

Energy as a Service

The benefits, challenges,
and opportunities for the
acceleration of EaaS in Australia

December 2022

About this report

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This report was commissioned by the Australian Renewable Energy Agency (ARENA), on behalf of the Distributed Energy Integration Program (DEIP). This report has been written by Accenture Pty Ltd with input from the DEIP. The report presents the findings of Accenture, which was prepared to explore the role of Energy-as-a-Service (EaaS) in Australia. The report is provided as is, without any guarantee, representation, condition, or warranty of any kind, either express, implied or statutory. ARENA, the DEIP and Accenture do not assume any liability with respect to any reliance placed on this report by third parties. If a third party relies on the report in any way, that party assumes the entire risk as to the accuracy, currency or completeness of the information contained in the report.

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Acknowledgement

ARENA and Accenture would like to thank all the stakeholders who contributed their time in consultations for this report. A full list of stakeholders is provided in the appendix

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Glossary

Term	Definition
C&I	Commercial & Industrial customer segment Energy retailers offer different contracts for different consumption levels. C&I customers are those that use >100MWh per annum, such as factories and refrigeration facilities. For the purposes of this report, large public sector companies (e.g municipalities, universities, schools & hospitals) are considered C&I.
CAPEX	Capital Expenditure An organisation or household's expenditure to buy, maintain, or improve its fixed assets, such as buildings, vehicles, equipment, or land.
Demand Flex & DR	Demand flexibility & demand response Changes in electricity usage by end-use customers from their normal consumption patterns in response to changing market conditions, especially changes in the price of electricity over time, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardised. This includes using building controls or distributed energy resources to reduce, shed, shift, modulate or generate electricity.
Demand Management	Demand management Overarching management of end-use electricity demand. Demand flex / demand response can be used to optimise the management of demand, as can other management methods, such as undertaking energy efficiency measures.
DEIP	Distributed Energy Integration Program Collaboration of government agencies, market authorities, industry and consumer associations aimed at maximising the value of customers' distributed energy resources for all energy users.
DER	Distributed Energy Resources Smaller generation units that are located on the consumer's side of the meter, e.g. rooftop solar photovoltaic (PV) units.
EPSC	Energy Performance Savings Contract A contract that allows a customer to pay for today's energy efficiency facility upgrades with future energy savings with less capital budget requirements. Usually facilitated through an ESCO providing the up-front capital for upgrades.
ESCO	Energy Service Company Companies that develop, design, build, and arrange financing for projects that save energy, reduce energy costs, and decrease operations and maintenance costs at their customers' facilities.
ETS	Emission Trading Scheme Market-based scheme for environmental improvement that allows parties to buy and sell permits for emissions or credits for reductions in emissions of certain pollutants.
EV	Electric vehicle

Glossary

Term	Definition
FCAS	Frequency Control Ancillary Services Process used by the AEMO to maintain the frequency of the system within the normal operating band around 50 cycles per second. FCAS provides a fast injection of energy, or fast reduction of energy, to manage supply and demand.
FRMP	Financially Responsible Market Participant Usually a retailer, Generator, Market Customer, or a Market Small Generator Aggregator, identified in respect of a connection point. Responsible for dealings with AEMO in relation to a specific load.
FTA	Flexible Trading Arrangement An arrangement that enable end users to separate their controllable electrical resources and have them managed independently from their passive load without needing to establish a second connection point to the distribution network.
HEMS	Home Energy Management Service Services comprised of both hardware, software, and processes that allows the user to monitor energy usage and production and to manually control and/or automate the use of energy within a household.
HVAC	Heating, Ventilation, and Air Conditioning
ICE	Internal combustion engine Fossil fuel reliant engine.
LNSP	Local Network Service Provider The organisation that owns the poles and wires used to distribute electricity to premises within a geographical area and in the relevant participating jurisdiction.
NEM	National Electricity Market Operating in New South Wales, the Australian Capital Territory, Queensland, South Australia, Victoria and Tasmania, the NEM is both a wholesale electricity market and the physical power system.
Novated Lease Agreement	Novated Lease Agreement An agreement between an employee, the employer and a leasing company where the employer uses the employee's gross salary (before tax is deducted) to pay the leasing company for a car the employee uses privately. Novated leases are used in salary sacrifice arrangements.
OEM	Original Equipment Manufacturer A company that makes systems or components that are used in another company's end product.
OPEX	Operating Expenditure An organisation or household's expenditure on ongoing costs.
PPA	Power Purchase Agreement An agreement between a power generator (or vendor) and a purchaser for the sale and supply of energy.

Glossary

Term	Definition
REC	Renewable Energy Certificate A market-based instrument that certifies the bearer owns electricity generated from a renewable energy resource. Once the power provider has fed the energy into the grid, the REC received can then be sold on the open market as an energy commodity. RECs earned may be sold, for example, to other entities that are polluting as a carbon credit to offset their emissions. RECs can be provided as small-scale technology certificates from small scale energy resources (e.g. DER) or as large scale generation units for power stations.
VPP	Virtual Power Plant A network of connected solar PV and batteries that can be coordinated to export and import energy as required, acting as a power plant for multiple energy users.

Entity Acronyms	Entity
ACCC	Australian Competition & Consumer Commission
AER	Australian Energy Regulator
AEMC	Australian Energy Market Commission
ARENA	Australian Renewable Energy Agency
ATO	Australian Taxation Office
CEC	Clean Energy Council
CEFC	Clean Energy Finance Cooperation
ESB	Energy Security Board

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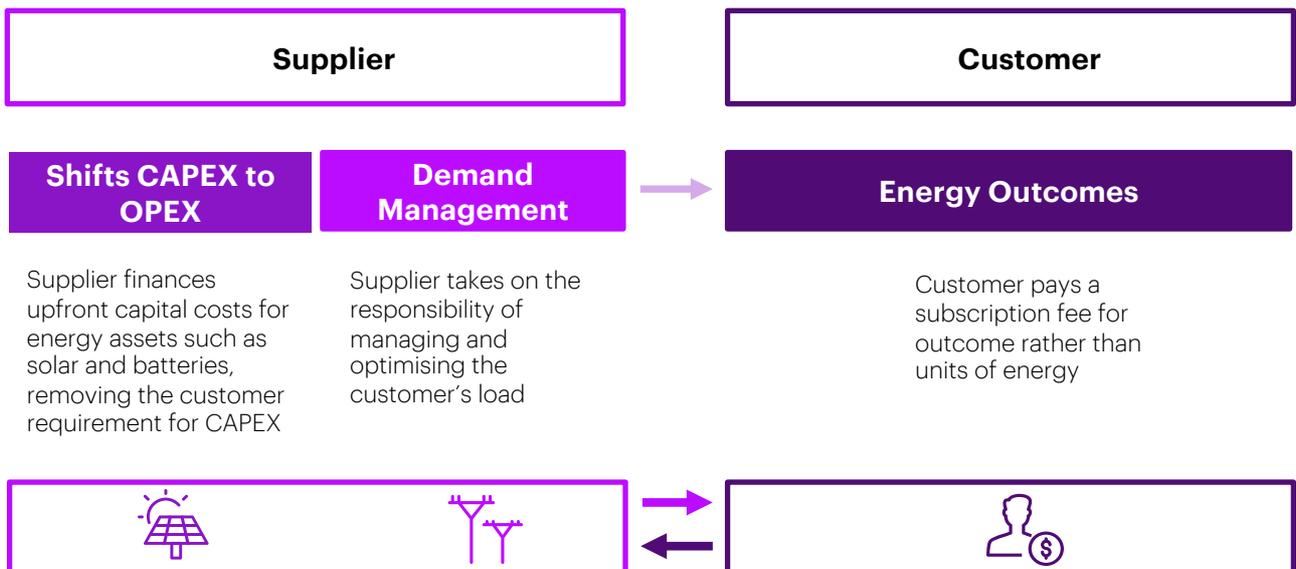
1. Executive summary

Energy as a Service (EaaS) is an emerging business model that shifts the incentive of energy services from volume to optimisation.

EaaS business models typically display one or more of the following characteristics:

- 1. The customer receives a guaranteed outcome.** A customer will pay a fee for a particular outcome or 'energy service'. This contrasts with traditional energy services where a customer pays for a unit of energy, such as a kWh. Examples of services include; heating, lighting, vehicle charging, and mobility.
- 2. The offering shifts CAPEX costs to OPEX costs.** EaaS removes the up-front cost of energy assets, such as solar and batteries, for the customer. Suppliers finance up-front costs, recovering these through an ongoing, predictable, fee¹.
- 3. The offering, to some extent, shifts demand management from customer to supplier.** A supplier takes on the responsibilities and risks of energy demand. In the lesser extent, this is done by optimising DER import versus export. More complex models also include demand optimisation of equipment (e.g. heat pumps, pool pumps, HVAC).

All these characteristics incentivise suppliers to optimise energy production and use. This breaks the traditional incentive to increase the volume of energy production and use. The optimisation of energy usage will organically promote increased demand flexibility and DER.



1. Ownership of energy assets could be by either the customer or the supplier, dependent on the EaaS model.

The acceleration of EaaS can increase demand flexibility and distributed energy resources (DER) in Australia.

The energy system needs to rapidly transition to avoid the most devastating effects of climate change. Yet, this transition is increasing volatility and complexity in the Australian energy market. This poses risk to grid reliability, creating a growing need to actively manage energy use.

Demand flexibility through DER provides an opportunity to actively manage energy. Demand flex shifts and shapes demand to ease pressure on the grid, whilst decarbonising through a lower reliance on fossil energy. Flexibility also allows customers to take advantage of time-dependent lower power prices and sell 'flexibility services' back into the market.

Demand flexibility through DER is a complex task with several challenges which can be overcome through EaaS:

- **EaaS overcomes complexity and skills/capability gaps.** The optimisation of demand flexibility and the DER is outsourced to energy experts.
- **EaaS overcomes high hurdle / discount rates barriers in customer business cases.** DER has high upfront costs, if C&I customers highly discount future savings, the initial investment may not pass internal business cases.
- **EaaS overcomes capital constraints. EaaS models can remove the need for upfront CAPEX.**



Stakeholder consultation suggests that whilst EaaS will most likely not become the dominant form of energy provision in the near-term, it holds a strong and increasing value proposition for a sub-set of customers.

This sub-set includes:



Customers who are capital constrained, either through an inability to borrow or a preference for OPEX.



Customers who place a high value on simplicity and predictability, by overcoming multiple bills and variable energy prices. This is especially beneficial for customers with changing energy usage patterns. EaaS offers customers the ability to be more flexible with their energy usage.



Customers with complex energy needs or wants, such as high levels of consumption across multiple assets requiring digital expertise to optimise (e.g. multiple large commercial sites, a household wanting solar, a battery and an EV).



Customers who wish to engage in flexibility markets, to optimise energy or take advantage of new revenue streams.



Customers with ambitious sustainability targets, which, based on their energy profile, may be difficult to achieve without outsourced expertise.

Most potential suppliers interviewed either have, or are considering offering, some type of EaaS.

EaaS is observed in the market under four different categories, each displaying a different set of the defining characteristics.

Table 1: EaaS business categories and common models observed in the market.

EaaS category	Characteristics			Common models
	Guarantee an outcome	Shifts CAPEX to OPEX	Shifts demand mgmt	
Turnkey Energy-as-a-Service	✓	✓	✓	<p>C&I : Turnkey Energy-as-a-Service models are where the term Energy-as-a-Service is most commonly used. These are predominantly targeted towards C&I customers. They provide the financing, installation and on-going demand management of energy assets for an on-going fee at no upfront cost.</p> <p>These models evolved out of energy performance savings contracts (EPSC) offered by many ESCOs. EPSCs guarantee a certain level of energy savings for a fee, either taking this savings as revenue or sharing with the customer. Turnkey EaaS goes further by also including on-site generation and demand response.</p>
Outcome-as-a-service	✓	Partial: capital outlay for efficiency / retrofit but not generation assets	✓	<p>Residential and C&I: Single outcome-as-a-service model manifest in residential and C&I as heating and lighting-as-a-service. These models manage installation or upgrade of energy efficient lighting and heating for no upfront cost. They then provide an on-going guarantee of light or warm hours for a fee.</p> <p>Mobility: In mobility, similar models are offered with a certain amount of charging (charging-as-a-service) or vehicle use (mobility-as-a-service).</p> <p>The outcome in these models are a product of energy, not energy itself. As such, they do not provide the installation of energy generation assets.</p>
Energy mgmt services	✓		✓	<p>Residential and C&I: Energy management models optimise a customer’s energy usage through demand response, this includes Home energy management services (HEMS) in residential and enterprise energy management in C&I. Services can automate solar, batteries and other appliances, such as heat and pool pumps, to achieve lower energy bills. Some services also generate revenue for the customer, or for supplier & customer in profit-sharing arrangements, through demand response (DR) & FCAS services.</p> <p>Mobility: In mobility this type of service manifests as Vehicle-to-Grid or managed charging, where an EV is used to participate in demand response.</p>
Innovative asset financing		✓		<p>Residential and C&I: Innovative commercial models are being used in residential and C&I to reduce the upfront costs of on-site energy assets, such as solar or EV leasing or providing the benefits of on-site assets virtually through Virtual Power Plant (VPP) models.</p>

Notes: see further information in 3.2The types of EaaS business models

There are several challenges in the Australian market that are limiting the prevalence of EaaS.

Many of these challenges are either macro in nature, pertaining to new energy products and services in general. However, there are several challenges specific to the characteristics of EaaS. These are outlined in Figure 1 and form the key focus areas for the opportunities to accelerate EaaS.

Figure 1: The specific challenges to EaaS.

	Challenge	Effect
 <p>A. Guaranteeing an energy outcome</p>	Lack of availability & access to behind-the-meter data	Inability to accurately forecast, quote, track & deliver EaaS
	Customers 'gaming' the system by changing their consumption once the outcome is contracted	Higher risk premiums incorporated into EaaS contracts
	Lack of supplier expertise in industry specific equipment & processes	Inability to guarantee reliability of operations for C&I customers
	Traditional customer procurement & tendering processes	Bias towards traditional kWh contracts that are easier to compare in tenders
	Striking the right balance in contract terms regarding the allocation of risk	Distrust from perceived disproportionate allocations of risk
 <p>B. Shifting CAPEX to OPEX</p>	Govt. rebates & tax incentives for DER are linked to the buyer of the asset	Incentivises customers to use CAPEX to buy their own assets
	Owner's corp. approval requirements for new energy assets in shared dwellings	Suppliers are stalled or blocked from offering new energy assets to customers in shared dwellings
	Internal combustion engines (ICE) are implicitly biased in novated leases due to their higher OPEX	More customers and employers will choose to use ICEs for novated leases
	Potential EaaS suppliers face a high cost of capital	Increased difficulty to offer EaaS at competitive price points profitably
	The contract length required to recoup capital outlays is longer than customer planning horizons	A preference for asset ownership, so that it is included in property/site equity upon sale
 <p>C. Taking control of demand management</p>	Perceived risks to customer operations from controlling equipment	Hesitancy for C&I customers to outsource control if they perceive risks to operations
	Lack of trust that suppliers will act in a customer's best interest	Hesitancy to cede control to a potential supplier
	Negotiating and communicating profit-sharing arrangements for the value from DR	Confusion & bias against profit-sharing models from customers and procurement processes

Notes: see section 4 Challenges to EaaS for a full description of each challenge.

Seven specific opportunities can be pursued by policy makers and industry bodies to address the set of challenges identified and accelerate EaaS.

- 1. Demonstrate an end-to-end EaaS offering, sharing outcomes to increase supplier and customer knowledge:** customers require demonstrable examples of EaaS to increase their trust in these services, whilst shared knowledge of best practice will also support suppliers.
- 2. Focus current data enhancement initiatives on increasing data accessibility:** Ensure current data enhancement initiatives are focussed on providing customers access to their own real-time metering and DER data, with the agency to share it with third-parties. In addition, support desensitised, aggregated data-sets being used to support the development of offerings that improve energy outcomes.
- 3. Suggest an augmented retailer licence and standard offer:** make a submission to the AER's review of Consumer Protections for Future Energy Services, for EaaS which does not intersect with the essential service of energy, to be considered under an augmented retailer licence. This licence should have a revised set of obligations that extend customer protections, whilst not stifling new entries into the market. A different set of considerations is outlined for EaaS which intersects the essential service of energy. Further, obligations for all EaaS suppliers should include the requirement for a standard offer. The standard offer should include non-prescriptive minimum standards to promote greater trust with customers and support their ability to compare different EaaS offerings².
- 4. Develop dedicated lines of credit for new energy services:** Through the CEFC contributing capital to financial institutions dedicated to innovative clean energy or providing direct concessional loans to EaaS suppliers, and in addition, supporting upskilling of project appraisals and risk assessments, to more accurately consider innovative energy offerings. This should provide more accurate risk premiums, and potentially a lower cost of credit to suppliers, supporting a reduction in the price of EaaS.
- 5. Streamline owner's corporation approvals for managed new energy infrastructure through standard guidelines:** Develop guidelines which address key concerns of owner's corporations which currently cause delays and blockages to new energy assets in shared dwellings. The guidelines should reference EaaS as a relevant business model to meet the guidelines recommendations.
- 6. Review assessment of vehicle expenses in novated leases to remove implicit biases for ICEs:** ICE's are implicitly biased in novated lease arrangements because they have higher operating costs, this does not meet societal objectives of supporting, or at the very least not handicapping, the uptake of EVs.
- 7. Integrate EaaS suppliers into state energy efficiency schemes:** Support EaaS suppliers to become accredited in energy efficiency schemes. Communicate to large C&I customers with complex energy needs³, that EaaS suppliers are well placed to deliver energy efficiency for them through the schemes.

2. Whilst retailer licensing regulations are directed towards residential customers, the standard offer obligation should also be extended to those EaaS suppliers catering to C&I customers. This will support C&I procurement processes, which favor comparable offerings.

3. Who are lagging in uptake of the schemes for a number of reasons outlined in Section 5.3.

Figure 2: The seven opportunities address the full set of specific challenges identified.

Opportunities	Challenges overcome
1 Demonstrate an end-to-end EaaS offering, sharing outcomes to increase supplier and customer knowledge	Lack of supplier expertise in industry specific equipment & processes
	Perceived risks to customer operations from controlling equipment
2 Focus current data enhancement initiatives on increasing data accessibility	Lack of availability & access to behind-the-meter data
3 Suggest an augmented retailer licence and standard offer	Traditional customer procurement & tendering processes
	Appropriately & transparently allocating risk in contracts
	Customers 'gaming' the system by changing their consumption
	Govt. rebates & tax incentives for DER are linked to the buyer of the asset
	Contracts are longer than customers planning horizons without clarity on property/site sale
4 Develop dedicated lines of credit for new energy services	Potential EaaS suppliers face a high cost of capital
5 Streamline approvals for new energy infrastructure through standard guidelines	Owner's corp. approvals for new energy installations in shared dwellings
6 Review assessment of vehicle expenses in novated leases	Internal combustion engines (ICE) are implicitly biased in novated leases due to their higher OPEX
7 Integrate EaaS suppliers into state energy efficiency schemes	Opportunistic

Notes: see full detail in section 5.

These challenges and associated opportunities for acceleration were identified through the following:

- An assessment of the Australian energy market in comparison to leading international EaaS markets.
- Stakeholder consultation with; potential suppliers of EaaS, customer representatives, industry bodies and, regulators⁴.

4. A summary of report methodology can be found in [2 The context for this report](#), with a full list of stakeholders engaged provided in the appendix.

