

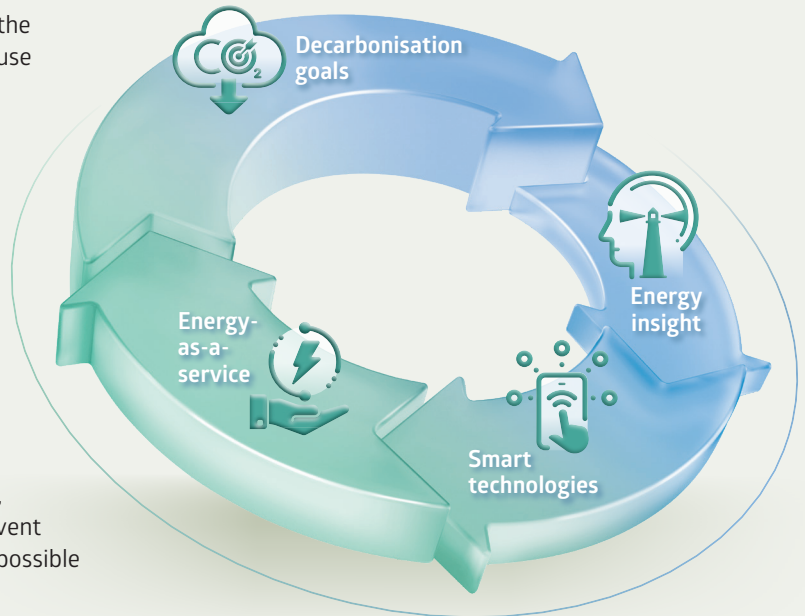


Energy-as-a-Service and its Accounting Implications

Overview

CLP's Climate Vision 2050 sets out the blueprint of the Group's transition to net-zero greenhouse gas emissions leading up to mid-century.

Decarbonisation is CLP's main priorities for our transition to a Utility of the Future. As the pace of change in the energy industry continues to accelerate, we recognise that the once linear and traditional electricity sector value chain has morphed into an interconnected and multidirectional mesh of opportunities with which we need to evolve. Energy efficiency programmes that use smart technologies provide a significant opportunity for achieving decarbonisation goals. However, the market barriers—high upfront technology costs, capital constraints for consumers, information barriers, and uncertainty about a technology's performance prevent widespread adoption of low-carbon technologies. One possible solution is the energy-as-a-service business model.



Energy-as-a-Service

Energy-as-a-Service (EaaS) business model is a one-solution model which combines hardware, software and services. The model combines demand management and energy efficiency services, facilitates the adoption of renewable energy and also optimises the balance between demand and supply.

EaaS business model usually takes the form of a subscription for electrical devices owned by a service company or management of energy usage to deliver the desired energy service. The model provides service providers with steady revenue streams while benefiting customers by enjoying the simplification of an increasingly multifaceted service without purchasing it outright or directly managing its use. Customers pay for an energy service without having to make any upfront capital investment, they also benefit from avoiding direct electricity payments, expensive upgrades for electrical equipment or software, and device management. It helps promote advanced technology and the potential for expanding the deployment of low-carbon technologies. Two typical EaaS models are introduced on the right, which are also part of the new business models CLP is adopting as we transition to a Utility of the Future.



Solar-as-a-Service (SaaS) is the service model for residential and community solar systems. SaaS has been used to overcome barriers to the use of low-carbon technologies while providing two advantages that many homeowners

pursue—electricity cost savings and environmental benefits—without requiring them to purchase or maintain the system. A solar services company installs and maintains a solar system on a homeowner's roof, at no upfront cost to the homeowner, supplying the household with electricity for the duration of the contract. The solar services provider retains ownership of the system and charges the customer for the service. The solar services provider receives monthly revenue and may also benefit from policy incentives and renewable energy credits for the system's electricity generation.



Cooling-as-a-Service (CaaS) is an innovative business model that enables customers to benefit from high end and energy-efficient cooling technologies without the need of an upfront investment. CaaS involves customers paying

for the cooling they receive, rather than the physical product or infrastructure that delivers the cooling. The technology provider installs and maintains the cooling equipment, recovering the costs through periodic payments made by the customer.

Accounting challenges

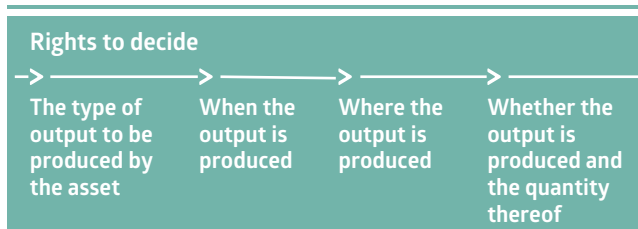
There are different types of EaaS models, but they all have a common feature - the service provider is responsible for the hardware, software as well as the operation and management service. This one-solution service contract brings out the question of what accounting model better reflects the hardware and software invested, and the services delivered by the service providers.



A lease arrangement?

The most fundamental accounting challenge on evaluating a EaaS model is whether the service contract contains a lease arrangement. One of the characteristics of EaaS model is to benefit the customers by not requiring them to make an upfront investment on the infrastructure but enabling them to enjoy the output over the term of the contract. This means the service provider provides the underlying assets while delivering the service over the contract term. As the customers enjoy substantially all of the economic benefits from the use of the assets, this comes to the question of whether a EaaS contract contains a lease arrangement.

