
ABB Ability™ I-SEM Insights

Are you in the know?



Drowning in data but starving for insights

"We are living in an age of information. Staggering amounts of information are collected, stored, and widely disseminated. Yet, we may be less knowledgeable than ever. This paradox of increasing information, yet decreasing knowledge and insight, has many possible causes, some of which are subtle and difficult to identify, and even more difficult to remedy. The fundamental issue is quantity crowding out quality, leading to an abundance of poor-quality information which may not be a good substitute for scarce but high-quality information."

**– Institute of Electrical and Electronics Engineers Society
on Social Implications of Technology, Editorial & Opinion
June 29th 2017**

The market

“Information is Power” may be a cliché, but it is truer than ever since the launch of the Integrated Single Electricity Market (I-SEM).

Good decisions require good information. But, there is an enormous difference between market information and market data. Data tells you what happened, information shows you why. To turn data into insightful information you need to combine multiple sources of data and present them together so that relationships can easily be seen and understood.

Industry challenges

The I-SEM is probably the most transparent wholesale electricity market in Europe. But all this transparency has a cost, you collect more data than ever yet may be less informed and knowledgeable than before. This is the Information Paradox.

Most power markets create and distribute a deluge of data from disparate sources. Collecting and analysing this sea of data to produce good actionable information is an expensive and resource intensive task. Market information and insight is in high demand yet in short supply.

ABB understand these challenges which are the same for every organisation active in the Irish market. This inspired our team to create a comprehensive and affordable software solution that puts essential market information at your fingertips. As a solution provider we can do this in a scalable, cost effective way.

Building on our long experience providing data and expert analysis in the global power markets and our expertise having been at the heart of the Irish market for over a decade, ABB has launched I-SEM Insights, a new decision support service which delivers accessible, timely and relevant market information direct to you. All presented in a powerful easy-to-use manner.

Use I-SEM Insights to spot market trends, investigate key events, capitalise on trading opportunities, explore competitive position, in a cloud solution that can be accessed from your PC, tablet or mobile phone.



Our solution

ABB Ability I-SEM Insights is our software-as-a-service (SaaS) solution that provides I-SEM stakeholders with the essential information about I-SEM in an easy to use, timely, hassle-free, and cost-effective format.

This subscription service covers the Integrated Single Electricity Market bidding zone and is designed to turn your market data into actionable insight.

Can't see the wood for the trees?

ABB Ability I-SEM Insights One-stop shop for all your I-SEM information needs

- System data
- Market data
- Unit data

Comprehensive I-SEM market data coverage

With the ABB I-SEM Insights solution on the Microsoft Azure Cloud, you get immediate access to formally published I-SEM market data from SEMO & SEMOpX.

Easy to use

All data presented in a consistent easy to digest format. Pre-prepared graphical analysis with easy access to the data behind the graphs.

Easy to own

I-SEM Insights takes the pain out of data maintenance. When the market rules or data formats change you don't have to worry – ABB takes care of this for you.

Cost effective

You focus on the value-add analysis, and do not spend time and money on data gathering, transformation, storage or maintenance.

Always be 'in the know'

Use I-SEM Insights to help you always know your market position relative to your competitors and are able to explain key market events.

What information does I-SEM Insights offer?

I-SEM Insights features tailored dashboards that provide you with situational awareness about the ex-ante markets, the balancing market, capacity market as well as competitor information.



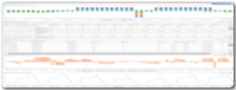
Overview ROI & NI

Features current 15-minute generation, demand, wind generation and interconnector import or export quantities, demand forecasts and actuals, market prices, wind speeds, and the latest market messages.



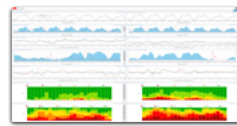
Market Analysis

Features ex-ante and balancing market price history, ex-ante and balancing market volumes history, imports & exports by interconnector, generation availability, demand forecast and outturn.



