

A photograph of high-voltage power lines and towers against a blue sky with light clouds. The image is partially obscured by a red horizontal bar at the bottom.

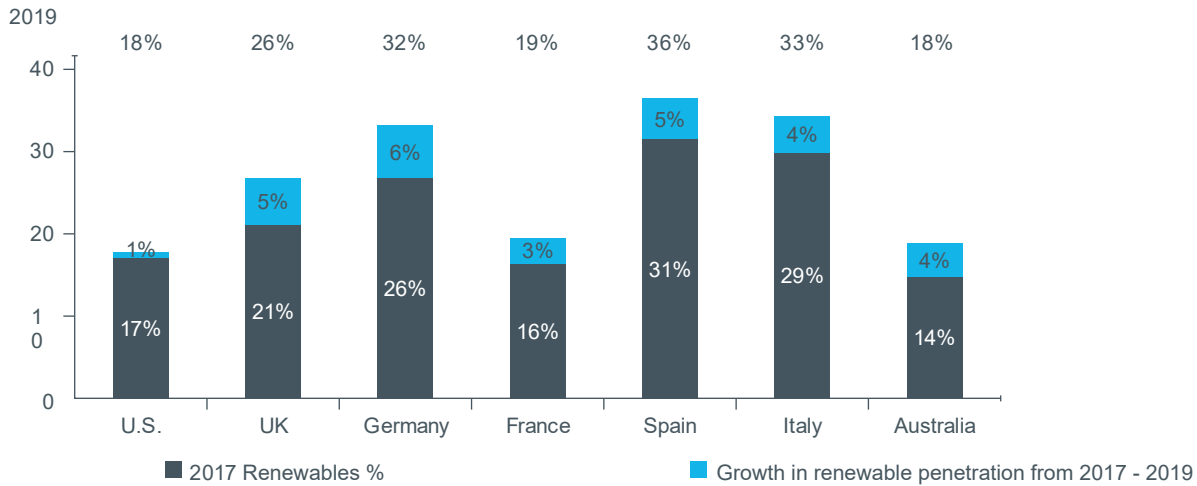
# Forecasting the Power Market

Duff & Phelps recently undertook a study of the power forecasting market, to glean insights on the key drivers, competitive landscape and customers' selection criteria when choosing a forecast provider. As part of our research, we interviewed more than 30 utilities and energy infrastructure investors in the U.S., Europe and Australia, as well as leading consulting providers in the market. This paper summarises our key findings.

## The Need for Long-term Price Forecasts

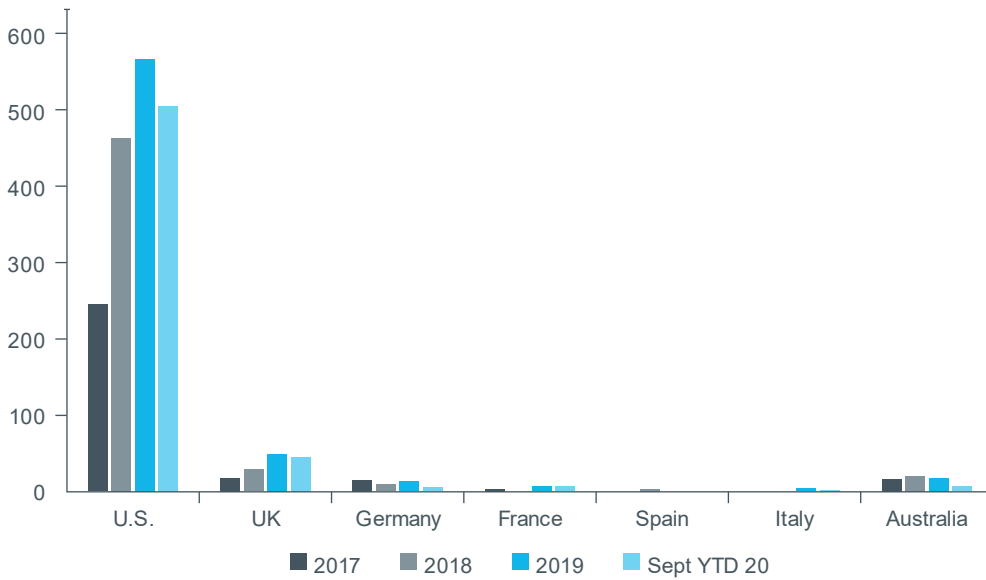
Power markets across the world are transitioning from fossil fuel-based electricity generation to renewables, driven by a combination of government policy, improving technology lowering renewable energy costs and greater demand from customers. This is evident in the level of renewables as a proportion of total generation in a number of key geographies, as well as the volume of power and renewables transaction-related activity over the last few years.