The accounting standard defines a lease as a contract that conveys the right to use an asset for a period of time in exchange for consideration. In order for such a contract to exist, the customer of the asset needs to have **the right to obtain substantially all of the economic benefits from the use of the asset** and **the right to direct the use of the asset**. A customer has the right to direct the use of the asset if the customer has the following decision rights to direct **'how and for what purpose'** the asset will be used:



In cases that the 'how and for what purpose' decisions are predetermined, the customer controls the asset if the customer has the right to operate the asset throughout the period of use or if the customer designs the asset in a way that predetermines how and for what purpose the asset will be used throughout the period of use.

The objective of a EaaS contract is to achieve an energy saving solution, therefore, the service provider usually designs, builds and operates the asset under the desired purpose and outcome. The contract usually specifies the technical design, construction, and installation of the asset. The service provider is also responsible for the operation and maintenance of the asset for the desired output. Under this setting, the contract pre-determines how and for what purpose the asset will be used and customer neither operates nor designs the asset. **EaaS contracts therefore usually do not contain a lease arrangement.**

A bundled service – a single performance obligation?

Once it is identified that the EaaS contract does not contain a lease arrangement, the next accounting challenge is on revenue recognition. EaaS contracts usually include the provision of infrastructure and services to customers. In the context of revenue recognition, the accounting standard requires the service provider to identify the underlying performance obligations within a contract. This determination shall be based on the overall substance of the arrangement, rather than the legal form.

When there are several components in a contract, whether the components are bundled together into one performance obligation or not is particularly important, as the timing of revenue recognition for each performance obligation is considered separately. In identifying the performance obligations, it is key to look at the relationship between contract components to determine whether they are **'distinct in the context of the contract'**. A number of factors to consider, including:

- > Can the customer benefit from the good or service either on its own or together with other resources that are readily available to them?
- > Are these goods or services regularly sold separately?
- > Is the supplier providing a significant service to integrate two or more of the goods or services promised?
- > Are the promised goods or services highly dependent on (or highly interrelated with) one another?

If individual components are not considered distinct, they are bundled together in order to form a single distinct performance obligation. In a EaaS contract, the service provider is responsible for the overall design, build and management of the project. The identified goods and services to be provided are usually tailored to the customers' energy needs, which include engineering, site preparation, procurement, construction, installation, as well as continuous energy management and operation such as system monitoring, remote control, and load optimisation.

The objective of the EaaS model is to promote and optimise energy saving. The service provider is providing a significant integration service combining all of the infrastructure and services in the contract into a one solution service that it has contracted with the customer. The energy saving objective can only be ascertained if the overall design and operation are tailored and integrated. Therefore, the individual activities under a EaaS contract are usually considered as not distinct and not separate performance obligations. **The bundle of goods and services contracted with the customer in a EaaS contract is usually considered as a single performance obligation.**

Performance obligation satisfied over time

An entity recognises revenue when or as it satisfies a performance obligation by transferring a good or service to a customer, either at a point in time (when) or over time (as). A good or service is 'transferred' when or as the customer obtains control of it.

Applying the transfer of control concept to a EaaS model, the service provider recognises revenue over time simultaneous to when the customer consumes and receives the energy service.

There are no fixed rules to account for a EaaS contract. Knowing the purpose of design and the commercial objective of the contract is key to identify the most appropriate accounting treatment.



EaaS in CLP ◊ ————— +

One key approach to strive for our Climate Vision 2050 is to assist customers in using energy more efficiently and to support renewable energy development. CLP continues to harness the latest technologies to offer businesses and consumers sustainable energy solutions, helping them become more energy efficient and reduce their carbon footprints. Through its increasing technological capabilities, the Group has stepped up efforts to develop EaaS business models and deploy customer-facing energy solutions.

Type	Project details	Accounting models
Solar-as-a-Service	<p>Solar Energy System at Wellcome Fresh Food Centre</p> <p>CLP co-developed a solar panel system with Dairy Farm International Holdings on the rooftop of the Wellcome Fresh Food Centre in Hong Kong. CLP offers one-stop solar services from system design to construction, and operations and maintenance. This is the largest solar energy system in Hong Kong's retail sector under CLP Power's Feed-in Tariff scheme.</p>	=
	<p>Solar Energy Project for Link Asset Management Limited</p> <p>CLP is developing solar energy systems at 12 properties of Link Asset Management Limited in Hong Kong, with combined capacity of about 800kW. The contract will provide renewable energy under a SaaS model, whereby the customer can enjoy the energy it uses without having to make upfront capital investments.</p>	Balance Sheet Fixed assets model
Cooling-as-a-Service	<p>Centralised Cooling Project at Po Park Shopping Plaza</p> <p>CLP helped retrofitted and upgraded the centralised cooling system at Po Park Shopping Plaza in Guangzhou. Alongside the modification of the cooling system, equipment and design, CLP has also taken up the operation of the cooling system to provide cooling services to the shopping center until 2036. It was CLP's first centralised cooling project in the Greater Bay Area.</p>	+
	<p>Cooling Project at Nina Tower</p> <p>CLP has entered into a 20-year contract with Chinachem Group for the cooling system at the multi-purpose Nina Tower complex in Hong Kong. Under a Build-Own-Operate-Transfer model, CLP will carry out chiller plant replacement works and provide operation and maintenance services for Nina Tower. It will be the first zero-carbon chiller system in Hong Kong.</p>	Profit or loss Recognises revenue over time as a bundled service