

Quickfuel

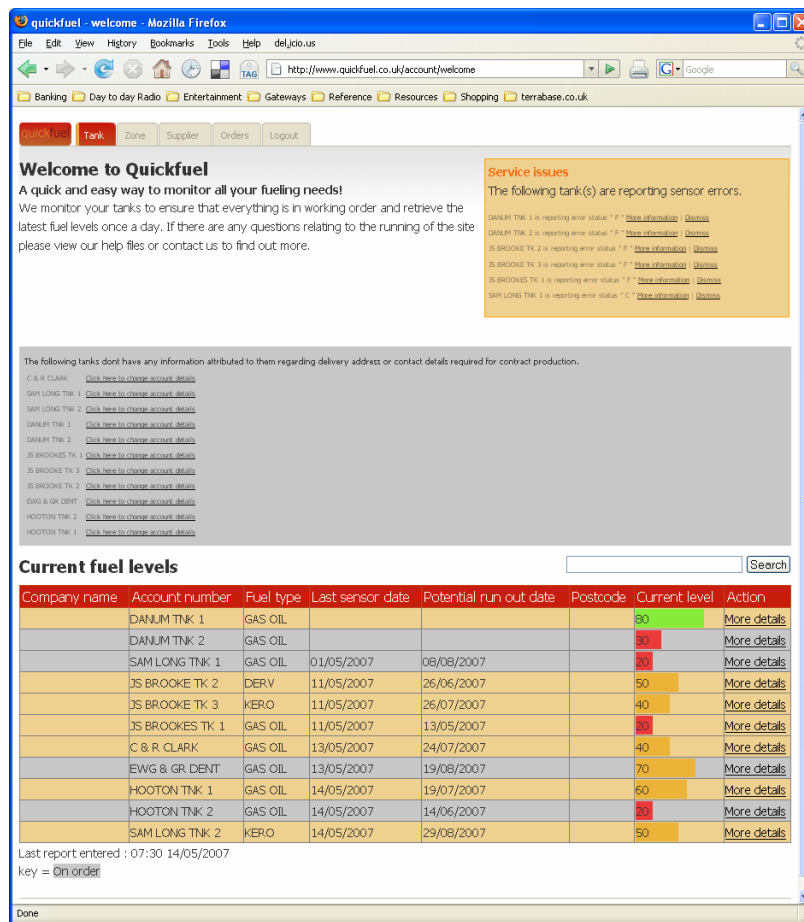
by Tony Harris BSc BCS MCP

Abstract

Quickfuel is a system which allows organisations to monitor their fuel stocks and usage for any fuel that is delivered to tanks by logistics, as opposed to pipeline or cable delivery. Sensors in fuel tanks and stores detect the physical level of the fuel and broadcast this information securely to a web-based user interface which a non-technical manager or administrator can use in their day-to-day decision-making or other activity.

How it is used

Quickfuel provides a view on distributed fuel (solid and liquid) usage and resources for a variety of interested parties.



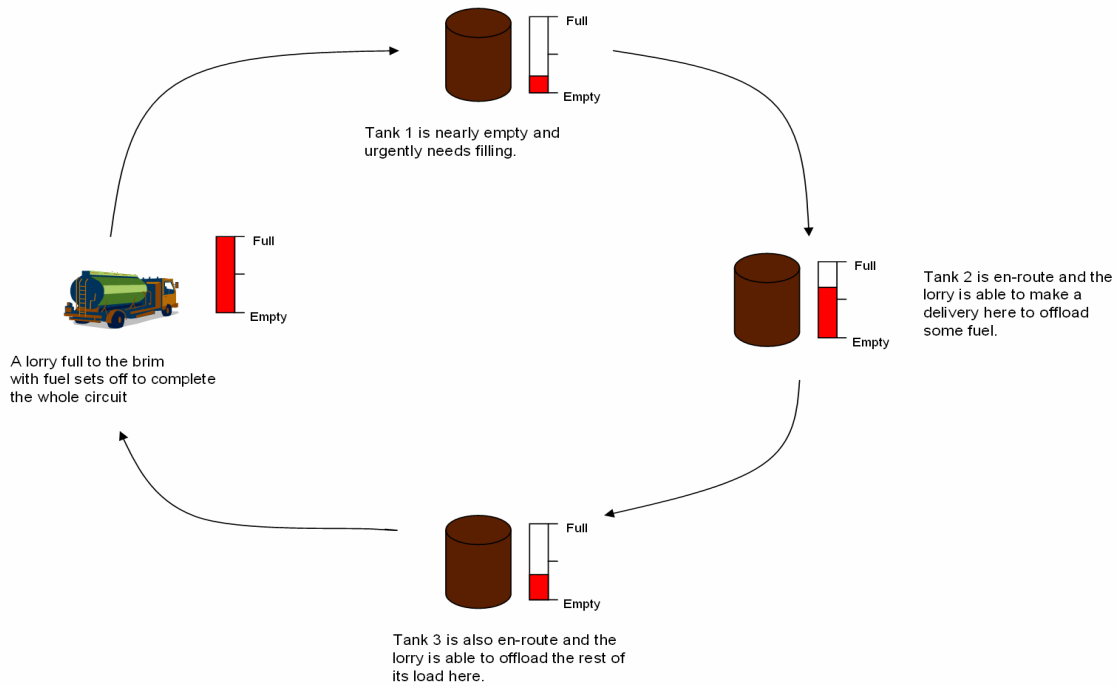
Quickfuel showing current fuel levels for a range of tanks across a wide geographical region