Chart 1: Renewables Generation Penetration - Selected Countries - 2017 to 2019



Sources: International Energy Agency (October 2020), Energy Information Administration (October 2020)

Chart 2: Number of Power and Renewables Transactions in Selected Countries



Source: Inframation (October 2020)

The inherent nature of renewables generation has created greater complexity and uncertainty on the supply side. Renewables are effectively low or zero-cost marginal producers, providing intermittent capacity driven by weather conditions and the time of day. This in turn has led to investment opportunities for peak generation capacity and for storage solutions (either via traditional means such as hydro or newer technologies like batteries).

The future price is therefore determined by the marginal cost producer of the capacity stack required to fill the anticipated demand at that time. These price forecasts are critical for utilities, infrastructure funds and developers when making major investment decisions on generation capacity and for valuing existing portfolios of assets for stakeholder reporting purposes.

## Power Market Forecasters

Large utilities tend to have in-house fundamental teams that develop forecasts themselves, typically using a commercially available model. In addition, they will often use third-party forecasts to challenge in-house views and provide the board of directors with the assurance of an independent perspective.

Smaller utilities, infrastructure funds and others rely on third parties for these forecasts and use them as input into regular valuations on assets and to support transactions

As such, the market is served by two sets of players, with overlap between the two:

1. Model software suppliers that sell a supply and demand model, enabling the customer to drive the input assumptions and scenario analyses
2. Consultants who develop their own input assumptions to populate either an in-house model or a commercially available model

## Modelling Software Vendors

Based on our interviews, three key modelling vendors were identified.

- Energy Exemplar is a leading global supplier of models both to utilities and to consultants. The business, founded in Australia, now has a global footprint and focuses on software sales to both utilities and consultants. As such, the company does not publish forecasts themselves, but will provide input data sets to customers if requested. The business primarily sells a model called PLEXOS across the world but also maintains another model, only deployed in the U.S. market, called Aurora.
- Afry/Poyry is a notable European player, supplying their BiD3 model to utility customers. As the company also acts as a consultant publishing forecasts, we understand that it does not make its model available to other consultants.
- ABB Ventyx is primarily in the U.S. and, similar to Afry, is a vertically integrated player, selling its PROMOD model and also providing consulting and forecasting services. It does not have a significant presence in Europe.

The models themselves are not seen as overly complex to build, but rather it is the data capture and cleansing, together with the experienced judgement on input assumptions, that are the effective barriers to entry.

## Power Market Consultants

A large number of players providing consulting services to utilities and investors in the power market were identified through our interviews, including strategy consultants (such as McKinsey), engineering consultants (such as Black & Veatch), information research providers (such as IHS and Bloomberg New Energy Finance), and more energy-focused consultants (both regional and national players).

The providers of price forecasts typically combine two types of business models:

1. Subscriptions for market forecast reports/updates, with relatively high renewal rates providing an element of recurring revenue visibility to the business model
2. Consulting: both directly related to power price forecasts in the context of power generation investments and transactions, but also often addressing broader business and operational issues

In Europe, three players were cited by our interviewees as the most highly regarded for power market forecasts:

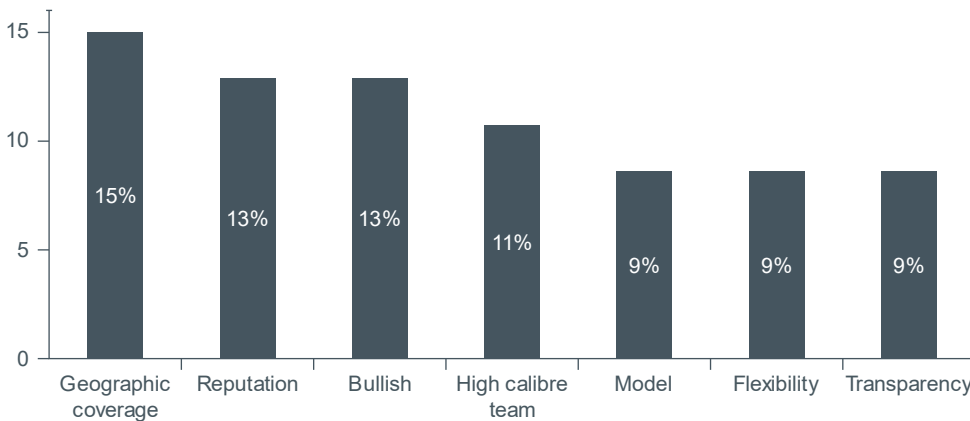
- Afry – a listed company that provides engineering and consulting services to a broad range of industries, but with a strong presence in the energy sector
- Baringa – a consulting partnership that focuses on the energy sector but also serves other sectors including financial services and technology, media and telecom (TMT)
- Aurora Energy Research – a company formed in 2013, focused primarily on energy forecasting rather than broader consulting

All three players are expanding geographically outside Europe, often following their customers on a project, and then expanding from there. Their forecasts are regarded as “bankable” by investors and are relied upon for valuation and transaction purposes. Our research suggests that no one consultant is regarded as more accurate than another — rather they are required for an independent benchmark when making investment decisions.

