



Powered by Wattwatchers

Lessons Learnt Report

Milestone 6 (November 2022 to June 2023)

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Terms and Definitions

Term	Definition
ACAP	Australian Centre for Advanced Photovoltaics
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
API	Application Programming Interface
APVI	Australian PV Institute
ANU	Australian National University
CDR	Consumer Data Rights
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSV	Comma Separated Values
DAP	Data Advisory Panel
EDP	Energy Data Platform
EV	Electric Vehicle
GDPR	General Data Protection Regulation
MEM	My Energy Marketplace
MyEnergy	Wattwatchers MyEnergy mobile application
RCAC	Reverse Cycle Air-Conditioning
SME	Small and Medium Enterprise
T&Cs	Terms and Conditions
UNSW	University of New South Wales

Project Overview and Update

The My Energy Marketplace (MEM) project, led by Wattwatchers Digital Energy (Wattwatchers), has developed a large new energy-data resource in Australia, along with the 'soft infrastructure' for increasing consumer participation in the electricity system as the energy transition unfolds.

This 'soft infrastructure' includes customer-friendly terms and conditions (T&Cs); principles for collecting and hosting customer energy data; and software tools to enable a 'marketplace' for sharing this data. This in turn provides services to maintain economic, health and social standards as consumers are under increasing pressure to manage and reduce energy costs while Australia progresses towards Net Zero outcomes. This provides value to consumers, to understand their energy consumption and manage their costs, and also additional value to the energy industry through data visibility and sharing.

The MEM is an approximately \$9.6 million project, with \$2.7 million in grant funding from ARENA being focused mainly on subsidising participation in the project by homes, small businesses and schools.

Now at the completion of the 3.75-year extended project duration, all but one of the key target outcomes for the project have been achieved. This is despite disruption from Covid 19, global supply-chain issues and cost increases, industry resource constraints and major weather events in several states.

Our focus for this milestone period has been on the continued scale-up of the device deployment with our rollout partners in the lead up to project completion activities. We completed the delivery of our first commercial data services implementation with the Australian Centre for Advanced Photovoltaics (ACAP) via the University of New South Wales (UNSW Sydney), as well as establishing a new project with CSIRO and its Data Clearing House, the NSW Digital Infrastructure for Energy Flexibility (NSW DIEF).

Our MyEnergy app development has been focused on implementing new user engagement features to support marketplace offers and energy data insights. The original intention of developing 'an app store for energy' is also being realised by our partner apps, as they integrate these offers into their own apps and customer communication channels.

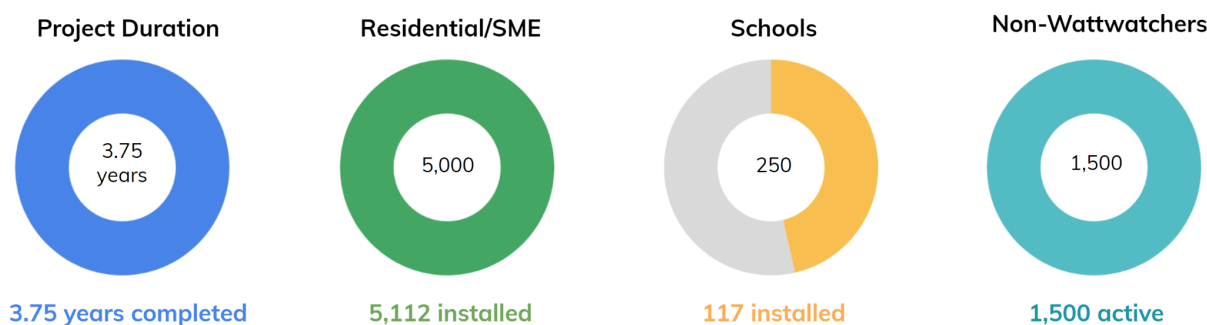


Figure 1 - MEM rollout results at project completion (30 June 2023)

The MEM project also has reached the following key achievements in this period:

