

Distributed generation consortium trial

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Image courtesy of British Solar Renewables

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Background

The issue

The development of distributed generation has led to the electricity network becoming constrained across much of the UK. The first developer requiring increased capacity from a point in the network must pay the full cost of sole use assets required to make their connection, plus a proportion of reinforcement costs on shared use assets. There is a £200/kW cap on reinforcement costs set by Ofgem, with costs in excess of this being paid for by the applicant. This 'shallow policy' approach can result in very high quotes for distributed generation connections when the network is constrained, making them unviable.

Consortia approach to reinforcement

In March 2013 Ofgem published its 'Strategy decision for the RIIO-ED1 electricity distribution price control'. This proposed that to reduce the cost of grid reinforcement to individual developers and first movers, developers apply for grid reinforcement as a consortium, teaming up with other developers operating in the same region. Ofgem cite Section 22 of the Electricity Act (s22): "Special agreements with respect to connection as the method by which this different approach to applying for and funding grid reinforcement can be undertaken". It allows a consortium of customers to approach a District Network Operator (DNO), and steps outside of the individual connection offer mechanism. The approach gives the potential for developers to reduce costs by sharing upfront charges.

Consortia are a common feature of grid reinforcement for demand customers such as large housing and commercial developments. In these cases developers will form a single company responsible for the infrastructure to support the development. This company will form a contractual agreement with Western Power Distribution (WPD) to reinforce the grid as necessary for the demands of the whole development and then split the costs amongst developers. These developments will have planning permission and, therefore, a reasonable degree of confidence they will progress at some stage.

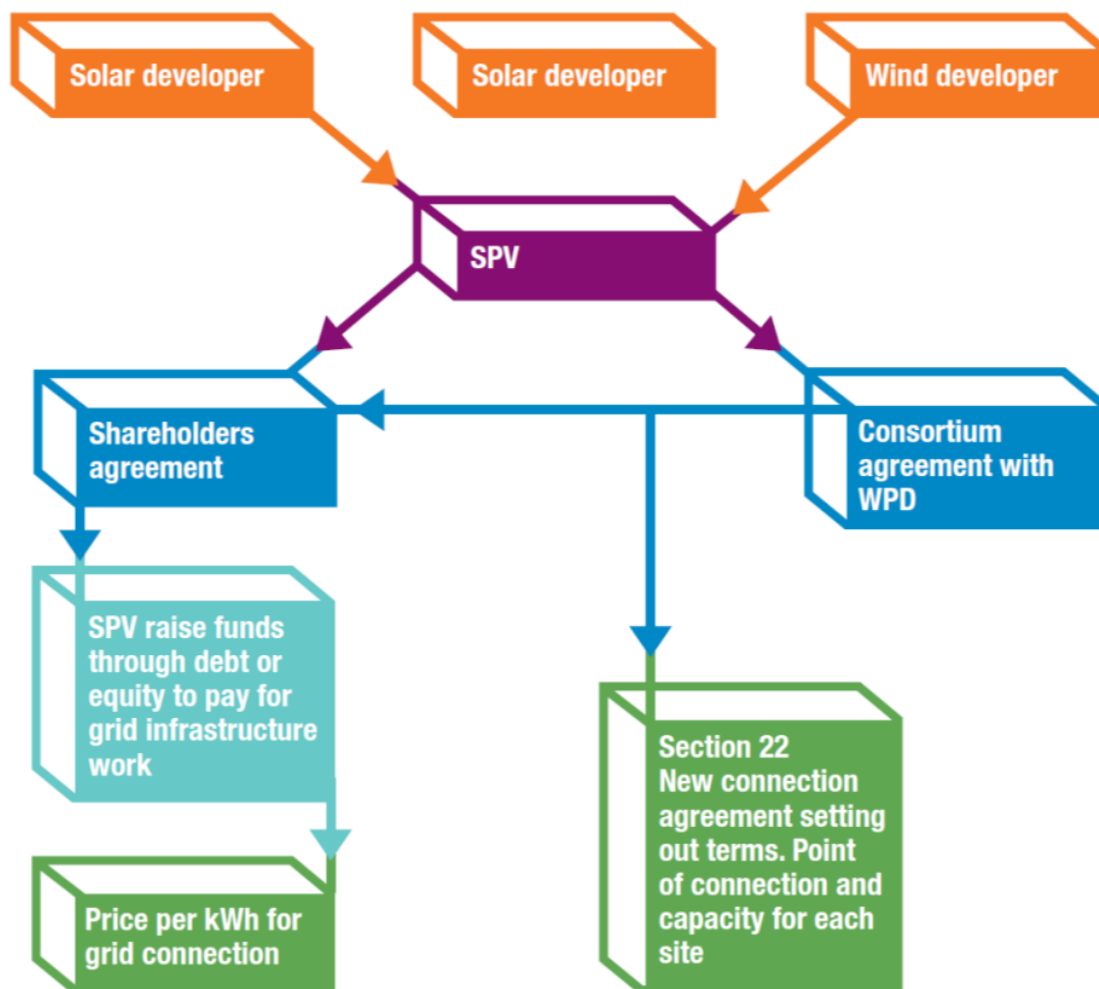
In February 2015 Ofgem issued a consultation on '[Quicker and more Efficient Distribution Connections](#)' which discussed the potential role of consortia and asked for stakeholder input (this featured the interim report of the WPD and Regen SW trial as Appendix C). In their [Decision Letter](#) Ofgem concluded:

