

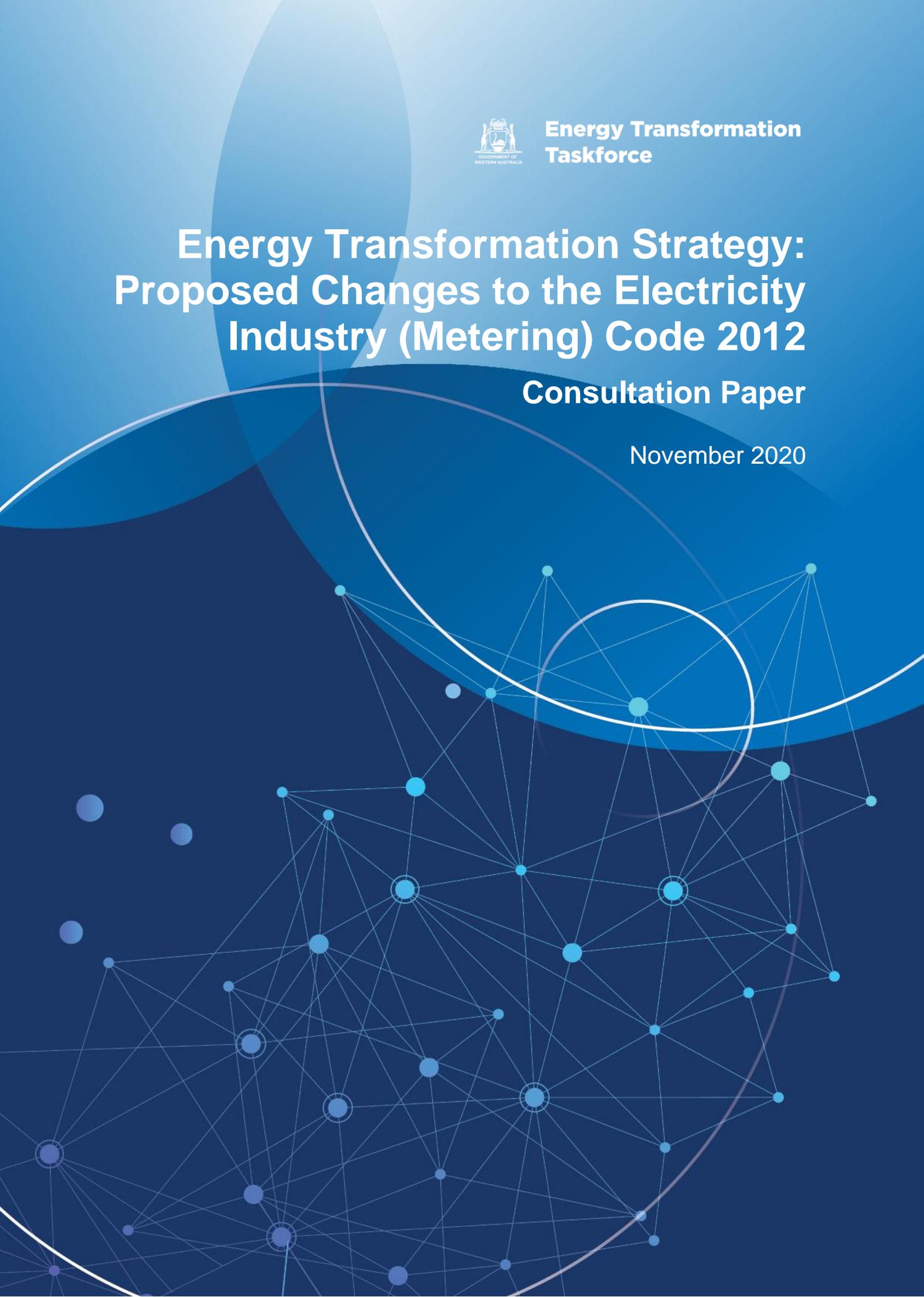


**Energy Transformation
Taskforce**

Energy Transformation Strategy: Proposed Changes to the Electricity Industry (Metering) Code 2012

Consultation Paper

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It is provided to assist in understanding the approach being taken to develop changes to the Electricity Industry (Metering) Code 2012.

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Abbreviations

The following table provides a list of abbreviations and acronyms used throughout this document.

Term	Definition
5MS Meter	Five-minute settlement meter
Access Code	Electricity Networks Access Code 2004
AMI	Advanced Metering Infrastructure
CT	Current transformer
DEBS	Distributed Energy Buyback Scheme
DER	Distributed Energy Resources
ESS	Essential System Services (formerly Ancillary Services)
ERA	Economic Regulation Authority
GWh	Gigawatt hour
Metering Code	Electricity Industry (Metering) Code 2012
MWh	Megawatt hour
NWM	Notional Wholesale Meter
SCADA	Supervisory Control and Data Acquisition
STEM	Short Term Energy Market
Strategy	Energy Transformation Strategy
SWIN	South West Interconnected Network
Taskforce	Energy Transformation Taskforce
TDOWG	Transformation Design and Operation Working Group
VT	Voltage transformer
WEM	Wholesale Electricity Market

1. Introduction

1.1 Background

The power system is experiencing transformation due to changes to the mix of grid-connected large-scale generation technologies, consumer demand patterns, and growth in the penetration of Distributed Energy Resources (DER), including solar PV and battery storage systems. Because of this transformation, the market systems, standards, obligations and frameworks that underpin the operation of the Wholesale Electricity Market (WEM) have become unsustainable.

