RIIO Innovation Funding - The Good, the Bad and the Ugly in the Gas Networks

Synthotech has been successful at winning several NIA funded projects as well as an NIC project so believe that we are well placed to comment on the effectiveness of the NIA and NIC process and the benefits and negatives that it provides to the consumer, third party members of the public and the gas distribution and transmission companies as well as third party suppliers like ourselves.

The problem with Innovation

There is a major problem with innovation within the corporate and government perspective. And that is people do not understand what innovation is. In general terms everyone uses innovation as a term for new. However new is not innovation, and that is one of the major problems with RIIO-1 innovation incentive. Please do not carry this perception through to RIIO-2.

Innovation and the Gas Industry

Synthotech have been innovating in the UK gas industry for over 27 years we have been through several changes in how and what the UK gas industry will invest in innovation. Prior to 1995, the UK gas industry had a research and development budget of £96million. However, the distribution and on-shore transmission research were developed from the coat tails of the exploration business. When British Gas was split up, the innovation budget disappeared.

Between 1996 and the IFI funding, there was little or no funding from Transco for innovation. There was Best Practice which looked at the implementation of new technologies, but these were generally not innovations, but transferable projects or products from other industries or other gas companies round the world.

IFI allowed the UK gas companies to start to look at innovation again. But the Gas companies were very much focused on innovation at a high TRL. They only invested in innovation that could make an impact within 12 months. And ultimately, they were only looking at innovation that had a return on investment within 12 months. This meant that the rather than true innovation they only looked at best practice.

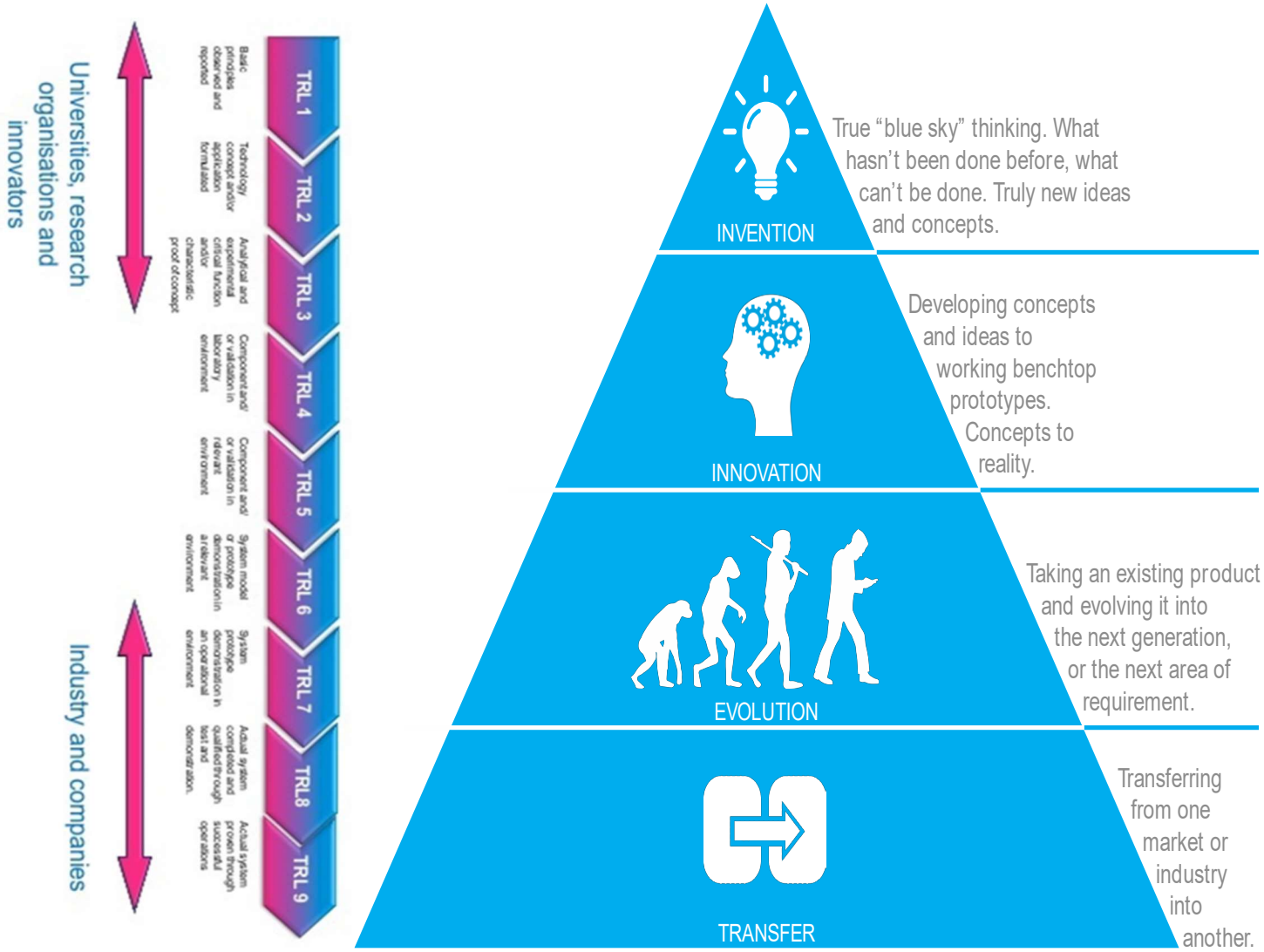
Therefore RIIO-1 was the first time that true innovation had been brought into the UK gas industry as a funded scheme for over 18 years.

