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Foreword

This input from Pollywood Ltd is made from the position of a critical friend. While we have made some criticisms and suggestions for improvement below, from our experience the NIA process is easily the most positive of any of the many funding routes we have explored.

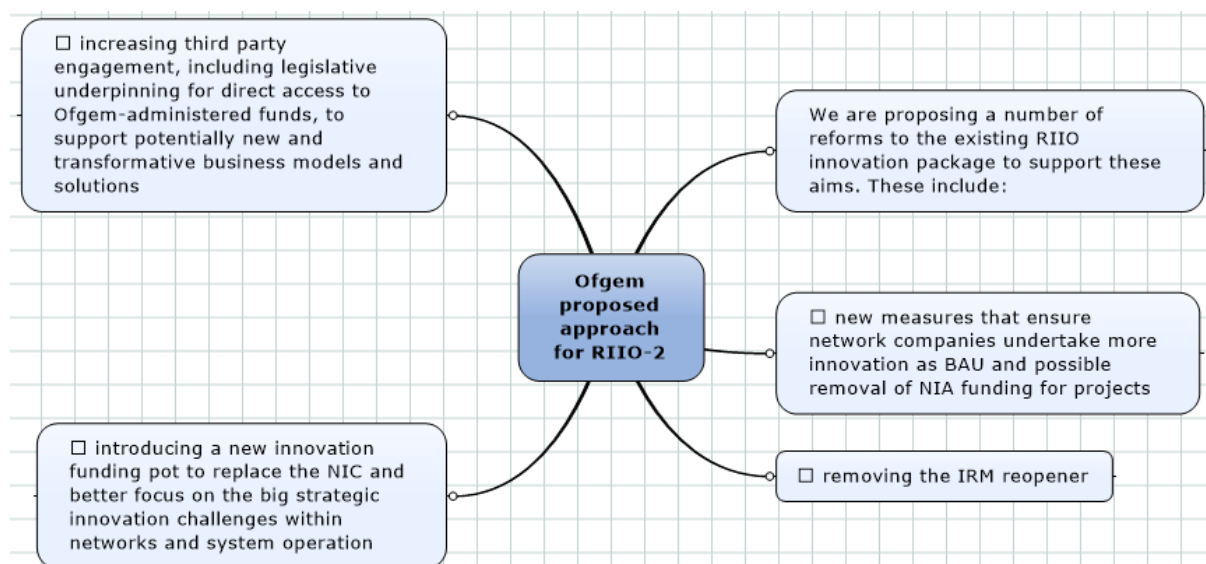
Positives: the scheme brings together people with a real problem who have a commitment to seeing the SME succeed in solving it. This is unique in our experience. In clause 8.45 of your consultation document, you discuss the potential for early TRL development funding. This is invaluable, because most funding sources are so risk averse that this stage of development is just as much of a challenge to get support for, as the well known mid TRL “Valley of Death”.

Comparison with Innovate UK: We have secured one round of funding from Innovate UK under Materials for Demanding environments. An illustration of the difficulty is that even on a call with this title, Pollywood Ltd were the only applicant from the built environment to succeed. We have failed in several others, in particular the Materials & Manufacturing rounds 2 & 3, where we were seeking funding to support the DNOs funding under an NIA. The frustrations we had with the scheme, are I know shared by many SMEs. In each case, when we received our feedback, it was clear that if we had averaged the best 4 of 5 assessors, we would have comfortably exceeded the benchmark score and would have been in the competition for the available funds. In each case we were marked down by one assessor, whose remarks appeared to be made in relation to a different document to the document assessed by their peers, because the perception reflected was so different. In one

