

Flexibility services: Catch me if you can!

Why and how utilities should seize the opportunity before others do



As utilities are exposed to bigger risks of supply-and-demand imbalance fueled by unpredictable, intermittent generation sources, they are searching for flexibility solutions to offset their open positions. In this market context, energy aggregators have emerged, and are taking an increasingly important role in optimizing electricity generation and demand volatility by providing the needed flexibility. Meanwhile, multiple traditional (integrated) utilities have developed similar demand-side response (DSR) solutions and even acquired aggregators altogether. Catching the inherent value in these services is becoming part of the core business of utilities. However, being in this game requires speed, skills, agility and differentiators. The key question is how utilities can make this happen.

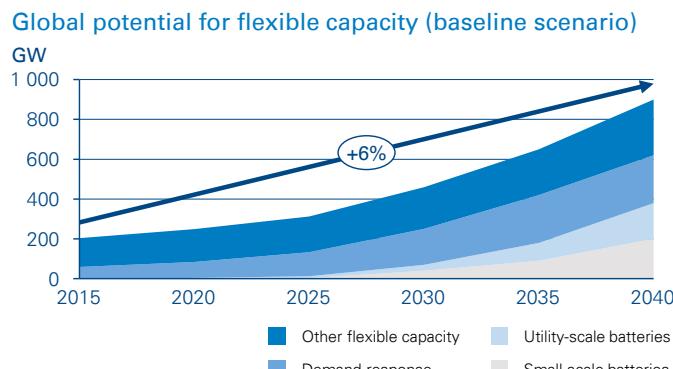
While it could seem counterintuitive at first, multiple factors are pushing utilities to become active providers of flexibility services, which is outside of the traditional comfort zone of the energy commodity. We distinguish three main reasons traditional utilities are adding flexibility services to their commercial offerings.

Benefit 1: Additional source of stable revenues within the rapidly growing flexible-capacity market

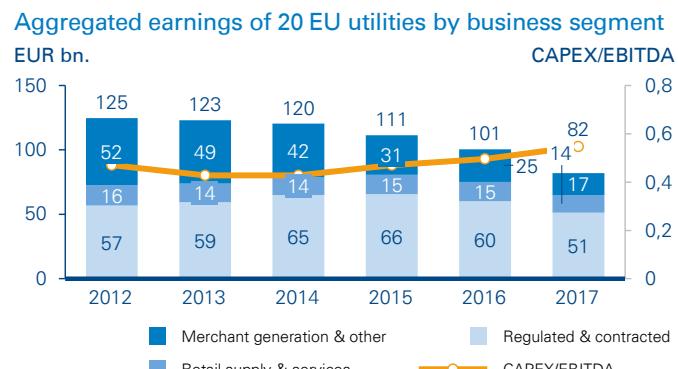
Underlying market drivers for flexibility (the rise of intermittent generation, the expected shutdown of conventional generation assets) are gaining strength. Consequently, the global market for flexible capacity is expected to experience significant growth, at

a CAGR of 6 percent over the next two decades, to reach 900 GW by 2040. However, there are important differences in the forecasted growth rates of the different types of flexible capacity under consideration.

First, the share of DSR within the flexible capacity mix is expected to remain stable at ≈27 percent. Second, the share of utility-scale and small-scale batteries is expected to grow at a CAGR of ≈23 percent, resulting in a combined share of ≈42 percent of the total flexible capacity in 2040. Finally, the relative share of other flexible resources, such as open-cycle gas plants and gas peakers, is expected to drop from ≈71 percent in 2015 to ≈31 percent in 2040, at a lower-than-average CAGR of ≈3 percent. These growth figures present welcome compensation



Source: Arthur D. Little Analysis, IEA, Bloomberg



Source: Arthur D. Little Analysis, IEA

for some industry players, such as the European utilities whose earnings from traditional activities are either stagnating (in the case of retail & supply services) or significantly dropping (in the case of merchant generation), as can be seen from above figure. Utility earnings now stem from segments offering more stable cash flows, such as networks and generation based on contracted/regulated pricing models such as ancillary services or PPAs.

On top of that, flexibility usage can represent an additional and cheaper way to prevent utility imbalance, and therefore avoid paying penalties.