The State Government's Energy Transformation Taskforce (Taskforce) is progressing improvements to the WEM to address current and emerging power system security risks and provide the right market incentives. This is occurring through the implementation of the State Government's Energy Transformation Strategy (Strategy).

This includes creating appropriate market and regulatory frameworks to encourage investment in generation facility types that will be needed in the future WEM. Fast-responding technologies, including storage and flexible gas generators, will be increasingly required to maintain power system security where there is increasing penetration of intermittent generation. Ensuring market and regulatory frameworks enable participation of these facilities and provide appropriate compensation for their services is essential.

Market frameworks must also be designed to enable efficient market operation. This includes enabling new participants to enter the market by decreasing barriers or disincentives to market participation.

In 2019, the Taskforce approved changes to the financial settlement processes in the WEM that compensate service providers for the energy and Essential System Services (ESS) they provide and recover money from Rule Participants that cause or require the need for those services.

The majority of the changes to market settlement will be implemented through amendments to the WEM Rules; however, the following two Taskforce decisions require amendments to the Electricity Industry (Metering) Code 2012 (Metering Code):

1. The introduction of five-minute settlement, commencing 1 October 2025.
2. Implementation of a weekly settlement timeline, commencing 1 October 2022.

A summary of these Taskforce decisions is outlined below. Further detail on the policy positions relating to five-minute and weekly settlement are outlined in the following information papers:

- *Foundation Settings for Market Settlement*¹
- *Market Settlement – Implementation of Five-Minute Settlement, Uplift Payments and Essential System Services Settlement*²

¹ Energy Transformation Taskforce, 2019, *Information Paper: Foundation Settings for Market Settlement*, <https://www.wa.gov.au/sites/default/files/2019-10/Foundation%20settings%20for%20market%20settlement%20-%20Information%20paper%208%20Oct%201.pdf>

² Energy Transformation Taskforce, 2019, *Information Paper: Implementation of Five-minute Settlement, Uplift Payments and Essential System Services Settlement*, 2019, <https://www.wa.gov.au/sites/default/files/2019-12/Information%20paper%20-%20Market%20Settlement%20-%20Implementation%20of%20five-minute%20settlement%20-%20Uplift%20payments%20and%20ESS%20settlement%20-%20December%202019.pdf>

1.1.1 Five-minute market settlement

The Taskforce has endorsed the reduction in dispatch interval from 30 minutes to five minutes.³ This change will provide dispatch information closer to real time, enabling Market Participants to adjust dispatch positions more swiftly to reflect physical facility limitations (for example, minimum loading requirements for generators). It will also enable the Australian Energy Market Operator (AEMO) to better match supply with demand, potentially decreasing reliance on the expensive (relative to energy in the spot market) Regulation ESS. If the existing 30-minute interval for market settlement is retained, there will be a misalignment between the dispatch and settlement intervals. This means that different prices must be used for dispatch and settlement, and the price for the 30-minute settlement interval must be calculated based on the spot price for six five-minute dispatch intervals.

To complement the five-minute dispatch interval, the Taskforce has endorsed a five-minute settlement interval for the WEM to be implemented from 1 October 2025. This decision relates to generators and contestable loads only. It does not apply to non-contestable loads, being the majority of residential and small business customers.

If a misalignment between dispatch and settlement intervals remained, it would likely to lead to undesirable consequences, including higher market (and therefore customer) costs and increased risks to system security.

Dilution of investment signals for fast-responding technologies, including energy storage

An averaged 30-minute settlement price that is lower than the five-minute spot price is likely to dilute the signal to invest in fast-responding technologies, such as energy storage, gas peaking generators, and demand-response (large customers, or groups of customers, that can turn their usage down in response to an instruction from the system manager). This is because the averaging of prices across six dispatch intervals means the full effect of the price spike is not reflected in the settlement price. The dilution of higher prices in intervals where these technologies are dispatched will decrease revenue for facilities that can quickly respond to them, and therefore incentives to participate in the market. These technologies will be increasingly required by the power system, including to maintain system security, due to the changing energy supply mix and customer demand profiles.

Encouragement of 'disorderly' bidding

The misalignment of dispatch and settlement intervals may encourage 'disorderly' bidding as generators would bid into the energy market on the basis of their expectation of the 30-minute settlement price, as opposed to the five-minute spot price. For example, if prices are high early in a 30-minute settlement interval, generators may adjust their bids later in the interval to capture the high price. That is, the generator may offer at a lower price in later intervals than it otherwise would to ensure it is dispatched. This may be inefficient if the facility is displacing generation from another facility with a lower marginal generation cost. This disorderly bidding behaviour increases the likelihood of inefficient market outcomes and increased costs for customers.