Potential suppliers looking to develop an EaaS offering should take four considerations into account.



1. Assess your organisational capability to deliver different EaaS business models:

Different types of EaaS require different skills and capabilities deliver. Traditional energy services companies will have different skills and capabilities than new entrants, such as tech companies. Potential suppliers must decide where they are best suited to play based on the skills and capabilities they have in-house, or what they are willing to invest in to partner for or acquire.



2. Define your risk vs reward appetite: EaaS models transfer risks from the customer to the supplier. It is through managing this risk that suppliers can provide an attractive value proposition and capture potential higher value for themselves through flexibility markets.



3. Understand your target customer: Potential suppliers who can design offerings which are appropriately tailored to this sub-set of customers can reap the benefits. Further investigation is required to better identify exactly who this sub-set is, what they value and, how much they are willing to pay for this value.



4. Perfect your marketing & comms in the moments that matter: Stakeholder consultation and industry data into customer perspectives, shows that customers, for the most part, are not engaged with energy services and have little knowledge of new energy terms and concepts. This means it is imperative for suppliers to engage with customers on their terms, communicating the outcome their service will provide rather than the intricacies of the product, and during the moments that matter such as the purchase of an EV or when moving site.



2. The context for this report

2.1 Why this report is important

EaaS overcomes barriers to demand flexibility and DER, such as; split incentives, complexity and skills & capability gaps, high discount rates and access to finance. By doing this, EaaS can accelerate the decarbonisation of the electricity sector. Whilst not all customers will engage in EaaS, artificial barriers to doing so should be removed, to give customers the opportunity and choice.

EaaS business models are described in more detail in section 3 Overview of Energy as a Service, but broadly speaking they seek to shift customer-provider relationships away from trading in kWh towards trading in outcomes. These outcomes include heating and cooling, lighting, entertainment, and mobility. By doing this, customers could receive the same benefits for lower cost and risk, while suppliers are incentivised to better manage energy usage.

Despite the potential for EaaS to help Australia's energy transition, these business models have not emerged organically. Whilst there is no clear leader globally, Europe (namely the U.K and Germany) and the U.S (California) have more advanced markets for C&I models. Key global examples include Schneider's Alphastruxure, Siemens' Calibrant Energy and, Johnson Controls who all offer turnkey energy services. Enel X's as-a-service offerings in the Demand response and FCAS space are also leading, particularly in Europe. Residential and mobility models also exist in these markets but are less advanced than C&I.

In contrast, the uptake of EaaS models in Australia appears to be slow. While Australia has high residential solar penetration rates, and significant volatility in the wholesale electricity market, these have not translated into new mainstream demand-side business models. The country's electric vehicle, commercial energy efficiency, and industrial FCAS also seem to trail behind global peers and Australia's potential.

This report explores what challenges might exist to EaaS business models and how industry, and / or governments, might help unlock the potential of EaaS as a beneficial infant industry. This aligns with ARENA's goal to enable the uptake of renewables in Australia, support the energy transition, and reduce the effects & costs of climate change. Note this report does not seek to answer the extent to which industry and / or government should prioritise EaaS over other energy market and energy transition priorities, nor inhibit demand driving the correct offerings in industry.



2.2 Who this report is for

This report has three key audiences:

1. Policymakers – this report seeks to provide an overview of EaaS business models, their opportunity and challenges, and an analytical, industry-led view of opportunities to accelerate it. It should serve as a reference base for further work on prioritisation, and specific policy and programme opportunities.
2. Energy industry players – this report also seeks to share information between current, and potential, buyers and sellers of EaaS. Information sharing should support better understanding and development of the business models overall.
3. Energy regulators – this report also engages with specific questions about the role of the current energy regulatory framework in preventing or enabling EaaS business models to emerge. It seeks to synthesise and analyse industry views on these questions and identify priorities for future work.

2.3 Objectives of this report

This report sets out to understand the potential of EaaS business models in Australia, challenges to its uptake, and opportunities to accelerate its adoption. Specific objectives include:

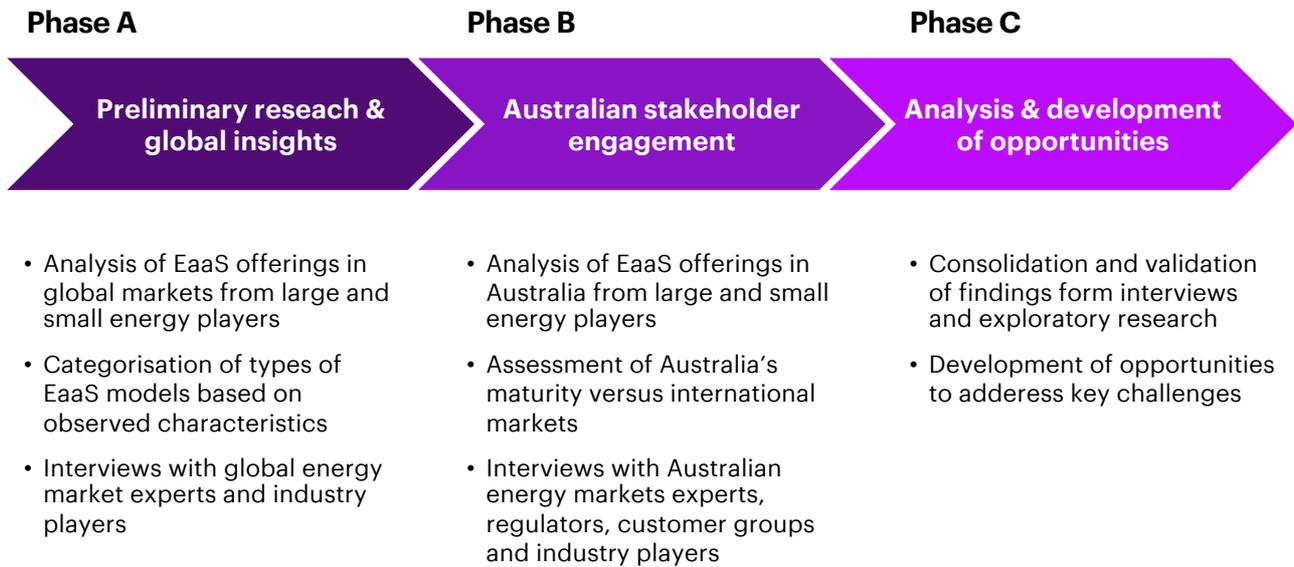
- Define Energy-as-a-Service. EaaS is a nebulous concept that means different things to different energy market players. To bring some order to the policy debate this report seeks to define EaaS in a way that enables the conversation to mature.
- Identify types of EaaS business models. While EaaS is a useful policymaker’s construct, it is not a specifically defined or understood offer in the market. Instead, there are a range of business models – across the residential, commercial & industrial⁵ and mobility sectors – that can be characterised as EaaS. This report sets out to identify these different types of business models.
- Understand industry trends which are giving rise to EaaS. There are a certain set of conditions that are giving rise to some EaaS models, these include; higher volatility in wholesale prices, higher energy prices, technological advances & cost reductions, and increased community & political focus on sustainability.
- Map challenges to uptake. There are a range of known and unknown challenges to the uptake of EaaS business models. Some of these challenges are macro in nature and relate to many parts of the energy transition, whereas others are specifically focussed to EaaS business models. This report sets out to identify the set of market and regulatory challenges to adoption – both on the provider / supply side, and customer / demand side of the market.
- Recommend actions to accelerate growth. Following from the assessment of models, trends, and challenges, this work seeks to identify actions to unlock and accelerate EaaS growth. These could include actions for ARENA, DEIP, or others.

5. Note that public sector customers such as municipalities, schools, universities, and hospitals are considered as commercial and industrial (C&I) customers throughout this report.

2.4 Report methodology

This report has been written after three phases of research, engagement and analysis as outlined in figure 3 below:

Figure 3: Report methodology



Notes: List of stakeholders interviewed and offerings assessed can be found in the appendix.



3. Overview of Energy as a Service

3.1 Defining EaaS

Energy-as-a-Service (EaaS) is a nebulous concept which has multiple definitions in the market. At its heart it is a business model that shifts the traditionally paradigm of energy so that suppliers are incentivised to optimise energy usage. This can be through equipment efficiency upgrades, DER, demand response or otherwise. There are many innovative business models which achieve this and they all exhibit similar characteristics. For the purposes of this study, we use these characteristics as the criteria to categorise EaaS. We include discussion of any offerings which exhibit at least one of these characteristics, noting that they only display parts of EaaS.

The three EaaS characteristics are as follows:



a) The customer receives a guaranteed outcome.

In outcome-based business models a customer will pay a fee for a particular outcome. This is contrasted with traditional energy services where a customer pays for a unit of energy, typically a kWh. Fees for outcomes are not linked to the amount of input (in this case energy) required to achieve that outcome. Examples of outcomes include; heating, lighting, vehicle charging, use of appliances/equipment or mobility. Some business models may offer these outcomes with a limit attached, such as a certain number of heat/light/charging hours, or they may offer them unlimited such as having mobility whenever you require it. This can overcome the split incentive of traditional energy supply, discussed in more detail in 'The benefits of EaaS' below. As long as the fee a customer is paying is linked to the outcome itself, then it is considered a type of EaaS business model.



b) The offering shifts CAPEX costs to OPEX costs.

In EaaS business models which include on-site energy assets such as DER and more efficient equipment and appliances, the up-front cost of the asset will be reduced or removed for the customer. Instead, the supplier will finance the asset, recovering the cost through on-going fees. Suppliers who are charging customers for a guaranteed outcome are incentivised to install DER and efficiency upgrades that lower the cost and amount of energy used for them to achieve that outcome. This can overcome financial, knowledge/expertise and time challenges that have slowed customer-led uptake of DER.



c) The offering, to some extent, shifts demand management from consumer to supplier.

In demand management EaaS models, suppliers will take some level of control of the customer's assets. There are different extents of control that exists in these models. In the least controlling models, a supplier may only control energy generation and storage assets, for example choosing when to import versus export. In more controlling models, a supplier may also take control of other appliances and equipment such as pool pumps, HVAC and, industrial process equipment. Suppliers may also use demand response to generate revenue through wholesale market price arbitrage and FCAS. Some models may use this revenue to recover costs and generate profit whilst others may provide it back to the customer in whole, or via profit-sharing arrangements.

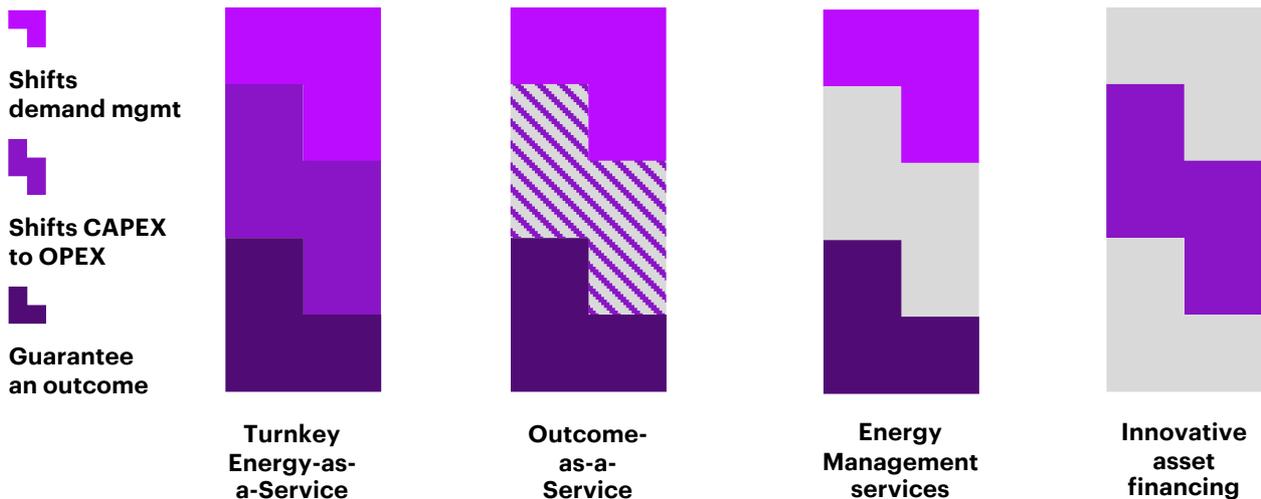
3.2 The types of EaaS business models

Four EaaS categories have been observed through exploratory research. Each category displays some or all of the characteristics discussed in section 3.1 Defining EaaS, and appear in the market under multiple common models as shown in Table 2.

Table 2: EaaS business categories and common models observed in the market.

EaaS category	Characteristics			Common models
	Guarantee an outcome	Shifts CAPEX to OPEX	Shifts demand mgmt	
Turnkey Energy-as-a-Service	✓	✓	✓	<p>C&I : Turnkey Energy-as-a-Service models are where the term Energy-as-a-Service is most commonly used. These are predominantly targeted towards C&I customers. They provide the financing, installation and on-going demand management of energy assets for an on-going fee at no upfront cost.</p> <p>These models evolved out of energy performance savings contracts (EPSC) offered by many ESCOs. EPSCs guarantee a certain level of energy savings for a fee, either taking this savings as revenue or sharing with the customer. Turnkey EaaS goes further by also including on-site generation and demand response.</p>
Outcome-as-a-service	✓	Partial: capital outlay for efficiency / retrofit but not generation assets	✓	<p>Residential and C&I: Single outcome-as-a-service model manifest in residential and C&I as heating and lighting-as-a-service. These models manage installation or upgrade of energy efficient lighting and heating for no upfront cost. They then provide an on-going guarantee of light or warm hours for a fee.</p> <p>Mobility: In mobility, similar models are offered with a certain amount of charging (charging-as-a-service) or vehicle use (mobility-as-a-service).</p> <p>The outcome in these models are a product of energy, not energy itself. As such, they do not provide the installation of energy generation assets.</p>
Energy mgmt services	✓		✓	<p>Residential and C&I: Energy management models optimise a customer’s energy usage through demand response, this includes Home energy management services (HEMS) in residential and enterprise energy management in C&I. Services can automate solar, batteries and other appliances, such as heat and pool pumps, to achieve lower energy bills.</p> <p>Some services also generate revenue for the customer, or for supplier & customer in profit-sharing arrangements, through demand response (DR) & FCAS services.</p> <p>Mobility: In mobility this type of service manifests as Vehicle-to-Grid or managed charging, where an EV is used to participate in demand response.</p>
Innovative asset financing		✓		<p>Residential and C&I: Innovative commercial models are being used in residential and C&I to reduce the upfront costs of on-site energy assets, such as solar or EV leasing or providing the benefits of on-site assets virtually through Virtual Power Plant (VPP) models.</p>

Notes: 1. Turnkey EaaS providers exhibit the ‘light-touch’ demand response (e.g. energy assets only rather than customer appliances/equipment), there are limited examples of services which offer full demand control. 2. see full list of all offerings assessed in appendix.



SINGLE OUTCOME AS A SERVICE CASE STUDIES⁶



Arc Renewable Group offers **lighting-as-a-service** as an all-inclusive contract-based model to upgrade and manage lighting at C&I sites. Arc will assess a site and provide a tailored quote, they then manage the installation and on-going maintenance of upgraded LED energy-efficient lighting. The upfront cost of the lighting is paid for by Arc who recover the costs through sharing in the energy savings achieved from the upgrades.



JET Charge's CORE offering delivers **charging-as-a-service** for electric vehicle fleets or multi-tenant buildings. Charging infrastructure is installed and managed by JET Charge, who use an intelligent energy management system to autonomously optimise the charging of multiple vehicles in a building. Dependent on the number of chargers that need to be installed, this can be offered at no upfront capital cost.

ENERGY MANAGEMENT SERVICES CASE STUDIES⁶



Enel X offers **wholesale demand response and FCAS services** to C&I customers. They will install relevant metering and controls to participate in flexibility markets and then manage a customer's demand to earn revenue in these markets whilst maintaining the customer's energy needs.



Evergen provides **energy management services** through its site optimisation solution. This uses intelligent algorithms to automate, orchestrate and optimise the charging and discharging of multiple batteries. This can ensure reliability, reduce costs and achieve value through price arbitrage in flexibility markets.

6. Note case studies are non-exhaustive, see appendix for full list of companies and offerings assessed.

ENERGY MANAGEMENT SERVICES CASE STUDIES⁶



AGL and Plenti have partnered to offer residential customers solar and battery with interest-free finance, making the assets more affordable for capital-constrained customers. The customer is signed up to AGL's **virtual power plant (VPP)** which gives AGL access to some of the stored power in return for the discounts offered.



Flow Power offers a corporate **renewable power purchase agreement (PPA)** where the customer pays a transparent monthly fee over a long-term contract, achieving lower than retail prices. The PPA also ensures that the power sourced is 100% renewable, providing customers a virtual link to renewable energy assets as no upfront capital cost.

ENERGY MANAGEMENT SERVICES CASE STUDIES⁶



Johnson Controls is a leader in smart, healthy and sustainable buildings. One of Johnson Controls' offerings is OpenBlue Net Zero Buildings, a suite of connected solutions which deliver on decarbonization, renewable energy, and resilience goals while optimising a buildings' performance - this is an example of **turnkey EaaS**. Johnson Controls partners with customers to provide solutions for energy management, assets and services through as-a-service or alternative commercial models.



3E Group (formerly Ecosave) provide C&I and public sector (e.g. health, education, municipalities) customers with **turnkey EaaS**. This includes co-designing a tailored energy solution that meets their sustainability goals, building the business case to secure low-interest financing, procuring an integrated set of energy assets and installing, operating and continually optimising those assets over multi-year partnerships.

6. Note case studies are non-exhaustive, see appendix for full list of companies and offerings assessed.

3.3 Why EaaS should be accelerated

EaaS will benefit the energy system by increasing demand flexibility and DER through:

- **Overcoming split incentives for suppliers** – traditionally, energy suppliers are incentivised by increased revenue when a customer uses more energy. By guaranteeing an outcome, and shifting the financing and management of energy assets to suppliers, they are then incentivised to optimise energy production and use.
- **Overcoming complexity, skills & capability gaps for customers**– optimisation of demand flexibility and the installation and operation of DER is increasingly complex. EaaS models can outsource this complexity to experts.
- **Overcoming high discount rates & customer business case requirements** – DER has high upfront costs, if C&I customers highly discount future savings, the initial investment may not pass internal business cases. By taking on the initial up-front cost, EaaS can deliver EaaS in a commercial model that passes internal business cases.



Value of EaaS to customers

EaaS models can only enable the benefits to the energy system, outlined above, if they are valuable enough to be offered by suppliers and bought by customers.

Beyond the basic financial value proposition (which varies dependent on the specific model, supplier, and customer requirements), there are several other benefits provided by EaaS models.

These include the following:

Access to finance	EaaS presents a financing mechanism for customers who are not able to raise their own capital. The value of this is increasing as rising interest rates limit customers borrowing capacity.
Simplifies complexity	EaaS provides customers with simplicity by providing all energy services, including the optimisation of energy in one bill. The value of this is increasing as the optimisation of customer energy becomes more complex, requiring expertise in demand response and new technologies such as 5G, automation and internet of things (IoT).
Predictability	Predictability is achieved through fees that are determined by an outcome rather than variable use of a unit of energy, providing the same fee every period. The value of this is increasing in line with energy price and market volatility.
Sustainability	Sustainable energy can be promised as an outcome in EaaS models and even if it isn't, suppliers will be incentivised to use the cheapest form of energy, which is renewable, in the smallest & most efficient amounts.
New revenue	EaaS can provide access to demand flexibility and FCAS markets that a customer may have previously not had the technical expertise to benefit from. Suppliers of EaaS can capture revenue through arbitrage in these markets, and dependent on the contract, revenue can be shared with customers.