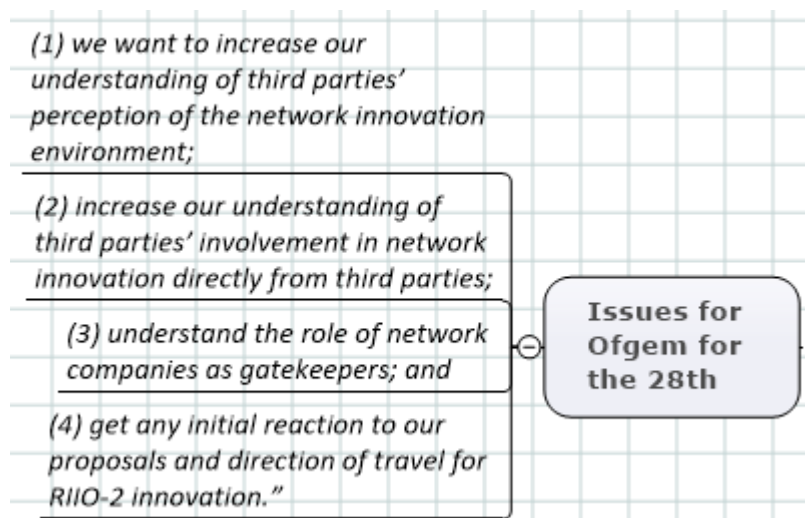
case, because they had a bias clearly expressed in relationship to one research organisation, we lodged a complaint about bias. Pollywood Ltd have given feedback to Innovate UK on this matter at the request of the Senior Technical Management of Innovate UK. In the case of Innovate UK, having learned about our project first hand on the successful application, the Senior Materials Technology Managers were really keen that we should receive follow on funding. The system is so focused on avoiding the risk of being accused of bias, like many Government run funding/contract schemes, the people who understand the project and can see the benefit of the product coming to market are precluded from any decision making capacity. There is also a clear risk aversion expressed. Real step change innovation cannot be achieved without risk. Step change brings benefits which warrant those risks, despite some inevitable waste. In conclusion the Innovate UK competitions are very different to the NIA, where the people who are seeking an answer to a problem are involved and committed to getting a solution to it.

Ofgem Objectives, which Pollywood Ltd wish to respond to.

From your Consultation Document RIIO-2 Sector Methodology, Pollywood Ltd understand that the proposals you think will give the best result for consumers are in the Mind Map below.



From the note Ofgem supplied to the Energy Innovation for our meeting on the 28th January 2019



If Pollywood Ltd have understood you correctly, you wish to achieve the following.

1. Stable networks which respond to the many challenges of change at a lower cost to consumers.
2. Costs should be driven down by the implementation of innovative product and service changes and the wider sharing and adoption of best practice by all distribution companies.
3. The consultation document expresses concern at duplication and the difficulties of measuring the impact of money invested in innovation projects, since you see insufficient evidence of innovations getting adopted and becoming part of "Business as Usual".
4. Your objectives include securing the input of more 3rd Party involvement.

Pollywood Ltd think that your concerns in points 2 & 3. and objectives will be successfully addressed by our recommendations.

Discussion of Point 3.

1. – **Insufficient evidence of innovations being fully adopted.** Pollywood Ltd's direct experience can shed light on a number of reasons that could have resulted in this being your view.
 - a. Our Chairman Quentin Kopp has been Managing Director of a number of large businesses in a FTSE 100 company, which were noted by their customers for their innovation. He has never planned innovation activity in the way that the current NIA process operates. Innovation does not happen

without risk. It does not happen without a degree of waste of time and resources, because that is the nature of learning. The NIA rules appear to make DNOs have to consider the risks more than the potential benefits. Why do we say this? The questions we have received from the DNOs other than Northern Powergrid are all about assuring them that there is no risk, for example by asking us to give them cost price assurances when we are only at TRL 3.

- b. The process therefore makes the DNOs consider the innovation in small chunks of no more than 3 TRL levels at a time. As you will see from the chart of our experience and our recommendations, this has led to a huge waste of time. For long periods of time we have had to self-fund since we will have no income from trading until this product is launched. It has also meant that we have had to postpone for years securing our patent. We cannot prove the claims in the patent without the purchase and adaptation of the machinery. This elapsed time makes it hard to keep the patent claims out of the public domain. All of this is frightening and will I am sure mean that many companies in our situation either give up voluntarily or are declared bankrupt. The stress on the individuals cannot be under estimated. It is all unnecessary.
- c. This stop start process will also mean that many developments fatally lose momentum.
- d. Successful innovations inevitably have higher costs until economies of scale and the inevitable early wrinkles are removed. The onus on purchasing departments is on cost price and they have no incentive to look at the longer term potential of an innovation . Allied to this many technical managers prefer to stick with what they know and have confidence in. We understand this, because they have to guard against danger to their colleagues as well as the public, but it is potentially a significant factor in preventing the adoption of innovations.
- e. Northern Powergrid hold the same view as us that the change management of the introduction of an innovation is a crucial part of the process. We have therefore built into our project plans the involvement of their Senior Standards Manager and the operational staff and managers who will work with and on our poles. Do other DNOs and innovators take the same approach? If they do not, this could be another contributor to innovations not being adopted.