"We agree that consortia can be a useful way of sharing high connection costs across a number of users. We acknowledge that whilst a consortium may not be a practical solution in many situations, DNOs should encourage and facilitate consortiums when appropriate."

Consortium Legal model

Figure 1 below indicates the model used for the consortium to apply for a grid connection under s22 of the Electricity Act, as developed by Stephens Scown Solicitors (www.stephens-scown.co.uk)

Figure 1 – s22 grid application legal model



Aims of Trial

In response to Ofgem's decision in 2013, Regen SW and Western Power Distribution (WPD) established a trial of a consortium approach. The trial aimed to:

- test the commercial viability of a consortium based approach to grid reinforcement
- to provide learning to DNOs on how to facilitate consortia
- to provide learning to developers on practical approaches to forming and progressing consortia.

The Trial

Selection of Bridgwater site

WPD looked at how it could create large capacity points on its network and presented three options for a site to trial a consortium approach to interested developers convened by Regen SW. The options were as follows:

Location	Reinforcement	Cost	Timescale
Street/Bridgwater Substations, Somerset	Add a 132/33kV transformer, circuit breakers and a short cable run to create 40MVA of generation capacity at 33kV	Around £3m	Around 1- 2 years, mostly on site works with limited issues
Alverdiscott Grid Supply Point, Devon	Add a 132/33kV transformer, circuit breakers and a short cable run to create 60-90MVA of generation capacity at 33kV	Around £3m	Around 2 years, some land and consent issues
North Tawton Bulk Supply Point, Devon	Add a second 132kV overhead line and a second 132/33kV transformer, to create 200-250MVA of generation capacity at 132kV, and 60MVA at 33kV	Around £10m	Around 5 years, major consents and land issues for new line

The Street/Bridgwater option was chosen due to the relatively short timescale and lower cost of reinforcement.

This was then narrowed down to Bridgwater, as not enough sites were identified in the Street area. Developers indicated this was due to much of the area being a flood plain. A map of the Bridgwater sites are shown in appendix 1.

Network Reinforcement Options and Costs

There were a number of restrictions in the Bridgwater area, due to connected and accepted generation:

- Most of the 33kV systems were at capacity, due to voltage or thermal restrictions
- The transformers were at the limit of their capacity. As such, no further generation could be added to this group without changing all four grid transformers.