These models are most attractive to a sub-set of customers including:



Customers who are capital constrained, either through an inability to borrow or a preference for OPEX.



Customers who place a high value on simplicity and predictability, rather than multiple bills and variable energy prices. This is especially beneficial for customers with changing energy usage patterns. EaaS offers customers the ability to be more flexible with their energy usage.



Customers with complex energy needs or wants, such as high levels of consumption across multiple assets requiring digital expertise to optimise (e.g. multiple large commercial sites, a household wanting solar, a battery and an EV).



Customers who wish to engage in flexibility markets, to optimise energy or take advantage of new revenue streams.



Customers with ambitious sustainability objectives, which, based on their energy profile, may be difficult to achieve without outsourced expertise.

3.4 General trends in the industry giving rise to EaaS

As discussed in section 2 The context for this report, EaaS is more advanced in European and U.S markets, however, it is beginning to emerge in Australia. The industry trends giving rise to EaaS in those markets are discussed below. Many of these are growing in prominence in Australia:

- **Volatility in wholesale energy prices creates larger value pools for demand response.** The integration of intermittent renewable energy into grids globally has created more volatility in wholesale markets. Extremely low prices when renewables are available versus higher prices when they are not, has created price arbitrage value pools. Energy players with expertise in storage and demand response can capture these.
- **Higher energy prices increase customer appetite for innovative models to avoid market price risk.** Europe and the U.S have been facing higher energy prices which Australia has only begun to experience recently. These rising energy prices increase the appetite for customers to lock in an on-going fee for an outcome as EaaS models provide, rather than facing market risk on a per kWh charge.
- **Technological advances and decreasing costs has made it increasingly more viable for energy providers to offer innovative orchestration services.** Advances in technology such as 5G, automation & artificial intelligence (AI) and internet of things (IoT) have enabled the connection, orchestration and optimisation of multiple devices and equipment. This allows for energy providers to offer services which guarantee an outcome by optimally managing customers energy resources. Further, the cost of DER assets such as rooftop solar and batteries are decreasing⁷, supporting models which seek to use these.
- **Community and political focus on addressing climate change has pressured corporations to set stronger sustainability targets.** Political direction on climate change has been stable in Europe for more than a decade, with policy signals such as the EU Emissions Trading Scheme (ETS) pushing companies to include decarbonisation in their financial decisions. Community focus on the topic has also led to shareholders pushing for sustainability targets such as net zero from the corporations they own. This increases the value proposition for EaaS models which decrease a customer's carbon footprint through energy efficiency and renewable sources of energy.

7. Global average prices for Solar PV have fallen by 81% and batteries by 60% over the last decade. See [solar PV module prices](#) and [battery price decline](#). Our World in Data

4. Challenges to EaaS

There are several macro-level challenges to new energy services and innovative contracting models. These are summarised below:

- **There is an overall lack of trust towards energy suppliers from customers:** Only 46% of consumers think that energy suppliers are working in their long-term interests⁸. With a higher level of trust required to engage in innovative services, low trust is a cultural barrier that the energy industry needs to overcome.
- **There is a shortage of the skills and capabilities required for integrated new energy offerings:** Multiple roles required in new energy technologies, are in short supply. The Clean Energy Council reports shortages of roles including electricians, roofers, and construction managers⁹. EaaS offerings require both the integration of multiple skill domains and technical expertise across generation, storage, and orchestration technologies.
- **A historic lack of a stable high level government direction has kept corporate investment at bay:** Domestic companies have not been willing to make long-term investment decisions due to instability in historic Commonwealth Government energy transition policy. Constant rule changes in the regulatory environment were noted by some stakeholders as exacerbating this. This instability (combined recently with pauses on expansion during COVID-19), has also warned off international capital. Many of the leaders in new energy and innovative offerings from overseas, do not offer these services in their Australian operations¹⁰. Stakeholder consultation suggests this challenge has decreased, with new clear policy direction and legislation, under the recently elected Commonwealth Government.
- **There is a lack of customer understanding of demand flexibility and its benefits:** For many residential customers and small businesses, demand flexibility is a foreign term¹¹. A lack of interest on the customer's part, and a lack of simple communication and engagement from trusted sources in industry, exacerbates this challenge.
- **Some new energy services and innovative contracting models involve the sharing of energy assets. This requires a cultural shift for Australian customers:** In Europe shared energy models such as district heating and cooling have been common for a long time¹². As such it is has been culturally easier for models involving shared assets such as VPPs or community batteries to be accepted. Conversely, customers in Australia have, for the most part, used their own individual supply of energy or on-site energy assets.
- **EVs penetration is relatively low:** only 2% of new car sales in Australia were EVs in 2021¹³, this has been largely due to relatively high prices and a lack of models available in the market. Low government incentives and investment into charging infrastructure contributes to this. It is important to note that the challenges to EV uptake may actually accelerate EaaS models which circumvent the need for EV or charging infrastructure ownership, such as Mobility-as-a-Service and Charging-as-a-Service.

8. As at December 2021, [National Consumer Sentiment Survey](#), Energy Consumers Australia

9. [Clean Energy at Work](#), Clean Energy Council

10. See for example, Schnedier's Alphastruxure, Siemens' Calibrant Energy and Engie and Enel X's respective EaaS offerings.

11. Many residential customers are disengaged when it comes to understanding new energy terms and concepts, in a customer survey terms such as demand response and community energy resources only had 17% and 32% recognition respectively. See [Consumer Perspectives on Demand Response and Community Energy](#), CSIRO

12. Europe leads the world in district heating. Denmark and Sweden are European leaders; 65% and 45% of building heating comes from shared district heating, compared to the global average of around 11%. See [District Heating](#), IEA

13. Compared to 10.7% in the U.K and 74% in global leaders Norway, with a global average of 4.2% as of 2021. Note that this had risen to 3.39% as of October YTD in 2022. See [State of Electric Vehicles](#), Electric Vehicle Council

- **There has been a relatively low focus on sustainability from corporate customers until recently:** Australia has lagged other markets such as Europe and the U.S when it has come to companies signing up to net zero and other sustainability commitments¹⁴. The lack of policy direction and less societal / shareholder pressure may have contributed to this.

Whilst these macro-challenges influence EaaS, the solutions to them will interact with multiple parts of the energy transition, and as such, sit outside of the scope of this report.

There are several specific challenges that have been identified through stakeholder consultation. These are influenced by macro challenges, but have targeted consequences for EaaS. The specific challenges make it either more difficult for a supplier to provide EaaS, and / or, decreases a potential customer’s willingness to buy EaaS. Specific challenges are therefore categorised under challenges to delivering the characteristics of EaaS. These challenges are summarised in figure 4 and discussed in more detail in sections 5.1-5.6.

Figure 4: The specific challenges to EaaS.

	Challenge	Effect
 <p>A. Guaranteeing an energy outcome</p>	Lack of availability & access to behind-the-meter data	Inability to accurately forecast, quote, track & deliver EaaS
	Customers ‘gaming’ the system by changing their consumption once the outcome is contracted	Higher risk premiums incorporated into EaaS contracts
	Lack of supplier expertise in industry specific equipment & processes	Inability to guarantee reliability of operations for C&I customers
	Traditional customer procurement & tendering processes	Bias towards traditional kWh contracts that are easier to compare in tenders
	Striking the right balance in contract terms regarding the allocation of risk	Distrust from perceived disproportionate allocations of risk
 <p>B. Shifting CAPEX to OPEX</p>	Govt. rebates & tax incentives for DER are linked to the buyer of the asset	Incentivises customers to use CAPEX to buy their own assets
	Owner’s corp. approval requirements for new energy assets in shared dwellings	Suppliers are stalled or blocked from offering new energy assets to customers in shared dwellings
	Internal combustion engines (ICE) are implicitly biased in novated leases due to their higher OPEX	More customers and employers will choose to use ICEs for novated leases
	Potential EaaS suppliers face a high cost of capital	Increased difficulty to offer EaaS at competitive price points profitably
	The contract length required to recoup capital outlays is longer than customer planning horizons	A preference for asset ownership, so that it is included in property/site equity upon sale
 <p>C. Taking control of demand management</p>	Perceived risks to customer operations from controlling equipment	Hesitancy for C&I customers to outsource control if they perceive risks to operations
	Lack of trust that suppliers will act in a customer’s best interest	Hesitancy to cede control to a potential supplier
	Negotiating and communicating profit-sharing arrangements for the value from DR	Confusion & bias against profit-sharing models from customers and procurement processes

Challenges manifest in each customer segment; residential, mobility and commercial & industrial.

14. No Australian companies were being tracked in the RE100 sustainability commitments until 2018, whereas the U.S and Europe have had companies in the list since 2014. See [The RE100](#), CDP and Climate Group.



4.1 Challenges to guaranteeing an energy outcome (characteristic A)

Table 3: EaaS categories impacted by challenges presented in 4.1

Categories exhibiting this characteristic	Example offerings
Outcome-as-a-service models	Residential & C&I: <ul style="list-style-type: none"> • Heating-as-a-Service • Lighting-as-a-Service Mobility: <ul style="list-style-type: none"> • Charging-as-a-Service • Mobility-as-a-Service
Turnkey EaaS	C&I: <ul style="list-style-type: none"> • Turnkey EaaS

Challenges in the residential segment

There is insufficient availability of metering data for suppliers to forecast energy usage and guarantee an outcome.

In the first instance there is insufficient metering data available from the lack of residential smart meters; in states outside of Victoria smart meters are only installed at 25-35% of homes¹⁵. When metering data is available, it is at times lacking in the required levels of granularity for potential suppliers to guarantee an outcome. Many smart meters are still transmitting data at 30min intervals whilst the market has moved to 5min settlement, work is underway to address this¹⁶.

Metering data access is limited to certain market participants, causing delays. International markets studied have similar (the U.K), or worse (Germany), availability of residential metering data through smart meters, so this is not a unique challenge to Australia¹⁷. However, Australia does have a complex process for suppliers to get access to smart-meter data. Potential EaaS suppliers must engage with metering providers to get access to the meter, its data, and connect their own hardware and software to it. In Australia metering providers are only obliged to provide data to Financially Responsible Market Participants (FRMP) and Local Network Service Providers (LNSP) for billing purposes. This can cause complexities for EaaS suppliers who aren't market participants (e.g. do not hold a retailer licence as a FRMP), and delays for those who are. The liaison required with metering providers can delay a potential supplier from being able to accurately quote a service, guarantee an outcome and in turn provide the service. The AEMC's metering review is currently considering how to provide better data access, this is discussed in further detail in section 5.3.2.

15. Whereas in Victoria 98% of houses have smart meters installed, see [Review of the Regulatory Framework for Metering Services](#), AEMC.

16. See reference source above.

17. See, [Smart grids and meters](#), European Commission.

Suppliers must manage the risk of unpredictable customer behaviour to offer a guaranteed outcome.

A large proportion of a residential energy customer's energy usage is for comfort and entertainment. This contrasts with C&I customers, whose key reason for energy usage is for business and industrial processes. These are largely predictable based on the customer's operating hours and production schedules. Residential customer energy usage may vary greatly dependent on the weather, changes in household composition or new appliances.

Furthermore, even if a supplier is willing to guarantee an outcome, based on forecasted predictions of a customer's energy usage, a customer energy usage behaviour may change after the outcome has been guaranteed. Potential suppliers of EaaS must incorporate and manage this risk in contracting.

Challenges in the mobility segment

Charging-as-a-Service models face difficulties in tracking and billing when charging has occurred in multiple locations.

Charging-as-a-Service models can face issues when EV users choose to charge at multiple charging points. For example, in corporate Charging-as-a-Service models, a company may be paying for a certain amount of charging linked to charging infrastructure installed at their site. However, many employees may drive corporate cars home and charge them through their own residential supply. This is difficult for providers to track and manage. In most cases, they need to calculate how much charging occurred away from the site and re-imburse the customer. This increases the administrative burden for suppliers, and in turn, the price of the service. The FTA proposal that is under consideration by the AEMC could provide a potential solution to help to alleviate this, corporate vehicles could be charged at home through a separate meter, suppliers could then more easily track usage through this meter alone¹⁸. Further, the international standard ISO/IEC 15118 ('Plug and Charge') provides another opportunity to overcome this. 'Plug and Charge' can automatically register information for billing purposes, at the point of charging. The transaction can therefore be tracked and recorded from both the on-site charger and a customer's home charger¹⁹.

Challenges in the C&I segment

A high level of technical industry and process expertise is required to guarantee reliability in C&I.

C&I sites require tailored solutions to achieve their desired energy outcomes, whilst ensuring continued reliability of on-going production. Ensuring on-going production often requires expert knowledge of industry-specific business processes and equipment. Changes to energy usage may impact equipment and processes, this requires industry-specific expertise to update.

18. [Flexible trading arrangements and metering of minor energy flows in the NEM](#), AEMO

19. See [What is Electric Vehicle Plug & Charge](#), Driivz (referencing ISO 15118)

Energy brokers and procurement departments prefer to assess traditional energy service contracts in tendering processes.

Even if an energy manager is on-board with buying an EaaS product, in many companies this will need to be assessed through a procurement department tendering process, and, in some cases, by a third- party broker. Procurement departments and brokers will seek out contracts that are comparable in the tender process. This biases against innovation and EaaS contracts. Outcome-based contracts are seen to carry much more risk and therefore procurers and brokers usually avoid them. Transparent and comparable EaaS contracts, which meet the requirements of standardised procurement processes could help to overcome this.



Allocating risk in outcome-based contracts can be difficult and lead to a lack of confidence, or distrust, with the supplier.

Due to unpredictability in the energy market, outcome-based contracts usually require multiple caveated clauses. This is even more apparent for greenfield sites where there is little operational data for suppliers to be truly confident in guaranteeing a specific targeted outcome.

Whilst suppliers use qualifications and ranges to limit their own risk it can create a lack of confidence from the customer in the supplier’s abilities and may not pass the customer’s own risk assessments (for C&I).



4.2 Challenges to shifting CAPEX to OPEX (characteristic B)

Table 4: EaaS categories impacted by challenges presented in 4.2

Categories exhibiting this characteristic	Example offerings
Outcome-as-a-service models	<p>Residential & C&I:</p> <ul style="list-style-type: none"> • Heating-as-a-Service • Lighting-as-a-Service <p>Mobility:</p> <ul style="list-style-type: none"> • Charging-as-a-Service • Mobility-as-a-Service
Innovative asset financing	<p>Residential & C&I:</p> <ul style="list-style-type: none"> • Solar + VPP bundles
Turnkey EaaS	<p>C&I:</p> <ul style="list-style-type: none"> • Turnkey EaaS

Challenges in the residential segment

Government incentives for energy assets are linked to the owner of the asset, incentivising customers to pay CAPEX themselves.

Government incentives for assets, such as rooftop solar panels, have been common in Australia over the last decade. These benefits have provided discounts on the purchase price of the asset (e.g. solar rebates and small-scale technology certificates) and on-going benefits such as feed in rates for energy exported to the grid. These incentives have been attractive enough to facilitate close to 3 million rooftop solar installations in Australia²⁰. Further there are also state-based low interest loans available for renewable energy assets, such as the NSW Empowering Homes Solar Battery Loan²¹, and for energy efficiency upgrades, such as the Victorian Energy Upgrades program²². Models in which companies own the capital asset move these benefits away from the customer and to the supplier. This reduces the attractiveness of EaaS models where the supply buys and owns the asset (with a customer either leasing from them or paying to own the asset over time).

20. As of 2021, see [Solar Report](#), Australian Energy Council

21. [Empowering Homes Solar Battery Loan](#), NSW Government

22. [Victorian Energy Upgrades](#), Victorian Government

Challenges in the mobility segment

Owner's corporation approval is required to install EV charging stations.

This adds a third-party into EaaS negotiations for residents living shared dwellings – a key market for mobility EaaS. In cases where charging stations need to be installed on common property, this approval is unlikely to be granted as Corporations will be unwilling to pay for an asset that is not used by all residents they are not obliged to under law²³. Even in cases where charging stations can be installed in a private parking bay, if the structure was to drill too deep into the ground or the wall, it may be classed as being in common property. In cases where there is approval, it still delays the process, and requires special contract terms to ensure liability rests with the customer instead of the Owner's Corporation. This all adds to administrative burden for suppliers, and therefore higher prices for the service.

EV novated leasing has historically not stacked up commercially because the treatment of operating costs in tax assessments is inherently biased towards ICE vehicles.

In a novated lease arrangement, the cost of the vehicle and its operating expenses are bundled and paid for through a pre-tax salary sacrifice. This essentially lowers a customer's taxable income. EV operating costs (electricity & charging infrastructure) have historically not been properly considered in pre-tax operating expenses. Therefore, they've needed to be paid from a customer's post-tax income, reducing the value proposition of the lease arrangement. This is opposed to petrol/diesel, which has always been considered an operating expense. Therefore, ICEs have been inadvertently favoured for customers who are seeking to enter novated lease arrangements. The ATO has updated how it assesses EV operating expenses to include electricity. Further, the Commonwealth Government's removal of fringe benefits tax on electric vehicles will reduce their costs in novated leases and may potentially overcome this challenge.

These actions have attempted to address this challenge, however they do not fix the fundamental issue. Because the operating costs of an EV are, for the most part, lower than an ICE, there will still be an inherent bias towards ICEs in novated lease²⁴. Whilst this inherent bias has occurred organically it goes against societal objectives of supporting, or at the very least, not handicapping, the uptake of EVs.



23. See for example [Owners Corporations Act \(2006\)](#), Victoria and [Strata Schemes Management Act \(2015\)](#), NSW

24. unless the changes to fringe benefits tax push employers to only offer EVs in these arrangements.

Challenges in the C&I segment

Tax and other commercial incentives exist in Australia for capital outlays on renewable energy assets.

C&I customers can claim deductions on capital expenditure in the form of depreciation, these deductions are typically higher than what is available for OPEX. Furthermore, for some assets (including commercial solar systems and clean energy assets), small to medium size businesses can claim an instant asset write off²⁵. Therefore, for many customers it makes economic sense to buy the asset themselves, rather than paying full price overtime in an EaaS OPEX arrangements. This challenge is less prominent for CAPEX- constrained customers.

Other commercial incentives exist for companies investing in their own renewable energy projects. Firstly, they may be eligible for access to clean finance and / or funding through public avenues such as the Clean Energy Finance Corporation, ARENA, or privately through green corporate bonds²⁶. There are also some government schemes at a state level which serve similar functions, such as the Greener Government Buildings program²⁷, which provides low interest loans for energy efficiency upgrades. Secondly, government incentives such as Renewable Energy Certificates (RECs) exist, which can be received for generating renewable energy and traded on the carbon credit market to generate revenue²⁸.



High cost of capital for potential suppliers makes it difficult to provide EaaS at competitive price points.

Banks are risk-averse in the way they lend to potential EaaS providers. They price a high-risk premium in lending for EaaS. Firstly, this is because they do not recognise a secondary market for energy assets due to difficulties in selling and moving energy assets to different sites (in the case that the asset would need to be sold in the event of a default). Secondly, banks do not recognise cashflow from energy savings as an acceptable form of collateral²⁹.

Stakeholders indicated that banks employ similar project appraisal processes as they would for a traditional PPA, and therefore, potential suppliers receive a similar cost of credit. This makes it difficult to offer EaaS at a more competitive price point than traditional energy services.

