energy saving trust

# Energy Saving Trust

*Developing innovative services to target energy efficiency improvements in UK housing stock*

## Smart is...

***Utilising analytics and GIS technology to provide unprecedented insight into the energy efficiency of UK housing.***

Energy Saving Trust's mission is to help individuals, energy suppliers, the government and other organisations develop and execute a more effective strategy for increasing the energy efficiency of UK homes. An initiative known as Home Analytics provides vital data on all 26 million UK homes to help organisations target efficiency programmes. Assimil8 helped to develop the solution using IBM® Cognos® and Esri software, running on IBM SmartCloud™ Enterprise.

Energy Saving Trust, a UK-based social enterprise with charitable status, employs approximately 150 people and has offices in London, Cardiff, Belfast and Edinburgh.

Energy Saving Trust provides impartial, accurate and independent advice to communities and households on how to reduce carbon emissions, how to use water more sustainably, and how to save money on energy bills. It works in partnership with government, local authorities, third-sector organisations and businesses to help deliver and manage government programmes, test low-carbon technology, certify and assure businesses and consumer goods, and develop models and tools for energy efficiency research and planning.

## Supporting energy efficiency initiatives

One of the most important aspects of Energy Saving Trust's operations is to assist with energy efficiency initiatives that help the UK's 26 million homes. Much of the UK's housing stock was built before modern insulation and energy efficient materials were available or prevalent, and in many cases there is an opportunity to retrofit these buildings with insulation, such as cavity wall or loft insulation. Central heating systems have also advanced significantly in recent years, and upgrading old boilers to more energy-efficient models can also make a huge difference to fuel usage and costs. Equally, as photovoltaic technologies become more cost-effective, many homes could benefit from the installation of solar panels.

"To take one example, the government has established the 'Green Deal', which will help UK households and businesses improve their properties by meeting the up-front costs of energy efficiency measures," explains Will Rivers, Housing Data Manager at Energy Saving Trust. "Over time, the cost of the installation will be offset and repaid by savings on electricity and heating bills – so it's a win-win situation. Consumers will save on their energy costs; the government will mitigate the risk of fuel poverty; and everyone will benefit from the reduction in carbon emissions and environmental impact."

IBM

## Business Benefits

- Clients' operations teams can analyse housing stock data in an immediate and intuitive interface, helping to optimise energy efficiency planning.
- Using this data to support initiatives like the "Green Deal" could help improve energy efficiency in properties across the UK.

## Meeting the challenge

However, initiatives like the Green Deal pose significant challenges to the central and local government organisations, energy suppliers and other parties that are tasked with implementing them. To ensure that these programmes deliver the greatest benefits, it is vital to identify the homes that will benefit most from being fitted with, for example, better insulation, new windows or boilers.

"Traditionally, there have been two main issues: first, nobody had a comprehensive and detailed record of the UK housing stock; and second, even where the data was available, operations and planning teams were not able to make use of it. Energy Saving Trust's Home Analytics initiative set out to tackle both of these problems."

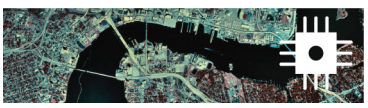
## Creating a comprehensive data-set

Energy Saving Trust gathered data from a range of sources, including government housing surveys, installation records from organisations and schemes such as CERT, EEC, Warm Front, CIGA, FENSA and CORGI, and its own research. The Home Analytics team then built a database that stores approximately 50 key attributes for each home, including data on: property type, size, age, number of bedrooms and tenure; wall insulation, loft insulation, glazing and boiler type; use of solar photovoltaic or solar thermal technology, distance from biomass suppliers and wind-energy potential.

Where data was missing, the team used multinomial regression techniques to extrapolate data from nearby houses of the same type. As a result, Energy Saving Trust now possesses a comprehensive record of all 26 million UK homes. The team also used sophisticated GIS analysis to ascertain, for example, the roof orientation of every dwelling and the distance of every property from the mains gas grid.

"The next step was to make the data more accessible for the people who actually need to use it on a day-to-day basis; for example, the teams within the energy suppliers who are likely to be some of the key delivery agents of the Green Deal and its related schemes, or the operational planning teams within local authorities who will play a key role in communicating schemes like the Green Deal to householders," explains Will Rivers.

## Smarter Government — Improving energy efficiency by analysing housing data

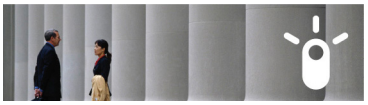


**Instrumented**

Housing planning teams from the private sector and government access the cloud-based service by logging on to a web portal that provides seamless access to analytics and mapping tools.

**Interconnected**

The solution collects and analyses energy efficiency data on 26 million UK homes, captured from government surveys, in-house research and reports from a host of other organisations.



**Intelligent**

Analytics and GIS technology enable unprecedented insight into a nationwide property and energy database. This highlights opportunities for improving the energy efficiency of the housing stock and reducing carbon emissions.

## Solution Components

**Software**
- IBM® Cognos® Business Intelligence

**Services**
- IBM SmartCloud™ Enterprise

**IBM Business Partner**
- Assimil8
- Esri

## Accelerating access

"The ideal solution was to present the data visually, using maps – but the lead times were simply too high. Effectively, it would take a day for the operations team to define the data that they wanted, another day for the data team to extract it, and a third day for the GIS team to plot the data on the map. As a result, many operational teams felt it was not worth the effort, and made decisions based on their own experience rather than hard data.

"To promote a culture of data-driven decision-making, we needed to transform the way our data is accessed and presented – and we needed to cut the turnaround time from three days down to three minutes, or even three seconds."