Duplication –

- f. Why do you consider duplication to be wrong? If you look at innovation in the wider field of work, you will see duplication is expressed as competition, driving better solutions to problems and often much better value for money for consumers whether individual or industrial. If you take the example of replacing the creosoted pole, you could say that the work the existing supply base is doing is sufficient. That has produced different chemical formulations which in the words of our Northern Powergrid Project Manager, last for a few years only and not the decades the creosoted poles do. In fact in his evocative phrase, they “pop like cucumbers”. They are also looking at barrier protection for the critical 0.5 metres above and below the ground. These are at best incremental improvements and often dead ends. The competition is now between them, GRP Poles, Steel Poles and solid wood laminate poles as well as our engineered poles. This could be described as duplication or alternatively a stimulus to innovation that will produce a completely different solution with many benefits. They are described below from page 10. These benefits meet other Ofgem objectives, as well as providing a replacement pole.
- g. The ENA portal holds the details of all projects and enables DNO Innovation Managers to identify if in fact they are pursuing an innovation needlessly.

Involving 3rd Parties in Innovation

- a. The NIA process is a great way of securing fresh inputs to solve problems and reduce costs while providing resilience to the Networks. How does it achieve that? Where innovation is via an SME or micro start up like Pollywood Ltd the SME should understand that they cannot achieve it on their own. We certainly do. In consequence, our project so far has had the direct participation, some funded by ERDF schemes and Innovate UK from:
 - i. Bangor University BioComposites Centre
 - ii. Durham University Dept of Chemistry and Business School
 - iii. The Centre for Process Industries (CPI)
 - iv. Teesside University Dept of Engineering
 - v. Innovate Tees Valley – with North East Process Industries Cluster (NEPIC), Materials Processing Institute (MPI) and Teesside University business outreach department
 - vi. A specialist machine builder

- vii. A specialist automation business
 - viii. Two major international chemicals companies' adhesives businesses
 - ix. Other players have helped as well including our Patents Attorney.
- b. This is a comprehensive range of support for innovation for the electricity industry. The list includes the major players only. Pollywood Ltd believe in collaboration so there are others. This has enabled us to achieve TRL 3 and be well prepared for TRL 4 to TRL 6 and beyond, which allied to the superb support we have received from EIC and our Project Manager and his colleagues at Northern Powergrid is testament to the ability of the NIA scheme to involve an impressive range of skills and experience in pursuit of solving a real problem for the industry i.e. replacing creosoted poles. Much of this support has not costed the DNOs and therefore consumers of electricity a penny.
- c. Pollywood Ltd argue that it would be difficult to ensure the involvement of 3rd parties more effectively by other means.
- d. Pollywood Ltd would also argue that the NIA enables EIC to involve SMEs with original ideas for solving problems for the industry in a way which would also be difficult to achieve by other means. There is no way that we would have been able to secure the interest of the industry without them.
- e. The combined impact of this is that industry can benefit enormously at a much lower cost and with better results than if they had tried to provide all of this at DNO level. For the record, Pollywood Ltd have kept all the DNOs, including Western Power Distribution, ENW and ESB in Ireland, up to date.
- f. We therefore recommend that you retain and improve the NIA scheme. Pollywood Ltd have recommendations to enable you to see innovation delivered more rapidly and more cost effectively by adopting some simple to implement changes, which would provide a positive impetus to change innovation behaviours.

