Electricity Market Metrology Procedure* for the SWIS, and supports the continuation of this provision during and after a smart meter rollout.

4.6.4 Retail electricity services

Western Power suggests that retailers should offer innovative tariff structures with a view to drive consumer behaviour in terms of demand and consumption. This could also stimulate retail competition.

Distributors can facilitate the provision of other related energy and information services.

4.6.5 Additional in-home services such as in-home displays and DLC

Western Power suggests that the introduction of in-house displays and DLC would provide consumers with improved information, including actual energy consumption, providing them with the opportunity to make informed decisions to improve their energy consumption management.

4.7 Do stakeholders think the central communications option is feasible? If not, what steps would need to be taken to make it so?

Western Power believes a central communications system is feasible and is aware of technology trials currently underway.

Western Power suggests that there is a requirement for a communications infrastructure that unifies the system and enables remote reading, DLC signalling and the activation of tariffs.

Interoperability and scalability are key considerations for technological development and improvement in terms of a central communications option. Adopting a standards approach can reduce risks in this area.

4.8 Could elements of the central communications option, such as complete central data set or greater interoperability, be considered as additions to other options? Do stakeholders see benefit in having one set of official data held by a third party?

Western Power does not support the central communications option as an addition to other options.

Western Power agrees with the risks mentioned in the RIS, particularly the impact on the current and future network, as well as distribution business communications systems.

4.9 Of the rollout models listed, which is your preferred option and why?

Western Power prefers a distributor-led rollout, as:

- It allows distributors to take full advantage of the potential benefits associated with the advanced functionalities, particularly demand side management, critical peak pricing, and efficient network augmentation;
- Western Power is currently efficiently managing a meter population of around one million;
- Western Power has available resources to manage turnkey solutions for the proposed smart meter rollout; and
- Western Power's Metering Business Systems along with other operational systems are in place to effectively manage assets, communications and data.

4.10 Are there any other models (including hybrids) that could be considered?

Western Power is not currently aware of any other models warranting consideration.

4.11 Are there any jurisdictional issues that stakeholders think have not been addressed in the cost benefit analysis?

According to the cost benefit analysis for WA, the consultants only considered consumers connected to the SWIS and did not include costs provided by WA for the purpose of their analysis.

Western Power suggests that the feasibility of a WA rollout to meter points outside the SWIS would require further consideration to determine feasibility.

Moreover, Western Power suggests it is important to align the timing of any rollout with that of regulatory submissions.

4.12 Are there any further implications stakeholders wish to raise if smart meters are rolled out in only some jurisdictions or rolled out in a staged approach?

Western Power suggests that it would be rational to stage a rollout of smart meters in WA by initially targeting areas where higher benefits can be derived before progressing the rollout to other areas.

However, the potential of a negative reaction from consumers in other areas (e.g. perception of being denied the benefits of smart metering technologies) requires consideration.

4.13 In light of this analysis do stakeholders see any implications for a smart meter rollout in rural and remote areas in comparison to urban areas?

Western Power agrees that smart meters should first be rolled out in areas where higher benefits can be derived.

Further consideration of implementation issues is required prior to the rollout of smart meters in rural areas.

4.14 Where do stakeholders think smart meters should be rolled out? What timeline is appropriate for specific jurisdictions and what additional jurisdictional factors should be considered in the timeline?

Western Power is planning a five-year rollout commencing 2009/10 at a target rate of 200,000 meters to be replaced per annum. This is subject to regulatory approval.

The rollout would commence with meters in urban areas within the SWIS where the derivation of higher benefits is expected.

4.15 Where do stakeholders think the details of a mandated smart meter rollout should be set out, including responsibilities, timelines and cost recovery? Which aspects should sit in national or jurisdictional instruments?

Western Power supports the inclusion of rollout details in jurisdictional legislative frameworks and associated procedures. The national minimum functionality should sit in national instruments, and additional functionalities in jurisdictional instruments.

4.16 What are stakeholder views on the proposed legislative model in table 15? Are there any other issues that should be considered in the legislative framework?

As the WA electricity market operates independently of the NEM, consideration needs to be given to its own legislative framework and procedures.

4.17 What process should inform the design of smart meter pilots and trials? Who should be responsible for undertaking them?

Western Power strongly suggests that distributors are best placed to undertake smart meter pilots and trials, as they are not in competition with each other. Thus, encouraging information sharing.

Distributors should be closely involved with data collection in any trials conducted in Australia and trials should be designed to test systems in various geographical locations, and consumer behaviour by jurisdiction.

A coordinated strategy is required for the implementation of national pilots and trials to ensure duplication is minimised (e.g. technology testing).

Western Power suggests that consideration be given to undertake ongoing pilots and trials, as they have the potential of adding value to the process of developing smart networks and could assist in the development of a smart networks knowledge base.

4.18 What are stakeholder views around resourcing of pilots and trials?

Western Power suggests the formation of a cross-jurisdictional project team to manage pilots and trials while liaising with relevant stakeholders across jurisdictions

Western Power suggests that pilots and trials should be regarded as research and development, with a clear identification and understanding of risks, costs and benefits before the allocation of funds.

4.19 What do stakeholders think is the best approach to the safety review?

Western Power suggests that this will need to be by relevant jurisdictional energy safety and policy agencies.

4.20 Do stakeholders have particular issues to be considered by the review of consumer protection arrangements?

Western Power has no comment to provide at this stage.

4.21 Do stakeholders have views on different approaches to public education on smart meters, or on the funding of such campaigns?

Western Power agrees that both distributors and retailers should be involved in public education on smart meters, as issues to be covered span across the expertise of both industry segments.

4.22 What are stakeholder views on the need for interoperability in smart meter infrastructure and how would it be best achieved?