they on target?, do they have any surplus?). Once the fuel usage information is available, operators can put them to any use they need beyond just ensuring supply.

Fuel suppliers would log into their version of the website and be able to look up the fuel levels in a particular tank or set of tanks, perhaps in answer to a customer request. Knowing the fuel levels in all their customers' tanks they would then have the facility to produce carefully designed

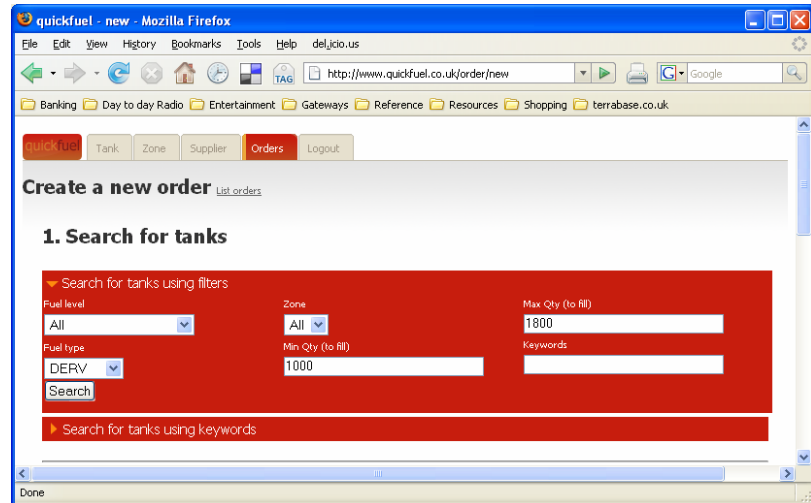
The system provides organisations that are dependent upon a ready supply of fuel to a remote site, such as farms or hospitals, with the ability to log into their own website and look at the levels of fuel they have available. They would also be safe in the knowledge that the fuel supplier is also aware of their fuel stock and will have systems in place to make sure they never run too low. The fuel user can also log-in to download analyses of their fuel usage to a sufficiently granular level (day-by-day or finer) and relate it to certain organisation activities, allowing them to alter their behavior and increase their carbon trading potential. It can generate reports which can show the user exactly how much of their allowance has been used at any point in time (are

delivery circuits to maximise the efficiency of the delivery. So, one lorry journey may suffice where many were needed before, and the delivery can be a circuit rather than a there and back again job which may not involve a full load. The supplier can offer the service to their customers as a way of guaranteeing supply and thereby taking responsibility for ensuring fuel stocks are maintained.