Bid Analysis

Features interval prices and traded volumes for each ex-ante market (day-ahead, intraday 1, intraday 2 & intraday 3) and balancing market, aggregate submitted bid volumes banded by price for both buy and sell trades.



Forecast Analysis

Features comparisons of demand forecast and wind generation forecast, accuracy over past 7 days together with demand and wind generation error frequency distribution for past 7-days, summary statistics and demand.



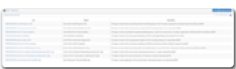
Physical Analysis

Features interconnector imports and exports compared to interconnector capacity, aggregate generation availability, aggregate Final Physical Notifications, forecast net imbalance volume.



Plant & Units

Features comparisons of demand forecast and wind generation forecast, accuracy over past 7 days together with demand and wind generation error frequency distribution for past 7-days, summary statistics and demand.



Repository

Features aggregate balancing market and capacity remuneration market payments by charge type.



Market Messages

Features both SEMO and SEMOpX market messages in a single key word searchable grid making it easy to find key notification types.

Case Study: Investigate recent ex-ante negative prices

Between the 2nd and 4th November 2018 the I-SEM ex-ante market experienced two significant periods of zero or negative prices in the Day Ahead and Intraday-1 markets.

Let's use I-SEM Insights to examine why this may be.

In the Ex-Ante & Imbalance Prices chart on the **I-SEM Area ROI+NI** dashboard (Figure 1) we can easily see that there were five events of zero or negative prices in the Day-ahead and Intraday-1 auctions between the 2nd November and 15th November 2018.

The most significant occurred between the 2nd and 4th November 2018. For 8 hours (23:30 on Friday 2nd to 07:30 on Saturday 3rd November) the price paid for electricity in the Day-ahead auction was below zero €/MWh. This happened again for a further 5½ hours on the 4th November.

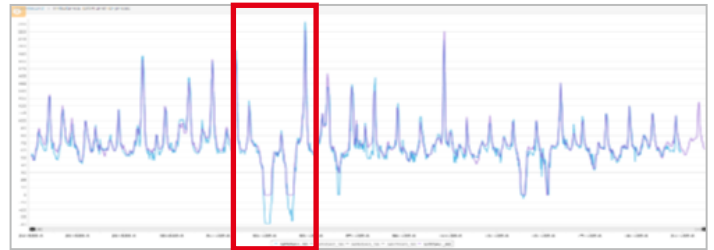


Figure 1: I-SEM Area ROI+NI dashboard

Most significant time slice

From experience an obvious candidate for investigation is the impact of Wind Generation on the price. Reviewing the dashboard's **Wind Generation Forecast v Actual (MW)** chart and the **Demand Forecast v Actual (MW)** chart for the I-SEM bidding zone (Republic of Ireland [ROI] + Northern Ireland [NI]) shows us that for the period between 23:30 on the 2nd and 07:30 on the 3rd the actual wind generation was significantly less than forecast for the entire period (indicated by the red outlined square). At the same time, the forecast demand was low.

From this it looks like wind and demand alone cannot fully explain the long period of zero or negative prices (a conclusion backed up by observing that in the 4th Nov event the pattern of wind generation and demand was reversed, yet the price effect still occurred). If wind generation didn't substitute all conventional generation bids, then what did? To find out we should explore the bid behaviour around the time in question.



Figure 2: Actual Wind Generation & Forecast Wind Generation (ROI+NI)



Figure 3: Actual Demand and Forecast Demand (ROI + NI)

Let's turn to the I-SEM Bid Analysis dashboard.

Its **Day-ahead bid volumes by price band** for ROI and NI charts suggests that on the 3rd November, many generating units had effectively acted as "price takers" by submitting offers to generate at a price below zero. Following the Euphemia algorithm these would have been treated as a block of energy, so all units would have been scheduled for an equal percentage of their offered volume up to the total block amount, which would explain the prolonged period of zero or negative prices (whether this bidding behaviour by the conventional generators was deliberate or not is a question that data cannot be used to answer).

