Milford Haven : Energy Kingdom – System Architecture Report – Appendix E, Trading Platform Requirements Specification

Milford Haven : Energy Kingdom, A Prospering from the Energy Revolution project

Energy Systems Catapult

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Appendix E – Trading Platform Requirements Specification

#	Functional Non functional	Requirement Subject	Verb	Functional Statement	Notes / Considerations
				SYSTEM REQUIRMENTS	
1	Functional	System Requirements	SHALL	Comply with all appropriate standards and regulations for energy vectors	As Hydrogen Standards develop, they should be captured for local, national and international activity.
2	Functional	System Requirements	SHALL	Be auditable	Define the mechanism to record all trades and characteristics (time, price, quantity, certificate of origin, traceability...)
3	Functional	System Requirements	SHALL	Be secure	Define how to keep transactions secure.
4	Functional	System Requirements	SHALL	Have a clear process for when there are malfunctions	This should ensure there is a fail-safe for operation of the network if something goes wrong, be it caused by the platform or wider infrastructure (i.e. a loss of internet connection).
5	Non Functional	System Requirements	COULD	Be replicable	Create the trading platform so that it can be replicated in other regions.
6	Non Functional	System Requirements	SHOULD	Be easy to use	The ease of using the interface will affect whether only trained assets managers or residential consumers feel able to access the platform.
7	Functional	System Requirements	SHALL	Publish market data	Visibility of market data can promote investment in the region and market entry of new participants with new innovative propositions.
8	Functional	System Requirements	SHALL	Include a mechanism for recovering costs.	Trading platforms could charge a percentage amount per trade that occurs on the platform. However other methods have been seen such as being funded by someone such as a DNO for them to use the platform to help manage their network. Many platforms are funded through innovation funding from Government but this would clearly not be a permanent source. At this time we have not witnessed any generation of funding via advertising on the platform.
9	Functional	System Requirements	SHALL	Have product requirements that enable participation from all possible assets that could provide/require the service.	The product requirements should ensure that small participants and non-traditional assets can take part in the market. For example, minimum bid sizes should be kept low and qualification processes kept simple for distributed assets.
10	Functional	System Requirements	SHALL	Establish processes to resist market manipulation and processes for highlighting possible breaches	
11	Functional	System Requirements	SHOULD	Verify asset dispatch	Once contracts have been agreed the trading platform can see whether the agreed services were delivered.
12	Functional	System Requirements	SHOULD	Settle transactions	Once the delivery period is complete the platform could assess who delivered against their contracts and have a process to automatically charge imbalance charges to participants who did not fulfil their contracts (some markets such as the ESO may have their own processes for doing this, the trading platform could interact with them on behalf of participants).
13	Functional	System Requirements	COULD	Send signals to dispatch assets	This does not have to be the platform's functionality but if users in the area desire it, the platform could have this functionality. The platform could control users' assets, possibly to supply an ancillary service.
14	Functional	System Requirements	SHALL	Use open communication protocols	Ensure all assets can interface with the trading platform.
				TRADING REQUIREMENTS	
15	Functional	Trading Requirements	SHALL	Allow participants to place bids and offers on markets	
16	Functional	Trading Requirements	SHALL	Have standardised contracts for trading products.	These would include terms such as time period, purity and volume.
17	Functional	Trading Requirements	SHALL	Define if a bid is successful and at what price	Define that a contract has been agreed between two participants.