An example of how Quickfuel can be applied to make efficiency savings

Carbon Trading Verifiers would be able to log onto their implementation of the website and view the carbon usage of a particular organisation and produce tailored reports, comparisons and analyses as might be useful. The data would be provided in real-time by an independent third party (Quickfuel) and would remove the idiosyncratic manual labour processes currently envisaged to analyse fuel use. WoldMarsh are one of the country's largest agricultural purchasing cooperatives. They use the system to provide a service to their members ensuring fuel supply of up to 1m litres per day of gas oil. The fuel is priced according to the quantity



Tanks requiring a certain number of litres can be batched together to simplify ordering

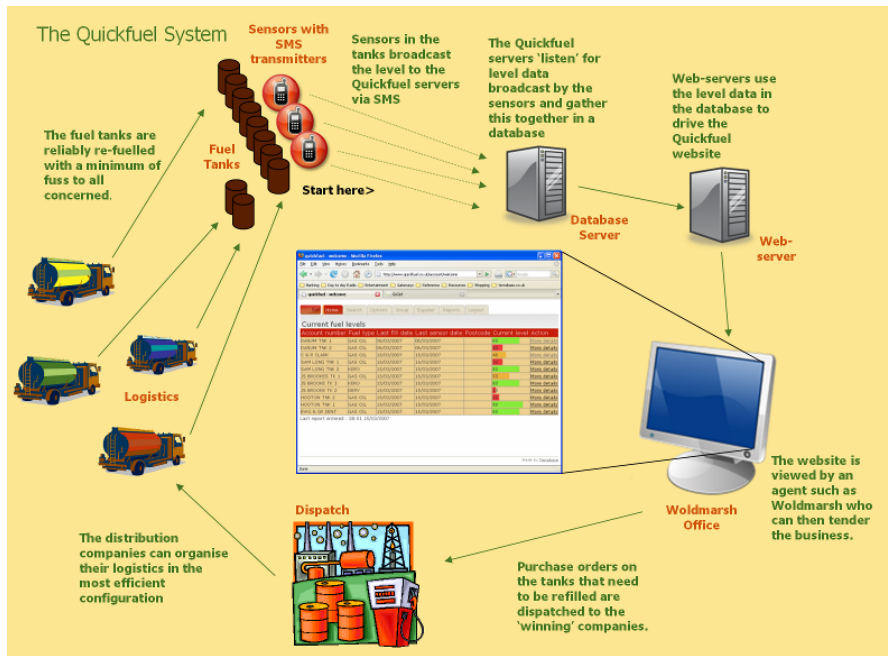
purchased and Woldmarsh are able to produce orders tailored to fill all tanks which require a certain level of fuel. For example consider the typical pricing situation presented below:

Quantity Purchased (litres)	Gas Oil Price per litre (pence)
0 – 1000	34.7
1000-2300	34.2
2300-4500	33.7
9000-17000	33.6
17000+	33.5
Full Load Artic	33.2

The agent can select all tanks that require between 9000 and 17000 litres quickly and send the purchase order off to the supplier, automating what would previously have required a lot of manual work. Other possibilities present themselves. Agents can set-up geographical areas and bulk buy all the fuel required for that area, knowing how much capacity they have in the tanks in that area. There is a facility to put that whole delivery up for tender to encourage competition between fuel suppliers.

How it works

The technology is an application of tried and tested existing systems put in the context of Web 2.0 ideology. So, fuel sensors, with a battery life of several years, broadcast a coded text



Overview of the Quickfuel System

message; containing the fuel level data, and other status information, to a central server which collates the data received and puts it together into a database. The system uses the established technology of the mobile phone networks to reach the server, which then uses the Internet to distribute the data to the users in whatever format they are permitted to see it. It is

similar in some respects to the existing remote metering systems that can be seen around, but instead of monitoring a meter, the sensors monitor the physical level of fuel in tanks.

What are its benefits for Carbon Trading?

There are many users of isolated fuel tanks, where usage is not automatically metered, using large volumes of carbon producing fuels all over Europe and the wider world. Users, like the NHS,

have fuel tanks distributed all over their operations which currently have no clear, verifiable way of having their use monitored. Verifiers are currently considering how to analyse fuel bills, a highly manual, error prone and ambiguous process. With a variant of the Quickfuel system verifiers can immediately look at a user's carbon footprint for their monitored tanks for any specified period. This data can also be integrated into the verifier's other systems to enable a report to be produced showing an organisation's total carbon footprint. This turns a very manual, expensive and time-consuming process into a real-time calculation that would make trustworthy, reliable carbon-trading a real possibility; and there's no reason why the systems couldn't be tied together into electronic carbon trading systems. For example, an organisation might look at the carbon footprint of their own projects and see that they are going to need a greater allowance, they would be able to search for other organisations that have carbon allowance to sell and purchase that allowance quickly and reliably. This has particularly interesting implications for the agriculture industry who are massive carbon absorbers.