Western Power agrees with the problems and recommendations as stated in the RIS with regards to interoperability and open communications standards.

Western Power views interoperability (and scalability) as a crucial part of the smart meter infrastructure, which will best be achieved using a standards approach. Such an approach is also likely to minimise risks.

4.23 What do stakeholders think is the best approach to address data management and business interface issues?

Please refer to discussion under section 4.6.3.

4.24 What do stakeholders think is the best approach to accommodating existing interval and smart meters currently in use and the Victorian process?

Western Power suggests that the best approach for WA would be a replacement strategy implemented as part of a normal rollout process.

4.25 Do stakeholders know of any other issues that may require transitional arrangements?

Western Power strongly suggests that consideration should be given to ensure that market operator and retailer systems are scalable to meet the number of smart meters being rolled out.

5 Other issues

5.1 Reliance on Power Line Carrier

Western Power notes that the RIS assumes Power Line Carrier (PLC) for rural and remote areas and the preferred scenario following from the cost benefit analysis results relies on universal rural and remote PLC coverage. EMC^a's view that there are adequate answers to the concerns raised such that PLC can be considered a viable technology for Australia is provided in support.

The Government and Victorian Electricity distribution and retail businesses jointly commissioned a study into AMI communications in 2005. Two distributors opted to use PLC. One trial was abandoned before conclusion and neither system was able to capture interval data, which is a core functionality of smart meters. The Trial Working Group's conclusion at the end of the trial was that PLC systems are available that are suitable for further investigation for the Victorian Rollout. Western Power suggests that this raises serious doubts about the ultimate viability of PLC.

Western Power further suggests that finding a PLC system that will meet the bandwidth requirements for the AMI core functionality *and* the universal coverage requirements for rural and remote areas may prove an intractable problem because of the bandwidth vs. coverage trade-off inherent to PLC.

As PLC systems operate from several hundred to several hundred thousand Hz, the available bandwidth is directly proportional to the PLC operating frequency. To guarantee coverage over a distribution line, frequencies less than 1000 Hz are typically used. Western Power's recent DLC trial used 283 Hz to provide coverage to better than 99% of participants. At frequencies over 1000 Hz on distribution lines, load changes create shifting impedances that cause signal peaks and dropouts, which jeopardise communications. Higher frequencies are required for the increased bandwidth to serve multiple customers on a rural or remote distribution line. These frequencies cannot reliably propagate to all customers over the distribution lines, which is suspected to be the fundamental problem with the two trials mentioned above.

The suitability of PLC for Western Power's application goes to the core of the RIS cost benefit results that follow from reliance on PLC for rural and remote locations.

6 Other comments

6.1 Overview of Western Power

Western Power is the largest electricity network operator (transmission and distribution) in WA, responsible for operating and maintaining the electricity network within the SWIS. The SWIS extends from Kalbarri to the North to Albany in the South and extends to Kalgoorlie to the East. The SWIS includes:

- In excess of 140 zone and terminal substations;
- 6,750 km of transmission lines and cables; and
- 83,000 km of overhead and underground distribution lines and cables.

Western Power is owned by the WA Government but, as a corporation, makes commercial decisions based on regulation, and has an independent Board of Directors providing strategic direction to the business.

Western Power is responsible for:

- Maintaining the electricity network within the SWIS;
- Restoring power after interruptions;
- Developing the electricity network within the SWIS to meet the needs of customers and developers, and to bring electricity to new areas; and
- Providing generators and retailers with access to the SWIS.

Western Power provides more than 800,000 customers with a safe, reliable and efficient supply of electricity.

Western Power is supported by a number of ancillary operations such as administration centres, associated depots and communication sites located throughout the SWIS.

6.2 Strategic direction

To address current and future challenges and opportunities of energy supply in WA, Western Power has developed a Strategic Plan for 2008-2010 and a Strategic Direction Statement to 2016, both of which will assist the development of the energy industry in the State.

The foundation of Western Power's strategic direction remains operational excellence – a commitment to the safe, reliable and efficient transmission and distribution of electricity through efficient work practices, commercially focused business operations, achieving a challenging capital works and maintenance program, and improving our support systems and processes to deliver quality programs and services.

To build on our operational excellence, Western Power has added three strategic themes, all of which will assist the continued development of the energy industry in WA. The three strategic themes recognise and anticipate the need for sustainable development and the changes occurring in government policies, community expectations and technological changes.

The three strategic themes are engaging with the community; transforming the customer experience; and developing the 'green edge'. All three involve Western Power evolving and maturing from being a network operator to an energy solutions business.

We have embarked on the need to engage with our communities and our stakeholders to develop energy solutions that meet the needs of our customers, communities and industry.

Western Power intends to broker better relationships in the delivery of energy solutions and the ensuing greater level of understanding of issues will improve the prospects for consensus in developing optimum energy solutions.

A clear and detailed understanding of our customers current and future needs will ensure we develop optimum solutions to meet these needs. This will minimise the risk of asset stranding, reduce the long-term costs of supply and facilitate the most sustainable energy sources.

Developing the 'green edge' involves raising awareness of energy consumption patterns, leading the sustainability debate and identifying energy solutions for the future.

Western Power will think and act beyond 'poles and wires' by working with industry and the community to develop alternative options for energy development.

To facilitate these initiatives, Western Power will support communities in developing sustainable energy solutions by developing a portal for services; establishing community and industry forums; undertaking demand management initiatives; developing intelligent network technology and capabilities; and working with industry to deliver support services to connect renewable energies to the SWIS.

We look forward to working with all our stakeholders to develop energy solutions that contribute to sustainable development, security and reliability of energy supply and competitive energy prices in WA.

7 Further information

For further information on this submission, please contact:

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