

THE ADVISORY HOUSE

A background image of a financial chart with multiple white lines on a blue grid, showing various trends and peaks. The chart is slightly blurred and has a blue color scheme.

Market study on
“Standard Software for Automated Energy Trading”
Teaser

Agenda

1. Motivation and scope
2. Vendor overview
3. Findings and conclusion

The market study supports you in your decision process for choosing an appropriate automated trading software

Situation in market	Challenge	Solution
<ul style="list-style-type: none"> ▪ Commodity market <ul style="list-style-type: none"> – Wholesale prices stable on low level – Increasing renewable capacities result in increasing short-term volumes – Increasing cross-market liquidity and transparency (e.g. XBID) ▪ Software technology <ul style="list-style-type: none"> – Standard intraday automated trading solutions established – Market unspecific data analytics software exists ▪ Commodity trader <ul style="list-style-type: none"> – Shrinking margins on intraday trading – Some traders already established semi to full automated solutions for intraday trading – Automated forward trading solutions not established – Little use of standard data analytics software to derive meaningful automated trading strategies 	<ul style="list-style-type: none"> ▪ Which market to be in and what is an appropriate strategy? ▪ What level of automation <ul style="list-style-type: none"> – Time horizon – Geographic – Commodity ▪ Which software to utilize? Make versus Buy <ul style="list-style-type: none"> – Data analytics – Optimizer – Automated algo trader – ... 	<ul style="list-style-type: none"> ▪ Typical TAH consulting project ▪ The Advisory House (TAH) market study ▪ TAH for design and software selection process ▪ Standard software of vendors

The survey is split in four main chapters with up to five sub-levels; the questionnaire consists of 300 line items

Main chapter of study	Short description
Market	<ul style="list-style-type: none">▪ Commodities, asset types and exchanges supported out of the box by vendor application▪ Focus is on all common exchanges, assets and commodities in Europe
Methodology	<ul style="list-style-type: none">▪ Predefined strategies, supported models, model optimization and validation; optimization algorithms and strategies are investigated▪ Back testing capabilities will be analysed
Functional	<ul style="list-style-type: none">▪ Functional capabilities as strategy development, application and trade execution▪ Both process steps “strategy application” and “trade execution” require automation, a partial coverage is possible
Technical	<ul style="list-style-type: none">▪ Technical aspects as robustness, flexibility and usability▪ Licensing models, service agreements and user rights management are out of scope

The survey focuses on European markets within a limited functional scope

Existing / Planned	
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Market	Commodities: Power Gas Coal Oil Carbon Other	Assets: Coal PP Gas PP Gas ST Water Wind Other	Exchanges: EPEX EEX ICE GME PEGAS Other
	Predefined strategies Strategy types Trading indicators Parametrization	Model optimization Calibration methods Trading simulation Market simulation	Model validation Back testing Stress testing Benchmarking
	Strategy development Market analytics Strategy setup Strategy management	Strategy application Model calibration Data retrieval Signal generation	Trade execution Compliance & limit checks Order management Trade management
Technical	Robustness Accuracy & Reliability Error handling Speed & scalability	Flexibility Model formulat. conc. Data management Data interfaces	Usability UI concepts Degree of automation Roles & rights / Security












- Focus on all common assets and commodities
- Europe stays main focus
- All relevant exchanges
- Optimization algorithms and strategies are investigated
- Back testing capabilities will be analyzed
- Both process steps “strategy application” and “trade execution” require automation
- Partial coverage is possible
- All technical building blocks will be analyzed
- Licensing models, service agreements and user rights management are out of scope

Grey marked items are not in scope

Agenda

1. Motivation and scope
2. Vendor overview
3. Findings and conclusion

The eleven providers have different specializations; only the auto trading solutions were considered for the following study