In Australia, the competitive landscape was dominated by three local players, Jacobs, ACIL Allen and EY Roam, that primarily provide bespoke reports and data to clients rather than publishing forecasts. Over the last few years, the entrance of two of the leading European players (Baringa and Aurora) has had a disruptive effect on the market and enabled them to gain market share.

In the U.S., the landscape is more complex, with national players including Wood Mackenzie, ABB Ventyx and Black & Veatch, and to some extent, ICF and PA Consulting, together with significant regional players, such as ESAI Power and LCG Consulting.

Chart 3: Key Purchase Criteria for Power Forecast Providers (% of mentions)



Source: Duff & Phelps Market Interviews

Our interviews with users of power forecasts suggests a wide range of key purchase criteria (KPC), with the most pertinent being:

- Geographic coverage – the breadth of countries covered, the inter-connections between countries (e.g., in Europe) and hence the consistency of assumptions across countries can be important, especially for utilities with a geographically diverse portfolio
- Reputation – many interviewees clearly distinguished between “tier one” providers (often a proxy for being “bankable”) versus other providers
- Bullishness – the majority of the interviewees own and invest in generation capacity and often expressed a preference for a higher power price outlook, often caveated that it should still come from a reputable source

Interestingly, the quality of the model was a more mid-level criteria and price was outside the top KPCs.

## Outlook for Forecast Providers

We anticipate four key themes for this market going forward:

### 1. Business Model Evolution

The pure power forecast subscription business model has limited head room for revenue growth, and the main players will need to continue to supplement it with consulting services. Despite the overall favourable increase in renewable and flexible power generation, there is a relatively limited universe of customers (regulators, utilities, infrastructure investors and project builders in the UK, Germany and France) and most already have subscriptions. The propensity for multi-sourcing subscriptions does create some opportunity for growth, although the high industry renewal rates suggest the growth opportunity through switching is more limited. Consulting engagements around the core price forecast typically provide higher fees than annual subscriptions and therefore are a potentially higher value market in revenue terms, although more people dependent and therefore less scalable. And while these consulting projects are not recurring, there is an opportunity for repeat business, especially where customers are serial transactors (e.g., infrastructure funds and investors). Additionally, pursuing broader business and operational consulting services is a logical cross-sell opportunity already capitalised by market leaders like Afry and Baringa.

### 2. Software-as-a-Service (SaaS)

Some forecast provider players have existing modelling software offerings and this could provide some differentiation and additional growth given that some of our interviews suggested genuine interest in a SaaS type offering. However, they currently fall short of a true SaaS offer and face strong modelling incumbents.

Energy Exemplar is currently investing in a SaaS offering, which it hopes its clients will gradually adopt. ABB Ventyx and Afry also offer modelling software. All of these models require a relatively sophisticated in-house modelling capability. By contrast, Aurora Energy Research, which does not sell modelling software, has launched a cloud-based wind offering with limited features and requiring less in-house capability.

### 3. Emergence of a True Global Player

There is a market opportunity for a global player to emerge albeit a number of significant challenges to overcome. Our interviews highlighted geographic coverage as a key purchase criterion, suggesting that customers would be interested in a more global player. In addition, we note the relative success of Baringa and Aurora in entering the Australian market, despite well regarded local incumbents.



However, the nature of the U.S. market likely makes market entry more difficult. It is large, complex and very regional, and therefore typically hard for entrants to build scale and credibility. Well-regarded European players like Afry and Baringa have entered the market but are yet to build a reputation, highlighting the local challenges. However, their success seems to be in following their internationalising European utility customers, which may give them an advantage over other players.

#### 4. U.S. Market Consolidation

Given the challenges in the U.S. market and the relative importance of local reputation, there is a strong argument for any U.S. entry strategy to involve acquiring regional players. Our interviews suggest that the underlying model is relatively less important; there exists opportunities for operational improvements through platform consolidation although careful consideration would need to be given to key staff retention and brand strategy.

## Conclusion

Countries around the world are investing in renewable energy sources, which in many cases is disrupting the traditional structure of the industry. Power market forecasters and consultants have a critical role to play in providing advice to support investment in this sector. These consultants, which have traditionally been local in nature, are likely to become, or be consolidated into, regional and global players, that have the scale to invest in data mining and cleansing, model development into a SaaS environment and the best talent.

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