25. Allowing deductions to be claimed immediately. See temporary tax depreciation incentives in [instant asset write-off for eligible business](#), Australian Taxation Office (ATO)

26. See for example banks with membership to ICMA and ICMA's [Sustainable Finance Guidance](#), ICMA

27. [Greener Government Buildings](#), Victorian Government

28. [Renewable Energy Certificates](#), Clean Energy Regulator

29. [Designing Credit Lines for Energy Efficiency](#), World Bank Group

Challenges common across customer segments

Hesitancy to be locked into contracts which are longer than a customer's planning horizon.

Suppliers often sell very long contracts to recoup the costs of capital assets. For C&I, where contracts can be 20y+, this length goes beyond many customers energy management planning horizons. Residential customers are also hesitant to be locked into long-term contracts where they may move property before contract end. In the case of both C&I and residential segments, customers could be left with a payout if they move site or residence before the end of the contract. It is important that these terms are clearly communicated before entering long term contracts, and that customers have sufficient access to dispute resolution if required.





4.3 Challenges to taking control of demand management (characteristic C)

Table 5: EaaS categories impacted by challenges presented in 4.3

Categories exhibiting this characteristic	Example offerings
Outcome-as-a-service models	<p>Residential:</p> <ul style="list-style-type: none"> • Home energy management services (HEMS) and DR & FCAS services <p>C&I:</p> <ul style="list-style-type: none"> • Enterprise energy management and DR & FCAS services
Turnkey EaaS	<p>C&I:</p> <ul style="list-style-type: none"> • No upfront cost financing, installation & operation of energy assets

Challenges in the C&I segment

Outsourced demand management is perceived as a risk to ensuring reliability of production.

Production is the number one priority for C&I customers. Whilst demand management may offer cost reductions, it could potentially risk production. If risks to production materialise, they will most likely erode any cost reduction that had been achieved through energy saving. For example, demand management being automated for optimisation could potentially result in a piece of machinery not coming online when required, leading to an unplanned site shutdown.

Challenges common across customer segments³⁰

Negotiating and communicating profit-sharing arrangements can be confusing.

Like the communication of risk in outcome-based contracts, it can be challenging to communicate profit-sharing arrangements in models which seek revenue in demand flexibility markets. These models include a supplier capturing profits through manipulating a customer’s demand to benefit from price arbitrage in flexibility markets. These profits may be kept by the supplier or shared with the customer dependent on the contract. It can be difficult to articulate these arrangements and how profit should be shared. On one hand it is the customer who creates the opportunity for value, through their energy demand, but it is the supplier who has the expertise to capture this value through demand response. Again, like outcome-based contracts, energy brokers and procurement departments in C&I, will usually prefer traditional contracts over profit-sharing as they are easier to understand and monitor.

30. This includes the residential and mobility customer segments.

Better visibility of what flexibility is worth to the Networks is required for providers to confidently forecast value from demand response offerings.

Once flexibility can be modelled accurately, suppliers can reduce the risk premium embedded in demand response offerings, making these models cheaper for customers. More transparent data is required for trading in the flexibility market, beyond just FCAS. For example, the U.K has multiple trading platforms for flexibility markets, which has helped to see the amount of flexibility capacity being contracted by network providers rise from 116MW in 2018 to 1.6GW in 2021³¹.

Customers are hesitant to cede control over assets they own due to a lack of trust that suppliers will act in their best interest.

EaaS models which optimise demand management for customer’s assets require some level of control to be ceded to the supplier. Stakeholder consultation indicates that there is a cultural aversion in Australia to outsourced control. This is like the preference against sharing of assets, discussed earlier as a macro challenge to new energy offerings. Some C&I customers may also be hesitant to cede control because it would turn their previous investments, (i.e. in-house expertise in energy management), into sunk costs.

Further, stakeholder consultation indicates that some customers may be hesitant to cede control due to a lack of trust that suppliers will act in their best interest. There is a perception that an EaaS supplier’s actions in demand response could come at the expense of a customer’s energy needs. For example, an EaaS supplier in a demand response model, may turn off a customer’s equipment to avoid high wholesale prices³². This may negatively impact the customer’s utility if they had wanted that equipment to be running.



31. [Local Flexibility Markets Analysis](#), Aurora.

32. Assuming the EaaS provider is on-selling the grid-supply of energy.

5. Opportunities to accelerate EaaS take-up

In looking to accelerate the take-up of Energy as a Service as a business model, we have identified factors which are already in train; opportunities for potential suppliers and buyers to address; and opportunities for policymakers and industry bodies to consider.

5.1 Factors already increasing EaaS

It is our assessment that EaaS is growing organically in Australia. This is due, in part, to general trends in Australia beginning to align more closely with those presented as conducive to EaaS in section 3.4, and policy, technology, and behavioural changes which are addressing some of the macro challenges to the energy transition outlined in section 4.

Specifically the changes occurring are:

- **Energy prices are increasing.** Our global analysis found that high energy prices were a key determinant of EaaS take up. They can make the economic value proposition of EaaS stronger along with increasing the value of predictability. Through a variety of reasons, primarily being high domestic gas prices in Eastern Australia, we have seen a price shock in electricity and gas prices in the NEM. We would expect that this would therefore result in higher EaaS take-up.
- **Emissions policy is more certain.** Our consultation found that the certainty associated with a legislated carbon target, and firm government commitment to decarbonisation, has given suppliers confidence to invest in capability and new offering development. It has also given customers confidence to make purchasing decisions over longer term horizons. Since this is a very recent development, we haven't yet seen the implications with respect to additional EaaS take-up in any data.
- **There are initiatives aimed at increasing flexibility take-up.** the CER (consumer energy resources) implementation plan as part of the ESB's Post 2025 Reform program continues to increase the take-up of flexibility. The Flexible Trading Arrangements rule change is also likely to increase the market for value-added services for a customer's controllable energy resources. This is likely to promote EaaS take-up as a subset of the overall flexibility market.
- **Customer awareness around sustainability and innovative offerings is increasing.** Australia is catching up to global trends regarding customer awareness of sustainability and innovative offerings. These trends indicated that an increased awareness of climate change impacts, and increased familiarity with As-a-Service models (e.g. in cloud computing and ridesharing), led to customers changing their behaviour around how they interact with, and purchase, energy services.
- **Interest rates are increasing.** Higher interest rates will see more customers become capital constrained, and more likely to delay or cancel large capital outlays. This in turn increases the value proposition of EaaS. Conversely, this may also increase the cost of capital for EaaS suppliers. The acceleration opportunity discussed in section 5.3 "Develop dedicated lines of credit for EaaS suppliers" can support this issue.

Finally, we would note that new business models (in all sectors of the economy) are often trialled in the larger markets of Europe and the US a few years before they become available in Australia. EaaS has been growing in Europe and the US for the last few years and as such the timing suggests that EaaS may now begin to grow in Australia.

5.2 Opportunities for Policy Makers and Industry Bodies

Seven specific opportunities can be pursued by ARENA, DEIP and other policy makers and industry bodies to address the challenges outlined in section 4.

Figure 5: The seven opportunities address the key challenges identified.

Opportunities	Challenges overcome
1 Demonstrate an end-to-end EaaS offering, sharing outcomes to increase supplier and customer knowledge	Lack of supplier expertise in industry specific equipment & processes
	Perceived risks to customer operations from controlling equipment
2 Focus current data enhancement initiatives on increasing data accessibility	Lack of availability & access to behind-the-meter data
3 Suggest an augmented retailer licence and standard offer	Traditional customer procurement & tendering processes
	Appropriately & transparently allocating risk in contracts
	Customers 'gaming' the system by changing their consumption
	Govt. rebates & tax incentives for DER are linked to the buyer of the asset
	Contracts are longer than customers planning horizons without clarity on property/site sale
4 Develop dedicated lines of credit for new energy services	Potential EaaS suppliers face a high cost of capital
5 Streamline approvals for new energy infrastructure through standard guidelines	Owner's corp. approvals for new energy installations in shared dwellings
6 Review assessment of vehicle expenses in novated leases	Internal combustion engines (ICE) are implicitly biased in novated leases due to their higher OPEX
7 Integrate EaaS suppliers into state energy efficiency schemes	Opportunistic

5.2.1 Opportunities for ARENA

Demonstrate an end-to-end EaaS offering, sharing outcomes to increase supplier and customer knowledge

Who should be involved?	ARENA, Selected organisations
Mechanisms for change	Practical demonstration of EaaS
Key actions	<ul style="list-style-type: none"> • Offer grant funding to organisations with diverse energy needs to procure and engage with an EaaS offering, on the proviso that outcomes are shared. • Document and share knowledge of the entire process and on-going service delivery with industry and customers.
Expected outcomes	<ul style="list-style-type: none"> • Increase knowledge for suppliers around the provision of EaaS, including: <ul style="list-style-type: none"> • How different aspects of the services (e.g. financing, asset installation, orchestration), and technologies (e.g. batteries, heat pumps etc.), can be integrated into a solution. • Customer preferences and willingness to pay. • Identification of target customers for EaaS. • Increase trust for customers that EaaS can be reliably delivered.

There was near universal agreement among stakeholders consulted for this project, that more knowledge of EaaS models in practice would be of great assistance to the industry. Multiple stakeholders have commented that:

1. potential suppliers do not have the knowledge, skills, and capabilities to pull together an end-to-end offering (which requires expertise across multiple domains such as financing, procurement, operations, and digital optimisation), and,
2. customers do not trust that suppliers are able to deliver to an agreed upon standard, because they have little credentials to assess them on (in the Australian market).

Therefore, this recommendation seeks to develop an example for suppliers to learn from, and customers to gain trust from. For this example to be tangible, this recommendation proposes that ARENA offers funding, open to public and private organisations, to purchase an end-to-end EaaS offering (e.g. Turnkey EaaS).

Multiple organisations with diverse characteristics should be selected. Characteristics for consideration may include;

- Small, medium and large energy users (measured by annual historic consumption).
- Single and multi-site operations.
- Sites requiring 24hr operation.
- Sites with 100% renewable energy targets.
- Sites requiring retrofitting / upgrades due to old age.

The selected organisations should engage in a transparent tender process for the selection of the EaaS provider. This process should be shared with the wider industry. The EaaS supplier's actions and outcomes should also be documented and shared with industry.

Objectives of the demonstration should be to gain and share knowledge on:

- Equipment, devices, appliances that can be reliably managed by an EaaS provider without impact to operations.
- Customer preferences for different features / characteristics of EaaS models.
- Best practice on managing the customer / supplier relationship (e.g. what needs to be communicated and when).
- Best practice approaches to data access and on-going data management.
- Identification of a specific a sub-set of customers that are best placed to benefit from EaaS and how they should be targeted / marketed towards.



5.2.2 Opportunities for DEIP

Focus current data enhancement initiatives on increasing data accessibility

Who should be involved?	AEMC, ACCC, ESB
Mechanisms for change	AEMC Metering Review, Consumer Data Right Initiative, ESB Data Strategy
Key actions	<ul style="list-style-type: none"> • Review the Consumer Data Right (CDR) after 12-24months of operation to ensure that it is meeting the following objectives: <ul style="list-style-type: none"> • Customers have access to their historical metering data. • Customers can share this metering data to third-parties as they wish, both remotely and locally. • Support the following draft findings of the AEMC’s metering review: <ul style="list-style-type: none"> • The acceleration of the smart-meter roll-out. • The implementation of a general data sharing framework, termed ‘power quality data access and exchange framework’. • Recommend the AEMC’s metering review consider: <ul style="list-style-type: none"> • Whether there are any other barriers preventing the CDR from meeting the above objectives and how they can be overcome. • Developing a general data sharing framework to ensure that third-parties handle data correctly. • How similar objectives to those recommended for the CDR can be met for behind-the-meter data and integrated with metering data. • Recommend the ESB Data Strategy: <ul style="list-style-type: none"> • Opens up desensitised, aggregated data-sets to be used to support the development of offerings that improve energy outcomes.
Expected outcomes	<ul style="list-style-type: none"> • Increase accessibility to historical metering data for better quoting, forecasting and delivery of EaaS offerings. • Potential to include behind-the-meter data access into future data sharing frameworks. • Ability for new offerings to be generated through insights into aggregated, whole-of-market, data.

Stakeholder consultation suggests that there are challenges to obtaining metering and behind-the-meter data. This impacts a potential supplier’s ability to accurately quote and deliver services. In some instances, this is due to a lack of availability of quality data.

However, even when available, there can be delays for potential suppliers who require access to this data to provide EaaS. This is especially the case when potential suppliers are not market participants. This issue is more apparent in the residential and small C&I customer segments. Larger C&I customers who contract their own metering providers, are in most cases already able to get regular access to their historical data.

There are multiple initiatives underway which intersect the issue of data availability and access. These include:

- **The consumer data right initiative³³**, the first phase of which went live in November 2022, which aims to enable customers to transfer their data to businesses to find products and services tailored to their needs.
- **AEMC review of the regulatory framework for metering services³⁴**, where draft recommendations have been submitted for consultation, and looks both into the acceleration of smart meters (availability) and improving data access.
- **ESB data strategy, currently being implemented³⁵**, which among other things, recommends unlocking desensitised datasets for research uses.

Suggestions for the Consumer Data Right Initiative (CDR)

EaaS providers require access to historical data to accurately quote a service and guarantee an outcome. The CDR has objectives to allow customers to access their own data and determine what third-parties it can be shared with. If this objective is met, the data access concerns found to be limiting EaaS in stakeholder consultations, should be alleviated. The CDR should be reviewed in the next 12-24 months to ensure these objectives are being met.

Suggestions for the AEMC Review of the Regulatory Framework for Metering Services

Firstly, to address concerns around the availability of granular energy usage data (particularly outside of Victoria), the more ambitious and accelerated targets for the deployment of smart meters should be supported (the AEMC's draft findings recommend a target of universal smart meter coverage by 2030). The AEMC's draft recommendations to implement a general data sharing framework should also be supported. This should help to overcome delays in data sharing between different participants in the energy system and ensure that data is being handled in an appropriate manner and to consistent standards.

The AEMC review could also consider how similar objectives of customer-access being implemented through the CDR, can be met for customers' DER data (i.e. data 'over-the-top' of the meter, such as from a battery). It would be beneficial for these data sources to be considered in tandem with metering data in case integration or interoperability becomes an issue.

Addressing these data sources together could support a future outcome of customers being able to access all their energy data in real-time, and in-turn, share this with suitable third parties. The ability to access and share real-time data could increase the efficiency of EaaS services in the future. However, it must be noted that the current lack of real-time data is not prohibiting EaaS providers from quoting and offering a service.

33. See, [Consumer Data Right](#), ACCC

34. See, [Review of the Regulatory Framework for Metering Services](#), AEMC

35. See, [Data Strategy](#), ESB

Suggestions for the ESB Data Strategy

Further, as another potential accelerator of EaaS, the ESB data strategy should consider allowing desensitised, aggregated data to be used in market research. This could support the development of offerings that support better customer and system outcomes. This would mean expanding the data-sets available for government research to also be used for research into offering development. This would support modelling the viability of offerings such as EaaS, their potential impact on the sustainability, and reliability, of the energy system and, provide suppliers more confidence to invest in them.

Suggest an augmented retailer licence³⁶ and standard offer³⁷

Who should be involved?	ARENA, AER, consumer groups, EaaS suppliers, Customer Insights Collaboration (ESB)
Mechanisms for change	Review of Consumer Protections for Future Energy Services (formerly the Retailer Authorisations and Exemptions Review)
Key actions	<ul style="list-style-type: none"> • Make a submission to the AER’s review of consumer protections for future energy services recommending an augmented retailer licence. <ul style="list-style-type: none"> • An augmented licence should apply to EaaS suppliers who are not engaging in the provision of the essential service of energy. • Engage with the AER to develop a revised set of obligations for the augmented licence, aligning with the AER’s approach to reforming the future regulatory framework through the Review of Consumer Protections for Future Energy Services. • Develop an obligation for licence holders to have a standard offer that meets a set of objective-based minimum criteria. These should promote greater trust, knowledge, and transparency with customers. • The AER should carry out ongoing monitoring of the licence and reserve the right to disallow EaaS products which impact the essential service of energy from being on the licence. • Further investigation should be carried out to understand use cases where EaaS providers may impact the essential service of energy and/or other market participants providing services at the same premises.
Expected outcomes	<ul style="list-style-type: none"> • The objective of the augmented licence should be to ensure a minimum standard of quality for EaaS, extend customer protections from energy retail law to EaaS, lower the barriers to entry for new entrants³⁸, and provide EaaS suppliers access to market participant-only data.

36. Retailer licensing currently applies to the Residential customer segment. Any extension of licensing to cover other customer segments (e.g. C&I) should depend on analysis of whether customers in these segments are likely to experience similar risks. This can be assessed through the AER’s risk assessment processes. However, this report does note that it is unlikely that C&I customers will face the same risks as residential customers for these services.

This is because, in most cases, C&I contracts are negotiated with customers who have a higher degree of time, knowledge, and negotiating power, than residential customers.

37. The opportunity to suggest a standard offer pertains to all customer segments (i.e. Residential, C&I and Mobility).

38. In comparison to a full retailer license.

Retailer licencing, authorisations and exemptions are currently being reviewed by the AER under the Review of Consumer Protections for Future Energy Services. Part of this review relates to whether EaaS providers should require a retailer licence for the provision of their services.

To obtain a retail licence an organisation must meet a range of criteria and adhere to a set of ongoing obligations. These requirements are necessary due to energy being an essential service (i.e. a service that is vital to the health and well-being of the population).

Some types of EaaS do not meet the essentiality criteria to require a full retail licence, whereas others can. Therefore, this recommendation has different implications for different types of EaaS:

- 1. EaaS which do not intersect with the essential service of energy:** Many EaaS services are delivered on top of the essential service. In these instances, there would be both a traditional retailer of energy and a separate EaaS retailer at the one premises, with the separate EaaS provider only interacting behind-the-meter. For these services we suggest an augmented retailer licence with a different set of obligations than the current retailer licence.
- 2. EaaS which do intersect with the essential service of energy:** EaaS can interact with the essential service of energy when the outcome of the service itself is essential (e.g. heating, lighting). It can also intersect when EaaS is provided through an on-sell arrangement and the customer no longer interacts with a separate FRMP. In this instance the EaaS provider is a gatekeeper between the customer and the supply of essential energy. In both instances, additional provisions to the augmented licence must be considered.

Implications for EaaS that does not intersect essential energy – augmented retailer licence⁴⁰

Obligations of an augmented retailer licence

The obligations which should not be included in the augmented licence are as follows:

- **Financial hardship provisions:** the obligation for retailers to provide financial hardship options to customers who request them. This can include payment plans, payments in arrears and waived payments. Disconnection cannot occur for a customer who has indicated financial hardship unless all financial hardship options have been exhausted.
- **Life support requirements:** retailers must maintain a list of customers with life support equipment and ensure that disconnection does not occur, and any interruptions are given sufficient notice.

These obligations are not required for this type of EaaS as they relate to ensuring the provision of the essential service of energy. Further, the retailer authorisation criteria for the augmented licence should be revised to consider the reduced set of obligations. This criterion refers to an applicant's organisational and technical capability, financial resources, and suitability.

39. Previously the Retailer Authorisations and Exemptions Review, see [Retailer Authorisations and Exemptions Review](#), AER

40. There are other new energy products and services outside of EaaS which may or may not benefit from a similar augmented license. The scope of this report focuses on EaaS, other new energy products and services should be judged upon their own risks and merits to determine whether a similar license is appropriate.