Recommendations drawn from Pollywood Ltd's experience documented below

Project definition and agreement on the TRL starting point										
For this example assume TRL 1 as for Pollywood Ltd										
Review Points at TRL 3 and TRL 6 and sign off at TRL 9										
Agree aims and outputs for each TRL level	TRL 1	TRL 2	TRL 3	TRL 4	TRL 5	TRL 6	TRL 7	TRL 8	TRL 9	
Agree outline budget and time scales for each level and the review mechanism for the next stage	→			→			→			
		Review Point				Review Point				
At Each Review Point a Close Down Report is prepared for review by EIC. The report should also define the budget required and the actions to be completed by the next Review Point. The budget should explain any major differences to the outline budget. If within the ranges approved funding for the next phase should be released by EIC who will hold the funds for the DNOs										

- a. To encourage SME and other 3rd party involvement. Each problem submitted to the NIA scheme is a real problem which has proved intractable and needs fresh ideas. While a risk assessment is a constant part of any responsible development process, Pollywood Ltd recommend that there should be more focus given, to the benefits of the successful implementation of the answer to the Network's problem. Too much emphasis is currently placed on risk and potential waste, especially at early TRL levels.
- b. Therefore the recommendation is that the process looks at the project development in its totality. That means from the entry point TRL level through to implementation of a successful product or service having achieved economies of scale. For the purposes of illustration let us assume that we are looking at a project which is at TRL 1 at the beginning of the project. The funding should be identified in detail to move to TRL 3 and in outline to be detailed at each review point for TRL 4 to TRL 6 and TRL 7 to TRL 9. Decision gateways should be placed at the end of each of the stages TRL 3 and TRL 6, which if passed should trigger continuity of funding, which will maintain the momentum of promising projects and not waste time and money

if the project is to go no further. Critically the project plan and therefore the funding incorporates the Project Close down Report and Review stage. This will provide an incentive to come to a decision for Networks and eliminate the current financial risk faced by SMEs waiting for decisions.

- c. One of the criteria to test a new application is what is the strength and capability of the consortium pitching for the funding, which will in some cases include a sponsoring Network(s). In some cases, especially for a project from a micro SME, it may not. We welcome your proposal that 3rd Parties could seek direct funding, because this would open the field to even more innovative ideas.
- d. Pollywood Ltd recommend that the Energy Innovation Centre could extend their role from that of helping to find solutions for their Network partners to finding Network partners for 3rd Parties with innovative proposals. This would enable distribution networks and consumers to benefit from two types of innovation. Firstly innovations, as now, solving intractable identified problems and challenges faced by the Networks. Secondly by funding innovations which enable benefits which had not been identified by the Networks. This would greatly help the delivery of the Ofgem objective to introduce more 3rd party innovation.
- e. Pollywood Ltd would also recommend that the Energy Innovation Centre be given a key role in assessing whether projects have met their objectives sufficiently to pass through an Assessment Gateway.
- f. This recommendation for project design and management will offer clarity to SMEs taking part and ensure that they do not get into extreme financial difficulties waiting for decisions for over a year.
- g. The momentum and clear decision points will minimise waste and risk. When combined with Pollywood Ltd's other recommendations, this will hugely increase the chances of projects resulting in the wide spread implementation of innovations on a BAU basis. This project basis is exactly how Quentin Kopp successfully managed change and made product and service innovations which were welcomed by his blue chip retail customers. The main board of the PLC approved the projects in this way because of the clarity of objectives and the potential benefits identified against the risks involved.
- h. To ensure that projects move to day to day reality, as discussed above requires the innovating company to surmount other obstacles after they have proved that they have a project which solves the Network's problem. This is especially true of a manufactured product, regardless of the size of the

innovating company. It is however even harder for an SME seeking their first earnings. These obstacles relate to two matters discussed above in 1. d. Please can a positive incentive be given to the Networks to encourage them through price support or other suitable mechanism to purchase the innovations to enable economies of scale to be reached and therefore provide a route to a normal cost and price regime? Allied to this is a normal PQQ requirement for companies not to be considered if the proposed contract represents more than 25% of their previous year's earnings. In normal circumstances this is clearly a prudent purchasing practice. In the case of a business seeking the first sales of an innovative product it can present an insuperable barrier.