What is the problem with innovation?

Until OFGEM defines what innovation is, innovation funding will always have significant question marks over it. Innovation is an abused word. Innovation is used for anything that is ground breaking new ideas, technology or methodology, to adopting something new for the first time, even though it might already be best practice within another company.

In preparation for RIIO-1 Synthotech developed its innovation triangle. This highlighted the variation in types of research and development. We developed the innovation triangle which split the TRL`s into Invention, Innovation, Evolution and Transfer.

The following example of our innovation triangle utilises standard TRL explanation to link the Invention, Innovation, Evolution and Transfer against TRL 1-2, 3-5, 5-7 and 8-9.



So, for OFGEM to make innovation the centre of RIIO-2, they should clearly understand what they want form it, and then clearly state what it means to them. Don't sit on the fence stating that they want innovation, but not saying what innovation is. There is a fundamental difference between inventing something, innovating, evolving, or transferring something, all of which can end up transforming a business or its operations, but some are best practice and some of it is 'innovation'.

Innovation should start at OFEGM first?

Its never easy to hear, but innovation should always start at the start. As a company that has worked under the OFGEM RIIO-1 guidelines, our suggestion would be that OFGEM looks at innovating too. The ambiguity that OFGEM left in all its guideline's documents for RIIO-1 meant that there were five gas networks (distribution and transmission) under four different legal advisors giving different interpretations of an amazingly ambiguous document. We would beg OFGEM to provide the gas networks with black and white, clear information on what is and what isn`t allowed, who and how can IP be shared, and how does the consumer get their investment back. OFGEM for far to long has sat on the fence with ultimately splinters causing it to make ambiguous documents. OFGEM must clearly state what it wants, and how it will get it. Then innovation will run smoothly.

The relationship between OFGEM and the Gas Networks.

Due to the ambiguity mentioned above in the guidelines, there is a concern that if the networks innovative OFGEM will take the money back off them, or if the innovation fails, OFGEM will take the money back off them. OFGEM should not underestimate how scared the gas networks are of them and their power. This is where clarity on all sides would enable transparency on what and what isn`t permissible.

Innovating in a non-innovating business

It should be noted that we all want our gas networks to be risk adverse. We want them to be safe and secure. So, under a culture of being risk adverse, it is hard to innovate. It is hard to deviate from the norm and to say were going to do things differently today. And for what it is worth, the gas networks have struggled with innovation. And even when they have taken the risk on a true invention or innovation, they have not been able to embrace it or take it forward. So, it looks like innovation has failed, but actually it's the implementation and the challenge to get it to Business As Usual rather than the technology or methodology that has failed.

