Interview with Steve Guy

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Introduction

The Norwich Biosciences Institute is a cluster just outside Norwich of four international centers of excellence in plant science, microbiology, harnessing foo for health and controlling food-related disease: the Earlham Institute, the John Innes Centre, the Sainsbury Laboratory, and Quadrant Institute of Bioscience.

Steve recently oversaw the refurbishment of the lighting for two buildings in the business park.

Context

We've got number of buildings on site, real mixture of data centers, labs offices, canteens conference centers - a broad spectrum.

The two buildings in question were constructed around 1993, I suppose at the time state of the art lighting system with a very simple metal grid ceiling. The labs were increasingly requesting additional lighting above their benches. Just because the lighting was so poor in the areas. But we had a real concern with energy consumption as well.

Outside of normal working hours, if there was only one or two people in the labs, all of the lights and all of the areas were switched on all the time, just because of the way the lights and switching was configured.

Problem

So we had two challenges: how do we replace the lighting to improve it? How do we do that without taking the whole ceiling down, wo working around existing users without causing too much disruption and improving the lighting control as well.

This has been going on for a number of years.

Solution

So finally working with Jamie, we came up with a solution and said: we can retrofit a fitting that will fit in your existing ceiling and we can do away with all the existing switching in that would be no requirements for additional wiring, which is a huge bonus for us. It's probably quite cost effective and the lighting levels will be increased dramatically.

So we did a pre-phase. We bought a couple of these lights, put them in a couple of areas, had a chat with a lab manager who uses the areas and said, yeah, this is really good.

And I'm really, really happy with the results. We then put a business case into BBSRC.

The business case

One of the biggest selling points was the energy savings, not just in terms of reducing costs for the LEDs replacement from the previous fluorescent tubes. Also the improved controllability of the lights. So just putting in intelligent controls meant that you only use the lights in the area you're working in.

So we were lucky that we got funding. We broke up into three different phases because it was such a huge project. And they agreed to fund it over a three year period. And we basically replaced all of the lights in all of the areas.

Across the labs, the two major buildings on site, so probably close to £800,000 eight worth of work.

And the results have been fantastic. Their lighting levels within the labs, themselves have seen a huge increase and the scientists really like them.

They now don't use the additional lab lighting on the benches themselves, which is a real bonus. They liked the controllability as well - where they're working, they only get the light they need.

And when we have, on the odd occasions come into the building at night, to do any shutdowns or we get called out to the engineers, you can turn up to a building, you can see one or two lights on, which is a huge, huge benefit rather than turn up at two o'clock in the morning and see the whole building lit up.

And on a slightly different note, security used to go around, patrolling the areas and nighttime and they now like the flexibility they can walk up there, the lights come on. And also when they leave the building, they know within 20 minutes, the lights off as well.

So it gives them a bit of an early indication to know that if they can see lights on the building, they know someone's in the building. So from a safety point of view as well. So this had huge benefits to us.

I wouldn't say it was simple to install, but considering the options that we would have had to take the ceiling down and rewire the whole system, it did prove a simple solution for a very complex problem. Huge benefit.

Funding

We are funded directly from BBSRC. We're allowed to put in business cases for estate improvements each year, but we have to justify them. So it might be a case of something's broken and needs to be replaced, but it needs to be very much science specific. So does it improve science? Is it a benefit to science? if it is can you prove there's some sort of energy saving as well?

There's quite a detailed business case we had to put forward that then goes forward towards the committee. They look at all the business cases and agree or disagree whether or not to fund each year. So that funding could be £1 million. It could be £10 million depending on what we're planning to do.

There's no direct cost revenue return to BBSRC, but they'd like to see a reasonable payback within four to five years. So as long as we can prove that again, that's a real plus point when we put the business cases in.

Cost savings?

The cost-saving was very much done on a an assumption of what the original, fluorescent tubes were using and what the LEDs were based on the information provided from Jamie. In hindsight, we wish we would have really mapped out where the energy profile of the buildings worked before we start the project.

And then mapped it again when we finished to give us a real true cost-saving analysis. The downside is we were doing other projects associated with the building. We changed the chillers. So there was a lot of other factors involved, so we could never really get a true energy cost savings for the building itself.

In hindsight, that's something we should've done really. And not just for the buildings themselves, we could use that information moving forward to other business cases for the future.

You never do one thing in isolation so it’s always hard to pinpoint a single effect.