The current retailer licence requires retailers to have, and properly communicate a standard offer. We believe a similar, but less prescriptive, obligation should be extended to EaaS under the augmented licence.

Suppliers should be obliged to have, and communicate, a standard offer that meets a set of minimum criteria. The minimum criteria should be developed in collaboration with the AER, consumer groups and EaaS suppliers. The minimum criteria for standard offers should relate to objectives rather than prescriptive terms and conditions. Suggested minimum criteria are outlined in the figure below.

Figure 5: Suggested objective-based minimum criteria

The standard offer contains terms and conditions that achieve the following:

- Ensures that any government incentive such as solar rebates or instant asset write-offs can still be received by the customer or assigned to the service provider for a benefit.
- Provides clarity and transparency around the payout requirements if the customer were to move houses or sites, this should also consider.
- Places reasonable limits on contract length, such as the term not being longer than the EaaS supplier's amortisation schedule for the equipment (unless prices are reduced at this point).
- Any services with demand management contain service levels, agreed to by both parties, with avenues for rectification, or compensation.
- Ensures that in all instances, the energy service guaranteed through the service has been provided before attempting to make revenue through demand flexibility markets.
- Provides clarity around profit-sharing of revenue achieved through demand flexibility markets.
- Ensures that suppliers are compensated in the event of 'gaming' behaviour of customers⁴¹ in outcome-based models.

It must be noted that this recommendation does not support a standard offer becoming mandatory, EaaS providers and customers should still retain the ability to negotiate non-standard contracts. Whilst EaaS contracts still may not be attractive for all customers, an accredited and standardised contract may help those customers who are unsure of EaaS because of perceived risk or confusion around the product.

Regular monitoring of adherence to the above obligations and rights should be undertaken by the AER.

41. This can be managed through price adjustments when energy usage changes above an agreed upon range for a consistent amount of time.

Benefits to creating an augmented retailer licence

The benefits of developing an augmented retailer licence for EaaS, in contrast to having these services remain outside of the remit or retail regulation are as follows:

- **Ensures a minimum standard of quality** for all EaaS services through criteria in the standard offer. This can increase the trust and confidence of customers. It can also support procurement managers who like to compare 'apples to apples' during tenders and can use the standard offer for comparison purposes.
- **Extends consumer protections** by bringing dispute resolution with EaaS new entrants in line with all other energy services, under the remit of the energy ombudsmen.
- **Provides new entrant EaaS suppliers with a role in the market** as a participant – this provides access to data such as MSATs and the ability to liaise with the Networks where they otherwise wouldn't have been able to.

Further, the benefits of developing an augmented retailer licence for EaaS, in contrast to having the full retailer license extended to these services are as follows:

- **Lowers the barriers to entry for new entrants (e.g. non-traditional energy suppliers)** to be able to provide non-essential new energy services. The effort and complexity involved in obtaining the current retailer licence may deter these new entrants, whilst the protections concerned with essential services are not relevant to them. New entrants may accelerate innovation in the industry by bringing new skills that were not previously available in the market. For example, a telco or tech company new entrant may bring some of the following skills and capabilities, which could benefit innovation in EaaS:
 - AI, automation and IoT skills, supporting the optimisation of individual energy usage and orchestrating across aggregated customers.
 - Sophisticated and wholistic understanding of customers through big data analytics, understanding the way they behave and use energy.



Competition

We do not believe that an augmented retailer license will be anti-competitive towards FRMPs because traditional / essential energy services and EaaS exist in distinct markets and the advantages of the augmented licence also come with a cost:

- **Regarding distinct markets:** The status quo will remain in the market for traditional energy retail, with FRMPs having to meet the regulatory obligations of a full retailer licence. All retailers are facing the same regulatory obligations and associated administrative costs in this market. In contrast products in the EaaS market will fall under the augmented retailer licence and face the same administrative cost structure. FRMPs have the option to develop and sell products in this market on a level playing field against other EaaS suppliers.

These markets are of course related to each other, in the fact that they are substitutes. A customer⁴² may choose to demand less traditional energy services and more EaaS if the market price of EaaS falls and vice versa. Consequently, if the lower administrative cost burden allows EaaS to be provided cheaper, this market should grow – potentially at the expense of traditional energy services. If there were barriers to entry for FRMPs to enter the market for EaaS, this could be unfair to FRMPs. However, these barriers do not exist FRMPs are in a strong position to offer EaaS products and compete in this market. The growth of demand in this market can be shared by FRMPs and meets this report’s objective of uncovering opportunities to accelerate EaaS.

- **Regarding benefits for a cost:** In contrast, the market for EaaS services will change from not requiring any retail licence to an augmented licence. This provides benefits at a cost to EaaS suppliers. The benefits, as stated above, include increased customer protections and trust, and access to data available only to market participants. These benefits are only received, for non-current retailers, for the higher administrative costs of meeting the licence’s obligations. Current retailers/ FRMPs can offer products in the EaaS market at lower administrative costs than their services in traditional energy service markets.



42. Assuming the customer is in a financial position to be able to make these decisions.

Other considerations

There may also be distinct use cases where a retailer and an augmented retailer providing services at the same premises negatively impact each other. For example, if a customer-facing financial hardship prioritises the payment of their EaaS service and doesn't pay for their traditional / essential service of energy (with the knowledge that they won't be cut off from the latter). Use cases such as these should be further tested with the suggested stakeholders such as the Customer Insights Collaboration (ESB).

Implications for EaaS that does intersect essential energy

EaaS that does intersect essential energy should still require the objective-based standard offer outlined above, regardless of whether the AER deems them suitable for an augmented retailer licence. The objective of a consistent standard offer is to support customer trust and procurement processes. It does not relate to the essentiality of the service.

Specific implications for the two instances where EaaS intersects the essential service of energy are outlined below.



Service outcome impacts the essential service of energy

The AER should reserve the right to determine whether a service outcome delivered through EaaS should be considered essential, and therefore warrants a full retailer licence. Table 6 below indicates the potential that different EaaS services may impact the essential service of energy.

Table 6: Potential for EaaS to impact the essential service of energy

EaaS Category	Common Models	Potential to impact the essential service of energy
Turnkey Energy-as-a-Service	<p>C&I:</p> <p>Turnkey Energy-as-a-Service models are where the term Energy-as-a-Service is most commonly used. These are predominantly targeted towards C&I customers and provide the financing, installation and on-going demand management of energy assets for an on-going fee at no upfront cost.</p> <p>These models evolved out of energy performance savings contracts offered by many ESCOs who would guarantee a certain level of energy savings for a fee, either taking these savings as revenue or sharing them with the customer. Turnkey EaaS goes further by also including on-site generation and demand response.</p>	<p>● ●</p> <p>Moderate</p> <p>In most cases these services are focussed on DER behind-the-meter. However, services that also include demand management, like energy management services, have the potential to impact equipment that are delivering an essential service, such as a heat pump. (however, whilst these services could result in certain equipment not automatically operating at certain times, it is unlikely they would inhibit grid supply of energy to them. Therefore, they could still be manually operated).</p>
Single outcome-as-a-service	<p>Residential and C&I:</p> <p>Single outcome-as-a-service model manifest in residential and C&I as heating and lighting-as-a-service. These models manage the installation or upgrade of energy-efficient lighting and heating for no upfront cost and then provide an ongoing guarantee of light or warm hours for a fee.</p> <p>Mobility:</p> <p>In mobility, similar models are offered with a certain amount of charging (charging-as-a-service) or vehicle use (mobility-as-a-service).</p>	<p>● ● ●</p> <p>High</p> <p>Impacting the supply of heating or light to premises could impact health & well-being.</p> <p>●</p> <p>Low</p> <p>Stakeholder consultation suggests that electricity supplied to an EV, just as petrol supplied to a car, is not an essential service. In most cases, there are other modes of transport available to people⁴³.</p>

43. It is important to note that a definitive assessment on whether EV charging is or is not an essential service has not yet been made by the AER. Stakeholders in the Mobility space have put forward the arguments stated above for why it is not an essential service. However, further assessment into potential customer harms is still being undertaken by the Review of Consumer Protections for Future Energy Services before a decision is taken.

EaaS Category	Common Models	Potential to impact the essential service of energy
Energy management services	<p>Residential and C&I:</p> <p>Energy management models optimise a customer’s energy usage through demand response, this includes Home energy management services (HEMS) in residential and enterprise energy management in C&I. Services can automate solar, batteries and other appliances such as heat and pool pumps to achieve lower energy bills.</p> <p>Some services also generate revenue for the customer, or for supplier & customer in profit-sharing arrangements, through demand response (DR) & FCAS services.</p>	<p>● ●</p> <p>Moderate</p> <p>In most cases energy management services are focussed on DER or non-essential equipment. However, dependent on the model there is the potential for demand management to impact equipment that are delivering an essential service, such as a heat pump (however, whilst these services could result in certain equipment / appliances not automatically operating at certain times, it is unlikely they would inhibit grid supply of energy to them. Therefore, they could still be manually operated).</p>
	<p>Mobility:</p> <p>In mobility, this type of service manifests as Vehicle-to-Grid or managed charging, where an EV is used to participate in demand response.</p>	<p>● ●</p> <p>Moderate</p> <p>Whilst electricity supplied to an EV-may not be an essential service, there are potential risks resulting in customer harms in models which utilise EVs for demand response. For example, batteries may be depleted to a point where the customer cannot use their EV for its intended use when required.</p>
Innovative asset financing	<p>Residential and C&I:</p> <p>Innovative commercial models are being used in residential and C&I to reduce the upfront costs of on-site energy assets, such as solar or EV leasing or providing the benefits of on-site assets virtually through Virtual Power Plant (VPP) models.</p>	<p>●</p> <p>Low</p> <p>These models deal with DER behind-the-meter.</p>

Service acts as a gatekeeper to the essential service of energy by on-selling

Any of the above business models could potentially be delivered through an arrangement where the EaaS provider is the on-seller of energy the customer deals with at a premises. In these instances, added provisions should be included in the augmented retailer licence to:

- Ensure that the EaaS provider records life support information and passes this on to the FRMP.
- Ensure that claims of financial hardship are promptly passed onto the FRMP and,
- In the instance that the EaaS providers chooses to cancel a service due to non-payment, they are required to ensure that the customer’s account is transferred to the FRMP at no cost to the customer.

5.2.3 Opportunities for external bodies

Develop dedicated lines of credit for EaaS suppliers

Who should be involved?	CEFC, private financing institutions
Mechanisms for change	CEFC capital for financial institutions dedicated to clean energy (with energy expertise) and direct concessional loans to EaaS.
Key actions	<p>CEFC to Consider:</p> <ul style="list-style-type: none"> • contributing capital to financial institutions dedicated to innovative clean energy, and supporting upskilling of project appraisals and risk assessments, to consider innovative energy offerings more accurately. • provide direct concessional loans to EaaS providers.
Expected outcomes	Increase price competitiveness of EaaS offerings by lowering supplier's cost of capital, whilst ensuring financing risk is appropriately considered.

The CEFC should consider options including:

- contributing capital to financial institutions / investment funds who are:
 - o dedicated to innovative clean energy, or,
 - o who have upskilled their project appraisals and risk assessments to assess innovative energy offerings more accurately.
- providing direct concessional loans to EaaS providers to accelerate the development of the Australian EaaS market.

These above dedicated financing options for EaaS suppliers, would support more competitive prices. Dedicated options should come from financing products managed by energy experts. Energy expertise, which understands the risks and rewards of EaaS, should provide a more accurate risk premium, and potentially lower cost of credit.

Contributing capital to financial institutions

Cost of capital is high in generic loans for EaaS. This is because project appraisals often incorporate a high risk premium, and do not consider the energy cost savings from energy efficiency as collateral. This is less of a challenge in international markets where several dedicated financial institutions offer tailored finance for innovative energy offerings. Examples include; Sustainable Development Capital LLC in the UK, Hannon Armstrong, Sparkfund in the US, and SUSI Partners in Switzerland.

The CEFC could contribute capital to institutions in Australia that had dedicated funds for innovative clean energy options, such as EaaS, managed through energy-specific project appraisals and risk assessments.

The World Bank has engaged in similar schemes – they provide cheaper lines of credit to banks who are willing to lend at lower rates for energy efficiency projects. Participating banks in the scheme are provided with a technical assistance grant to upskill employees in understanding risk and correct appraisal of energy efficiency projects⁴⁴. Institutions who do not have the relevant expertise or dedicated products but invest in upskilling their project appraisals and risk assessments, should also be able to gain access to this capital.

Providing direct concessional loans

The CEFC could also provide direct concessional loans to EaaS suppliers. The objective of these loans should be to accelerate the maturity of EaaS in the market. Once a set target maturity has been reached, concessional loans should be removed. Once mature EaaS should compete in the private market for its capital (this includes through the dedicated options outlined above).

Streamline owner’s corporation approvals for managed new energy infrastructure through standard guidelines

Who should be involved?	State & territory Governments
Mechanisms for change	National guidelines for installing new energy assets in shared dwellings.
Key actions	<ul style="list-style-type: none"> • Develop guideline material that covers the key concerns causing delays or disapprovals for new energy asset installations from owner’s corporations. This should include: <ul style="list-style-type: none"> • Ensure energy assets are below a certain size or capacity, or managed through demand response, to ensure they do not overload the rest of the building. • Ensure billing of electricity use can be apportioned to users of the asset. • Include EaaS as a potential option to meet the above guideline criteria.
Expected outcomes	<ul style="list-style-type: none"> • Remove delays and/or barriers to EaaS uptake for potential customers in shared dwellings.

44. [Designing credit lines for energy efficiency](#), World Bank

Owner's corporation laws are impacting the ability for potential suppliers to install new energy assets for customers living in shared dwellings. Key concerns which owner's corporations cite when disapproving new energy infrastructure in shared locations are⁴⁵:

- the potential to impact other tenant's electricity access or overload the main power for the building,
- The free rider problem where EV owners are using electricity, which is paid for through the strata,
- A need to install chargers in every parking bay to ensure equity across all residents, which is usually too costly.

Currently, all new energy infrastructure must go through Owner's Corporation approval, which is timely and costly. A set of streamlined, accredited, guidelines should be developed. When met, these guidelines should provide Owner's Corporations confidence to approve requests for new energy infrastructure.

Suggested objectives of the guideline should be:

- New energy assets for individual tenants are:
 - Below a certain capacity or size (for example, a 10kw limit on charging infrastructure would reduce the likelihood of them impacting electricity to the rest of the building) or,
 - Managed through demand response to ensure charging is occurring during off-peaks.
- A method exists to track the amount of apportion the amount of energy used by users of the asset for billing purposes.

EaaS models such as Charging-as-a-Service are primly poised to be the delivery partner to meet these guidelines. EaaS models optimally managing charging, and track and pay the electricity usage from their infrastructure. EaaS should be listed as a potential option in the guideline materials.

Germany has developed similar material and mandated that Owner's corporations can't deny applications for new energy infrastructure that passes the guidelines. New South Wales has also developed material which other states could use as a template⁴⁶. The Commonwealth government has also indicated its willingness to engage with states to develop guidance material for installing EV charging infrastructure for exiting apartments, whilst updating the building code to ensure it is installed at new apartments⁴⁷.

45. See, [lack of EV charging deters apartment buyers, renters](#), AFR, [the EV 'social equity' dilemma that may put apartment residents off electric cars](#), ABC and stakeholder consultations.

46. [Making your residential strata building EV ready](#), NSW Government

47. The EV 'social equity' dilemma that may put apartment residents off electric cars, Terzon. E, ABC

Review assessment of vehicle expenses in novated leases to remove implicit biases for ICEs

Who should be involved?	ATO, Commonwealth Government
Mechanisms for change	Novated leases – expenses assessed in pre-tax income
Key actions	<ul style="list-style-type: none"> • Monitor the impact of the Commonwealth Government’s removal of fringe benefits tax on EV take-up in novated leases • Proactively consider how vehicle expenses can be updated or changed to remove inherent biases towards ICEs in novated leases, in the case that the fringe benefits tax removal is ineffective. Example ways in which this could be done include: <ul style="list-style-type: none"> • Adjusting the rate at which electricity expenses are assessed, to be higher than fossil fuel expenses. • Creating allowances for other adjacent energy assets to be included in pre-tax expenses (e.g. charging infrastructure, batteries).
Expected outcomes	<ul style="list-style-type: none"> • Increase price competitiveness of EVs versus ICE vehicles in novated lease arrangements (a Innovative asset financing model of EaaS)

Novated leases are a type of EaaS falling under the ‘Innovative asset financing’ category, as they shift CAPEX to OPEX. There has historically been an inherent bias in novated leases towards ICEs because they have higher operating costs than EVs. Whilst this has occurred organically it goes against societal objectives of supporting, or at the very least not handicapping, the uptake of EVs.

The Commonwealth Government has introduced legislation to remove the Fringe Benefits tax from electric vehicle, which may partially solve this issue. This impact of this legislation should be monitored.

The ATO could also proactively review how it assesses vehicle expenses in novated lease arrangements with the objective of ensuring that ICEs are not given an unfair advantage purely because they are more expensive to run over their lifetime. Consultation suggests that this could be done by:

- adjusting the rate at which electricity expenses are assessed to be higher than petrol / fossil fuel expenses, or,
- allow other expenses adjacent to an EV to be included in the pre-tax assessment of expenses (e.g. charging infrastructure, batteries).

Integrate EaaS into state-based energy efficiency schemes

Who should be involved?	State governments / administrators of energy efficiency schemes, potential EaaS suppliers
Mechanisms for change	National Energy Efficiency Strategy
Key actions	<ul style="list-style-type: none"> • Integrate EaaS suppliers into state energy efficiency schemes, targeting large C&I customers with complex energy needs. This could be done through: <ul style="list-style-type: none"> • Scheme administrators accrediting EaaS suppliers and communicating them as an option to customers. • EaaS suppliers positioning themselves as preferred sub-contractors, to support retailers in meeting their targets under target-based schemes.
Expected outcomes	<ul style="list-style-type: none"> • Increase the market for EaaS through a targeted customer base. • Increase awareness and trust in EaaS through demonstrated use-cases.

There are currently four state energy efficiency schemes: Victoria, New South Wales, South Australia, and Tasmania. There is an opportunity for EaaS to be more closely integrated with these schemes. This can increase the amount of large C&I customers with complex needs using the scheme and increase the market for EaaS.

Stakeholder consultation indicates that to date, state schemes have been relatively successful in the residential and small C&I space (e.g. LED lighting upgrades). However, larger, more complex C&I customers, have had a much smaller uptake. This is largely due to the following:

- To receive the incentives / rewards from the schemes, energy savings and / or emissions reduction from the actions taken must be measured, verified, and reported. For large customers this can be a complex task, which requires expert skills and capability.
- In some schemes, tradable certificates are provided as the reward / incentive to participate. These can be sold to cover the cost of energy efficiency actions, however, the volatile market for certificates creates uncertainty and risk for companies wishing to do so.

EaaS could open the complex C&I segment for these schemes. EaaS is well suited to overcome the lack of skills & capability issues and can take on the risk of certificate price volatility, incorporating this into their offering.

Further, energy efficiency upgrades and retrofits under energy performance savings contracts (EPSCs), are what many of the C&I EaaS offerings have evolved from. Stakeholder consultation indicates that the energy efficiency capabilities of EaaS are the most mature. Incorporating EaaS into state energy efficiency schemes could present an opportunity to:

- Increase the market for EaaS, and,
- Increase awareness of EaaS by showing successful use cases based on mature offerings.

This would provide potential EaaS suppliers a springboard to on-sell more innovative EaaS offerings (i.e. those including installation, operation and optimisation / orchestration of energy assets).