- Continued development of features for the consumer-facing mobile app, MyEnergy, developed for MEM customers.
- The creation and continued expansion of opportunities for MEM participation using third-party apps, dashboards and analytic tools. This includes the existing apps from Clipsal Cortex and Solar Analytics as well as integrations with EV Charging solutions provider ChargeHQ.
- Data from 900 utility-style electricity smart metering devices, as well as data from 600 EV charging customers, is now being ingested, demonstrating how the data from 1,500 non-Wattwatchers devices and data can form part of the MEM.
- Scaling up of the data services aspects of the project, with 7 new data sharing agreements established including the new (NSW Government) grant-funded project with CSIRO, which will both utilise existing MEM data from 2,000 sites, and create 50 new MEM sites from the Commercial and Industrial (C&I) sector (currently mainly unrepresented in the MEM).
- Further validation of the 'soft infrastructure' developed in the project—consisting of plain-language legal terms and conditions, security protocols, a data governance framework and enhanced data analysis tool sets—is being achieved through expanded customer participation and data services negotiations.

This document provides a summary of the key lessons learnt in the final project Milestone 6 period from November 2022 to June 2023.

Lessons learnt and key reflections

Financial

Continuing to establish a self-sustaining data services business model

This project has utilised funding from ARENA as a proxy for customer payments to enable an opt-in data sharing and marketplace model for consumers to access discounted monitoring.

The MEM is able to provide monitoring accessibility to energy stakeholder while minimising both costs and time delays. For example, research organisations can access data through the MEM without needing to install costly hardware, which can vary between \$1,000 - \$2,000. There is further value in the time avoided to capture the typical amount of 12-24 months of data before commencing detailed analysis. The MEM addresses both of these aspects at a far lower cost of \$250 - \$1,000 per device, by making the anonymised data available from existing installed devices that provide continuously-updating data in near real-time.

This emerging business model is based on the experience of the 25% ARENA rebate tier that provided a \$229 discount for hardware installations. The additional revenue for MEM data services offsets the upfront hardware and installation costs to reduce the costs to consumers.

Over the last 12 months in particular, Wattwatchers has been ramping up discussions with our customers and industry partners about the data available from this project, now that it has achieved scale of over 5,000 devices installed.

The previously launched marketplace offer for the ACAP/UNSW EDP project¹ was the first MEM data commercial engagement that demonstrates how the MEM is progressing towards becoming a self-sustaining business model, provided that additional data services customers are secured over the next 6–12 months.

Wattwatchers will further demonstrate this capability with the new 3-year project with CSIRO for the NSW Digital Infrastructure for Energy Flexibility (NSW DIEF)², that

¹ <https://wattwatchers.com.au/how-to-get-rewarded-for-sharing-your-home-energy-data-with-researchers/>

² <https://www.csiro.au/news/All/News/2023/August/Smart-buildings-project-to-cut-emissions-and-electricity-costs-in-NSW>

commenced early in 2023. This project leverages the MEM data, and will expand it with additional commercial/industrial sites and integration into the CSIRO's Data Clearing House (DCH) to develop additional value and capability for both Wattwatchers and CSIRO.

These activities have been part of realising the original vision of the project to establish the MEM as a new line of self-sustaining business for Wattwatchers. This provides additional value and services to customers, while following a secure and opt-in ethos to provide lower device and data costs for both consumers and industry participants.

Social and Customer

'Electrification of everything' is accelerating

Australians are living in a period of rapid inflation and increases in the cost of living. The accelerating retirement of legacy coal-fired electricity generation, and the dramatic increase in gas prices (triggered in part by international events) has further exacerbated these increases. All the while the energy market was operating in an extremely volatile year, with smaller retailers being pushed out and others struggling to continue to operate.

The results of all of these forces are being felt by consumers, with energy tariff rates doubling (or more) in some cases. While rooftop solar installations continue to expand at a rapid pace³ customers—both with and without solar—are realising the benefits of electrification with a focus on the transition away from gas and fossil fuels. This has led to heat pumps for hot water and Reverse Cycle Air-Conditioning (RCAC) becoming the most cost-effective ways of heating and cooling.

As premium solar feed-in tariff periods come to an end, consumers are also looking for more intelligent solutions to optimise self-consumption of their own solar generation to realise the benefits of their investment in solar. This is coming in the form of solutions for hot water, pool pumps and other controllable loads that ensure they operate when there is solar generation available.