Less accurate calculation of 'uplift payments'

An 'uplift payment' will be used in the new market design to compensate a facility that would otherwise not be dispatched because its offer (bid) price was higher than the spot price (the price at which all facilities are paid for that dispatch interval), but was required to operate due to the presence

³ Energy Transformation Taskforce, 2019, *Information Paper: Foundation Market Parameters*, <https://www.wa.gov.au/sites/default/files/2019-08/Information-Paper-Foundation-Market-Parameters.pdf>

of a network constraint. The uplift payment ensures the facility that is dispatched receives at least its marginal offer price. It should be calculated as the difference between the price the facility was willing to be dispatched for (its marginal offer price) and the spot price for the dispatch interval. Settling the market on a 30-minute basis means accurate calculation of the uplift payment is not possible because the facility's offer price and quantity is for a five-minute dispatch interval; however, the settlement price it would receive would be calculated for the 30-minute settlement interval. This may result in the uplift payment over- or under-compensating a Market Participant, potentially either leaving the facility under-remunerated or incentivising it to engage in disorderly bidding.

Limitation of ESS cost recovery on a 'causer pays' basis

The costs of ESS should be recovered on a 'causer pays' basis. That is, the entity that caused the service to be required should pay for the service. This approach best incentivises behaviour that minimises market costs (and costs to customers) and maintains system security. Similar to uplift payments, a misalignment between dispatch and settlement intervals results in either over- or under-charging a Market Participant for its contribution to ESS costs, and therefore dilutes the incentive to invest in and operate facilities in a way that minimises costs.

Timing of commencement for five-minute settlement

To enable five-minute settlement, five-minute generation and consumption data (energy data) for each contestable load or generator metering installation will need to be available to AEMO for market settlement calculations.

On advice from Western Power, AEMO and Market Participants, the Taskforce determined that the upgrades to meters and changes to ICT and other business systems required to record, store and process five-minute energy data could not be completed at the same time as the new market arrangements being implemented under the Strategy commencing on 1 October 2022. To allow sufficient time for meter upgrades and system replacements to be implemented, five-minute settlement will commence from 1 October 2025.

Western Power estimates the works program to implement five-minute settlement will cost approximately \$25.5 million incurred over the four year works program. These costs will be recovered from network users over 15 years for meter upgrades and six years for ICT works.

1.1.2 Weekly settlement

The Taskforce has determined that from the commencement of new market arrangements on 1 October 2022, AEMO will undertake settlement calculations and issue invoices on a weekly rather than monthly basis and the settlement days for the Short Term Energy Market (STEM) and non-STEM will be aligned. This change complements other reforms due to the benefits it will provide to existing and future Market Participants by way of reduced prudential requirements and administration costs.

Currently, there is a two-month lag between the end of a trading month and when settlement occurs. This requires AEMO to hold 70 days of credit support to account for the risk of non-payment. High prudential requirements can be a barrier to entry for new Market Participants and can affect the amount of working capital available to existing Market Participants.

Analysis indicates that reducing the lag between trading and settlement may reduce prudential burden on Market Participants by about half to approximately \$40 million. Alignment of STEM and

non-STEM settlement timeframes also reduces the number of days where AEMO is required to undertake settlement runs, reducing administrative costs for AEMO and Market Participants.

1.2 Scope of Metering Code amendments

The scope of the proposed Metering Code amendments covers those required to implement five-minute and weekly settlement and related amendments that are needed to provide a foundation for the five-minute and weekly settlement amendments (for example, updating the meter type specifications and treatment of bi-directional energy flows).

Additional amendments to the Metering Code to implement other components of the Strategy (for example, matters relating to implementation of the DER Roadmap) may be progressed at a future date.

The Metering Code amendments are complementary to upcoming WEM Rule amendments made to implement the Strategy:

- WEM Rule amendments to support the transition to weekly settlement will be made in December 2020.
- WEM Rule amendments relating to five-minute settlement will be made following the commencement of new market arrangements (including five-minute dispatch on 1 October 2022). Although these amendments will not be made for several years, the complementary amendments to the Metering Code must be made as soon as possible to enable Western Power to upgrade its meters and ICT systems as these works have a long lead time.

A summary of the proposed amendments is outlined in Table 1 in Section 4 of this paper.

1.3 Stakeholder engagement

The proposed Metering Code amendments have been developed in consultation with Western Power and AEMO. The proposed changes are also informed by the Taskforce's consultation with industry stakeholders through meetings of the Transformation Design and Operation Working Group (TDOWG) in September and November 2019 and one-on-one engagement.⁴

Feedback can be submitted on the proposed changes to the Metering Code in any of the following ways:

- Email your written submission to energytransformation@energy.wa.gov.au.
- Contact energytransformation@energy.wa.gov.au to arrange a one-on-one discussion.
- Post your written submission to Energy Policy WA at Locked Bag 11, Cloisters Square, WA 6850
- Register to attend the Metering Code Industry Forum

Consultation on these Metering Code changes closes at 5:00pm (AWST), Monday 1 February 2021. Late submissions may not be considered.

In the interests of transparency and to promote informed discussion, submissions will be made publicly available on www.energy.wa.gov.au unless requested otherwise. Accordingly, stakeholders should clearly specify if the information they provide is confidential and, where possible, should separate confidential information from non-confidential information. Persons making any claim for confidentiality should familiarise themselves with the provisions of the *Freedom of Information Act 1992* (Western Australia), which imposes obligations on Energy Policy WA in respect to the release of documents.

⁴ TDOWG slides and minutes are available at <https://www.wa.gov.au/government/document-collections/transformation-design-and-operation-working-group>

2. Implementation of five-minute settlement

AEMO requires Western Power to provide it energy data at five-minute granularity to enable it to settle the market on a five-minute basis.