EaaS could be integrated into the schemes through the following ways:

- **For schemes where an accreditation is required** to provide energy efficiency services (e.g. Victoria), EaaS suppliers could be targeted for this accreditation. Administering authorities could list EaaS as a potential supplier in their communications of the schemes to customers.
- **For schemes where retailers are obliged to meet a certain energy efficiency target** (e.g. South Australia), EaaS suppliers should engage with retailers to be positioned on their preferred tenderer lists as sub-contractors to deliver energy efficiency services.



5.3 Opportunities for suppliers and customers

As the EaaS market grows, both through the factors discussed in 5.1 and opportunities presented in 5.2, potential suppliers can take the opportunity to prepare their own EaaS. Potential suppliers should take the following considerations into account to accelerate their offerings and increase customer uptake. These considerations have been identified through our research from international markets which are further advanced in EaaS, and through stakeholder consultation with potential buyers.



5.3.1 Assess your organisational capability to deliver different EaaS types

Different types of EaaS require different skills and capabilities to deliver. Traditional energy services companies will have different skills and capabilities than new entrants such as tech companies. Potential suppliers must decide where they are best suited to play based on the skills and capabilities they have in-house, or are willing to invest to acquire, or want to partner to provide.

A non-exhaustive list⁴⁸ of capabilities required to deliver different types of EaaS is as follows:

- **Energy analytics:** suppliers require the capability to assess a customer's energy usage, and accurately forecast future usage, to quote and deliver services. This capability requires skills in modelling and forecasting. These skills are supported by analytics, machine learning and artificial intelligence (AI).
- **Audits & advisory:** energy analytics would feed into site audits. Suppliers must have expertise in auditing and advisory to tailor an energy solution that best meets their needs. This requires a technical knowledge of energy assets, including how they operate in different geographic locations and under different weather patterns.
- **Financing:** EaaS which shifts CAPEX to OPEX will require the supplier to engage in some form of financing. They will require the relevant appraisal and risk assessment skills to understand whether a customer can afford a service. If they are in turn financing their EaaS products through a third-party financing institution, they will also require skills in procuring finance from these institutions.
- **Procurement:** EaaS suppliers will also need to procure energy assets from manufacturers (outside of cases where original equipment manufacturers [OEM] choose to supply EaaS). Sophisticated procurement processes are required to ensure that quality products are being sourced at lowest cost.
- **Installation, operations & maintenance (O&M):** electricians, roofers and specialist engineers are all required to install and operate energy assets such as rooftop solar and batteries. These roles need to be tapped on regularly to provide many EaaS offerings.
- **Asset optimisation & orchestration:** optimising demand management of assets requires digital skills in analytics. Optimisation is best achieved when automation, machine learning and AI are combined with devices and assets connected through the internet of things (IoT). All these digital technologies become even more imperative for EaaS which seeks to orchestrate the demand management across multiple sites.
- **Flexibility trading:** models which trade and profit in flexibility markets require the digital skills outlined in 'Asset optimisation and orchestration' above. They also require an expert understanding of the wholesale energy market, and how to take advantage of price arbitrage through trading.

48. These focus on capabilities explicitly related to EaaS. Capabilities common across all products and services are not discussed here (e.g. pricing strategy, people management).

Table 6: Capabilities required to deliver different types of EaaS.

EaaS category	Energy analytics	Audits & advisory	Financing	Procurement	Installation O&M	Asset opt. & orch.	Flexibility trading
Turnkey EaaS	✓	✓	✓	✓	✓	✓	✓
Outcome-as-a-Service	✓	✓	Partial- for efficiency upgrades, not generation assets	Partial- for efficiency upgrades, not generation assets	Partial- for efficiency upgrades, not generation assets	Partial- for efficiency upgrades, not generation assets	
Energy mgmt. services	✓	✓				✓	✓
Innovative asset financing			✓	✓	✓	✓	
Example players with capability	<ul style="list-style-type: none"> • Tech players • ESCOs • Utilities 	<ul style="list-style-type: none"> • ESCOs • Utilities 	<ul style="list-style-type: none"> • Specialised finance⁴⁹ • Utilities • ESCOs 	<ul style="list-style-type: none"> • ESCOs • Utilities • OEMs 	<ul style="list-style-type: none"> • OEMs • ESCOs • Utilities 	<ul style="list-style-type: none"> • Tech players • ESCOs • Utilities 	<ul style="list-style-type: none"> • Utilities • ESCOs

Different players may find themselves with strong maturity in some capabilities, but less so in others. Potential suppliers finding themselves in a position where they have insufficient capability to offer their desired EaaS, must develop a strategy to acquire these capabilities. This could include building internal capability through training and recruitment, buying the required capability through mergers or acquisitions, or sub-contracting / partnering with other organisations.

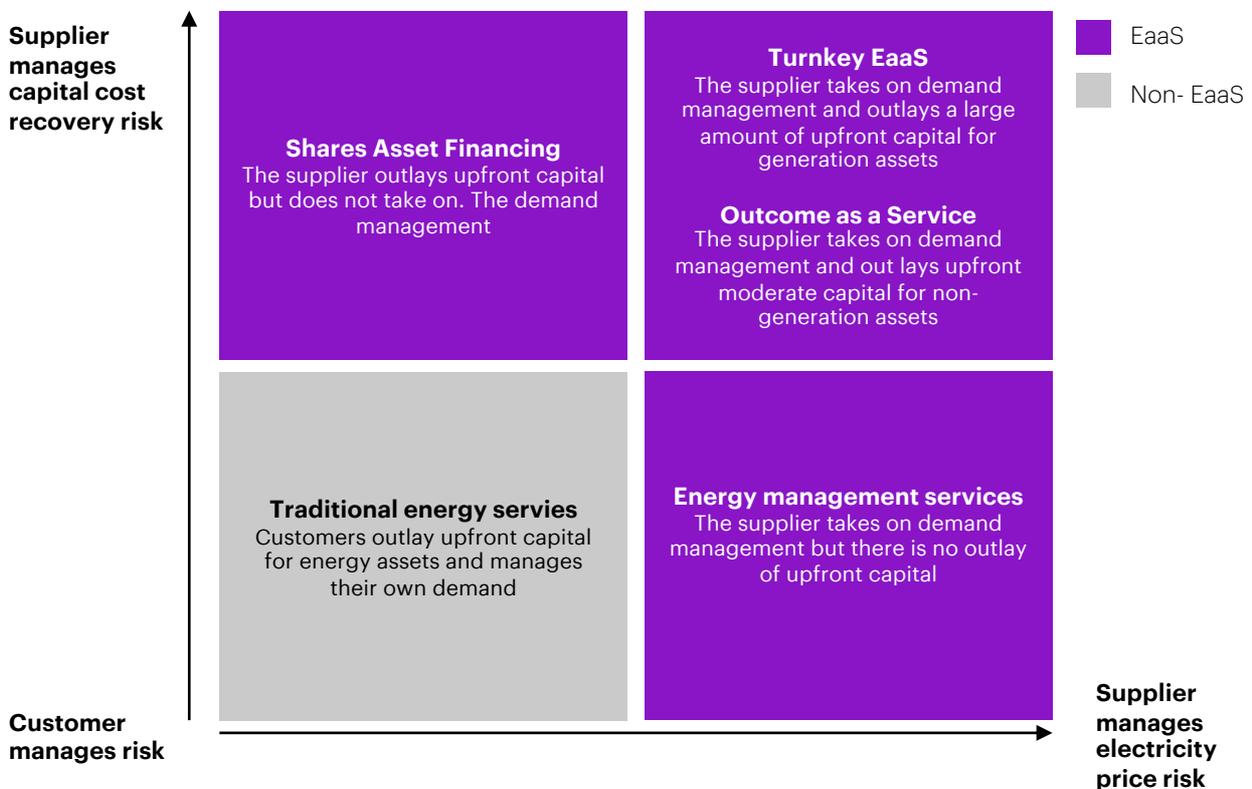
49. See for example Plenti and Generate Capital. Links to further information provided in appendix.

5.3.2 Define your risk vs reward appetite

EaaS models transfer risks from the customer to the supplier. It is through managing this risk that suppliers can provide an attractive value proposition and/ or capture potential higher value for themselves through flexibility markets.

- Capital cost recovery risk vs reward:** Suppliers take on the risk of having to recover the cost of the initial capital outlay, and, in third-party financing arrangements, having to pay back the financier. This is material in EaaS models where a supplier outlays the upfront cost for capitals assets such as in Turnkey EaaS, Innovative asset financing and, to an extent, Outcome as a Service⁵⁰. Suppliers who have the capability and appetite to take on capital cost recovery risk, can unlock a currently untapped segment – those who have been locked out of the market for new energy assets, or energy efficiency, due to capital constraints.
- Electricity price risk vs reward:** Suppliers who manage a customer’s demand to deliver an outcome, take on the risks of higher electricity prices. In consistently high price environments, or without capable energy expertise in demand response, suppliers could risk higher costs and reduced margins for their services. These models include Turnkey EaaS, Outcome as a Service and, Energy Management Services. Of course, the flip side of this risk is a large value-pool for suppliers to capture. Those with the right capabilities and appetite to manage this risk will be rewarded in these models.

Figure 6. Risk transfer involved in EaaS



50. Single outcome as a Service models do not deal with generation assets and as such this capital outlay, and therefore risk transfer, is smaller.

Potential suppliers should consider their current and future capabilities, as outlined previously, to inform their risk vs reward appetite assessment. The assessment of both considerations, in tandem, should give suppliers a good indication of what EaaS offerings they are best placed to provide.

5.3.3 Understand the target customer

Stakeholder consultation suggests that whilst EaaS may not be used by the whole market for energy services, it contains a very strong value proposition for a sub-set of customers. Potential suppliers who can design offerings which are appropriately tailored to this sub-set can reap the benefits.

Suppliers should have clear market research to identify exactly who this sub-set is, what they value and, how much they are willing to pay for this value. Opportunities such as the demonstration of EaaS with shared knowledge, will support this at an industry level. Individual suppliers need to then use this information to tailor their products and pricing to capture the target market.

Table 7 presents an example output of customer segmentation that could be achieved through market research activities such as interviews and surveys.

Table 7: Illustrative example of customer segmentation and assessment of EaaS value drivers

	Example target customer segments				
Value drivers:	Customers who are capital constrained	Customers who place unpredictable cashflow	Customers with complex energy needs	Customers who wish to engage in flexibility markets	Customers with ambitious sustainability objectives
Access to finance	✓	✓	✓		✓
Simplicity			✓	✓	
Predictability		✓	✓		
Sustainability					✓
New Revenue	✓	✓		✓	

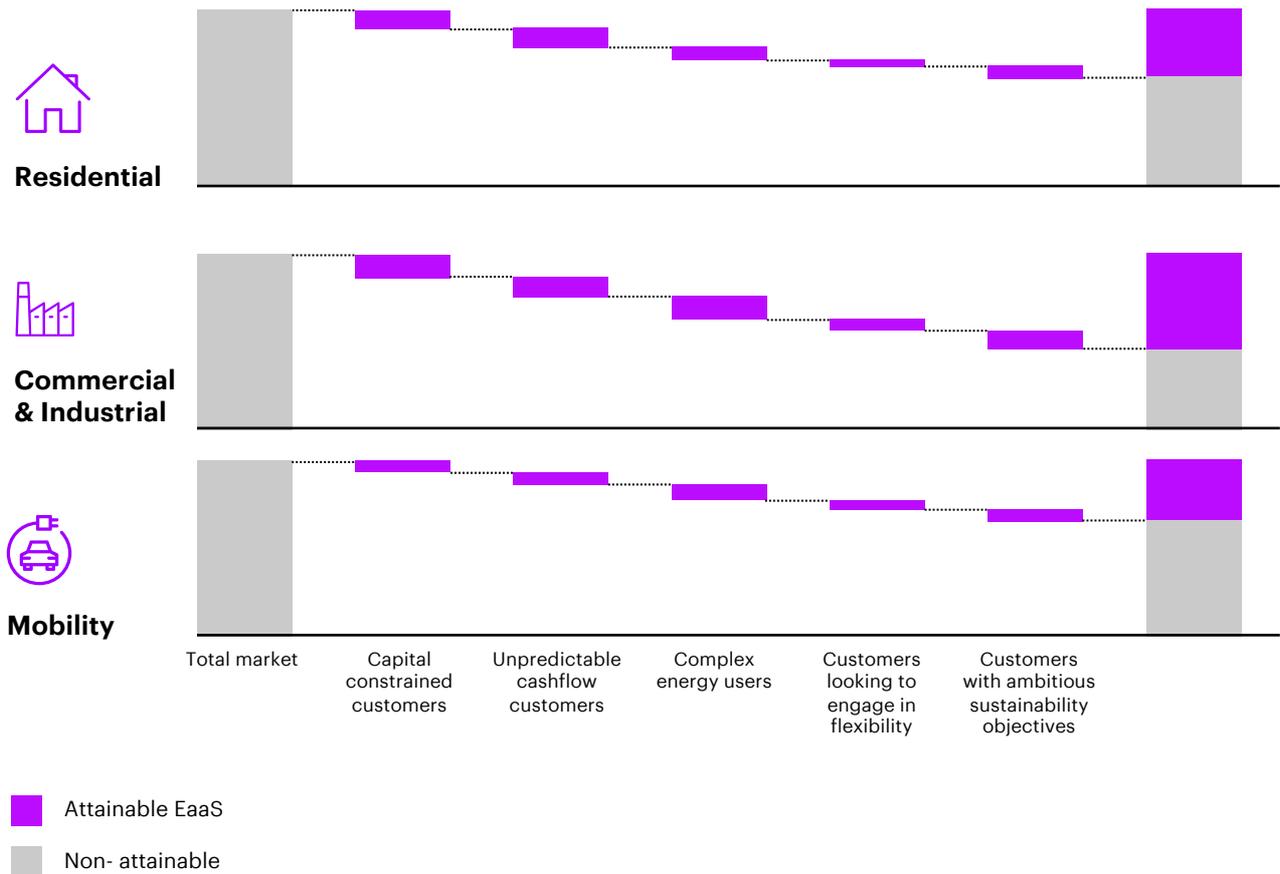
Economic analysis can be undertaken into customer willingness to pay for each of the value drivers identified during segmentation. Again, this can be done through surveys, or through analytics of historical energy service sales information. This information should inform potential supplier’s EaaS pricing strategy.

With an understanding of target customers and willingness to pay, potential suppliers can better model the attainable market for EaaS, helping in the decision process for what type of offering they should pursue.

Figure 7: Illustrative example output of attainable market size modelling

Spend on electricity services & DER (including Evs)

\$AUD M



5.3.4 Perfect marketing & communications in the “moments that matter”

Stakeholder consultation with potential buyers showed very clearly that residential buyers, whilst open to the idea of EaaS, were not engaged with new energy services and had little knowledge of new energy terms and concepts⁵¹. C&I buyers were far more engaged but were also somewhat “traditional” in their procurement practices and were wary of new business models. To gain traction of EaaS, the targeted value proposition must be communicated to customers on their terms.

Potential suppliers should focus on the following when engaging in marketing and communications of their EaaS offering:

- **Communicate on the outcome:** communication should be in terms that the customer understands. Marketing of energy services should move away from focussing on the product, to focussing on the outcome the customer will receive, whether that be simplicity, mobility, sustainability or otherwise. This should be informed by the work undertaken to understand the customer and their targeted value proposition.
- **Engage during the moments that matter:** Most of the time, customers are unlikely to be thinking about energy. Potential suppliers need to reach customers during times when they are. For example, EaaS offerings should be presented when a customer faces changing energy needs, such as the purchase of an EV, or an overhaul of site equipment. Big data analytics can help to understand customer behaviour and when the moments that matter are occurring.
- **Promote cultural and process change with C&I customers:** engage with customers to be more open to different ways of procuring energy. Bring sales conversations back to basic principles - different offerings should be assessed on their ability to meet business priorities (e.g. lifetime cost, cashflow, sustainability targets), rather than just box-ticking a stock standard tender process. Campaigns to increase general customer knowledge about EaaS may be required for customers to become comfortable with the concept, like cross-industry campaigns in the early days of Cloud technology – this could include webinars, trade shows and the like.



51. See challenges in section 4 related to customer engagement and [Consumer Perspectives on Demand Response and Community Energy](#). CSIRO

6. Conclusion

EaaS fundamentally changes energy consumption by shifting the incentive of energy services from volume to optimisation.

EaaS services are defined by three characteristics:

1. The customer receives a guaranteed outcome,
2. The offering shifts CAPEX costs to OPEX costs, and,
3. The offering, to some extent, shifts demand management from customer to supplier.

These characteristics incentivise suppliers to optimise energy production and use, rather than the traditional incentive to increase the volume of energy production and use.



The market for EaaS is beginning to emerge in Australia and has a strong value proposition for a sub-set of customers.

EaaS is more advanced in global markets such as the U.S, U.K and Germany. Australia, however, is beginning to follow suit, with stakeholder consultation suggesting that many potential suppliers are developing, or planning to develop, EaaS-like offerings.

Other general trends, which are conducive to EaaS, are also emerging in Australia. These include higher energy prices, more stable emissions policy, initiatives focussed on increasing flexibility and, a heightened awareness around sustainability from both customers and suppliers.

Whilst it is not expected that EaaS will become the dominant form of energy service, it will have a strong value proposition for a sub-set of customers. These customers include those who; are capital constrained, place a high value on simplicity and predictability, have complex energy needs or wants, wish to engage in flexibility markets, and / or have ambitious sustainability targets.

However, a number of challenges may limit the growth of this emerging market.

Challenges exist for potential suppliers to offer, and customers to buy, offerings with the characteristics of EaaS. These include, but are not limited to:

- Lack of availability and access to behind-the-meter data.
- Managing the risk of changing customer consumption behaviour.
- Lack of supplier expertise in industry specific equipment and processes, and the perceived risks to production this may cause.
- Traditional customer procurement and tendering processes.
- Government rebates and tax incentives flowing to energy asset purchasers.
- Owner's corporation approval requirements for new energy infrastructure in shared dwellings.
- High cost of capital for potential suppliers of EaaS products.
- EaaS contract lengths which are misaligned to customer planning horizons.

Seven opportunities can be pursued by policy makers and industry bodies to overcome these challenges.

1. Demonstrate an end-to-end EaaS offering, sharing outcomes to increase supplier and customer knowledge.
2. Focus current data enhancement initiatives on increasing data accessibility.
3. Suggest an augmented retailer licence and standard offer.
4. Develop dedicated lines of credit for new energy services.
5. Streamline owner's corporation approvals for managed new energy infrastructure through standard guidelines.
6. Review assessment of vehicle expenses in novated leases to remove implicit biases for ICEs.
7. Integrate EaaS suppliers into state energy efficiency schemes.

Potential suppliers should take four considerations into account when looking to enter the EaaS market.

Potential suppliers looking to enter the EaaS market should firstly consider assessing their organisational capabilities, and secondly, their risk vs reward appetite, to understand which EaaS model is right for them. Thirdly, they should carry out research to segment the market into a target customer base. Finally, they should perfect their marketing and communications strategy for this targeted customer base.

EaaS can be accelerated through pursuing the opportunities identified. This acceleration can ultimately support the clean energy transition.

EaaS, through its fundamental shift of incentives, encourages suppliers to install more DER, and engage in energy efficiency and demand flexibility. This is increasingly required to ensure a sustainable and reliable energy system. That is, one which is both transitioning towards zero emissions through the integration of renewables, whilst avoiding the volatility that this integration can cause.