Products of	Opti- mizer	Autom. Trader	Logi- stics	ETRM/ PFM	Relevant Coopera- tions and suits
 decision trees stochastic optimization		ep	ep		Ongoing cooperation with VisoTech and opti. offering
 EXXETA CONSULTING AND TECHNOLOGIES					Offers an ETRM suite
 FIS	ep				Offers "Aligne" suite, ProCom as an optimization partner
 KYOS					Automated trading is not considered as key area
 LIKRON					Partnership with Misurio
 openlink					Cooperation with Powel. Also offers ETRM suite
 PIONEER SOLUTIONS					Automated trading is not considered as key area
 powel					Cooperation with Openlink and Kisters
 ProCom bringt Transparenz	ep				Optimization cooperation with FIS
 SOPTIM Digital Transformer					Offers an ETRM suite
 VISO TECH	ep				Cooperation with decision trees and Energy opticon

Vendors product assessment
<ul style="list-style-type: none"> ▪ “Optimizer” are expected to provide supporting service in order to enhance automated trading results ▪ “Automated Trader” are purely focused on this area and are expected to provide automated signal generation, order placement as well as order handling ▪ „Logistics“ are expected to provide balancing, nomination, dispatching and other services ▪ “ETRM/PFM” are expected to have strong capabilities in the area of trade handling, risk calculations and settlement; automated trading capabilities are introduced also in this area

Offering services
 Offering additional services, but not main focus area
 ep = established partner

Market coverage for complete¹ automated trading shows clear standard markets but differences in specific ones

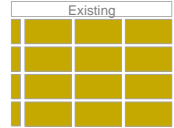
Participants	Power										Gas							Trayport	XBID
	EEX	EPEX SPOT	EPEX SPOT NL	EPEX SPOT UK ⁴	EPEX SPOT BEL	Nasdaq OMX	ICE	Nordpool Spot	TGE	GME	Pegas	Nasdaq OMX	ICE	Nordpool Spot	PXE	TGE	GME		
 decision trees stochastic optimization	No fully automated trading functionalities																		
 EXXETA CONSULTING AND TECHNOLOGIES	●	●	●	●	●	●	●	●			●	●	●	●				●	●
 FIS		●	●	●	●			●		●	● ²						●	●	●
 KYOS	No fully automated trading functionalities																		
 LIKRON		●	●	●	●			●			● ²			●				●	●
 openlink		●	●	●	●			●		●	●						●	●	●
 PIONEER⁵ SOLUTIONS		●				●													
 powel		●	●	●	●			●		●	●						●	●	●
 ProCom bringt Transparenz	●	●	●	●	●			●		●	●			●					●
 SOPTIM Digital Transformer		●	●	●	●			●			●							●	●
 VISO TECH	●	●	●	●	●	●	●	●			● ³	●	●	●				●	●

● Existing ● Planned ¹Only existing market coverage with fully automated trading is displayed. Semi-automated and general market coverage are neglected
²Spot planned, derivatives not; ³Spot existing, derivatives planned; ⁴EPEX Spot UK will only enable fully auto. trading in Q4/18; ⁵EPIAŞ existing

