AFRY BID3

UNDERSTAND THE FUTURE OF POWER MARKETS USING OUR BEST-IN-CLASS ELECTRICITY MARKET MODEL

AFRY BID3 is AFRY Management Consulting's power market model, used to simulate the dispatch of all supply and demand in electricity markets. Equally capable of covering both short-term analysis for trading and long-term scenarios, AFRY BID3 is a fast, powerful and flexible tool that provides comprehensive price projections in an intuitive and user-friendly interface.

AFRY BID3 CAN PROVIDE THE ANSWERS TO ALL POWER MARKET QUESTIONS

Understand how a rapidly decarbonising future will play out in power markets.

— Asset valuation

— Financing and risk appraisal

— Long term scenario analysis

— Short term market forecasts

— Interconnector assessment

— Policy studies

WHY AFRY BID3?

AFRY BID3 is unique, by its origins as well as by its functionality and data.

— Buying AFRY BID3 means buying into AFRY's market knowhow

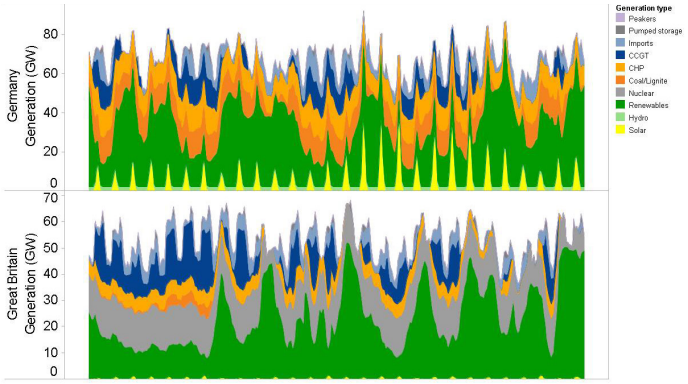
— User-friendly with excellent visualisation

— High quality datasets available

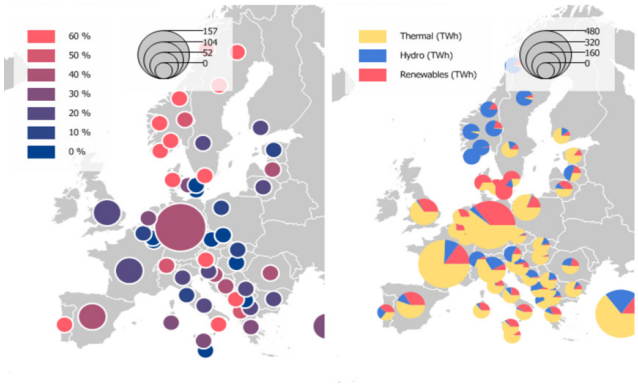
— Detailed hydro, wind and solar modelling

— Fast and powerful

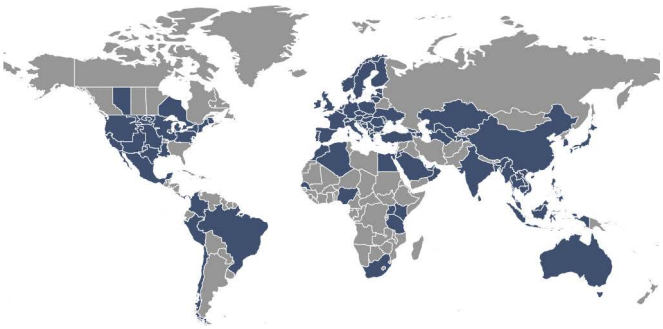
AFRY BID3 allows the impact of growing renewables to be easily visualised