Benefit 2: Strengthen the relationship with prosumers

Unlike aggregators, utilities have access to portfolios of existing customers (B2B/B2C), with insight into their current energy consumption (patterns). Flexibility service offerings would provide utilities with the opportunity to strengthen their relationships and increase customer retention.

On the one hand, utilities can use flexibility services to help customers save money by lowering their energy bills, as well as to monetize their newly acquired assets such as residential batteries (plus provide related subscription-based services such as maintenance contracts). This can be achieved by changing customer consumption behavior (e.g., shifting consumption away from peak periods), or even optimizing asset use of prosumers (e.g., releasing energy from residential batteries when it is the most valuable). On the other hand, the utility can leverage the flexible capacity provided by consumers to optimize its own operations across the value chain. The utility can then improve its asset management by, e.g., choosing to (de-)activate a virtual power plant (VPP, flexibility from the customers) instead of using a traditional generation asset.

Benefit 3: Protect the market position in the home country while achieving growth internationally

Illustrations of Enel's 2018 deals

 165 MW	<ul style="list-style-type: none"> ■ Enel X was awarded the delivery of 165 MW of demand-response resources in Japan following the completion of a tender for balancing reserves launched by a group of Japanese utilities ■ Enel has became the largest independent demand-response aggregator in Japan, and will nearly triple its VPP in the Japanese market with a market share of 17% when the new programs begin in July 2018
 157 MW	<ul style="list-style-type: none"> ■ Enel X was awarded market commitments to deliver 157 MW of demand-response resources in the for-ward capacity market by the Independent System Operator for New England (ISO-NE) ■ With this award, Enel also enters the demand-response market in the states of Connecticut and Vermont, broadening its footprint in the US
 62 MW	<ul style="list-style-type: none"> ■ Enel X was awarded a total of 62 MW of flexibility resources drawn from its own industrial and commercial customers in the last two pilot auctions launched by Terna (TSO) ■ This also includes a forward supply of resources reserved for holders of virtual consumption units to participate in the dispatching services market (UVAC)
 217 MW	<ul style="list-style-type: none"> ■ Enel X was awarded the delivery of 217 MW of demand-response resources following the completion of Ireland's first capacity-market auction, launched by EirGrid (TSO) ■ Enel will hold 40% of the demand-response market in Ireland, with a total of Enel's VPP in the Irish market expected to grow by 60% year-over-year to the awarded 217 MW (from the current 136 MW)

Source: Arthur D. Little Analysis

1 www.adl.com/VPP

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Multiple utilities have secured solid positions as large DSR aggregators, both domestically and internationally (e.g., Centrica, Enel, Engie.). (See "Virtual power plants – At the heart of the energy transition"¹.) This combination of "retain" (domestic market) and "gain" (new geographies) creates two sources of return for such initiatives.

Domestically, the flexibility market allows utilities to access flexibility income streams (as stated in "Benefit 1"), as well as fend off the rising number of aggregators in many markets. Non-incumbent aggregators do not only exploit revenue streams that utilities could tap into, but they also develop strong relationships with consumers and other players in the ecosystem. In this regard, aggregators threaten the market position of traditional utilities by offering one-stop-shop approaches that allow customers to subscribe to flexibility services combined with energy management services (which increases their energy efficiency and prosumer asset usage), as well as "traditional" energy contracts.

Entering a new market for flexibility services internationally does not typically require the same expensive fixed-asset investments as those needed to enter energy generation and supply markets. Moreover, a foreign flexibility services market allows the new entrant to interact and develop relationships with not only consumers, but also transmission and distribution system operators and other utilities that own physical generation assets. As such, offering flexibility services is one of the best and asset-light routes for a new player to enter an existing electricity ecosystem.

Enel is a good example of a utility that decided to take a significant stand in the flexibility services market both domestically and internationally, through its subsidiary, "Enel X". Above figure provides an overview of the main tenders for flexible capacity that Enel X was awarded in 2018, some of which enable Enel to develop dominant market positions in the local DSR market. Its 17 percent market share in Japan and 40 percent market share in the Irish DSR market allow Enel

to be one of the largest providers of flexibility in both these geographies. The total amount of flexible capacity awarded to Enel X equals approximately 600 MW. Enel X is currently following an aggressive inorganic growth strategy, and has already acquired multiple energy management companies, such as EnerNOC and Demand Energy.