But based on the figures of what we existing fluorescents were costing us, based on a unit cost per energy, the information Jamie provided, we roughly worked out what we feel the energy say would be over a four, five five-year period.

Because we're a charity we only pay 5% VAT and about nine or ten pence per kilowatt-hour. When we've looked at these sort of schemes in the past, the energy return or the cost return has always been eight, nine, maybe even 10 years.

But we were able to justify this one in terms of what the price per unit of the cost of the installation would be based on what we would have spent, if we'd had to take the lab out of use remove all the ceiling rewire the lights.

So it was more of an installation cost lifecycle costs, the fitting as well. We had to put a lot more detail behind it rather than just a fluorescent for an LED, which is what you normally do.

Life cycle concerns

When we do the business cases, we have to take into consideration the maintenance cost as well. How much time we have to allocate to change your lamps, to repair and fix etc.

So you have several factors. We get a five-year guarantee with the Glamox lights , which is a great warranty in terms of parts. We'll look at the life cycle of the lights as well, because there's another project going on to rebuild the site in its entirety.

So whenever we put the business cases in, we have to say: is the asset transferable?

So we quite, happily said that the lights could be used in the future. So if they did refurbish the building as a whole, as they begin to get the funding and the lights could be taken down stored and put back in again in any sort of configuration.

So it was very much: Are these fit for purpose in the short term also, have they got a real longevity for the next 15, 20 years?

Scientist satisfaction

We asked Jamie to do a design plan for the labs themselves. He come up with a couple of options and we decided to go for the maximum amount of lighting levels we could knowing that we could dim them back down again, based on actual requirements.

Because they have the daylight sensors as well, we were able to reduce that and adjust that depending on the requirements of the science.

So if one of the labs is doing some very close quarter work and they wanted to high light level, we could increase them. In other areas, where they just wanted a very uniform slightly less light intensity, we could reduce them down accordingly.

Because we have that flexibility, which we never had before to adjust the areas and depending on the science requirements. So if the area got refurbished in the future, because of the way the science was starting to change, we had that

flexibility that the lights could be used almost in any application rather than being very specific to the labs themselves. So it gives us great flexibility for the future.

I'm assuming that the business case that you put forward to the trustees is at least as stringent as one that you'd put forward to a commercial board -would you say that?

Yes, definitely. You basically have to come up with three, sometimes four different cost analysis. So if you did minimum, what would be the outcome? Do nothing. What would the outcome be? You have to show what the maximum, you have to show an alternative option. So it's quite a stringent business case that we have to put in. And these reviewed by various different members of the BBSRC not all of them, science, some estates based, some of them finance directors.

So a real broad spectrum of scrutiny in terms of which ones get approved and which ones don't. So there's always a two way conversation between us and the funders.

It sounds like the scientists who worked there already were quite happy. What about in terms of attracting new people? Do you see the environment as being part of that?

Yeah, we do. We, we don't generally get individual scientists. So the industries work on project leaders. So they're trying to entice project leaders that get a significant amount of grant funding to come. So if they can entice a project leader in terms of showing them the facilities they have available and what flexibility these facilities can offer them obviously that's a selling point to the project leaders themselves.

Then bring their own staff and the grant funding that comes with it.

It's like any facility. We can keep it looking as modern as new as possible with the flexibility built in, then surely that's got to be plus point for the Institutes and obviously the project leaders they encourage to work here.

Additional cost?

If there was somebody else in your position, in a commercial environment, would you say that was a good investment?

I personally think it was a really, really good investment. I know it's difficult in the commercial world. Other people might look at it and say it’s not great if you look at the financial figures alone.

But my view is not only what you can see in terms of energy savings, but it's also about improving the life quality for the actual staff themselves. And there's been loads and loads of research in the past about the effect on people's mental health and the effect on people's social wellbeing in terms of what the light levels could be.

And we've had various people in the past complaining of headaches and migraines and some of the new LED light that we've put in working with Glamox has improved that.

So I think any lighting improvements we do has a real benefit on the staff themselves.

I think it'd be very difficult to maybe prove in terms of reduction in sort of sick days, but I'd like to think that there's an improvement in wellbeing across the site. That's like anything. I think if you improve the atmosphere that people are working in, that it becomes a nicer place to work and they tend to spend more time in the lab, actually doing some good research rather than hidden away somewhere or working from home maybe.

Do you have an idea of it in percentage terms?

When it comes down to do it properly, it was more about the option was not sustainable because it was an old metal ceiling - we’d have to make the lab completely unusable and we're talking a 70 square meter lab.