Major MEM deployment partner Clipsal Cortex has signalled the release in July 2023 of a switchable option, utilising the Wattwatchers Auditor 6M+3SW monitoring plus control

³ <https://www.energycouncil.com.au/media/buqozv3k/australian-energy-council-solar-report-q1-2023.pdf>

device version, to enable household loads (starting with hot water) to be timed with solar availability through the Clipsal Cortex Home Energy Management System (HEMS) app⁴.

A range of new Electric Vehicles (EVs) has also entered the Australian market, with a rapid expansion of models from existing and new manufactures soon to be available. The opportunity to run an EV on 'green power' from your own solar panels, whilst simultaneously maximising self-consumption, presents a unique opportunity for electrification. This is why start-up company ChargeHQ⁵ has developed software to automate the charging of EVs from solar power with data from solar inverters and devices like Wattwatchers MEM devices to reduce the cost to charge and maximise the locally available renewable energy.

This 'electrification of everything' is accelerating at a rapid pace, driven by high energy prices and more efficient electric options becoming available for heating, cooling, cooking and transportation. This presents an opportunity to not only reduce cost for consumers able to invest in solar and batteries, but also reduce energy consumption and fossil fuel use over a range of everyday activities, delivering decarbonisation without compromising on quality of life or usability.

Impacts from global supply chain disruption have improved but remain

The major disruptions in prior periods from Covid 19 have eased substantially in Australia over the last 12 months. However, global supply-chain impacts continued to delay shipments of some goods and equipment as well as increasing prices across many industries due to a range of issues.

These events have also occurred in a period where there are increasing impacts to the general economy, as many of us are well aware, with much higher than normal inflation due to both domestic and global issues.

All of these issues have impacted end customers with delays to installations, reconsideration of household budgets and installation availability, as well as new customers receiving prices higher than in the years before.

Wattwatchers has been able to work closely with our manufacturing and rollout partners to work through these issues to meet and exceed the targets and objectives of this project.

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https://www.linkedin.com/feed/update/urn:li:activity:7077897649940557824?updateEntityUrn=urn%3Ali%3Afs_feedUpdate%3A%28V2%2Curn%3Ali%3Aactivity%3A7077897649940557824%29

⁵ <https://chargehq.net/>

Technical

A range of solutions are required for data services users

Wattwatchers has engaged with a range of research institutions and commercial businesses which have been interested in the data services available from the MEM. The data sharing agreements established as part of this project have provided the opportunity to experiment with the methods of providing access to this data as well as understanding the needs of a variety of data users.

Wattwatchers provides web tools to install, operate and manage devices as well as a web Dashboard to access and download data. These tools are more suited to business users who may not have access to software development teams to build new solutions or who do not necessarily need complex reporting. However, these standard tools typically provide access to potentially identifying information such as device names and customer site information that cannot be shared as part of the anonymised data sharing model of the MEM.

The Wattwatchers API⁶ is the standard method of providing access to a large number of devices and data for integration into external systems. As part of the MEM, Wattwatchers developed anonymisation features for the API to ensure that no identifying information would be available to users of MEM data services.

It should be recognised that each MEM device produces 66 energy and power quality measurements every 5 minutes. This equates to over 19,000 measurements per device per day, or nearly 7 million measurements per year. This means that customers rapidly outgrow simple spreadsheets or CSV files for managing the volumes of data involved.

A number of MEM data services users also needed access to tools to download the anonymised data from the Wattwatchers API. To enable this, Wattwatchers developed a tool using Jupyter Notebook,⁷ which is a web application for creating and sharing computational documents. It offers a simple, streamlined, document-centric experience with the reference code provided by Wattwatchers that enables users to edit a few simple parameters (like an API key and start and end dates) and then the data can be downloaded in simple CSV formats to the user's computer or cloud storage. The Notebook also acts as a 'how to' guide for users of the API, with examples in the python programming language.

⁶ <https://docs.wattwatchers.com.au/>

⁷ <https://service.wattwatchers.com.au/long-energy-data-download-using-jupyter-notebook>

Wattwatchers has also supported some individual users who did not have the capability to use the API or Jupyter Notebook. These users were provided a CSV export for a small number of devices directly by the Wattwatchers project and support teams.