Another notable example of such a strategy is the acquisition of the aggregator REstore by the UK-based utility Centrica, which allowed the utility to become present in foreign markets and pursue its ambition to further develop its position within the US market. More recently is the announcement of Engie, which has acquired a majority stake in Kiwi Power.

However, it is important to keep in mind that not all markets are equally attractive for DSR participation and/or development (by foreign players). Our support to utilities and investors in the assessment of geography attractiveness highlighted the disparity of regulation and market design within and outside Europe. Below figure provides a high-level assessment of some EU DSR markets. We distinguish multiple factors to consider when evaluating DSR market attractiveness. The most important are the level of competition, level of regulation and degree of industrialization. From a regulatory point of view, Ireland, the UK, France, Belgium, Switzerland, Finland and Italy are the most developed markets, with efficient policy frameworks already defined. In some other markets, such as Portugal and Spain, the limited push from the regulatory authorities and the TSO currently restrain the market potential. Most Eastern European countries still need to define their regulatory frameworks on flexibility, as the lack of this is increasing the uncertainty and the associated risk of a potential market entry. However, with the emergence of electric vehicles in some Eastern countries, we anticipate regulations to be clarified. However, the markets with

favorable regulation are also typically the most competitive ones, which makes market entry more complex and puts pressure on potential returns. In terms of size, the highly industrialized markets in Eastern Europe show very high potential, although this is detracted from by a significant level of risk resulting from the uncertain and/or nonexistent regulatory frameworks for flexibility services. As a result, utilities considering international expansion through flexibility services will need to clearly define their entry strategies, considering local specifics, and ensure their international portfolios are well balanced.

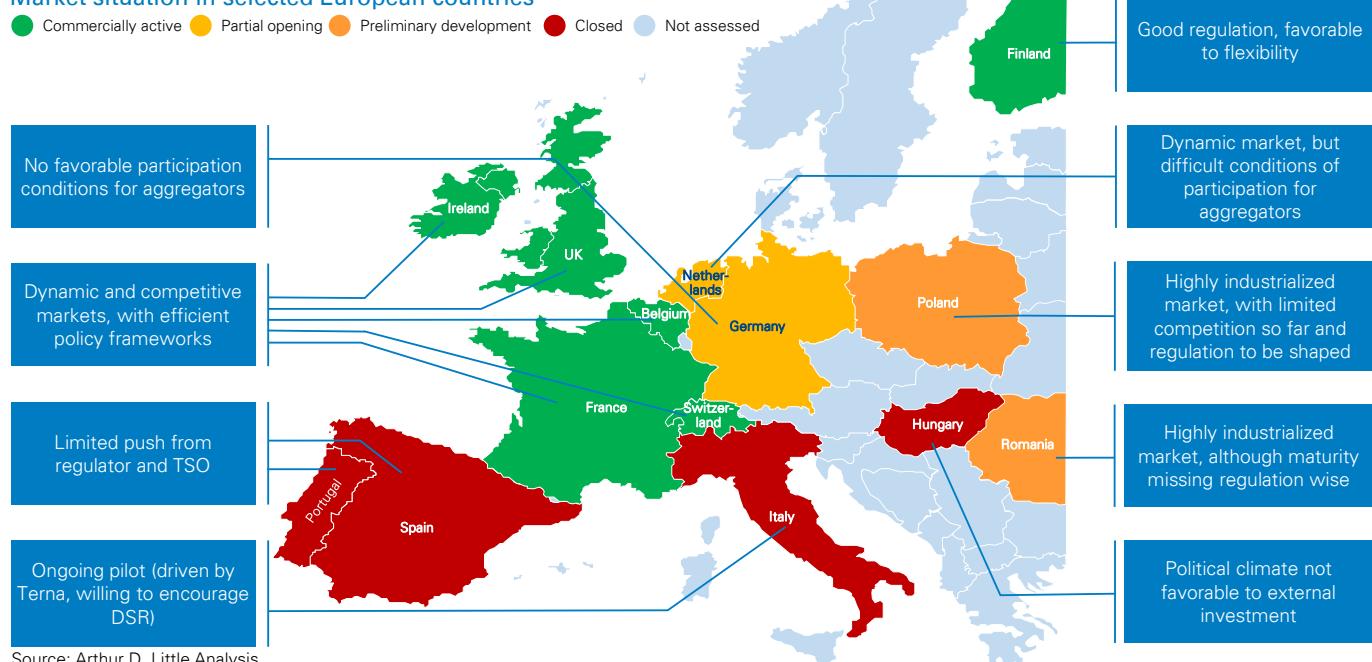
Recommendations to utilities: Key success factors to catch the opportunity