So to find that amount of space and that amount of scientific resource so we can close the lab shut everything down, take all the ceilings down and rewire all the lights, put back again and put the ceiling back on would be very difficult - and expensive.

The cost is more about the disruption to science and putting up some sort of temporary facility, which again, comes with a cost. We're talking two major buildings, there's four floors in each of the buildings. Probably 15, 20 different labs have that sort of size. So huge amount of disruption. Trying to deliver the project of that size would have taken a couple of years rather than six months.

It sounds as though the fact that Jamie was able to come up with the product which fitted and had that control was key. But did you look at competitors that were offering something cheaper?

We started the project before Jamie actually worked for Glamox and he tried to come up with a solution with the old company and unfortunately we just couldn't make it work. I also engaged with a electrical wholesalers. And they suggested a couple of companies and they tried to offer a solution as well.

And unfortunately, none of them actually met the criteria.

Jamie worked very hard and worked with Glamox and come up with a solution. And you know, we had a couple of light fittings, which we trialled and we were a bit skeptical whether or not they were going to work long term. But it actually worked.

And once we actually got the trial over the line and everyone was happy with it, we moved forward and went for the funding. So yeah, we did try a few other options.

So how much more did you spend - between a 'bog standard' and something good?

II you put in a very bog standard led light, which would have worked on a normal switch, no sort of real configuration they worked on about £100 to 150 per light.

These lights were in the region of £350. Which is quite a significant increase. But, from our point of view, we didn't have to touch the ceiling and we didn't have to rewire any of the lights and improved the control, improved light levels.

So yes, it was three times the cost of a very standardized lighting solution.

But the benefits definitely outweighed the additional cost in the scheme of things compared to all that disruption.

The actual labor and cost of putting the lights was pretty minimal because essentially you unplug one light and plugged in another one, you replaced all the switches with blank plates, and then it's just a bit of programming.

So the actual installation of the lights was very minimal. It's just obviously the cost of the lights themselves were expensive.

Again, if you looked at the other way, the lights were cheaper, the installation was huge.

I definitely think paying the extra for the light things with improved control was the right solution for this one.

Innovation

I'm always quite keen to try all these different things, because, as always when the, when the funding does drop and someone decides to either put a new building up or refurbish your building as a whole, because we've spent maybe £10, 15 or 20,000 now, trying them out and seeing the good and bad, you come up with a fairly robust solution in terms of what you want, long-term when you're actually fitting out that whole building completely.

And then you can offer that experience and learning and insight to other people, which is really, really great.

Energy targets

One of our biggest drivers at the moment is, as always we're we're starting to put together an energy strategy document that makes the place zero carbon by 2050.

As everyone knows, with global warming, we should be doing what we can.

So any improvements to lighting in terms of replacement to LED, but it's not just the LED's. We've worked with Jamie on another building where we've replaced all of the light fittings within the whole building to LEDs, but we've also replaced all of the switches with intelligent controls as well.

Moving forward, it’s not just about improving the lighting, but it's improving the light levels, based on whatever sunshine you're getting, as well. And making sure that switching is correct because we're all humans and we all leave the lights, which when we shouldn't do.

So again, we're not switching off every light at nighttime when the security guard goes around. Walk in, the light comes on. When you walk out 20 minutes later, it's gone and it's about improving control across the building as well.

They've always got the lighting they need, as they walk around, acts like an intruder alarm, so they know who's in the building as well.

You mentioned that idea of your light as an asset, instead of being a fixed thing.

This solution gives us the flexibility that, in the future, you could take that light out because of the lifecycle of it and put it somewhere else and you can still work.

It's not relying on the building itself. It's just a standalone asset and it can be taken and put anywhere.

It sounds like you had a personal interest in this, but other facilities, managers, or people in your position, where would they find out about this?

I suppose from our point of view, speaking with manufacturers is always a good opportunity. I know the last 18 months have been difficult but the big exhibitions are very good places to find out.

Not so much big companies because they seem to be very innovative and very good at marketing their ideas. But you do meet small, but clever individuals that are coming up with some clever ideas in terms of smart metering, intelligent controls. Some of their ideas might be five, 10 years away, but you start to get their ideas.

And, in the back of your mind is a seed of what is possible and what can be done in the future.

Moving forward

It's very easy to sit back and just go, that's the way we've always done it. And that's the way we'll do it. And unfortunately, if that's your mindset, it's never really going to improve.

If you've got a curious mind to make things better, then there are lots of opportunities out there.