As a technology company, we have regularly stated that the technology is the relatively easy part. It either works or it doesn`t. Getting the technology implemented, operating and the preferred methodology and then used daily as Business As Usual is the harder challenge. As so many UK Operatives, Supervisors, Managers and Directors must go on a journey of change, a journey quite often outside of their own comfort zone. Innovating is simple in comparison to implementing innovation.

Has NIA funding worked?

Without a shadow of a doubt it has worked. There has been more innovation in the last six years than there has been in the last twenty-four. However, has the NIA funding projects all been implemented. Then no. This goes back to understanding what innovation is. True Innovation (or Invention and Innovation) should only have a success rate of between 1 in 100 and 1 in 10. If every idea or concept worked, then it can`t really be inventive or innovative. However, evolution and transfer should be between 1 in 3 and 1 in 1. The NIA funding doesn`t grade funding payback anticipations against risk. There has been a tendency for all the UK gas networks since the 2017 midpoint review to de-risk the low TRL projects such as invention and innovation and to concentrate on the evolution and transfer projects.

Stopping NIA Funding

Everyone would agree that NIA funding has been a generous funding mechanism. But it has stimulated 'innovation' under the broader definition. So, by getting rid of NIA funding, OFGEM will, in our opinion stop the rapid development of innovation. Innovation from those focused on the gas industry, such as Synthotech, will continue, but when the suppliers are paying for it, it will occur at the rate that the suppliers can afford, rather than a stimulated innovation environment.

Therefore, the suggestion that NIA funding will be withdrawn will be a sad day for the modern gas industry.

Suggested NIA Funding

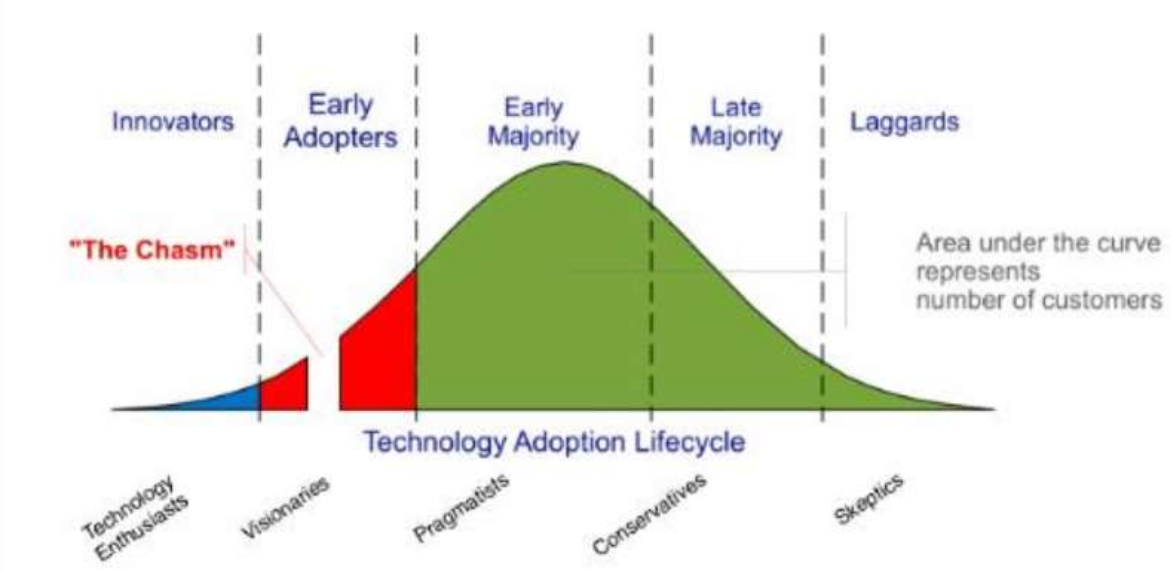
Our suggestion is not to rip out innovation if it is truly the heart of RIIO, but to stimulate it. The 90% NIA claim back was always generous, and as such should be reviewed. Synthotech would suggest that NIA funding (or something similar) continues with a 50% claim back. There should be a minimum 25% input from the gas company with a possible input from the supplier partners of up to 25%. This way the 'innovation' stimulus continues to provide the base funding that allows businesses to have confidence to invest themselves, as well as match funding from the networks.