EaaS overcomes several challenges which exist to customer-led uptake of DER and demand flex, including skills and capability gaps, high internal hurdle rates for customers and capital constraints.

The opportunities presented in this report should be taken into strong consideration, due to the positive outcomes they can enable for both customers and a clean, and reliable, energy system.



Appendix

A. Stakeholder consultation

Table 8: Stakeholders consulted

Ref.	Organisation	Stakeholder type
01	3E Group (formerly EcoSave)	Potential supplier
02	Australian Alliance for Energy Productivity (A2EP)	Industry body
03	AEMC	Regulator
04	AEMO	Regulator
05	AER	Regulator
06	AGL	Potential supplier
07	Amber Electric	Potential supplier
08	Australian Energy Council (AEC)	Industry body
09	Clean Energy Council (CEC)	Industry body
10	Combined Energy	Potential supplier
11	Energy Consumers Australia (ECA)	Customer representative
12	Energy Efficiency Council (EEC)	Industry body
13	Energy Networks	Industry body
14	Flow Power	Potential supplier
15	Hardwicks	Customer representative
16	JET Charge	Potential supplier
17	Johnson Controls	Potential supplier
18	Plenti	Potential supplier
19	Shell Energy	Potential supplier
20	Telstra	Customer representative
21	Tesla	Potential supplier
22	Accenture – North American Utilities Practice	Global perspectives
23	Accenture – U.K & Ireland Utilities Practice	Global perspectives
24	Accenture – European Utilities Practice	Global perspectives

B. Market offerings assessment

Table 9: Market offerings assessed⁵²

Ref.	Organisation	Offering	Locations
01	AGL	EV Leasing & Charging Plans	Aust only
02	AGL / Plenti	Solar & Storage with Interest Free Finance & Integration to VPP	Aust only
03	Amber Electric	Solar & Battery and EV Smart Shift	Aust only
04	Ameresco	Energy as a Service	International
05	Arc renewable group	Lighting as a Service, Solar PPA, Shared EV Charging	Aust only
06	Brighte	0% Interest Loan	Aust only
07	Budderfly	Effortless Energy Efficiency	International
08	Carbon Lighthouse	Carbon Lighthouse Unified Engineering System	International
09	Catapult Energy Systems	Heating as a Service (Trial)	International
10	Centrica	Smartwatt Lighting as a Service	International
11	Centrica	Energy as a Service	International
12	Easy being green	Solar & Energy Efficiency Installation Offerings	Aust only
13	EcoSave	Energy as a Service	Aust only
14	Enel X	Solar/Storage With VPP & Flexible Financing	Aust & international
15	Enel X	Demand Response FCAS Services	Aust & international
16	Enel X	E-Bus as a Service	Aust & international
17	Engie	Sustainable Mobility as a Service	International
18	Engie	Offsite & Onsite Green Corporate PPA	Aust & international
19	Engie	Smart City Public Lighting	International
20	Evergen	Software for Energy Management & Optimisation	Aust & international

52. Not all offerings assessed were considered to meet the characteristics of EaaS.

Ref.	Organisation	Offering	Locations
21	Flow Power	Power Renewable Plan with Kwatch	Aust only
22	Generate Capital	Build, Own, Operate & Finance	International
23	Generate Capital & BYD	EV Bus Leasing	International
24	Johnson Controls	Openblue Buildings as a Service	Aust & international
25	Metrus	Energy as a Service	International
26	Momentum	All You Can Eat	Aust only
27	NG electrical	Energy as a Service	Aust only
28	Octopus Energy	Intelligent Octopus EV Charging	International
29	Origin	Solar Payback Plan With VPP Integration	Aust only
30	Origin	360 EV Car Share (For Offices & Apartments)	Aust only
31	Pooled Energy	Pool Automation	Aust only
32	Redaptive	Energy as a Service	International
33	Reposit Power	\$0 Electricity Bill For 5 Years	Aust only
34	Schneider	Alphastruxure - Energy as a Service	International
35	Schneider	Ecostruxure For Emobility	International
36	Shell Energy	Powershop	Aust only
37	Shell Energy	On-Bill Financing For C&I Energy Sourcing & Demand Response Management Solutions	Aust & international
38	Siemens	Calibrant Energy - Energy as a Service	International
39	Signify	Lighting as a Service	Aust & international
40	SolarEdge	Solar Installation & Energy Management Software	Aust only
41	Sparkfund	Energy as a Service	International
42	SunRun	Monthly Solar Lease	International
43	SunRun	Integrated Solar & EV Charging/Back-Up Battery	International
44	Swell Energy	Compass Energy Management Platform, Swell Local VPP	International
45	Tesla	Powerwall VPP	Aust & international

C. Advanced international EaaS markets – key insights

Disclaimer: The following assessment was undertaken in **August 2022**.

Overview of markets with advanced EaaS offerings

Figure 8: Three International markets where EaaS is prevalent were chosen for the market assessment.

Market jurisdiction	Energy transition focus indicators			Energy prices & volatility (2017-2021) ²	Reason for selection
	Carbon price (\$/tCO ₂ e, 2021) ¹	Public spending on low carbon tech (\$, 2021) ²	Renewable penetration (% , 2020) ²		
Germany	\$33-87	~\$10 per capita	~39%	High	<ul style="list-style-type: none"> • Mature ESPC offerings in C&I⁴ • High DER penetration • Largest battery market in Europe & targeted storage policy
United Kingdom (U.K)	\$99-123	~\$9 per capita	~41%	Moderate	<ul style="list-style-type: none"> • Mature ESPC offerings in C&I⁴ • Mandatory sustainability disclosure for companies • Targeted energy efficiency policy & incentives
United States (U.S) ³	\$0-31	~\$11 per capita	~10-39%	Moderate	<ul style="list-style-type: none"> • Mature ESPC offerings in C&I⁴ • High DER penetration • High EV take-up • Targeted energy efficiency policy & incentives • Fragmented energy policies across jurisdictions
Australia	\$0	~\$5 per capita	~22%	Moderate	N/A

Notes/references: 1. World Bank, 2. IEA, U.S EIA, Accenture Analysis, 3. Markets considered were CAISO (California) and PJM (13 states across northeast and Midwest U.S. CAISO has more ambition energy policy and a larger EaaS market, PJM lags CAISO, Germany & U.K on these measures, 4. Energy savings performance contracts (seen as a precursor to EaaS), 4. Heavily active in jurisdiction

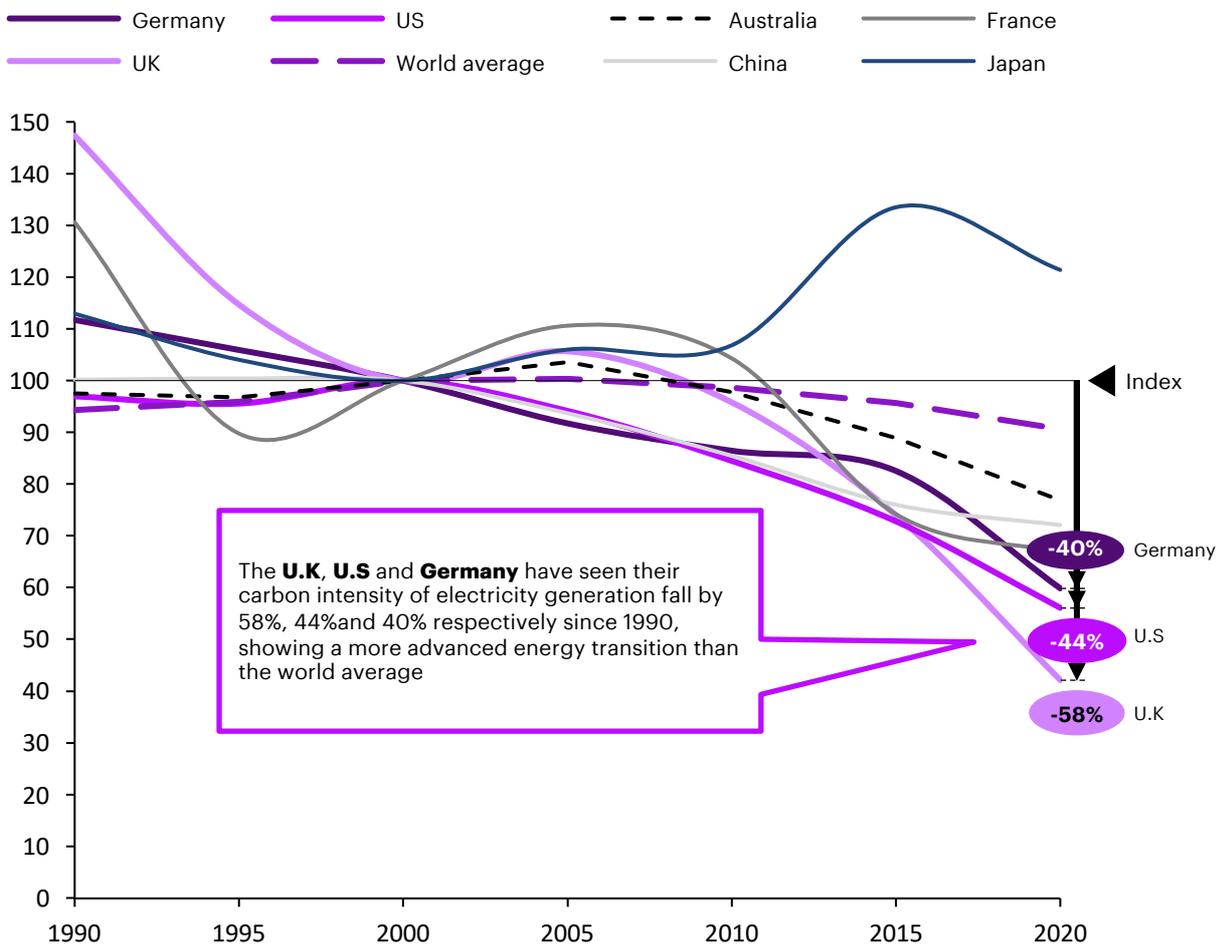
An assessment of international markets was undertaken to determine what trends exist in energy markets where EaaS has a larger presence than in Australia. Whilst there was no clear leader identified globally, markets in Europe (namely the U.K and Germany) and the U.S (California) were found to have more advanced markets, especially for C&I EaaS models.

Across these markets 'Turnkey EaaS' was the most prevalent type of EaaS. This was typically offered to the C&I customer segment, with little evidence of offerings in the residential or mobility segments. For 'Energy Management Services' and 'Outcome-as-a-Service' EaaS there was evidence across all customer segments, however C&I had a larger representation. 'Innovative Asset Financing' models had the least representation⁵³.

Figure 9: A more advanced energy transition in the international markets has led to several trends which increase the value proposition of EaaS.

Carbon intensity of electricity generation is lower in selected countries¹

Index, 100 = year 2000



Notes/references: 1. IEA, Accenture analysis

53. A full list of the market offers assessed both internationally and locally can be found in [Appendix B. Market offerings assessment](#).

Advanced energy transitions increase the value proposition for EaaS

 <p>1. Increased intermittency</p>	<p>Higher incorporation of renewables into the grids of advanced energy transition countries has increased intermittency. The intermittency has increased wholesale price volatility and therefore the arbitrage value opportunity of EaaS for suppliers.</p>
 <p>2. Increased DER</p>	<p>DER has been a feature of many countries energy transitions. DER provides a mechanism to take advantage of arbitrage value through demand response and flexibility. Many EaaS models use DER to capture value from intermittency.</p>
 <p>3. Higher average retail prices</p>	<p>Countries that have phased out fossil fuels early in their energy transition have seen higher average retail prices. This increases the value proposition for customers to move to DER or invest in energy efficiency measures – both of which EaaS supports.</p>
 <p>4. Sustainability momentum</p>	<p>Countries with more advanced energy transitions often have policy instruments or incentives for energy customers to move to cleaner sources of energy or invest in energy efficiency. There may also be public support pushing people and business to choose more sustainable offerings.</p>

Relatively advanced energy transitions in each of these international markets has given rise to several trends that drive a higher value proposition for EaaS-like models. These trends include increased intermittency, increased DER, higher average retail prices and sustainability momentum⁵⁴.

Common features of advanced EaaS markets

Figure 10: There are a set of common features in the advanced EaaS markets. Australia’s market lags in relation to these features.

Features of advanced EaaS markets		Presence of feature in Australia
<p>1. Stable underlying long-term policy settings providing market certainty</p>	<p>Policy certainty is required to give suppliers and customers the confidence to invest in new energy products and services.</p>	<p>● ○ ○ ○ ○ ○ Over the last 10y Australia has had unstable policy.</p>
<p>2: Initiatives in place to address renewable energy skills gaps</p>	<p>Skills shortages can lead to delays & increased costs in DER asset installations.</p>	<p>● ● ○ ○ ○ ○ Australia faces skills shortages without strong strategies in place to address them.</p>
<p>3: Proactive steps underway regarding customer protections</p>	<p>Insufficient or unclear customer protections around EaaS models and knowledge of energy concepts, can create distrust of offerings, decreasing uptake.</p>	<p>● ● ● ○ ○ ○ Australia is currently assessing its customer protections related to energy.</p>
<p>4: High prevalence of energy market players growing or acquiring capability</p>	<p>EaaS, as a typically multi-service offering, requires suppliers to have capability across multiple parts of the value chain to deliver.</p>	<p>● ● ● ○ ○ ○ There is less evidence of inorganic growth in the Australian market.</p>

5 complete circles = the feature exists in the Australian market to the same extent as the international markets

54. These trends are discussed further in section [3.4 General trends in the industry giving rise to EaaS](#) (note they are adapted in this section to reflect local stakeholder consultation).

A set of market features, some of which are influenced by a more advanced energy transition, were identified as conducive to a more innovative, distributed, and sustainable energy system. These features are all more advanced in the international markets studied, than they are in Australia.

Feature 1: Stable underlying long-term policy settings to provide certainty to the market.

Advanced EaaS markets have economy-wide energy transition policies that provide consistent signals to the market, such as; carbon pricing and ambitious interim emissions reduction targets (all above 50% by 2030), phase-out of fossil fuels, and renewable energy uptake. Supplementary, targeted mandates, such as sector specific energy efficiency requirements for building heating and lighting, have created additional certainty for customers and demand for suppliers, enabling EaaS market growth. For example:

- **Germany:** Since Germany’s overarching energiewende (energy transition) legislation was passed in 2010, the direction of policy has not changed, and targets have only increased since. Supplementary policies include requirements for C&I customers to use energy management systems; all new non-residential buildings to have solar, non-voluntary prices on carbon, EV uptake targets and fossil fuel phase-outs.
- **U.K:** The U.K’s climate change act has been in place since 2008, the direction of policy has not changed and targets have only increased since. The U.K has a non-voluntary & globally leading price on carbon, targeted polices such as the Energy Efficiency Action Plan, & UK Heat and Buildings Strategy and mandatory disclosure of emissions in the C&I sector.
- **U.S:** California has had renewable generation and energy efficiency targets in place since 2006. PJM has several state mandated energy efficiency programs, such as Pennsylvania’s rebates for building refits and upgrade, however policy is more fragmented⁵⁵. US federal infrastructure spending is a significant driver of industrial electrification and relies on sustainability goals and GHG targets of C&I customers.



55. This less stable policy environment in PJM also correlates with a smaller prevalence of EaaS than California.

In contrast, Australia has lacked both consistent, long-term policies and supplementary, targeted programmes to provide stability and certainty about the energy transition. For example, Australia’s overarching energy policy framework has changed materially with each change in Commonwealth Government between 2007 – 2022; carbon prices were introduced and then removed; and the country lagged global peers in committing to global emissions reduction goals. Similarly, state-based incentives for residential solar and energy efficiency have been short-term and not universal, and feed-in-tariffs for DER have fluctuated.

This lack of direction has seen Australia’s energy transition follow a boom-bust cycle. For example, annual solar installations rose from ~200k in 2010 to ~350k in 2012 only to fall to below 150k in 2016, and then rising again to surpass the 2012 peak in 2021⁵⁶. The overall environment has created uncertainty which disincentivises suppliers from investing in capability and skills or offering the shared-risk contracting models typical of EaaS. It has removed opportunities for EaaS to capture value from the price volatility associated with the energy transition.

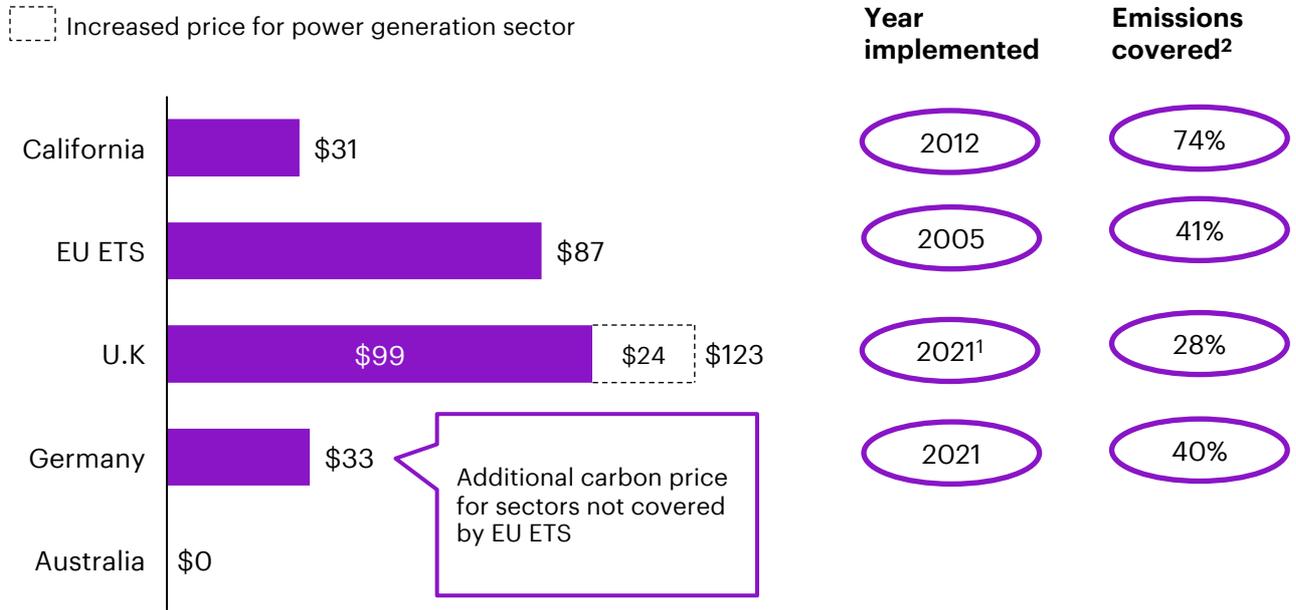
It also contrasts with leading EaaS markets which have clear long-term guidance and effective supplementary programs. For example, Australia’s lack of carbon cost contrasts with leading EaaS markets (it is up to \$99 / Tco2e in the UK)⁵⁷. Australia’s per capita public spending on low carbon research & development is less than half of the US’s level and lower than Germany and the UK⁵⁸. And while the share of energy demand covered by energy efficiency policy in the US, Germany and UK has increased by between 7- and 10-times since 2000, Australia’s has only increased 1.2-times⁵⁹.



56. Annual small-scale technology installations, [Clean Energy Regulator](#)
57. Carbon pricing dashboard, [World Bank](#)
58. Energy technology RD&D budgets, [IEA](#)
59. Energy efficiency, [IEA](#)

Figure 11: International markets have had long-term stability regarding their energy and climate policies, whereas Australia’s has been inconsistent.

