

CASE STUDY

# New Kubernetes platform for DfT delivered into Live service

Working for the Department for Transport (DfT), Triad delivered a new and strategically important platform for the Renewable Transport Fuel Obligation (RTFO) Unit; from the first line code to formal Live launch.

Employing infrastructure as code, GitOps and DevSecOps principles, this stable, secure and scalable microservices solution completed one year of Public Beta with **zero issues or downtime**. Following this and a successful GDS assessment, the service was accepted into Live in June 2020.

At the heart of this open source solution is a comprehensive continuous integration and delivery pipeline able to make efficient decisions to reduce microservice build times.

An extensive QA suite also allowed the Triad team to deliver robust, high quality iterations of the product with repeatable results at the end of every sprint.

## About the client

The DfT is a key Government department responsible for the UK's transport networks, including the maintenance of 400,000 kms of roads. The DfT also has a critical role in ensuring that the UK Government achieves its legally required reductions in CO2 emissions.



Legislation, designed to reduce these emissions, meant that the DfT needed to build a new GHG reporting system that enabled all fuel and energy providers across the UK to report on energy and fuel supplied and used in road transport. The system also needed to make it easy for these companies to claim and trade GHG credits under the GHG reporting regulations.



“Triad’s successful delivery of this modern platform marks the beginning of a significant transformation for the RTFO’s business processes by providing a rock-solid foundation for our future operating model.

Triad’s exceptional understanding of the underlying business, coupled with their technical expertise, has been instrumental in enabling us to move forward with our strategy.”

- **Richard Lynn** | Project Sponsor & Head of Compliance, Department for Transport

## The challenge

The RTFO unit and other organisations involved in renewable transport fuel reporting relied on an ageing legacy system to support the reporting of fuel and issuing of credits. In 2018-2019, legislative change fundamentally altered the RTFO mechanism, while also introducing a potentially short lived (2 years) but noticeably different Greenhouse Gas (GHG) mechanism to run in parallel.

The combination of needing to deliver a new national GHG system for a potentially short period of time, whilst also making risky changes to the legacy RTFO system, presented a unique challenge for both Triad and the DfT.

## The solution

**Triad collaborated with the DfT to produce a strategy that provided the perfect balance between unavoidable investment in legacy technology, considered investment in short-lived solutions and appropriate investment in a future state platform.**

Initially, Triad developed a continuous integration environment around the legacy platform, taking the on-premise solution into the cloud within a development context, and wrapping it within a safety net of automated tests with automated deployments. This provided a safe foundation from which to integrate fundamental changes to the legacy system and existing mechanism.

The next phase was to develop a solution that would persist beyond the life of the new GHG legislation and serve as the strategic platform for RTFO, providing a migration path for the legacy RTFO system regardless of the lifetime of the new GHG legislation.

For this, Triad built upon the new continuous integration environment to produce a comprehensive set of automation pipelines, specifically designed to efficiently build, test and deploy containerised microservices to Kubernetes clusters in Google Kubernetes Engine. The team then designed and delivered the new, fully open sourced solution on this platform to meet the GHG legislative requirements.

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| Organisation                       | Status   | Type     | GHG credits available | Obligation    | Obligated status |
|------------------------------------|----------|----------|-----------------------|---------------|------------------|
| <a href="#">Supplier Eight</a>     | Approved | Supplier | 28,056,799.04         | 4,224,786.48  | ✓                |
| <a href="#">Supplier Eighteen</a>  | Approved | Supplier | 11,892,985.34         | 753,431.75    | ✓                |
| <a href="#">Supplier Eleven</a>    | Approved | Supplier | 536,144.56            | 91,496,252.40 | £                |
| <a href="#">Supplier Fifteen</a>   | Approved | Supplier | 105,150.63            | 5,765,763.24  | £                |
| <a href="#">Supplier Fifty</a>     | Approved | Supplier | 0.00                  | 23,824,704.50 | £                |
| <a href="#">Supplier Fifty-one</a> | Approved | Supplier | 0.00                  | 0.00          | ✓                |
| <a href="#">Supplier Five</a>      | Approved | Supplier | 63,054.93             | 90,950,199.10 | £                |
| <a href="#">Supplier Four</a>      | Approved | Supplier | 59,791.02             | 33,700,260.61 | £                |
| <a href="#">Supplier Fourteen</a>  | Approved | Supplier | 96,918.44             | 0.00          | ✓                |
| <a href="#">Supplier Nine</a>      | Approved | Supplier | 259,975.78            | 4,766,642.96  | £                |

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## The result



Since the first deployment, the system has experienced zero downtime, and in 2020 the new system and platform completed Public Beta without issue. Having now passed Alpha, Beta and Live GDS assessments first time, every time the new system is fully operational.

This resounding success was a result of:

**Rock-solid stability** - self-healing orchestration of Docker containers on Google Kubernetes Engine combined with a microservices architecture that provides fine-grained control and resilience.

**DevSecOps** - security and operational support considerations are embedded within the development cycle, culminating in a friction-free transition through the information assurance process and PenTest.

**GitOps** – these were adopted by the Triad team to ensure that the entire system, its configuration and infrastructure was defined in code, built, tested and deployed without human intervention. This allows the delivery of product iterations into production at the end of every sprint.

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