It should be noted that before IFI funding Synthotech had invested over £750k in gas industry developments with no return. But we are a gas industry innovator.

NIA should be about Implementation as IRM was a mistake

If OFGEM looks at any innovation graph, they will see the innovation chasm. And that is the stage that we believe that they should be investing in.

Innovation is rarely cost effective straight away and needs to be utilised and then accepted across all gas networks before the cost of the equipment becomes cost effective. This is especially true when the equipment provides a better experience for the gas consumer, the third-party person in the street, the operatives and third-party health and safety and the reduced environmental impact.



The IRM from RIIO-1 was a nonstarter from a technology implementation perspective. The value required, the available time windows and the requirement to renegotiate the licence was never going to happen.

Several NIA technologies that would provide better third party and consumer experience, reduce health and safety risk and reduce environmental impact have been side-lined as the cost of implementing them initially is too expensive against existing costs. However, the non-metric element such as the customer, safety and environment are not calculated.

So, it is our suggestion that any NIA or NIC project is eligible for a 50% funding for implementation. Time limited, and location limited, it could be utilised to introduce a new technology that on paper is too expensive but has so many more benefits that aren`t apparent until it has been properly utilised.

This NIA implementation funding would be used on TRL 8 and 9 products and processes that could be reviewed against existing processes and products for total benefits, not just financial. This would meet the requirements of OFGEM getting the networks to operate innovation as Business As Usual, rather than dropping those that might be in the technology chasm, and therefore have regulatory implications if implemented even if it doesn`t save any money.

NIA funding reviewed

If OFGEM wants 'innovation' as business as usual, why don`t they provide a 10% funded fund for best practice. Understanding the difference between invention, and innovation at 50% funding, and evolution and transfer at 10% funding, and implementation at a further 50% funding,

What about the current limits on innovation funding

For NIA funding we would suggest that you leave it the same, just spread it across innovation, best practice and implementation.

NIC funding

Our experience of NIC funding is that it is difficult to get. As an SME, we needed up with 3 people working on our bid for nearly six months. That is a huge investment from an SME on a competition that you might not win. Therefore, we suggest that removing the funding for NIC bids is wrong. It is a risk that most SME innovative business could not afford to take.

NIA Funding - Has it Worked

One of the key points from your document is has NIA funding worked, as it has been a 'light touch' from OFGEM? Yes, it has worked. Has it been abused? Yes. Could it have been run better? Yes. Has there been duplication of work? Yes. Has there been collaboration? No.

So how has it worked. Because most projects have not abused the ethos of the system. They have been run by the supply chain, so they have a vested interest in the outcome, and have not been duplication of work. Most of the collaborative projects have been tainted by the competitive element that OFGEM tried to implement. Ultimately the gas networks are not in competition. Synthotech can not get its gas supply delivered by anyone else apart from Northern Gas Networks. Therefore, they are not in competition. They are in comparison to each other, but not competition. As such let the NIA and NIC work nationally.

It should be noted that most innovators only make returns on investment when they start to sell an implemented product. There are a few consultancy technology companies that benefit from NIA funding for 'technology' but most of those who have used the funding are focused on the return on a longer-term saleable product. Sustainability.

How to improve NIA for RIIO-2

There should be an independent consultancy company, like with innovate UK, that reviews financial inputs and outputs, and from a technology perspective a similar consultancy company that confirms the technology. This would be independent to the gas networks, who generally have employed project managers rather than innovation managers and therefore have failed to get the most out of developments. The supply chain who have benefited from NIA and NIC funding are happy to have their projects verified. Because when a project doesn`t work, the same amount of work effort and cost has gone into it as if it was a successful project.

How can OFGEM make a better united gas network for the consumer

A single policy acceptance group across the networks is imperative to reducing cost, time and effort to both the supply chain, the gas networks and the consumer. It is ridiculous that a development under NIA funding on one network, that has been approved for use and implemented, is not automatically approved for use on the other three networks. Granted it is their choice to use the equipment, but by having separate, non-regulated, approval processes the industry is taking a major step backwards. OFGEM is in a position of influence and can help shape the industry into working as one for a better UK solution.