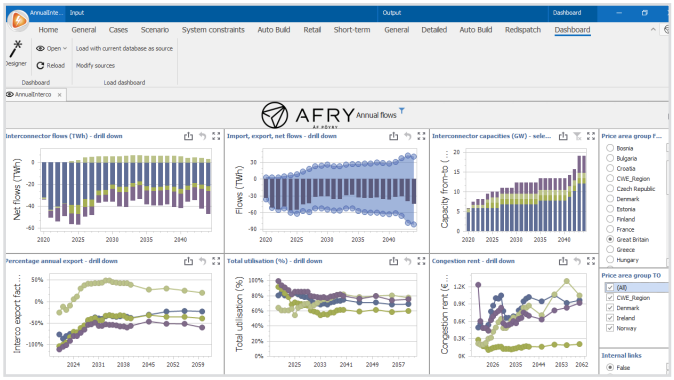


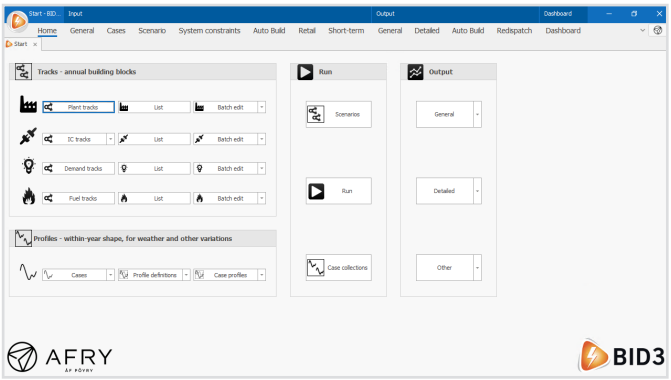
Sophisticated charting and dashboards allow instant visualisation of data

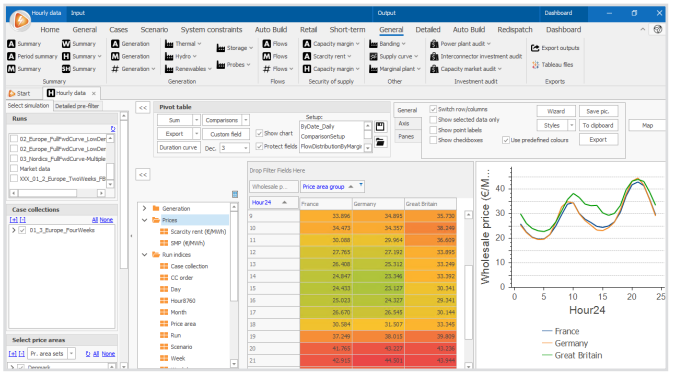


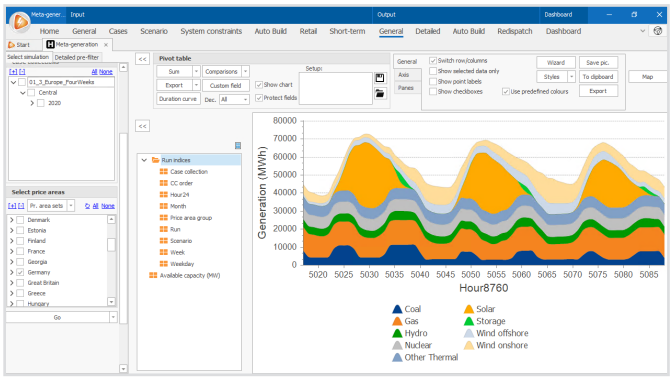
Data is available for a large number of countries and is continually expanding











FEATURES AND BENEFITS

— **Sophisticated Autobuild module** for scenario generation with optimal new-build, retiral and mothballing

— **Dispatch module using either linear or mixed integer optimisation** for start-up and part loading costs of plant. Comprehensive plant dynamics, including minimum stable generation; ambient temperature effects; minimum on and off times; and start-up ramp rates

— **Detailed and consistent weather pattern modelling.** Hourly renewable generation based on detailed historical windspeed and solar radiation data

— **Hydro modelling** using either option valuation for reser-voirhydro using stochastic dynamic programming or fully optimised approach

— **Detailed Combined Heat and Power** (CHP) modelling, including heat load, incremental efficiencies, and back pressure and extraction modelling

— Sophisticated treatment of **Demand Side Management and storage**, allowing simulation of flexible load such as electric vehicles and heat, and detailed modelling of batteries

— **Sub-hourly** modelling with up to 1 minute resolution

— **Co-optimisation of energy and reserve holding**, including inertia, primary, secondary and tertiary

— **Redispatch module** allowing simulation

— **Interconnector and transmission network modelling** using NTCs, Flow-based market coupling and Nodal (LMP)

— **Loss of Load Expectation (LOLE) module** for system adequacy studies

— **Other features** such as modelling of 'new technologies' such as hydrogen, electrolysis and networks, and bio-mass CCS. Retail pricing module

WHY AFRY BID3?

AFRY BID3 is used by 16 major companies, including some of the largest European Utilities and 8 European Transmission System operators.

Based around Fico Xpress, C#.net and SQL Server, AFRY BID3 is a serious piece of software which has had over 3500 days of development time since 2012 and is supported by a development team of 20.

"National Grid, Electricity System Operator has been using the AFRY BID3 power market model since 2016, and it has made a huge improvement to our GB investment analysis. Above all, the support from the AFRY team and their flexibility in adding new features to the model have been key success factors."

— **Julian Leslie, Head of Networks, National Grid Electricity System Operator**