Quickfuel can provide automated bill analysis for carbon trading verifiers

How else does it help organisations meet their environmental commitments?

Organisations will gain the facility to look at their fuel usage, brought together from a range of disparate data sources, and integrate that into their everyday systems. Charts and statistics can be shown on Intranet sites, integrated into business software, shown on flat-panel displays in offices, all with a mind to encourage staff to reduce the emissions footprint of the organisation.

But, more importantly, the organisation can quickly look for trends in their fuel consumption and have clear feedback on what activities have the most significant impact. They could look for correlations, as the fuel use is plotted over time, and the low hanging fruit of carbon reduction could be quickly picked off. For example, an organisation might see that some, fairly trivial activity accounts for a significant proportion of their carbon usage, by changing the way this activity is carried out they could produce a major reduction in their carbon footprint, whilst requiring a minimum of management effort.

How does it directly benefit organisations that implement it?

Direct benefits include that the organisation can reduce its fuel costs, increase its productivity for the same carbon allowance and guarantee supplies of energy, as described above.

However, the savings have a 'long tail'. That is, they produce many cascading benefits for the organisation with all manner of creative and opportunistic possibilities available. For example, it is easier for the organisation to 'bulk' its fuel purchases. Most fuel is sold at a price per unit based upon the scale of the volume bought. Users who look after several tanks would be able to know the maximum fuel they could buy in any one purchase. So tanks which are only half full, or a quarter full, can be filled alongside the empty tanks without someone having to go round all the tanks testing the levels whenever one tank needs refilling.

Purchase orders can be produced automatically by the system based upon the amount of fuel needed and the tanks requiring the fuel. This would reduce the manual labour involved in sorting and re-ordering fuel for individual tanks.

All tanks within certain geographical areas can be grouped together and tendered to fuel suppliers to find the most beneficial supplier, and the fuel supplier can be sent the fuel tank level

data so they can work out the most efficient way to deliver the fuel. For example, whenever a full lorry load of fuel can be distributed to a set of tanks in the area, the supplier will be able to arrange this so that there will never be lorries leaving the depot half full to fill one particular tank with an urgent need.

The uses to which fuel level data can be applied are many and varied, and Quickfuel is tailored in a modular fashion for each organisation so when certain specific functionality is required, it can be implemented, whether it's charting, statistics, integration with office systems, integration with 3rd party systems etc.

How is it implemented, including costs?

The sensors are sold for £50.00 each and one sensor is required per tank, there is then the additional cost of an SMS transmitter at £110.00. It is possible for the sensors to be fitted by hand, or an engineer can be sent out to ensure correct fitting and calibration for a further £50.00. The system then costs £2.85 per month per sensor plus £6.85 per month for the SMS broadcast unit with the cost of the texts (currently 4p per text with one being sent per day). There is an annual bureau fee of £18.00.

The user will then have the facility to look at all the tank levels using their implementation of the quickfuel web software. The core system shows tank levels, which can be sorted or searched through and allows the management of account information, supplier information and purchase order generation.

Further modules can be ordered as bolt-ons, utilising either existing modules, or by requesting brand new, bespoke modules specific for the user's requirements.

Who is behind it?

The system was developed for a company called Quickline Logistics Ltd by the software development house Terrabase Ltd. It is now a real-world technology having been in the R & D phase for several years. Woldmarsh Producers Ltd, one of the UK's largest agricultural buyers' conglomerate, have been important in a consultation capacity and have implemented it across their operations in Lincolnshire and beyond.

Conclusions

The Quickfuel system is an innovative application of existing and brand new technologies where the existing technologies take over the vital roles and the brand new technologies take over the presentation role.

There is no known direct competitor currently in the marketplace but the most similar systems allow technical people to read the data coming from installed meters (not fuel tanks) over the SMS network. The Quickfuel system however provides the end-user with a technical or non-technical presentation of the data from *fuel tanks* giving direct management value. It completes the whole solution, from the technical hardware to the software development, tailored to the needs of the particular fuel user.

The system allows fuel which needs delivering by logistics (as opposed to pipeline, or cable) to be monitored reliably for the user themselves, for the supplier, for agents (buying groups) and for verifiers with regard to carbon trading and, at the time of writing, appears to be the only such system on the market.