For and on behalf of Synthotech Limited

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Additional Information: Synthotech NIA Projects

National Grid Gas Distribution – Cadent

TORS Projects

Without NIA funding this type of system would never have been developed. The TORS project was a multi NIA project with each project being a self-contained stage gate in the development of a remote connection system. The robotics and micro electro-fusion fittings developed are word firsts. The technology was a success up to TRL 7. Unfortunately, the technology has not progressed, so far, as NGGD / Cadent have the wrong business model for implementation. The GDSP model with fixed rates for services and mains replaced means that their cost benefit analysis at a TRL7 stage meant that the latest system was between £5 and £15 per meter more expensive than traditional methods. However, this doesn`t consider the health and safety improvements, the reduction in third party disruption, and the reduction in environmental impact.

As costs go up heading to RIIO-2, the use of the TORS System will become more prevalent and its cost benefit analysis will narrow until it is a cost-effective system.

The £3.4m spent on the robotics, were supported by £1m by Synthotech and nearly £500k from the PE partners supporting the project. The NIA funding helped bring further investment forward in suppliers and technology partners who believe in the future technology. When TORS is operational in RIIO-2, it will save the NIA investment multiple times, excluding the value on customer, environmental and safety improvements.

Sealback 2

Project has just been stopped by Cadent. Unfortunately, policy change from the project starting to finish has caused problems, linked with the fact that the network was unable to get suitable field trial sites as they are operated by the GDSP`s. The project has overspent by 65% which has been covered by Synthotech.

ServiBoost

Project that has great potential. Each use has the potential saving in operation costs of over £300. This project, including its stages has the potential to pay back within an 18-month operational period, and be saving money for each use in RIIO-2.

ThermalTrax Feasibility

The original feasibility was not successful, but Synthotech continued the project to success at no extra cost to the NIA funded project. Cadent are focused on high TRL projects, but both Scotia Gas Network and Norther Gas Network are hoping to progress with this project as a true collaboration from April 2019.

Northern Gas Networks

Water Extraction for Services & Water Extraction for Mains

These two projects have already saved the original investment by Northern Gas Networks from a financial perspective, ignoring the reduced time of customers of gas, reduced excavations for customer, and the reduced health and safety risk of locating water ingress issues. The equipment has been adopted operational by one other network, were the saving is similar to Northern Gas Networks. Therefore, by the End of RIIO-1, the NIA investment will have been quadrupled in savings.

STASS

STASS is in its early days as business as usual. Synthotech is already in discussions with Northern Gas Networks on providing a second robot due to the success of the first, and trials re being lined up in Cadent Gas Network and Scotia Gas Networks. Current cost saving operational on repairing a tier Two / Three main is a reduction in cost from approximately £5,000 per joint to £150 per joint.

The NIA investment should be repaid within one year operationally.

Live ECV & Project Zero

This project will save money, but the biggest impact is about reducing customer interruptions by requiring a purge and re-light. Therefore, Synthotech expect the Live ECV and Project Zero projects to save there initial NIA funding within 12 to 18 months of operational use, the elimination of a purge and relight each time both eliminates interruptions and reduces the release of CH4 to the atmosphere.

Scotia Gas Networks

SynthoTrax ISP

Synthotech originally developed the SynthoTrax live access, keyhole robotic platform. Then it was developed as an IFI project into the profiler, for looking at butt fused joints following the Rosendale Incident. This led to Synthotech Consultancy writing the report on SynthoTrax ISP, which also recommended the ULC CISBOT system as already available. This then led to our the STASS robot for repair with NGN in 2017.

Service Renewal Information

Synthotech carried out a piece of consultancy looking at the permutations of service connections This data is still used today on many NIA projects.

Serviflex 1 ¼”

Synthotech developed the 1 ¼” Serviflex System for SGN. The cost saving per use is over £250.00 which will have paid back the original NIA investment every 12 months since launch.

SynthoScope

Has had limited use within the UK gas industry but has helped both the TORS project and the SGN annular pipe gap in road crossings project. NGN have requested the use of SynthoScope for use with their live service insertion project.

Synthotech Service Relay Initiative

The basis of the live Serviflex and ¾" Serviflex went onto be used in the TORS project and is now supporting the NG Live Service Insertion Project.