Fuel Cell CHP – Palestra

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The Palestra building: TfL fitout in 2008

The brief...
- Relocate 2500 staff in improved facilities
- Reduce running costs
- Minimise energy & water usage
- Improve BREEAM rating to Excellent
- Maximise ‘Tri-Generation’ opportunity
- Maximise recycling
- Payback within TfL’s lease period
- Improve cycling facilities
Technology & Product Evaluation

CIBSE Energy Performance Group

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1. 1.834kW electric gas combined heat and power (CHP) engine
2. 200kW electric fuel cell CHP
3. 3.75 cubic metre thermal store to even out the heat supply and demand
4. Absorption chiller to use the CHPs' excess heat to provide cooling to the building
5. Cooling tower to then get rid of excess absorption chiller heat
6. New electric "free cooling" chiller to provide more efficient base load cooling
7. Electrical generator and infrastructure to provide resilient supplies to support our operations
8. Rainwater harvesting tanks and pumps to use rainwater to flush toilets and urinals
Since 2010 the following has happened:

- In 2012, TfL instigated a redesign of electrical resilience infrastructure to accommodate for additional 24/7 staff operations within the building.
- This required the Fuel cell CHP to be put in to stasis, which led to various equipment failures within the unit.
- In November 2013 following a study by Verco to investigate why the original gas CHP system did not work as originally designed, the whole system was turned off while an energy performance contract via the GLA's REFIT framework was procured.
- In 2015 a Fuel cell twin (imported by SSE at the same time as TfL’s) was bought for use as spares to bring the Palestra Fuel cell back on line.
- In 2015 E.ON were also appointed to carry out the design & build energy performance contract for the rest of the tri-generation system (ie apart from the Fuel cell), with works completed in November 2017 guaranteeing £111k a year in savings and an 8 per cent carbon emissions improvement.
- In 2016 attempts to restart the Fuel cell via both Doosan (manufacturer) & Logan (installer) were halted due to lack of comms with the current unit.
- In January 2019 we smashed EON’s guarantee, saving £445k, achieving a D-rated DEC and improving carbon emissions by 17 per cent!
What next for our Fuel Cells?

Acton (spare)  
Palestra (in stasis)
Thank you!

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