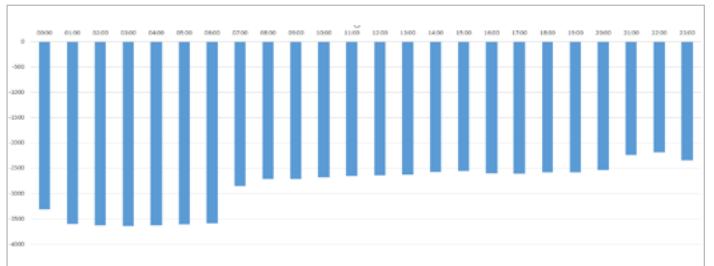


Figure 4: Day-ahead bid volumes by price band



I-SEM Insights: delivered as a SaaS subscription

I-SEM Insights is available on the ABB Ability™ Marketplace where you can purchase an annual subscription for named users.

Upon purchase, credentials plus a link to the solution are provided by the ABB Marketplace which means you can immediately start using the service.

Through the ABB Marketplace you will also be able to access video demos, and supporting documentation such as a user guide with data explanations.

The solution is accessible on including PCs, tablets and phones, using most HTML5 compliant internet browsers.



Learn everything you need to know about I-SEM Insights online

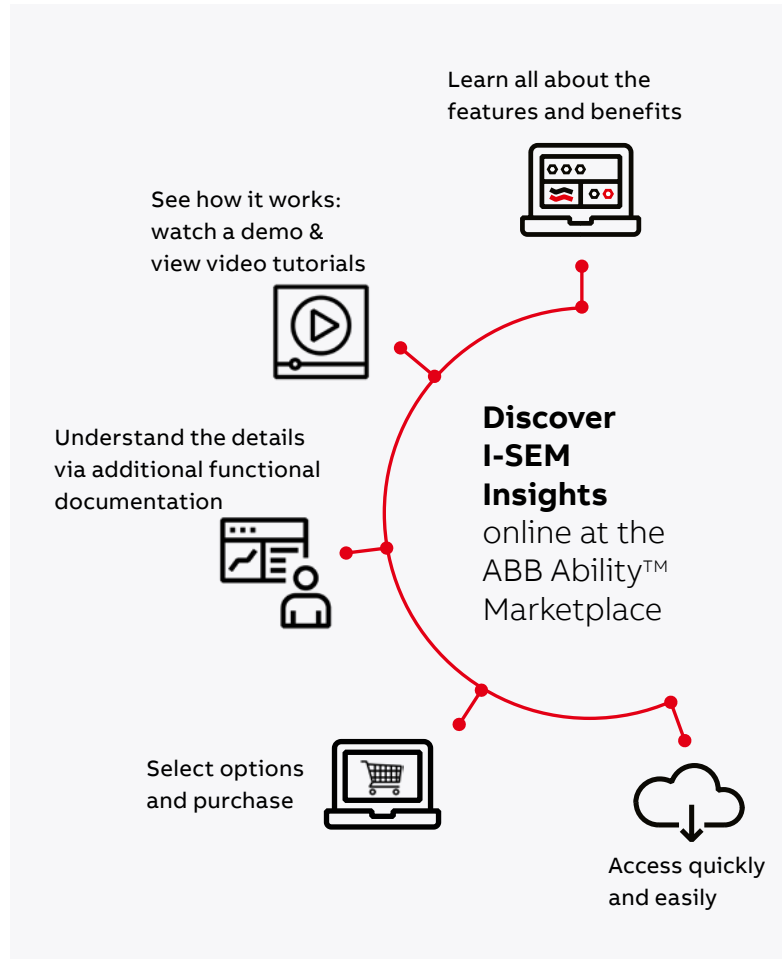


ABB Ability™ Marketplace

The new ABB Ability Marketplace makes all of ABB's software services accessible from one central portal. Customers can purchase, tailor, and manage their digital solutions online at eu.marketplace.ability.abb, wherever and whenever is convenient.

Quickly and easily adapt to changing business needs and market conditions



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