Background on Pollywood Ltd and their NIA Project

- Pollywood Ltd was created by the inventor and our Managing Director, Steve Crighton, to develop and commercialise his invention of a very strong lightweight engineered wooden tube (patent applied for). Pollywood Ltd is totally dependent on grant support until it has a patent and can start to sell the product.
- The principles involved were proven and a Proof of Concept tube was produced between 2011 and 2013.
- During the 3rd ¼ of 2014 we were approached by Tony Knowles of EIC, who was seeking a solution to the DNOs' problem of finding a replacement for the creosoted line pole. He was impressed with our Proof of Concept and invited us to present to the Innovation Committee of DNO representatives at EIC in the late Autumn of 2014.
- Chris Goodhand, Northern Powergrid's representative at the meeting, was very impressed and we were informed by the EIC we would be funded to move from TRL 1 to TRL 3.
- The project commenced during Q1 2016 and ran to Q3 2017 when a comprehensive Close Down Report was submitted and we were invited to submit a proposal to take the development to TRL 9. This was submitted to EIC and NPg during Q1 2018.
- NPg organised a PR campaign during the summer of 2018 to attract other DNOs to support the project and further meetings were held by EIC with NPg and the other EIC subscribing DNOs at LCNI. A formal presentation was made in early November by NPg to the other DNOs. The DNOs raised a number of questions to which Pollywood Ltd submitted answers. EIC requested a decision from the DNOs by the 21st December. The feedback was inconclusive and further questions were raised.
- Pollywood Ltd have asked for a meeting with the relevant key team members of the DNOs so that we can answer their questions directly and hopefully get a new project started by the beginning of Q2 2019. NPg are keen to facilitate the proposed meeting.
- The follow on Project will enable Pollywood Ltd to address the unresolved issues from the first project and to prove the claims in the patent application. The key enabler of progress will be the purchase and modification of a machine. Like many forms of manufacturing there are no lab scale machines available. You either have a production machine and can make progress, or you do not, and you remain in the frustrating position that we are in. This has not prevented us from continuing to seek to prepare for having a machine at our own expense (see the attached chart -Time

Line of Events). There are clearly defined areas of a production machine, which are designed for a packaging application, that need to be modified to work with wood.

- Please see this summarised on the attached chart -Time Line of Events with the potential impact of our recommendations at the bottom of the chart, which show that we could have had DNOs using the Poles by now if our recommendations had been in place at the beginning of the process.
- You will see from this that since the Autumn of 2014 the progress of the development has been much slower than ideal due to a lack of continuity of funding.
- This could appear to Ofgem as an unsuccessful project. The project was in fact successful. Pollywood Ltd are waiting for the key investment in machinery to create a path to Pollywood poles being seen across the country and in export markets. This investment was identified in the first project plan we submitted, but caution and risk aversion advised leaving stage 4 off the project plan until the results we achieved on stages 1 to 3 were reviewed.

Pollywood Unique Benefits Analysis, some examples.*

Type of benefit	Evidence available	DNO to assess
Financial		
	<p>a. Savings from a reduction in complexity</p> <p>b. A simplified range with a standard outside diameter regardless of the role of the pole, would create opportunities for savings by standardising fittings for the whole industry. This would mean a smaller range to purchase, stock hold and finance.</p>	<p>a. Each DNO has a wide range and number of types of pole e.g. NPg has 72, which could be reduced to as few as 4 types using Pollywood Poles. What does the complexity of the current range cost in purchasing and stock control and in the physical management of the stock and in accounting for this complexity?</p> <p>b. How much £ in stock do the DNOs hold currently? What realistically could it be reduced to. What savings in administration for the simplified range of poles could be targeted?</p>

Type of benefit	Evidence available	DNO to assess
	c. DNO costs currently include commitments in stock, and actual stock with a contingency against a major storm requiring many poles to be replaced e.g. 2,000 in the ESB case study at the Overhead Line Symposium before Easter 2018. This could be substantially reduced by Pollywood's "make to order" rapid process. The process is targeted to produce 20 poles per hour, but even at 10 poles per hour would produce 750 poles per shift.	c. How much capital employed, which could be substantially reduced does that stock tie up? What is the potential saving and benefit to be gained by a DNO through saving the space currently occupied and putting it to a more productive use? What is the saving required in not having to forecast usage 18 months in advance? How many "special" poles do DNOs face ransom pricing on, which would not be the case with Pollywood.
Health and Safety	<p>a. The elimination of the risks and unpleasantness of working with creosote for your employees, and the ceasing of creosote progressively to stop leaching into the environment, which is conservatively calculated by Derek Sinclair of c2400 tonnes of creosote into the environment per annum.</p> <p>b. Pollywood poles will be able to be climbed, which will be proven during extensive work with Standards Teams during the development.</p> <p>c. Reduced accident risks through Pollywood Poles being light and being</p>	<p>a. What will be the benefits to DNO employees of making this change? Are there and will there be health based insurance claims from employees? What will be the public relations benefit that DNOs could generate through eliminating the chemical treatment of poles? What is the benefit to crops and water courses from eliminating the leaching of any chemicals into the environment?</p> <p>b. Our aim is for this to be achievable with spikes. We do not think this practice would be approved by the HSE if we are starting now.</p> <p>c. How much do lifting</p>