18	Functional	Trading Requirements	SHALL	Notify participants that a contract has been agreed, with price, time and volume data.	
19	Functional	Trading Requirements	SHALL	Define trading time frames	The times during which trades take place. This is important for operation and interoperability. The time frames should be aligned to enable trading across vectors where possible.
20	Functional	Trading Requirements	COULD	Enable participants to bid into multiple markets	Participants could choose to bid into two markets and take the contract in the market which offers the best price. In this way participants who can take any hydrogen purity could bid into multiple markets.
21	Functional	Trading Requirements	COULD	Enable market participants to layer revenue between markets	If a participant can provide a service to two markets at once, the market could enable the participant to do this. This would require rules to determine which markets are mutually exclusive and which can be provided at the same time. This requires rules which dictate when a user can access different markets.
22	Functional	Trading Requirements	COULD	Optimise across markets for participants	Enable participants to enter in their availability, asset characteristics and requirements and let the trading platform secure the best contracts for the asset.
23	Functional	Trading Requirements	COULD	Provide an automatic trading mechanism	Make the steps to trading as streamlined and hands off as possible without compromising the platform or user integrity.
24	Non-Functional	Trading Requirements	SHOULD	Align the platform functionality with external platforms and markets	This would allow improved future integration with other platforms as the hydrogen capability increases and trading becomes more national
25	Functional	Trading Requirements	COULD	Coordinate local and national markets to optimise market and vector trading	facilitating rules-based and/or price-based collaborative trading across markets
				THE USER INTERFACE	
26	Functional	The User Interface	SHALL	Enable users to join and access the platform	Consider the requirements and process for users to join and access the platform. Enabling participants to coordinate their participation in markets Barriers to entry for small participants should be kept low. This could include having a manual clearly explaining the onboarding process.
27	Functional	The User Interface	COULD	Be linked to existing user accounts	Examples such as Amazon, PayPal, Google and others. There is a perception this would allow users to have a more streamlined, user friendly experience
28	Non Functional	The User Interface	SHOULD	Have a simple graphical user interface (GUI)	The ability to trade should be simple and easy for a user. The user should come away with a positive experience after using the platform as it is very easy to be switched off using something if it is deemed complicated or frustrating to interface with. It is acknowledged that perception of simple is an individual experience therefore a consumer insights view of use should be encouraged.
29	Non Functional	The User Interface	COULD	Have multiple ways to achieve the same outcome when interfacing	Many software packages allow a user to explore in a method they prefer such as clicking links, using drop down lists or having tutorials/help guides available on request
30	Functional	The User Interface	COULD	Have new user incentives	Such as financial or access support when first signing up to a platform but it must be clear that they are temporary
31	Non Functional	The User Interface	SHOULD	Have clear Terms and Conditions when signing up to the platform	Make these clear when accepting and when they change
32	Non Functional	The User Interface	SHOULD	Make clear any changes to the Terms and Conditions if they are altered for an existing user	Make these clear when accepting and when they change
33	Functional	The User Interface	SHALL	Adhere to GPDR standards	Protection of user data is critical
34	Non Functional	The User Interface	SHOULD	Be accessible by multiple multimedia tools	Accessible via iPhone, tablet, desktop PC and others
35	Functional	The User Interface	COULD	Be accessible via multiple software interfaces	It could be an App, website and others

36	Non Functional	The User Interface	SHALL	Continue to function as multimedia technology develops	It can often be the case that as technology develops a software tool get slower or is not compatible with new versions of interfacing software.
37	Non Functional	The User Interface	SHALL	Provide constant security updates to protect user accounts and data	The platform must protect against malicious malware and virus that could impact users and the H2 system
38	Functional	The User Interface	SHALL	Enable actors to leave and deny access to the platform	Consider the options for users to choose to leave the platform or be denied access. The options could include licenses, allow anonymous trading etc
39	Functional	The User Interface	SHALL	Have user protected accounts	For User security such as password protection, linking to user email or phone number.
40	Functional	The User Interface	SHALL	Have a consumer complaints process	Including a complaint escalation process
41	Non-Functional	The User Interface	SHOULD	communicate to participants the risks of market participation	As, if and when risks are identified they should be clearly stated to the user
42	Non Functional	The User Interface	SHOULD	Market and promote the use of the energy trading platform	The aim to develop and expand on a customer based directly and via aggregators should be encouraged
				ENVIRONMENTAL CONSIDERATIONS	
43	Functional	Environmental Considerations. The platform	SHALL	Show the carbon intensity of hydrogen and electricity traded on the platform.	This could be done through Guarantees of Origin or if these are not established a specific process established for the trading platform.
44	Functional	Environmental Considerations. The platform	COULD	Monitor and verify carbon intensity	If there is already a standardised process for doing this, the trading platform may not need to. Otherwise it should do this. Provide monitoring and verification needed to prove the carbon intensity of hydrogen, electricity or other energy vectors. At this time we are not aware of any local trading platforms trading in carbon. There have been discussions on having the functionality to allow a user to add in their own carbon price. National trading platforms trade GoOs for electricity.
45	Functional	Environmental Considerations. The platform	SHOULD	Identify energy source	Identify the current mechanisms such as certificate of origin and potential requirements for new ones. Identify how these mechanisms can be integrated in the trading platform in terms of information or pricing for consumers.
46	Functional	Environmental Considerations. The platform	COULD	Allow assets to enter their own carbon requirements.	Participants could state that they will only buy energy below a certain carbon intensity or add their own carbon price into trades.
				ADDITIONAL SERVICES	
47	Non Functional	Additional Services	COULD	Support mechanism for fuel poverty	
48	Functional	Additional Services	SHOULD	Track user trades to build an individual profile	
49	Functional	Additional Services	SHOULD	Track user trades to build a local profile	Complete analysis on data to show market trends.
50	Functional	Additional Services	COULD	Trade hydrogen for hydrogen blending	Blended hydrogen is likely to be a common option when trading platforms develop. Measuring level of blend (especially in a variable blend scenario) and associating it to trading and pricing need careful consideration and clear specifications.
51	Functional	Additional Services	COULD	Trade hydrogen carriers	The value of including liquid hydrogen, LOHC, ammonia, methanol. It is likely to depend on the transport and distribution means (pipeline or container), the traded quantity and the level of competition.
52	Functional	Additional Services	COULD	Trade natural gas	Trading gas could be out of scope as gas trading mechanisms are already in place and not locally produced. However, including natural gas could improve connection to wider market and give an option to balance long term trading and penalties.
53	Functional	Additional Services	COULD	Trade by-products	Identify by-products generated (oxygen, heat, carbon dioxide for CCUS or taxation purpose) and current trading arrangements. Consider the current mechanism and stakeholders involved in supplying those to consumers. The produced and tradeable quantity and the competition will affect the suitability for inclusion in the trading platform.
54	Functional	Additional Services	SHOULD	Counterparty review	The platform could conduct checks on participants to give confidence in their ability to deliver contracts. This could include credit checking and/or asset prequalification.