The proposed amendments to the Metering Code will require Western Power to undertake the following for all meters associated with a contestable load or generator:

- By 1 October 2025, ensure that all meters can record and communicate energy data at five-minute intervals.
- From 1 October 2025, provide energy data to AEMO at five-minute granularity.

These requirements do not apply to non-contestable meters, including those in the Notional Wholesale Meter (NWM), which will continue to be settled on a 30-minute basis. This is because the replacement of meters for contestable loads and generators to enable five-minute settlement is likely to produce the greatest benefits (on a per meter basis) in the short- to medium-term relative to non-contestable meters due to differences in throughput and the total number of meters needing to be replaced. The potential introduction of five-minute settlement for non-contestable meters will be considered by Government a later date in the context of Western Power's Advanced Metering Infrastructure (AMI) program and the implementation of the Government's Distributed Energy Resources Roadmap.

The Metering Code currently requires an interval meter to be installed for connection points that have an annual throughput of 50 megawatt hours (MWh) or more. These meters can provide energy data at least at 30-minute granularity; however, some meters already have hardware that is capable of providing energy data at five-minute granularity (with a software or firmware upgrade).

The Metering Code will be amended to require a minimum interval reading capability of five-minutes for contestable load and generator meters and specify that data at this granularity must be provided to AEMO for market settlement.

The proposed amendments to implement five-minute settlement are outlined in the sections 2.1 and 2.2. These amendments only apply to the South West Interconnected Network (SWIN) where the WEM operates.

Other foundation amendments are required to support or enable these amendments, including updating meter type specifications to reflect current technologies and clarifying how annual throughput is to be interpreted. Some of these amendments clarify existing arrangements and also apply outside the SWIN. The amendments are outlined in section 2.2.1 below.

2.1 Meter requirements

2.1.1 Foundation amendments

Contestable load and generator meters must be defined to enable the Metering Code to prescribe certain requirements (for example, energy data granularity) for meters servicing contestable loads and generators that do not apply to meters servicing non-contestable customers. This will be done by specifying the types of meters that are contestable load and generator meters.

The Overall Accuracy Requirements of Metering Installation Components table in Appendix 1 of the Metering Code (Table 1) outlines the technical specifications for each meter type. These specifications are more stringent for meter types with higher annual throughputs. This is because:

- the materiality of any errors increases as throughput increases, and therefore the acceptable error – both for the overall error and the individual components (e.g. current transformer or clock error) – is lower for meter types with higher throughput;
- measurement of reactive power is required for type 1 to 3 meters as the tariff design for these meters requires reactive power data; and
- type 1 to 5 meters service contestable customers that are settled on an interval basis and therefore an accumulation meter is not suitable.

Table 1: Current Meter Specifications table

Type	Annual throughput at connection point	Maximum allowable overall error (+/- %) at full load		Minimum acceptable class or standard of components	Clock error (seconds per month)	Minimum meter types	Measurement for reactive energy required
		Active	Reactive				
1	1000GWh and above	0.5	1.0	0.2 CT ⁵ /VT ⁶ /Meter Wh 0.5 Meter varh	+/- 5	Interval meter	Yes
2	100GWh to but not including 1000GWh	1.0	2.0	0.5 CT/VT/Meter Wh 1.0 Meter varh	+/- 7	Interval meter	Yes
3	750MWh to but not including 100GWh	1.5	3.0	0.5 CT/VT 1.0 Meter Wh 2.0 Meter varh	+/- 10	Interval meter	Yes
4	300MWh too but not including 750MWh	1.5	NA	Either 0.5 CT and 1.0 Meter Wh; or whole electric current connected General Purpose Meter Wh with a Data Logger	+/- 20	Interval meter	No
5	50MWh to but not including 300MWh	1.5	NA	Either 0.5 CT and 1.0 Meter Wh; or whole electric current connected General Purpose Meter Wh with a Data Logger	+/- 20	Interval meter	No

⁵ Current transformer

⁶ Voltage transformer

Type	Annual throughput at connection point	Maximum allowable overall error (+/- %) at full load		Minimum acceptable class or standard of components	Clock error (seconds per month)	Minimum meter types	Measurement for reactive energy required
		Active	Reactive				
6	Less than 50MWh	1.5	NA	Whole electric current connected General Purpose Meter Wh	NA	Accumulation meter	No

Source: Metering Code, Appendix 1, Table 3 (extract)

There are three aspects of the existing definition of meter types that create challenges for specifying groups of meters:

1. Meter types are, in part, defined in terms of 'annual throughput'; however, the term 'throughput' is not defined in the Metering Code. This may have been inconsequential when meter flows were uni-directional; however, as many meters now measure bi-directional energy flows the absence of a definition creates ambiguity in determining how to calculate throughput and therefore specifying a type for a meter. Clarification of the definition of throughput is required to enable a consistent approach to the specification of meter types.
2. The contestability threshold is defined in terms of consumption (50 MWh a year) at a connection point;⁷ however, as outlined above, the definition of throughput is not defined. As such, it is therefore unclear whether the delineation between meters reading less than 50 MWh (type 6) and from 50 MWh up to 300 MWh (type 5) reflects the contestability threshold.
3. Meter types are also defined in terms of technical specifications (for example, whether it must be an interval meter and the acceptable clock error⁸), as outlined in Table 1 above. The implementation of Western Power's AMI program includes installation of meters with type 4 specifications for connection points with annual throughputs of between zero and 750 MWh. For example, there are many meters measuring less than 50 MWh a year (type 6) that have type 4 specifications. While this is consistent with the overall objective of the AMI program to modernise the metering stock, it creates additional ambiguity in specifying the type of a meter.

