Case study: Heatweb
State of Open: The UK in 2024
Phase Two
"The Open Manifesto"

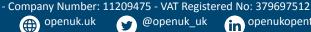Richard Hanson-Granville,
Director, Heatweb

Heatweb have been pioneers of hot water cylinder technology for about 35 years, as a long-established family business. In recent years they have moved away from manufacturing and shifted towards providing consultancy services, with a focus on enabling visibility of data and metrics in energy systems. Today, massive amounts of energy are lost due to inefficiencies in plumbing but this is not clearly identified and is not well monitored. By providing monitoring they are able to access the missing data that allows them to highlight and fix the problems in the plumbing systems that currently contribute to these massive energy losses, such as heating and cooling systems running in parallel. The organisation's ultimate goal is to help organisations achieve net zero carbon emissions by supporting them in this way and they believe that the use of open source software will support this.

Heatweb developed a CE approved electronic circuit board, called BEMS2.3, showing that the board met all EU requirements, for use with a Raspberry Pi board or any I2C enabled controller, to enable control and monitoring of plumbing equipment such as sensors, pumps and heat metres using open source software. This could improve energy efficiencies by allowing data to then be visualised in Grafana where inefficiencies can be seen clearly. They trialed their technology at Swansea University, the Barbican and the Excel Center, seeing potential energy savings as high as 30%.

Heatweb believe that open source is a vital component of its technology as they were able to build their tool on existing open source software – **using MQTT, PostgreSQL and Grafana** – allowing them to develop unhindered and to achieve the necessary results without paying a royalty to use the software that they modified, and allowing easy replication. Not only did this remove the need to reinvent the wheel by recycling existing software but it enabled them modify the software to meet their needs without going down the road of negotiating a paid proprietary software licence which would have taken months and cost them thousands of pounds per installation, to achieve the same result.

Their project was funded by a £250,000 plus VAT government grant from the Energy Catapult in 2023. The grant was part of a scheme offering funding to promote energy saving with a requirement of providing the outputs as open source software. Heatweb however feel that they been left without further support from the government once the project came to an end. They see crucial gaps that their technology could fill, for example, the UK Government are currently attempting to implement quality control through Ofgem, a use case that Heatweb's technology could deliver but they are struggling to

find anyone to take an interest from government or the public sector and have failed to engage the open source community, despite the fact that some huge real world energy savings have already been demonstrated.

Although Heatweb have built their technology using existing open source software and feel that they have benefited hugely from a technology and cost perspective from its being open source, they feel a little cut adrift within open source. This is their first engagement with open source and although they have built their controller on it and shared it on GitHub they are not seeing others using it, nor have they had third party contributions from a community.

As they went through the mentoring process within the grant funding programme they became aware that open source engagement and community building require not only delivering a software project but resource with time to engage audiences via events and evangelism. It has become clear that engagement will only occur within open source if they are able to support their project becoming recognised with potential open source software contributors,or other partners who may engage in collaboration. This would potentially enable them to receive contributions to support its growth and longevity and to maintain it, and improve it but also could allow its adoption to become a de facto standard within their industry. This latter benefit of open source is one they are very keen to leverage and is a key driver for their use of it.

They feel that this experience highlights a key issue in the public sector's handling both of funding and support of the delivery of open source software and innovation. For organisations like Heatweb, they needed more understanding of how to unlock the open source value they feel they have and would have liked to see that expertise being provided during and after their funding period by the public sector funder. They would also have valued understanding more up front what is needed to build open source and are surprised that these criteria were not included in the funding assessment as well as the code being shared on GitHub with an OSI approved licence which they feel from their experience is clearly not enough to ensure a successful open source project.

While Heatweb have used open source tools as part of their project, they have no in-house open source expertise. Relying on what they could learn themselves and from limited mentoring throughout the project which seemed to be closing the door after the horse has bolted. It was not enough for them to learn what they needed to know. They were therefore eager to turn to the open source community as a source of true expertise. But they felt they were met with a culture of competition and were unable to collaborate with the people they really hoped would help get their project off the ground. They had no leverage or ability to build engagement.

The lack of focus around a centralised zero carbon project and scattering of the funding across 6 small, unconnected projects has seemed to hinder true open collaboration within the funded projects and has not created either collaboration or a true open source community. This is something they have experienced first-hand and they do not believe that any of the 5 other funded projects has been more successful in the process of open sourcing their outputs (as the grant requires).

Heatweb also worries that open source competitions in future may require a greater level of open source expertise in order to gain funding. This would effectively kill off projects that are trying to use open source to complement and bring non-software technologies online – some of which may be critical to achieving net zero. They worry that the competition approach to open source is not compatible with net-zero, which requires efforts to coalesce around a (non-software) mission. Participants are forced to come up with something unique, rather than improving on existing systems, competing against each other rather than working together on different aspects of the 'whole'.

Heatweb believe that this problem can begin to be resolved with a centralised mission that focuses funding more effectively and places value on the outcome and future on projects such as theirs whilst also clarifying up front what is necessary to not only build on existing open source but to build code in a way that meets good practices, engages others in a community and enables contribution and collaboration. By directing funding to projects with the same goals, the public sector funding could achieve more by enabling organisations to collaborate in a mutually beneficial way, ensure that goals are achieved and that projects are not forgotten about but rather achieve adoption and become an established part of open source. With an approach like this, achieving enormous goals like net zero may be just around the corner.