#	Functional/ Non functional	Requirement Subject	Verb	Functional Statement	Notes / Considerations	Trading hydrogen	Trading hydrogen system services	Containerised transport	Hydrogen network capacity rights	Hydrogen Guarantees of Origin	Buying and selling electricity through national wholesale markets	Selling ancillary services to the ESO/(ISO)	Selling balancing and constraint management services to the DNO/DSO	Selling flexibility to curtailed generators	Selling curtailment queue positions	Direct trading between local consumers and local assets	Trading capacity/ connection/ access rights	Electricity Guarantees of Origin
				MARKET SPECIFIC REQUIREMENTS														
55	Functional	Market specific requirements. The platform	SHOULD	Trade the same product at different times ahead of a delivery period.	These time periods should evolve with the market based on liquidity and market participant requirements.	🟩	🟩	🟩	🟩	🟩	🟩	🟩	🟩			🟩		🟩
56	Functional	Market specific requirements. The platform	COULD	Aggregate together bids and bid into other markets with these assets	For example, if single assets cannot meet the ESOs requirements, the trading platform could aggregate together assets and bid.		🟩			🟩		🟩	🟩					
57	Functional	Market specific requirements. The platform	COULD	Register as a VLP	This would give participants access to the balancing mechanism.							🟩						
58	Functional	Market specific requirements. The platform	COULD	Enable traders to include transport costs in the hydrogen markets.	This would allow traders to see the full cost of hydrogen, including both the wholesale and delivery cost. In this instance the trader has a set price for transport included (i.e. they may have a long term contract with a containerised transport company).	🟩		🟩										
59	Functional	Market specific requirements. The platform	COULD	Enable traders to link hydrogen markets with the transport market.	This would allow traders to see the full cost of hydrogen, including both the wholesale and delivery cost. The platform could link the two markets, providing the trader with the lowest cost hydrogen, considering both markets.	🟩		🟩				🟩						
60	Functional	Market specific requirements. The platform	COULD	Have locational data on the assets trading on the platform.		🟩	🟩	🟩	🟩			🟩	🟩	🟩	🟩	🟩	🟩	
61	Functional	Market specific requirements. The platform	SHOULD	Receive data from the ANM system.	This would enable curtailed generators to reduce their curtailment through procuring services from assets in the region.							🟩		🟩	🟩			
62	Functional	Market specific requirements. The platform	SHOULD	Send signals to the ANM system to alter operation.	This could support curtailment queue trading and enabling assets in an ANM region to sell services to the ESO.							🟩			🟩			
63	Functional	Market specific requirements. The platform	SHOULD	Integrate trading operations with SCADA systems.	Control local network management equipment e.g. STATCOMS, OLTCs								🟩					

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