While the Wattwatchers API continues to be the primary method of providing access to anonymised MEM data, it is necessary to support other low-code or no-code methods to support the range of users who want access to the MEM data.

Legal and Governance

Rapid access to data is limited by customer procurement processes

Wattwatchers previously developed a short-form 2-page agreement to facilitate rapid access to MEM data on standardised terms. In this milestone period Wattwatchers established 7 new data sharing agreements where 4 of them used this standard agreement but the remaining 3 needed customised terms and conditions to be developed.

In one instance, this formed part of the larger project agreement that was more appropriate to the project specific requirements of the grant-funded project. Two other agreements with research institutions required substantial review and feedback due to the procurement and commercial processes of those organisations. This represents a substantial challenge, particularly for rapid prototyping on trial terms at no-charge. While ultimately these negotiations were successfully completed, they needed to be guided back to the Wattwatchers lean agreement approach or material commercial terms and costs would have been required.

Wattwatchers has successfully demonstrated and continues to use the short-form agreement as a lean approach so that organisations can quickly develop proof-of-concept integration and gain experience with the MEM data before establishing more substantial and specific agreements unique to each project.

Regulatory

Competing definitions of data ownership complicate data sharing

Wattwatchers had the opportunity to test the MEM data-sharing principles with a number of Australian utility customers in this milestone period. While the fundamental approach of being able to share anonymised data with customer consent is generally supported, the data ownership is complicated by the requirements of the Australian Electricity Network

Distribution Licences. These Licences generally require the utility to 'own' all data associated with their devices and jurisdictional requirements also apply that further complicate the situation that varies throughout the Australian market.

This is in conflict with the consumer law position that the organisation which initially collects the data (the data controller) owns the data and controls who has access to it (data recipients). This principle is enshrined in established international agreements such as the GDPR⁸ that support data sharing models in international markets.

Furthermore, managing cybersecurity requirements is of increasing importance, particularly to utility businesses deemed to be providing an 'essential service'. Changes to federal regulations with a particular focus on critical infrastructure need to be considered and addressed and may supersede consumer law protections.⁹

We were able to work through these complex issues to achieve a beneficial outcome for all parties—including for the end user where devices would be installed. Careful consideration and definition of the data and its uses were a key part of resolving the issues.

This demonstrates the complexities of data ownership and the overarching requirements of energy utilities in the local Australian market that can potentially restrict innovative ways of delivering these services that were successfully overcome in this project.

Driving regulatory change with submissions to industry engagements

Wattwatchers has made a number of submissions to regulatory processes to help drive change and improvement in the industry, leveraging our experiences in the MEM.

We responded to the AEMC Review of the regulatory framework for metering services¹⁰ in February 2023, in which Wattwatchers indicated there was a genuine reform opportunity: to accelerate the rollout of digital metering for customer billing and market reconciliation purposes (i.e. settlement¹¹); while also laying foundations for customers to gain greater benefit in a much more diverse, data-led, and genuinely competitive metering, monitoring and remote control/automation marketplace - one in which consumers have real choices to match their differentiated needs.

⁸ <https://gdpr.eu/>

⁹ <https://www.cisc.gov.au/legislative-information-and-reforms/critical-infrastructure>

¹⁰ <https://www.aemc.gov.au/market-reviews-advice/review-regulatory-framework-metering-services>

Wattwatchers sees the commonly used term 'smart meters' as a misnomer, suggesting as it does that the digital meters (or 'communicating interval meters') being deployed in Australia under the AEMC 'minimum specification' are in some way cutting-edge technologies, when they actually are already outdated and quite limited in technology and functionality terms. For example, data from Smart Meters was historically provided as 15-30 minute interval data for the previous day. This is now moving to 5 minute intervals but still delivered as day-behind data in the industry standard 'NEM12'¹¹ data format.

These limitations may not impede the role of smart meters if they are confined to their core role of being 'settlement meters', but are a major impediment to delivering current and future technology and data-driven services to electricity customers, including in tandem with smart home and smart building automation, and with strong competition among service providers and real choice for customers. By comparison, Wattwatchers MEM devices provide 5 minute and 30 second or 5 second data for both grid and sub-circuits in near-real time via a modern and secure API.