Create attractive value propositions

To be successful in a crowded flexibility market, utilities will need to differentiate themselves from other, often more agile and innovative, market players. However, we have advised our clients to create attractive value propositions towards their customers based on:

1. Strong presence and in-depth knowledge of the energy value chain and ecosystem to provide a full range of services. This includes load and supply aggregation, as well as energy management services (e.g., helping industrials identify more flexible manufacturing processes).
2. Ability to provide a one-stop-shop approach for all the consumer's electricity/energy-related needs. EDF Luminus is a good example. It has evolved from a gas and power supplier to an integrated energy partner. The company offers a combination of energy (electricity, with or without gas), flexibility, assets (PV panels, batteries, EV chargers, etc.), maintenance of the assets, and energy management. Although this can be achieved either fully in-house or using specific partnerships, taking a leading and coordinating

Market situation in selected European countries



role enables utilities to remain in charge of the customer relationship and experience. This includes more advanced service offerings, e.g. smart-home services, in which the utility becomes a central orchestrator of the smart-home ecosystem, enabling a variety of services with a single contract.

3. Flexibility service offerings must be attractive to customers, which implies that the remuneration for the provided flexibility should outweigh the (opportunity) cost of providing this flexibility. Although this seems to be trivial at first sight, the business case is often not obvious given the current market design and offerings. Utilities that already serve suites of offerings to these customers can apply creative pricing to capture the customer at entry point (including cross-subsidizing of multiple offerings to the client).

Educate the market and aggressively prospect for clients

Although the tangible benefits of flexibility towards virtually all players in the ecosystem have already been proven, many market players still need to be better informed and educated. This includes industrials and consumers who may be distrustful of the technology, but it can also mean grid operators active in countries where flexibility has not yet taken off. Given their position in the ecosystem, utilities should take a proactive role in educating the various players in the market. This includes aggressive prospecting to "recruit" sources of flexibility.

Develop the required skills and know-how

Utilities need to develop the right skill sets to act as full providers of demand-side response and energy management services. This should be a combination of the existing skill set in commercial, trading, legal, and financial capability and the required technical skills for flexibility management. These can be built organically or inorganically, by acquiring an aggregator.

Contribute to shaping regulatory frameworks

In order to ensure that the flexibility market will provide a stable source of revenues, utilities need to engage with regulators and other market players to shape a stable and transparent regulatory framework in which business models can be built. The regulatory framework must facilitate participation through attractive and fair market mechanisms that prevent discrimination between actors in the energy value chain, as well as between end users.

Arthur D. Little's experience

Arthur D. Little supported many transactions in the flexibility area, supporting utilities and investors in strategic reflections on acquisitions and establishing themselves in foreign geographies, as well as on setting out on the path to make their flexibility strategies fruitful. With our clients, we have qualitatively and quantitatively explored opportunities for investing in flexible assets (e.g., large-scale and behind-the-meter batteries) in Europe, the US, Asia and other parts of the world, and identified the capabilities required to succeed.

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Arthur D. Little

Arthur D. Little has been at the forefront of innovation since 1886. We are an acknowledged thought leader in linking strategy, innovation and transformation in technology-intensive and converging industries. We navigate our clients through changing business ecosystems to uncover new growth opportunities. We enable our clients to build innovation capabilities and transform their organizations.

Our consultants have strong practical industry experience combined with excellent knowledge of key trends and dynamics. ADL is present in the most important business centers around the world. We are proud to serve most of the Fortune 1000 companies, in addition to other leading firms and public sector organizations.

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