Type of benefit	Evidence available	DNO to assess
	easily manhandled by two employees. We have established that this would be true if we used Henkel at 100 gsm coverage and 32 plies, which is the heaviest pole we are likely to make at c72kgs	accidents cost and how much does mechanical lifting gear cost to buy maintain and replace per annum?
Environmental Benefits		
	a. As currently, the trees will be sourced from FSC approved sustainable forests, where each tree to conform with FSC standards, must be replaced with at least 2. Fast growing trees absorb more carbon in their 1 st 10 years.	
	b. Reduced transport costs and CO2 generation. Evidence: Each current pole shipped makes one pole. Each tree will make at least 6 Pollywood poles and possibly more, which will be known when we have established the number of plies required for each specification. c. Lower need to access sites with heavy equipment, which requires time and cost to obtain wayleaves for permission.	a. The DNOs will be able to assess what lighter poles will cost in fuel to transport and what manual handling equipment will not need to be used and ultimately replaced. c. The DNOs will be able to evaluate what it currently costs them and assess the potential savings.
Customers		
	a. See the benefits under environmental b. Creosote replaced with great potential cost	Factor all the savings from moving to the Pollywood

Type of benefit	Evidence available	DNO to assess
	<p>benefits to be passed on to customers</p> <p>c. Reduced impact of power cuts on the old and vulnerable</p>	system.
Community		
	<p>a. The hollow Pollywood Poles create other opportunities to help for example housing local battery backup packs.</p> <p>b. The light Pollywood Poles can be easily installed in difficult to access locations without the cost and disruption caused by large cranes.</p> <p>c. The cost of wayleaves etc</p>	<p>a. An opportunity to be evaluated in due course by DNOs. It is a potential additional benefit not a core one.</p> <p>b. How much does this currently cost DNOs for equipment and Permits to Work and reputation?</p> <p>c. See above.</p>
Carbon Reduction		
	<p>a. In addition to using FSC wood the process uses little electricity and no water. The claim on electricity will be dependent on the requirements to cure the adhesive chosen as a result of the work we will do during the project.</p> <p>b. Reduced transport costs (as above)</p> <p>c. The Pollywood process will be formally evaluated for embodied carbon during the project. It is clear it will be a much lower carbon process than the current supply route or either a composite or steel pole.</p>	a.

*This is taken from a report given to the DNOs subscribing to EIC as part of a document answering their questions.

The Pollywood Timeline

Time line Events	Q3 2014	Q4 2014	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016	Q1 2017	Q2 2017	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019
develop a replacement for the a creosoted pole having seen the proof of concept tube.	TRL 1																			
concept.																				
Waiting for project funding to be committed				LCNI																
Project launch																				
Project duration including extension								LCNI			TRL 3									
Project Close Down report complete																				
Pollywood self funded development																				
New Project plan to purchase machinery and move to TRL9 developed																				
Project Plan submitted																				
Awaiting DNO response																				
NPg PR campaign to support Pollywood launched																				
NPg invite Pollywood to revise the plan to be from TRL 4 to TRL 6																				
Revised Plan submitted to DNOs																				
Inconclusive responses received and matter deferred to 2019																				
Interim plan submitted to NPg																				
Using Pollywood Ltd recommendation the following would have been about learning, which brings to light matters which were not able to be anticipated.																				
If Pollywood recommendation had been in place in 2014																				
TRL 1 - TRL 3						TRL 3														
TRL 4 to TRI 6														TRL 6						
TRL 7 to TRL 9																		TRL 9		
Contingency for the last two sections																				
Key																				
Item in box e.g. TRL1																				
Event or planning stage																				
Awaiting decisions																				
Active funded project time																				
Pollywood working self funded																				