Wattwatchers also responded to the AEMC Unlocking CER Benefits through Flexible Trading¹² consultation process in February 2023. In our view, there is real merit to the concepts of a 'minor energy flow meter' and a 'secondary market' behind the customer's meter. There are many ways in which they can be expanded on and improved to deliver clear benefits to consumers, the electricity system, and the emerging marketplace for 'New Energy' solutions and services, including but not limited to real-time energy transactions and integration with smart home automation and features.

There was also an opportunity to comment on the Energy Security Board's Data Services Delivery Model Consultation Paper¹³ in February 2023, where we highlighted our concerns that given its high level of importance to accelerating and delivering the clean energy transition and decarbonisation for Net Zero targets, the current progress on data strategy is a case of being too little, being done too slowly, and is too limited in terms of its scope and ambition.

We also commented positively on the National Energy Performance Strategy: consultation paper¹⁴ developing a national plan to accelerate demand-side action, including energy efficiency and electrification.

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https://aemo.com.au/-/media/files/electricity/nem/retail_and_metering/market_settlement_and_transfer_solutions/2022/mdff-specification-nem12-nem13-v25.pdf?la=en

¹² <https://www.aemc.gov.au/rule-changes/unlocking-CER-benefits-through-flexible-trading>

¹³ <https://esb-post2025-market-design.aemc.gov.au/data-strategy>

¹⁴ <https://consult.dcceew.gov.au/heps-consultation-paper>

Wattwatchers will continue to provide input to these industry consultation and development processes to provide learnings from our experience with the MEM and other business activities. The dataset now available as a result of the MEM provides an industry leading example of an accessible and highly-granular resource to support the rapid analysis of current customer energy usage patterns and behaviours to further accelerate the 'electrification of everything'.

MEM Applications

Apple vs Android: iPhone preferred by MyEnergy users

Wattwatchers recognised that it would be essential to support smartphones running both Apple iOS and the open-source Android operating system when developing the MyEnergy app. The development approach used application frameworks that were compatible with both platforms to avoid unnecessary duplication during the app development process.

Throughout the project, there has been a much stronger user base on the Apple iOS platform than Android devices. Apple devices have remained on average around 75% of the MyEnergy users and finished at just over 78% in the final months of the project.

Apple vs Android App Installations (30 Jun 2023)

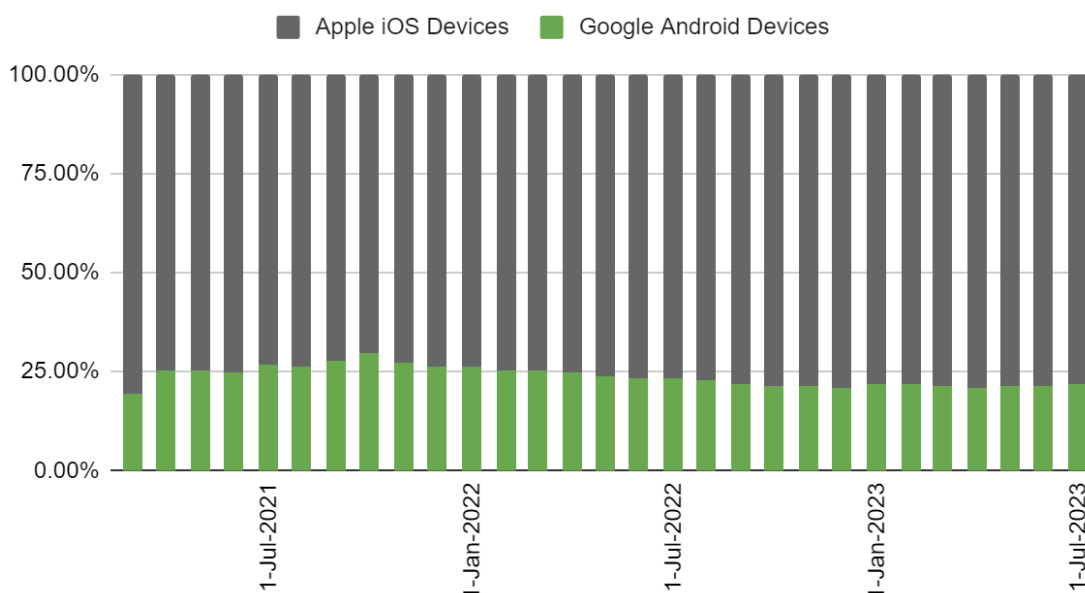


Figure 2 - Apple (grey) vs Android (green) App Installations

One hypothesis for this strong preference of Apple devices in our user base is that the type of customers interested in energy management are more likely to be interested in technology, and thus the benefits of the integrated Apple device ecosystem. It could also reflect the age of participants and their relative affluence (as they are likely to be property owners).