To address the above:

- the proposed amendments to the Metering Code will define 'throughput'; and
- the Overall Accuracy Requirements of Metering Installation Components (Meter Specification table) in the Metering Code will be updated to reflect current technologies.

Annual throughput

'Throughput' will be defined in the Metering Code as the sum of the energy sent into the network (import channel) and the energy consumed from the network (export channel). This is the total flow of energy through the connection point.

⁷ Contestable loads (customers) are loads that consume more than 50 MWh of electricity a year (per connection point), as prescribed in Electricity Corporations (Prescribed Customers) Order 2007, made by the Minister for Energy under section 54(4) of the *Electricity Corporations Act 2005*. A connection point is the entry or exit point to the network.

⁸ 'Acceptable clock error' is the acceptable meter reading error.

This amendment reflects that many meters now have bi-directional energy flows and that the potential for erroneous readings is a function of the total throughput, rather than the net throughput or throughput of a single channel. In addition, defining throughput as a net amount could have some unintended consequences. For example, a transmission connected battery would likely have high total throughput, but have a zero or near zero net throughput over a year given a standalone battery will generally consume energy from the network and then export the up to the same quantity back into the network.

The definition of throughput will apply for all meters covered by the Metering Code, not just the SWIN. This reflects that some meters outside the SWIN also have bi-directional flows.

The contestability threshold will continue to be defined in terms of consumption only (i.e. only the export channel), as outlined in the Electricity Corporations (Prescribed Customers) Order 2007.⁹ This means that that some type 5 meters may be associated with a non-contestable customer. For example, a type 5 meter may have 55 MWh a year throughput, comprising 45 MWh load and 10 MWh export from a DER.

Meter types and specifications

Western Power's AMI program is implementing meters with type 4 specifications for metering points with annual throughput that ranges from type 4 (300 MWh up to 750 MWh) to type 6 (less than 50 MWh) (this includes both contestable and non-contestable loads). This constitutes an improvement as a type 4 meter is an interval meter and has a communications link to enable remote reading.

The specifications of a type 4 meter – including interval and remote reading capability – are the baseline specifications that should be installed at most connection points in a modern electricity network. For example, in the National Electricity Market, all new meters must, at a minimum, meet the type 4 requirements.¹⁰ Remote reading capability reduces the cost and improves the accuracy of meter reading and interval reading capability enables more efficient market settlement that best reflects the consumption at a given connection point (e.g. removes cross-subsidisation).

Consistent with the above, the Metering Code will be amended so that no new type 5 or 6 meters are to be installed in the SWIN.

This requirement will apply from 1 January 2022. This will allow Western Power to install meters it has already procured or are in the procurement pipeline – minimising wasted assets – and provide it sufficient time to implement the required ICT system changes (e.g. how it identifies and categories meters in its systems).

A new Meter Specifications table specifically for the SWIN will be added, with the annual throughput as outlined in table 2 below.

⁹ *Government Gazette*, 28 August 2020, p. 27,
<https://www.slp.wa.gov.au/gazette/gg.nsf/gen/79C7EB2D066A6068C825730800169C52>

¹⁰ https://www.aemc.gov.au/sites/default/files/2019-03/ERC0246_Final%20determination_for%20publication.pdf

Note: The exception is that the metering coordinator can use its discretion to install for a small customer a type 4A meter, which is a type 4 meter with its remote communications disabled.

Table 2: Meter Specification table (SWIN)

Type	Annual throughput at connection point	Other Specifications
1	1000GWh and above	
2	100GWh to but not including 1000GWh	
3	750MWh to but not including 100GWh	
4	Less than 750 MWh or, where installed prior to 1 January 2022, 300 MWh to but not including 750MWh	Unchanged
5	50 MWh to but not including 300 MWh where installed prior to 1 January 2022	
6	Less than 50 MWh where installed prior to 1 January 2022	

This table only applies to the SWIN. The existing Metering Specifications table will continue to apply outside the SWIN.

Western Power is not required to prematurely *replace* existing type 5 or 6 meters (or retrofit a communications link). However, in the case the meter is replaced (for example, due to being at the end of its economic life) it must be replaced with a minimum of a type 4 meter (which includes a requirement to have a communications link unless an exclusion applies as outlined below).

Exclusions from requirement to have a communications link

Western Power may install a meter without a communications link if one of the following exclusions applies:

1. In the case of a contestable metering installation, a metering installation without a communications link can be installed if a communications link that is supported by Western Power is:
 - not available, or could not reasonably be made available, at the metering installation (this is because in some remote areas it is not economically feasible to install a communications link; and
 - unable to support the necessary reliability requirements including, for example, basements and other areas where communications signals can be impeded.¹¹
2. In the case of a non-contestable metering installation, a metering installation without a communications link installed if a communications link is:
 - not available/supported, or could not reasonably be made available/supported, as above; or
 - as opted by the user.