## Building a solution

Energy Saving Trust was already using IBM Cognos Business Intelligence software to analyse its housing data in a variety of ways. Working with Assimil8, an IBM Business Partner that specialises in analytics solutions, the organisation decided to extend this solution by integrating it with a geographic information system (GIS): Esri Maps for IBM Cognos.

"We looked at various software products that were capable of plotting data on a map, but the combination of IBM Cognos and Esri Maps was the only solution we saw that enabled analysis in both directions," says Simon Elam, Programme Manager at Energy Saving Trust. "You can generate a report that displays data on a map, but importantly you can then also make selections on that map that will generate a more detailed report. Moving from maps to data and back again gives users a simple, real-time way to refine their queries until they get the insight they require."

## Putting analytics into practice

To take an example: a local authority in London might want to promote a scheme for installing cavity wall insulation. To avoid wasting money on raising awareness in areas where houses are already insulated, its operations team could use the Home Analytics tool to identify the homes that have the worst energy efficiency rating and would benefit the most from insulation.

By selecting the appropriate filters in the Home Analytics interface, the local authority team can quickly generate a colour-coded map of their borough, indicating the wards that contain the most houses with unfilled cavity walls. They can then click on the wards to drill down to the level of individual addresses, and generate a map that shows the wall type of each house. By selecting groups of houses on the map, they can then output a list of addresses, which can be used by the scheme's marketing team to run a mail campaign and inform householders about the benefits of insulation.

## Supporting alternative energy

Will Rivers adds: "The maps aren't just useful as a way of visualising the data we already have; they are also a source of new information for the Home Analytics database. For example, one of the maps we use

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— Simon Elam, Programme Manager, Energy Saving Trust

displays each building as an individual polygon. By analysing the shapes of these polygons, we have been able to estimate the orientation of the roof-lines of 95 percent of UK homes, which enables us to predict the aspect of their roofs and the amount of sunlight they will receive. This data will be invaluable for planning solar panel installations."

The initial version of the Home Analytics mapping solution is currently being rolled out to its first major client – a central government organisation. Meanwhile, Energy Saving Trust is working on a new version that will meet the needs of other types of users, such as local governments, energy suppliers and installers of insulation and double glazing.

## Moving into the IBM SmartCloud

To meet the needs of increasing numbers of users, Energy Saving Trust realised that it needed to transform its IT infrastructure. The creation of data records for all 26 million UK homes and the demands of presenting this information in various visual forms was already putting a strain on the organisation's existing server landscape, and the Home Analytics team was concerned about performance.

"The key to the adoption of the solution by organisations is its usability, and the key to usability is response speed," explains Simon Elam. "Users are happy to wait a few seconds for a map to be generated, but if it takes several minutes, they just won't tolerate it. So we knew we would need a new infrastructure to support large numbers of users on the solution."

Working with IBM and Assimil8, Energy Saving Trust moved its Home Analytics solution into the cloud, utilising IBM SmartCloud Enterprise to provide infrastructure as a service.

"IBM SmartCloud means that the services we can offer are no longer constrained by the limitations of our on-site hardware," says Simon Elam. "If demand for the new Home Analytics service or any of our other data-sets increases, we can dynamically increase the size of our cloud landscape. The flexibility of scaling up and down to match our users' needs is a real advantage."

Kevin Hurd, Principal Consultant at Assimil8, adds: "The SmartCloud service is more than just servers and storage – it provides a set of easy-to-manage provisioning and management tools that make it simple for even non-technical people to manage large, sophisticated infrastructures. We recommended it to Energy Saving Trust because we were confident that it would resolve all of their infrastructure-related issues, and the results have been excellent."

## Improving energy efficiency across the UK

Will Rivers concludes: "Helping our clients harness the power of Home Analytics will be an ongoing process, but we have already achieved a lot. For the first time, we have a comprehensive record of the energy efficiency of the UK housing stock, and we have built a solution that makes this data accessible far beyond the traditional community of data managers and analysts.

*"The services we provide should support initiatives such as the Green Deal and make it possible to achieve energy efficiency targets faster and at less cost. Looking at the big picture, the aim is to help the UK avoid fuel poverty and reduce domestic carbon emissions to help minimise the effects of climate change."*

— Will Rivers, Housing Data Manager, Energy Saving Trust

"By putting new insight in the hands of operational planning teams in government and the private sector, we are contributing to a culture of data-driven decision-making. Ultimately, the services we provide should support initiatives such as the Green Deal and make it possible to achieve energy efficiency targets faster and at less cost. Looking at the big picture, the aim is to help the UK avoid fuel poverty and reduce domestic carbon emissions to help minimise the effects of climate change."

## About Assimil8

Assimil8 is a market leader in business analytics, financial reporting, planning and forecasting, and data warehousing. Using world-class IBM Cognos software as a base, and following an ethos of client collaboration and empowerment, Assimil8 is driving forward innovative and ground-breaking techniques such as geo-spatial business analysis and cloud-based systems.

To learn more about products, services and solutions from Assimil8, visit: **www.assimil8.com**


## About IBM Business Analytics

IBM Business Analytics software delivers actionable insights decision-makers need to achieve better business performance. IBM offers a comprehensive, unified portfolio of business intelligence, predictive and advanced analytics, financial performance and strategy management, governance, risk and compliance and analytic applications.

With IBM software, companies can spot trends, patterns and anomalies, compare "what if" scenarios, predict potential threats and opportunities, identify and manage key business risks, and plan, budget and forecast resources. With these deep analytic capabilities, our customers around the world can better understand, anticipate and shape business outcomes.

### For more information

For further information please visit **ibm.com**/business-analytics.

### Request a call

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