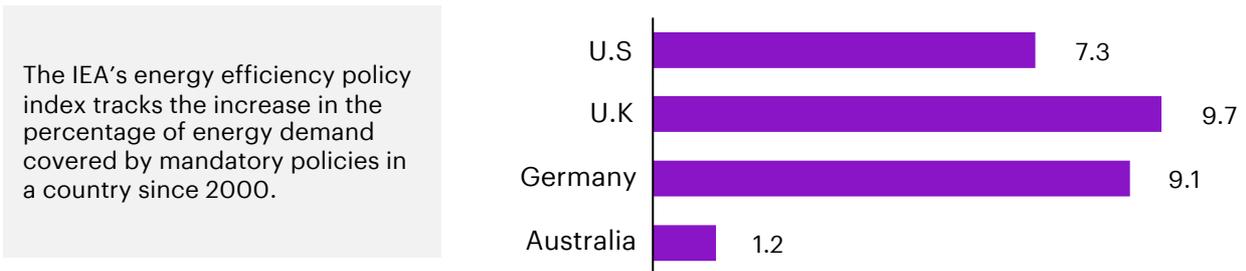
Non-voluntary carbon prices (\$USD/t CO2e)



California, Germany and the U.K all enforce non-voluntary carbon pricing through emissions trading schemes. States in PJM have not had an explicit carbon price (along with no federal carbon price in the U.S), however Pennsylvania and Washington are in the process of implementation.

Australia’s carbon market is voluntary and until recently has had relatively low demand, prices for most of the last decade have been below \$20.

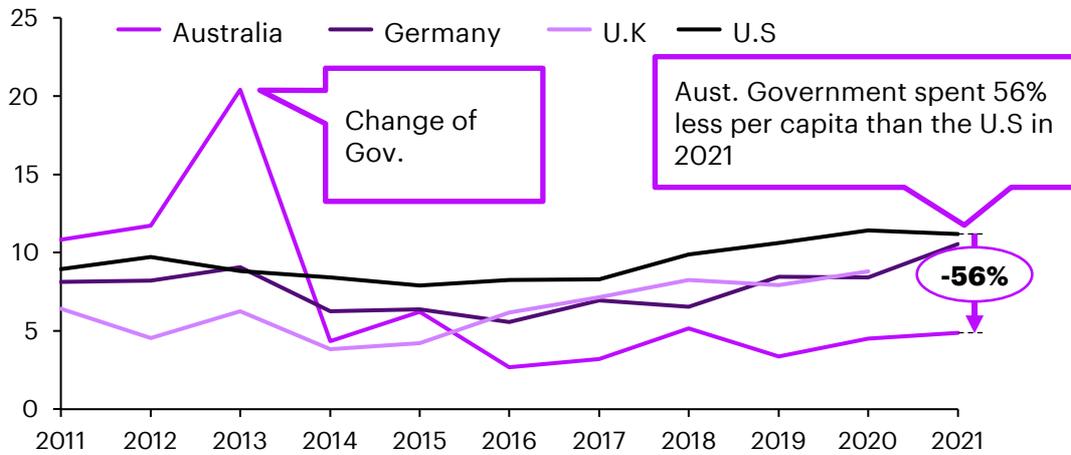
IEA energy efficiency policy index, 2018³(EEPI)



The IEA’s energy efficiency policy index tracks the increase in the percentage of energy demand covered by mandatory policies in a country since 2000.

Notes: 1. Previous to 2021 the U.K used the EU ETS with additional carbon price support for the power generation sector, 2. California includes industry, power, transport and building sector emissions some allowances for emission and trade intensive sectors, U.K. Includes energy intensive sectors (incl. fossil fuels) and aviation, hospitals and small emitters can opt-out, Germany Includes energy intensive sectors (incl. fossil fuels) buildings, and road transport sectors, EU includes Power, manufacturing and EU aviation, 3. Latest available, IEA data

Public low carbon R&D spend per capita (\$USD)⁴



Notes⁴. Including efficiency, renewables, batteries & storage, IEA data. Source: World Bank, Clean Energy Regulator, IEA, Accenture Analysis

Feature 1: Initiatives are in place to address renewable energy skills and capability gaps

Both government and energy market players have played key roles in advanced EaaS markets to overcome skills shortages. In Germany and the UK, an explicit focus on 'green skills' identification and forecasting in national skills strategies and policy in Germany and the UK helps to proactively address skills shortages. Access to larger European and US labour markets, with relatively less growth in skill demand from competitive sectors (e.g. mining), has also helped. Specific examples from the key markets are as follows:

- **Germany:** The German government has forecasted and planned 'green skill' requirements and top energy services companies have invested in building training and development (e.g. Engie, Schneider). Germany also reports no skills shortage in the areas related to energy services. This is in keeping with their proactive approach to skills strategy, freedom of movement between EU states, and high intake of skilled immigration⁶⁰.
- **U.K:** Historically skills shortages hadn't been reported in the U.K, however they have been rising since Brexit. Electricians and civil engineers are in shorter supply, suppliers have cited this shortage as a reason for postponing the Future Homes Standard⁶¹ to 2025. Funding has been previously available for 'Green Apprenticeships'⁶².
- **U.S:** The U.S government has been less proactive on skills however labour market dynamics have made electricity supply industries very competitive on wages. On average, workers with similar skills in electricity supply industries in the U.S make more than double what they do in construction and ~29% more than in mining⁶³.

60. Federal ministry of labour and social affairs (Germany)

61. The Future Homes Standard is a new building regulation to increase energy efficiency and low carbon heating in new homes, see: [Future Homes Hub](#)

62. Green jobs taskforce, [Department of Business innovation and skills](#) (UK)

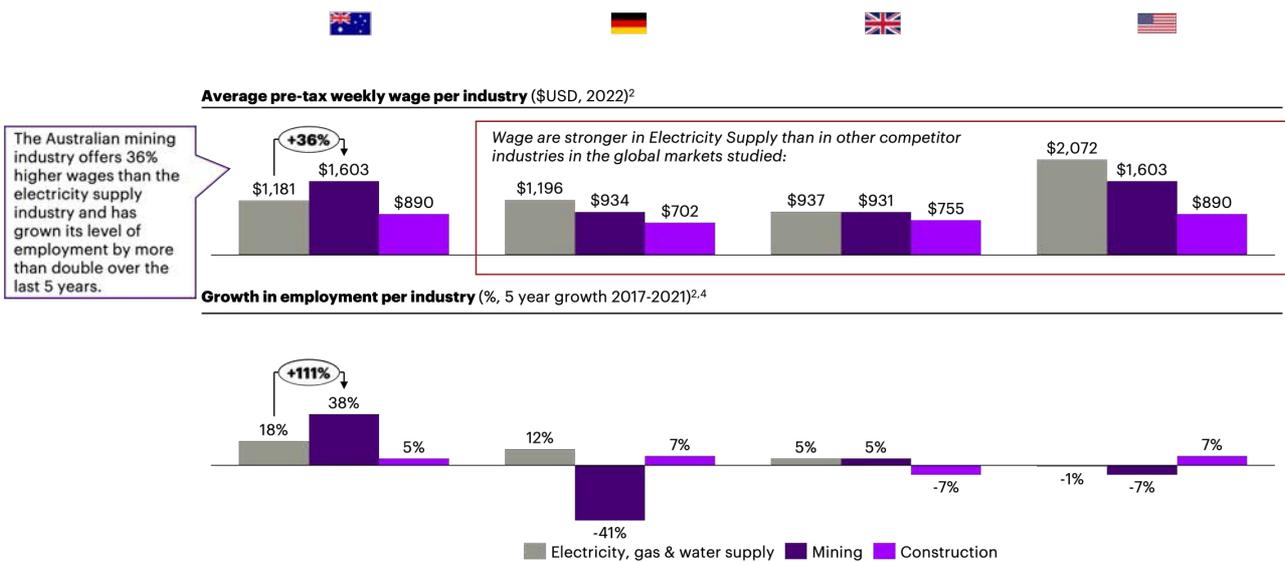
63. [U.S Bureau of Labor Statistics](#)

In contrast, Australia faces four key skills and workforce shortages that slow EaaS market growth. These shortages delay installation times and increase cost of some key elements of the EaaS value chain. Key shortages include:

- Electricians and roofers for small-scale DER
- Construction managers, and civil & electrical engineers for large-scale DER
- New data-related skills for a range of EaaS models such as home energy management and process automation.
- Sustainability skills embedded into general roles (e.g. designing & constructing for energy efficiency)

The shortages are caused by COVID-related skilled migration limits, workers' lack of experience in renewables, difficulties in recruiting candidates to regional locations, differing requirements across states and competition with other growing sectors such as mining and construction (who can often pay higher wages)⁶⁴.

Figure 12: Cross-industry competition for skills can exacerbate shortages. Competition outside of the electricity sector is higher in Australia than in the advanced EaaS markets



Source/notes: 1. Clean Energy Council. 2. U.K Office of National Statistics, Aust. Labour Market Insights (ABS), U.S Bureau of Labor Statistics, Federal Statistical Office of Germany, Accenture Analysis Notes: 3. other competitors include; manufacturing and technical & professional services such as architecture, design & engineering. 4. U.K electricity, gas & water supply and mining employment growth combined.

64. See Clean Energy Council reports; [clean energy at work](#) and [skilling the energy transition](#) and labour market insights, [ABS](#)

Feature 3: Proactive steps are underway around customer protections to increase trust in new energy products and services.

The advanced EaaS markets have initiatives underway to increase customer protections and customer's level of understanding around new energy products and services. This is correlated with a wider prevalence of residential EaaS in these markets than Australia. The advanced EaaS markets are addressing this topic in the following ways:

- Recommendations and directives for customer protection frameworks
- Redefining new energy services and entities for clarification of regulation

For example:

- **Germany:** The EU Energy Efficiency Directive (2021) introduced basic contractual rights, provision for vulnerable customers, and an out-of-court dispute settlement procedure. CEER (2021) published regulatory framework recommendations such as simple presentation of information for bundled products and regulations to limit customer captivity.
- **U.K:** The U.K introduced new customer protection codes and is defining the role of new market intermediaries. Customer trust has been historically low, however, recent Ofgem surveys indicate this is improving. Ofgem recognised supply to EV charging points as "supply" and selling electricity from these points as "not supply", to clarify the regulatory obligations. New customer protection codes, such as the Renewable Energy Consumer Code 2016, is in place for customers to set up contracts, guarantees and after-sale services. A voluntary code of conduct applies to the suppliers covering accurate bills, an energy switch guarantee, and to provide a safety net for vulnerable customers.
- **U.S:** Different states are at different stages of adapting current frameworks; California's Solar Consumer Protection guide has been made mandatory for all solar lease offerings, Colorado is reviewing how customers and suppliers are classified in their framework. However, in some states there have been reports of foul-play regarding customer protections

Without customer protections, some customers will be unwilling to take up new non-standard offerings. Clarity on these protections is even more important when multiple parties from a cross-section of industries are providing EaaS (e.g. utilities, tech companies, controls & systems companies, some of which may be start-ups).

In Australia, there are some actions in place, however, more needs to be done to bring the market in-line with advanced EaaS markets. In place actions include; the ECA's social licensing framework, reviews into the retailer exemption framework & essential services provision and the Clean Energy Council's New Energy Tech Consumer Code - which sets a minimum standard of service for customers looking to purchase behind-the-meter products.

Figure 13: Protections in-place or in consideration to address customer risks from EaaS, Australia compared to advanced EaaS markets

Potential customer risks from EaaS ¹		Considered in countries current protections?			
		Australia	U.K	Germany	U.S
1. Maintaining access to at least one source of energy (Essential service provision)	<p>Non-traditional suppliers are not obliged to maintain a customers access to at least one source of energy. By disconnecting from grid-sourced energy through DER offerings, customers could be at risk of no access at a later date in circumstances such as:</p> <ul style="list-style-type: none"> The EaaS supplier fails EaaS supplier chooses to disconnect a customer due to non-payment Customer decides they would like to be re-connected to grid supply 	Under review (AER)	In-part ²	In-part ²	Under review
2. Adverse outcomes due to insufficient knowledge	<p>Customers cannot, or do not, effectively exercise choice among competing suppliers because they have insufficient knowledge of offerings. This is due to:</p> <ul style="list-style-type: none"> No standardised rules on disclosure & information requirements (including pre-contractual information clearly outlining terms & conditions) above those provided in general law There may be limited price comparison websites/information available Customers may have little understanding of new energy terminology and concepts 	Under review (CEC) ⁷	Yes ⁷	In-part ^{4,6}	In-part ^{4,6}
3. Inability to switch from long-term lock-in contracts	<p>EaaS offerings often require repayment of an asset, this may lead to long-term lock-in contracts. This is due to:</p> <ul style="list-style-type: none"> No minimum contract terms related to time, billing, payment obligations or pricing for non-traditional suppliers 	No	In-part ³	Yes	No
4. Lack of access to low cost and accessible avenues for resolving disputes	<p>Disputes may have to be pursued through courts which is costly, due to:</p> <ul style="list-style-type: none"> Non-traditional suppliers are not considered in the remit of energy ombudsmen 	In-part ⁵	Yes	Yes	No
5. Vulnerability caused by financial hardship	<p>Vulnerable customers or customers experiencing financial hardship are not protected having regard to their particular circumstances, due to:</p> <ul style="list-style-type: none"> No specific legal requirements for non-traditional suppliers to supply energy to these customers 	Under review (AER)	In-part ³	Yes	No

Notes/references: 1. adapted from Decker, C (Energy Sources: Economics, Planning & Policy, Vol 16, 2021), Accenture Analysis,. 2. U.K: dependent on whether regulator has deemed provider a 'supplier', Germany: dependent on whether customer has been deemed 'active' 3. protections in place are voluntary to provide flexibility, 4. customers must be provided terms & conditions but little evidence of education of offerings or comparison information, 5. All supply of energy is protected under NECF, however supply definitions may not capture all new energy services, 6. issues still prevalent with customer understanding of new energy terms and concepts.

Feature 4: There is a high prevalence of energy market players growing or acquiring new capability.

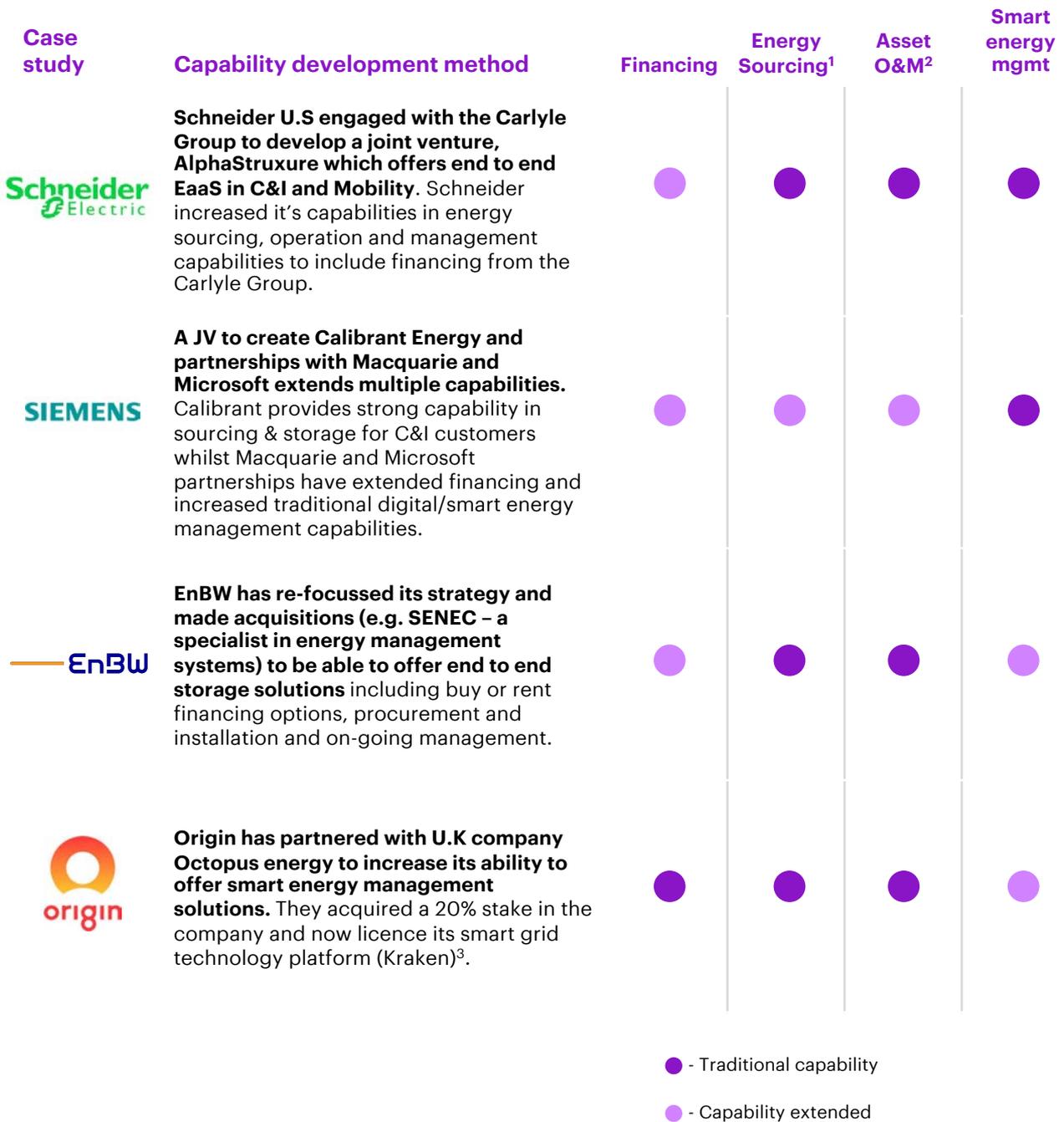
In the advanced EaaS markets, energy players have made large investments into organic growth (e.g. workforce training) and inorganic growth (e.g. acquisition), to develop and scale new capabilities. A larger number of suppliers operating and experimenting in the market also produces more information and shared knowledge. Examples include:

- **Germany:** In Germany, many of the top energy services companies have invested organically in building capability in financing, installation and on-going management (e.g. Engie, Schneider). There is also high maturity in 'pre-cursor' offerings such as ESPC.
- **U.K:** In the U.K there is also a high maturity in 'pre-cursor' offerings such as ESPC. Industry knowledge from the pre-cursors has given suppliers a better understanding of customer preferences. The U.K also shows evidence of acquisitions by companies seeking to build their digital capabilities such as Octopus energy's acquisition of Upside and subsequent partnership with E.ON.
- **U.S:** In the U.S, many of the top suppliers in California and PJM have made acquisitions across the value-chain to increase their capability and offerings (e.g. GE has acquired the capability to deliver lighting as a service, Schneider U.S has undergone two joint ventures to build their AlphaStruxure EaaS capabilities). There is also high maturity in 'pre-cursor' offerings such as ESPC.

Whilst there is some evidence of suppliers engaging in acquisitions to build cross value-chain capability in Australia⁶⁵, this activity is not as strong as in leading EaaS markets.

65. for example, AGL's acquisitions of Solgen and Epho, and Origin's partnership with Octopus Energy

Figure 14: Companies offering EaaS services have extended their capabilities beyond their traditional services



Notes/references: 1. Either through installation of on-site/off-site DER or connection to an aggregated source/VPP etc. 2. Operation and maintenance of generation and storage assets, 3. Note whilst Octopus is increasing its capability it still doesn't show evidence of offering EaaS



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