These exemptions will be outlined outside the metering specification table as they apply regardless of meter type.

Western Power estimates approximately 1,000 meters meet the first exemption criteria. Over time, meters falling into this category may decrease as communications infrastructure changes or is rolled out to more locations.

¹¹ Reliability requirements are outlined in clause 3.11 of the Metering Code.

Minimum hardware requirements

In addition to the minimum type 4 requirement, all new meters installed from 1 January 2022 in the SWIN must have hardware capable of providing interval energy data at five-minute granularity, even if the associated software/firmware is not installed or configured at the time the meter is installed. This is because the software/firmware can be installed and/or configured when it is required at relatively low cost, whereas the cost of replacing newly installed meters that do not have the required hardware is much higher.

This requirement codifies existing practice, including that all AMI meters have hardware that can read interval energy data at five-minute granularity.

This requirement will be specified outside the metering specification table as it applies to all meters in the SWIN regardless of type.

Deemed accumulation meters

Under section 3.2 of the Metering Code Western Power can deem an interval meter as an accumulation meter. This means that Western Power is not required to provide energy data to AEMO for settlement as the meter will be settled as part of Synergy's NWM.¹² Western Power can however record interval energy data for deemed accumulation meters and provide this interval energy data to the user at its request. For example, for some non-contestable meters that are settled in the NWM Western Power provides Synergy interval energy data for implementation of the Distributed Energy Buyback Scheme (DEBS).

The Taskforce has determined that all contestable loads and generators in the SWIN are to be settled on a five-minute basis. Therefore, Western Power must not be able to deem such meters as accumulation meters as that would mean they would be settled through the NWM, rather than on a five-minute basis. In addition, some contestable loads are served by retailers other than Synergy and therefore those meters are not able to be settled through the NWM.

The Metering Code will be amended to enable Western Power to only deem non-contestable meters as accumulation meters.

Bi-directional electricity flows

Consequential to the above is a proposed amendment to the metering of bi-directional electricity flows. Given the proposed definition of throughput, it is important both the import and export channels (rather than the net MWh amount) are recorded by a meter measuring bi-directional electricity flows.

Clause 3.3C, which prescribes how a network operator must measure bi-directional electricity flows, will be clarified to require both the import and export channels to be recorded.

This will apply for all meters covered by the Metering Code,¹³ not just the SWIN.

¹² The NWM represents the load of non-contestable customers and unmetered loads (both of which must be served by Synergy under the current legislative framework. The value of the NWM is calculated as the difference between total loss-adjusted generation and the total loss-adjusted metered consumption of contestable (interval metered) loads.

¹³ Any user with an electricity licence under *the Electricity Industry Act 2004* is required to comply with the Metering Code as a condition of their licence. Therefore that any meters that fall within the scope of an electricity licence are covered by the Metering Code.

Meter requirements – Amendments summary

- Annual throughout will be defined as the total flow of energy through the meter.
- Western Power can only deem a non-contestable interval meter as an accumulation meter.
- A network operator must record both the import and export channels for a meter measuring bi-directional electricity flows.
- From 1 January 2022:
 - all new interval meters in the SWIN must have hardware capable of reading energy data at five-minute granularity.
 - Western Power cannot install any new type 5 or 6 meters in the SWIN.
 - Western Power cannot install any new manually read meters unless an exemption applies.

2.1.2 Meter type specifications for contestable load and generator meters in the SWIN

The amendments outlined above provide a foundation for five-minute settlement of contestable load and generator meters and support any future policy decisions relating to the settlement of non-contestable meters.

The Metering Code will define the group of contestable load and generator meters as ‘5MS meters’ (five-minute settlement meters) so that requirements for these meters can be specified.

5MS meters will be defined as all metering points in the SWIN associated with a contestable customer or generator. Under the existing framework, this includes all types 1-5 meters, as well as some type 6 meters (for example, where a type 6 meter measures greater than 50 MWh consumption a year, but the customer has not transferred to another retailer and therefore has not installed a type 5 (or above) meter).

Amendments outlined in section 2.1.1 above require all meters in the SWIN to have hardware with five-minute interval-reading capability when they are replaced. Additional amendments are required to ensure that all 5MS meters have five-minute interval capability (both the hardware and the software/firmware) from 1 October 2025 when five-minute settlement will commence (five-minute settlement commencement date).

The Metering Code will be amended to require all 5MS meters to have five-minute interval-reading capability (and for this capability to be enabled by appropriate software being installed and configured) by five-minute settlement commencement.

An existing meter must be replaced if its hardware is not capable of reading energy data at five-minute granularity. An existing meter can be reconfigured if its hardware can read energy data at five-minute granularity but the software/firmware is not currently configured to enable this capability.

Western Power has advised 20,809 meters need to be replaced and an additional 7,217 meters require reconfiguring, as outlined in Table 3.

Table 3: 5MS meters to be replaced or reconfigured

Metering Installation Type	Throughput/ year	Meters to be replaced	Meters to be reconfigured	Total contestable and generator meters installed
1	>1,000GWh	10	4	14
2	100GWh up to but not including <1,000GWh	48	68	116
3	750MWh up to but not including <100GWh	1,090	484	1,574
4	300MWh up to but not including <750MWh	9,478	3,524	13,002
5 ¹⁴	50MWh up to but not including <300MWh	12,183	3,137	15,320
Total		22,809	7,217	30,026

Source: Western Power

Western Power is not required to install a communications link for existing type 5 and 6 interval meters. However, if a type 5 or 6 is to be replaced as it cannot provide energy data at five-minute granularity, then it must be replaced with a type 4 (or higher as appropriate) meter and therefore a communications link must be installed unless an exemption applies (see section 2.1.1.).