Agenda

1. Motivation and scope
2. Vendor overview
3. Findings and conclusion

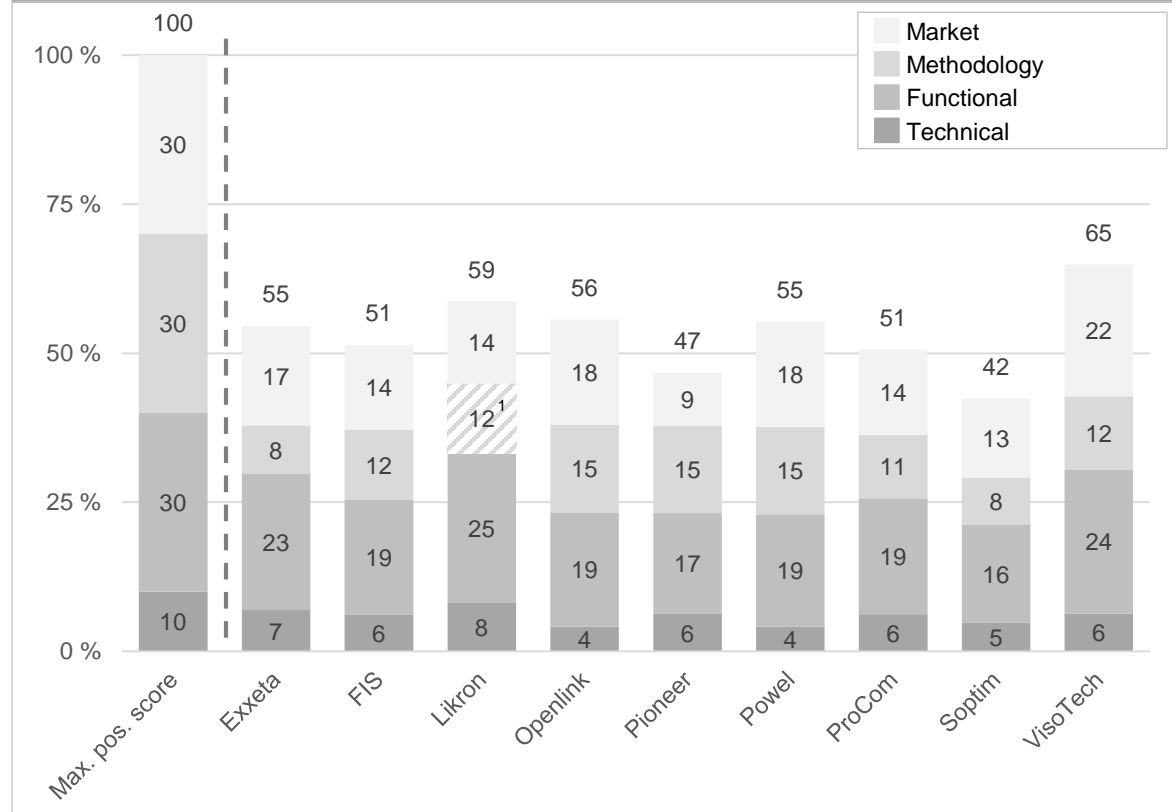
A market standard for automated trading solutions has not yet been established



Key findings

- All automated trading providers operate at similar levels with regard to their overall number of established capabilities with deviations around 25%
- Nevertheless, there is no established market standard yet
- There is not one supplier that covers all market requirements that have been queried
- High differences in the details which result from vendor specific focus areas and the status of development of this rapidly progressing field of business