Wattwatchers will continue to develop and support the MyEnergy app for both Apple and Android devices to ensure that the MEM remains available to the largest number of users possible.

MyEnergy Flow developments

The development of the new Flow features in the MyEnergy app (version 2.0) have continued during this period. One development in this milestone was a change in the technical details of data sharing with app partners.

We originally proposed an OAuth-style model of customer permissioning, allowing a MyEnergy user to opt-in to providing data to third-party app developers whose apps were promoted in the marketplace.

After discussions with multiple developers, we have landed on a simplified model that maintains Wattwatchers' standard API implementation, which greatly reduces the effort required by third-party developers to engage in the marketplace.

The MyEnergy user interface has also been streamlined with a simple "approve access" option and an easy method for copying the Wattwatchers Device Serial number into an external application or website to complete the external registration process.

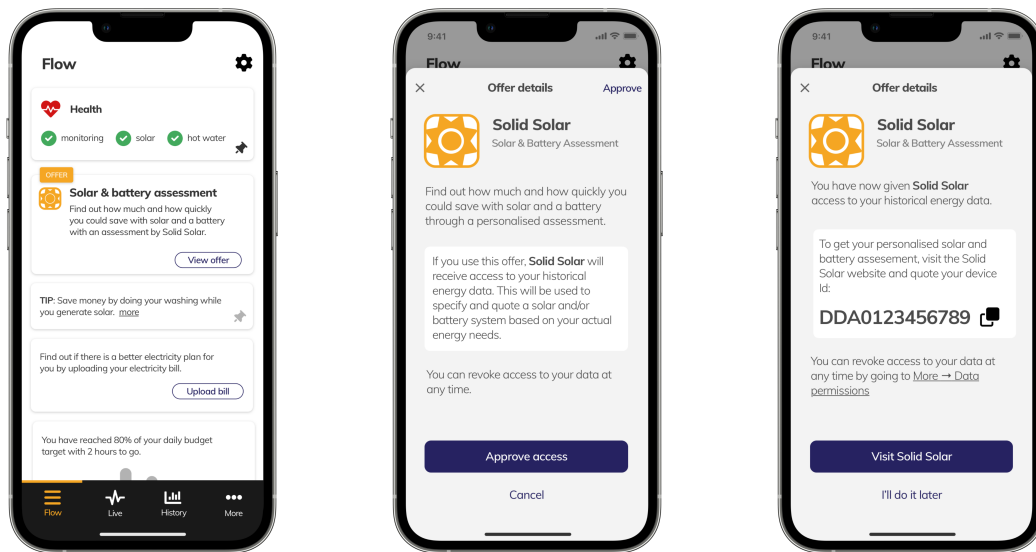


Figure 3 - New MyEnergy Flow simplified data sharing features (development preview of example offer only)

This will support a number of offers to be easily accessible through the MyEnergy Flow interface from a variety of partners in the near future.

Next Steps

Wattwatchers has now completed the ARENA-funded stages of the project and has commenced transitioning the MEM to a Business-as-Usual activity, as part of our ongoing strategic growth initiatives. This involves continuing to offer discounted hardware in return for the rights to share the data under the MEM terms and conditions, whilst also engaging with research and commercial organisations which seek the valuable data the MEM has developed.

New opportunities continue to emerge in the data services space to utilise the MEM data for its intended purpose. Wattwatchers is excited to be a key part of the energy industry transition to deliver the outcomes of the MEM as a new range of innovative data services to energy and data users in the Australian and international markets.

More Information

If you would like more information regarding the My Energy Marketplace project, please contact us using the links below.

Website: <https://wattwatchers.com.au/about/#contact-us>

Email: info@wattwatchers.com.au