ICT upgrades are also required to enable the additional data to be transmitted, stored and manipulated.

Western Power estimates the cost of these meter and ICT works to be approximately \$25.5 million (+/- 50%) over 4.5 years.

The cost of these works will be recovered from network users as follows:

- For metering upgrades: from applicable contestable customers over 15 years.
- For ICT works: from all network users over six years.

This is consistent with the standard approach to Western Power recovering costs when it replaces a meter at the end of its economic life.

Western Power advised that the residual value of meters being replaced to implement five-minute settlement is \$2.37 million, based on the current installation program timing. This low residual value is indicative of meters being close to the end of their economic life and therefore the timing of replacement for reform not being much earlier than their planned business-as-usual replacement.

¹⁴ Includes from meters that are currently classified as type 6 but have a consumption that exceeds the contestability threshold. This table was accurate as of August 2020.

This lost residual value is marginal in the context of the total cost of meter replacement and the implications of a delay for market-related costs.

Grandfathering arrangements

Western Power will not be required to install a meter at a metering point were the Metering Code currently permits SCADA¹⁵ data to be used for settlement.

Section 3.14 currently grandfathers the metering installations that were installed or committed to be installed in 2005 when the original Metering Code commenced. This enables SCADA data to be used for settlement, which is otherwise prohibited by the *National Measurements Act 1960* (Cth) and/or the Metering Code.

SCADA can provide energy data up to four second granularity and as such is suitable for five-minute settlement (as permitted by the Metering Code for grandfathered metering installations only).

There are 10 metering installations that are grandfathered. The former State Government's previous reform program estimated it would cost \$40 million to install meters at these grandfathered metering points. Given the high cost of installing new meters and that the remaining economic life of some of these metering installations is short, it is not prudent to invest in meters for these connection points.

The Metering Code amendments to require all 5MS meters to have five-minute interval reading capability are drafted to exclude metering installations grandfathered under section 2.14.

Meter Specifications - Amendment summary

- All 5MS meters must be capable of reading energy data at five-minute granularity from five-minute settlement commencement (1 October 2025).
- Existing metering installations subject to grandfather arrangements are not required to be replaced.

2.2 Provision of energy data to AEMO

Western Power is currently required to provide AEMO energy data for interval meters at 30-minute granularity. It is not required to provide energy data to AEMO for accumulation meters (including deemed accumulation meters) as these meters are settled as part of the NWM.

The Metering Code will be amended to require Western Power to provide interval energy data at the following granularities from 1 October 2025 onwards:

- Five-minutes for 5MS meters (being contestable and generator meters).
- 30-minutes for meters associated with non-contestable customers.

Western Power will continue to not be required to provide AEMO energy data for accumulation or deemed accumulation meters as these will continue to be settled through the NWM.

Provision of energy data to AEMO - Amendment summary

- From 1 October 2025, Western Power must provide AEMO interval energy data at five-minute granularity for all 5MS meters.

¹⁵ SCADA stands for Supervisory Control and Data Acquisition, an industry standard for gathering and analysing real-time data from equipment, including generators.

3. Weekly settlement timeline

AEMO requires Western Power to provide its meter data on at least a weekly basis to enable it to implement the weekly settlement timeline endorsed by the Taskforce as part of the Strategy.

The Metering Code will be amended to require Western Power to read meters on at least a weekly basis.

Most interval meters have remote reading capability. Where meters have remote-reading capability, Western Power can provide weekly meter data using its current frequency of meter reading.

However, there are 6,352 contestable load meters that are currently manually read and do not have the capability to be remotely read. Western Power has advised that reading these meters weekly would be prohibitively expensive at approximately four times more the current read cost. Instead, an estimation method can be developed to calculate weekly data for settlement, with adjustments taking place when more accurate data becomes available.

The Metering Code currently only enables Western Power to use an estimation method in specific cases, such as the data being corrupt or missing. It does not permit an estimation method to be used on an ongoing basis.

Amendments to the Metering Code are required to enable Western Power to develop and use a method to estimate weekly data from monthly meter readings. This estimation method must be:

- outlined in the Metrology Procedure approved by the ERA; and
- compliant with the *National Measurements Act 1960* (Cth) and the Metering Code.

The estimation method will only be able to be used for manually read metering installations.

The amendments will require Western Power to submit to the Economic Regulation Authority for approval a revised Metrology Procedure, including its proposed estimation method, no later than 1 October 2021 (12 months prior to commencement of weekly settlement).

Weekly settlement timeline - Amendment summary

- Western Power must read meters on at least a weekly basis.
- Western Power must develop an estimation method to calculate weekly energy data for manually read meters.

4. Summary of changes

The proposed amendments that are being consulted on in this process are marked up in **blue** in the attached draft Metering Code (Attachment 1).

Table 4 summarises the proposed amendments. (Note, minor drafting amendments – for example, replacing IMO with AEMO – have not been included in this table).