Requirement fulfilment



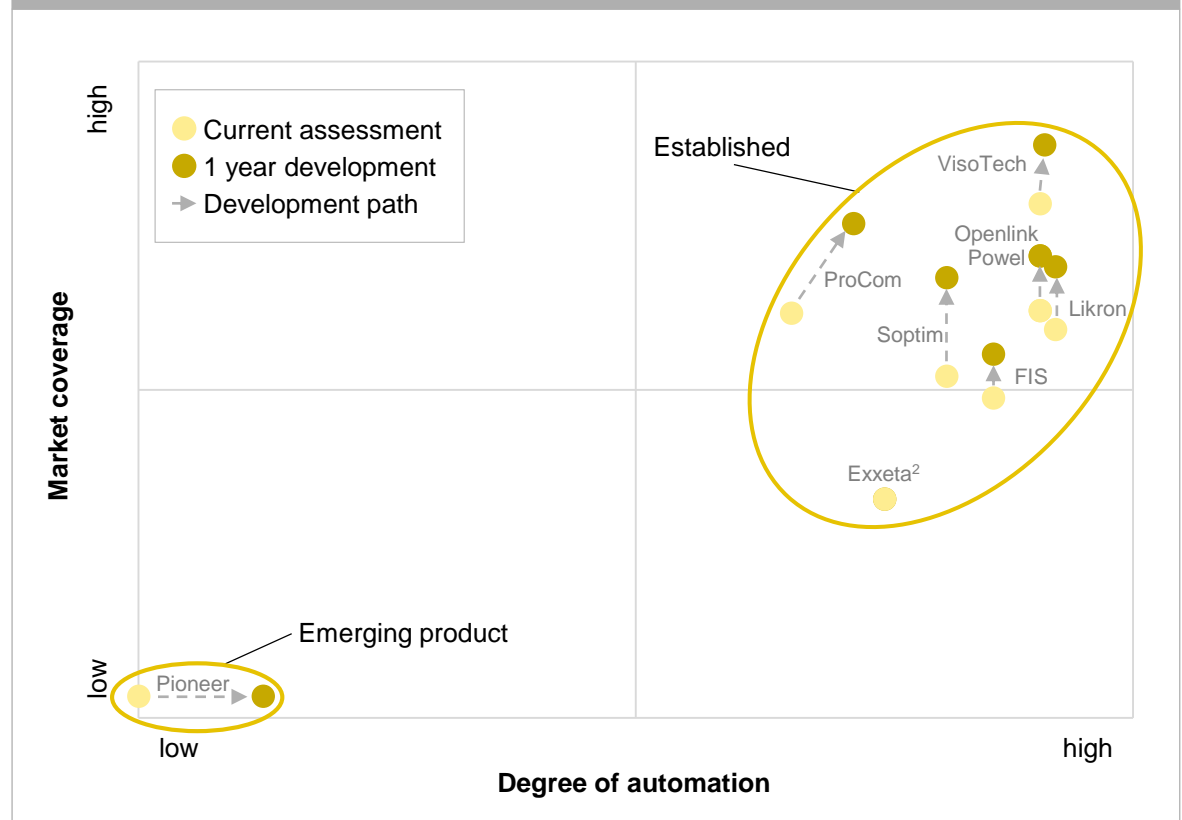
¹No answers for methodology due to non-disclosure; given value is an average based estimation

Most vendors are standing close from an automation point of view but having differences in market coverage

Key findings

- Most vendors show a similar degree of automation
- Differences arise from market coverage
- Most vendors tend to increase the market coverage within the next year
- Pioneer is currently entering the automation market

Degree of automation vs. market coverage (current and planned)¹



¹Based on existing standard and actually planned functionalities; ²Exxeta covers assets in their ETRM system and therefore asset coverage is not included here

Study shows evidence that no market standard is established yet though individual reviews are recommended

Overall	<ul style="list-style-type: none">▶ Overall, most of the investigated products are within a range of 25% with deviations arising from some key features; prospectively, the deviation range will decrease during the next 12 months▶ Vendors are striving to improve their products, especially to enable connections to other markets and to extend the capabilities to other commodities
Markets	<ul style="list-style-type: none">▶ Highest coverage is seen for spot power markets; derivative coverage is still low but increasing; gas markets are gradually being integrated▶ Gas coverage is planned to be implemented by all automated traders
Method.	<ul style="list-style-type: none">▶ Methodology requirements are showing a high deviation between the vendors, none of the vendors is able to match the majority of requirements in this area, however; a market standard is not established yet
Functional	<ul style="list-style-type: none">▶ Standard internal market capability is covered by most automated traders and capabilities will be significantly improved during the next 12 months▶ There is a clear trend towards a market standard for “Functional”

Your contacts for further information at The Advisory House are Mr. Fritzen and Mr. Poensgen

Our offerings for you

Please contact us for further information about the study and our corresponding offerings which include:

- Complete slide deck with detailed results as well as company profiles of all participants
- Arrangement of individual calls for the presentation of study results
- Arrangement of workshops for a detailed discussion of study results with an individual vendor assessment based on your requirements
- Consulting services for automated trading
- Business case evaluations and system selection support

Your contacts



Peter Fritzen, Manager
The Advisory House GmbH
Malkastenstraße 17
D-40211 Dusseldorf

Mobile +49 151 180 000 35
peter.fritzen@advisoryhouse.com
www.advisoryhouse.com



Marius Poensgen, Consultant
The Advisory House GmbH
Malkastenstraße 17
D-40211 Dusseldorf

Mobile +49 151 180 000 41
marius.poensgen@advisoryhouse.com
www.advisoryhouse.com