Table 4: Summary of proposed Metering Code amendments

What is the desired policy outcome?	How will this be achieved?	
	Section	Description of change
Implement five-minute settlement	1.3	<p>New defined terms:</p> <ul style="list-style-type: none"> • 5MS meter • 30-minute interval energy data • 30-minute interval meter • 30-minute metering interval • 2021 amendments date • 2021 Metering Code amendments • five-minute interval energy data • five-minute interval meter • five-minute metering interval • five-minute settlement commencement • manually read interval metering installation • metering interval • non-contestable customer • SWIN • throughput • weekly settlement commencement <p>Amended defined terms:</p> <ul style="list-style-type: none"> • accumulation energy data • interval energy data • interval meter <p>Deleted defined terms:</p> <ul style="list-style-type: none"> • trading interval (replaced with metering interval)
	3.2	Preclude Western Power from deeming a contestable load or generator interval meter as an accumulation meter.
	3.3C	For meters that record bi-directional energy flows, require the network operator to separately record the import and export channels (rather than the net flow).
	3.9	Refer the new metering specification table for the SWIN (Table3) Note: the existing Table 3 – which applies outside the SWIN – has been moved to Table 3A. Subsequent amendments to add reference to Table 3A have been included as necessary throughout the Metering Code.

	Clarify that meter type is defined in terms of the ‘throughput’ of the associated connection point. Note: Where a connection point is associated with a contestable customer then any meter associated with that connection point is considered contestable. For example, a connection point may have a throughput of 60MWh a year, and have two associated meters each reading 30MWh a year. Despite the individual meter reading less than 50MWh, it is contestable as it is associated with a contestable connection point.
3.13(1)	Clarify meter types are defined in terms of ‘throughput’.
3.13(3)(b)	Replace trading interval with metering interval to better reflect that it refers to the granularity of meter reads. Subsequent amendments have been made throughout the Metering Code (and are not repeated in this table).
3.15	Replace reference to the network described in Part 9 of the Act with SWIN for ease of reference.
3.16(1)	Require energy data to be recorded at five-minute granularity for contestable load and generator meters and 30-minute granularity for non-contestable load meters.
3.16(1A)	Require all interval meters associated with a non-contestable customer must have hardware capable of reading energy data at five-minute granularity (although it is not required to have the associated software/hardware installed/configured).
3.16(2A)	Outline when a metering installation is exempt from the requirement to have a communications link (see section 2.1.1).
3.16(3) and 3.16(3A)	Require a 5MS meter to record energy data at five-minute granularity from five-minute settlement commencement.
3.16(3B)	Prohibit the installation of a type 5 or 6 meter from 1 January 2022.
3.16(3C)	Require all the Metering Code provisions relating to type 5 and 6 meters that exist on 1 January 2022 to continue to apply to those meters until they are replaced with a type 1-4 meter.
3.18A	Require Western Power to have a meter capable of providing data at five-minute granularity in place for contestable load and generator meters by five-minute settlement commencement.
4.1 and 4.1(1A)	Require Western Power to store in its metering database energy data at five-minute granularity for contestable load and generator meters, and 30-minute granularity for non-contestable interval meters. Clarify that prior to 1 October 2025, all interval data is to be stored at 30-minute granularity.
5.3(2)	Require energy data for a meter that measures bi-directional energy flow to include a separate measurement of each channel and, from five-minute settlement commencements, to be at five-minute granularity for 5MS meters.
5.6(5)	Data Western Power provides to users and AEMO must include both the import and export channels for meters that measures bi-directional energy flows and, for contestable load and

		generators meters, data at five-minute granularity from 1 October 2025.
	Appendix 1: Table 3 and 3A	<p>Addition of new table 3 to outline the meter specifications for the SWIN.</p> <p>Existing table 3 – which now only applies outside the SWIN - has been renamed table 3A.</p>
Implement weekly settlement	5.3(3)	Require Western Power to read all interval meters weekly.
	5.22(3)	Western Power can use the method in the Metrology Procedure to estimate energy data.
	5.22(7)	<p>Western Power is not required to read manually read meters on a weekly basis.</p> <p>Western Power can use the method in the Metrology Procedure to estimate weekly energy data for manually read meters.</p>
	6.22	Transitional provision: Western Power must provide the ERA, no later than 1 October 2021 (12 months prior to Weekly Settlement Commencement), a revised Metrology Procedure including the proposed method to estimate weekly data for manually read meters. The estimation method must be consistent with the <i>National Measurements Act 1960 (Cth)</i> and the Metering Code.
Other administrative	1.3	<p>New defined terms:</p> <ul style="list-style-type: none"> • electricity generation and retail corporation <p>Deleted defined terms:</p> <ul style="list-style-type: none"> • electricity retail corporation • IMO

5. Next steps

The project milestones are as follows:

- Virtual industry forum – Wednesday 9 December 2020 (3:00pm – 4:30pm)
- Consultation period closes – Monday 1 February 2021 (5:00pm)
- Amendments submitted to the Minister for Energy for approval – March 2021

The intent is that the amendments will be Gazetted as soon as possible following Ministerial approval to provide certainty for Western Power and other industry stakeholders.

The amendments will commence on the date of Gazettal.

Attachment 1: Proposed amendments to the Metering Code