The least cost connection option was to add a dedicated, stand-alone 132/33kV grid transformer for new generation. The standard grid transformer sizes are 30, 45, 60 and 90MVA. The costs of works at Bridgwater Grid Supply Point (GSP) to install a new 30MVA grid transformer were estimated at approximately £2 million (with an additional cost of approximately £350,000 for a 90MVA transformer). As the transformer would be a sole use asset, the new generator/s would be required to pay for the transformer in full, in addition to any cabling costs.

Under the consortium the cost would be shared. And the more capacity required, the cheaper the cost per MW installed. For example, the cost per MW for a 30MVA transformer is over £66k, which drops to just over £26k for a 90MVA transformer.

There was also the potential to share cabling costs, depending on the location of each site. With the Bridgwater example, there was the potential to reduce the circuit length from 49,155 metres to 26,190 metres with a cost saving that could reach £4.2 million overall.

F Route Constraint

As the consortium progressed WPD announced that one of its key 132 kV routes, the 'F Route' that runs 82km from Bridgwater GSP to Seabank GSP, was at capacity and that no new connections could be accepted to the High Voltage (HV) network and above until this constraint was resolved

(www.westernpower.co.uk/docs/connections/Generation/Generation-capacity-map/Distributed-Generation-EHV-Constraint-Maps/WPD-South-West-network-capacity-restriction.aspx). WPD confirmed that as all three consortium members had existing 'accepted offers', that they would relinquish when they accepted a consortium offer, this constraint did not affect the consortium. However, this did raise the question as to what would happen if a new participant wished to join the trial without an existing 'accepted offer'.

Forming the Consortium

The process of engaging developers into a consortium trial was led by Regen SW. The first step was to engage developers and establish whether a consortium approach was compatible with their business models and, therefore, worth proceeding with. The next step was to facilitate the formation of a consortium that could make an application to WPD.

The key steps were:

- 1) Two meetings were held in 2013 with a number of renewable energy generators where WPD presented example projects to be used for the consortium application approach covering a range of cost, timescale and capacity. Stephens Scown presented a potential legal model for a consortium (see below).
- 2) The Street/Bridgwater area was selected for a trial site and another meeting was held with the developers that had expressed an interest in this area in March 2014.
- 3) Between March 2014 and October 2014, Regen SW ran a process of engaging developers and identifying sites. The first round of sites from the existing group of developers were not enough to bring the cost down to a viable level, so another call for sites took place through Regen SW's wider network.
- 4) 15 sites came forward: three sites were too far from the substations; four in the Street area; and eight in the Bridgwater area, making Bridgwater the most viable option.
- 5) In November 2014, six of the eight developers with sites in the Bridgwater area came together with WPD to discuss the potential for a consortium in more detail. Three of the developers expressed an interest to move to the next stage of setting up a consortium. The main reason for other developers not proceeding was due to their projects not having progressed sufficiently.
- 6) The three developers met in February 2015 and agreed to sign an Non-Disclosure Agreement (NDA) and apply as a consortium:
 - BNRG – BNRG Renewables is an International Renewable Energy development company specialising in utility-scale solar PV projects - www.bnrg.ie
 - Ecotricity – Ecotricity is a green energy company based in Stroud, Gloucestershire, England, specialising in selling green energy to consumers that it primarily generates from its 70 MW wind power portfolio – www.ecotricity.co.uk
 - EDF – EDF Energy is an integrated energy company in the United Kingdom, with operations spanning electricity generation and the sale of gas and electricity to homes and businesses throughout the United Kingdom - www.edfenergy.com

Applying for a connection

A key question at the point of making an application was who the applicant was. The consortium members were clear that the cost and time to establish a new Special Purpose Vehicle (SPV) did not make sense until they had received and agreed to accept an s22 connection agreement.

Stephens Scown advised that the consortium should apply as an unincorporated joint venture 'The Bridgwater Consortium'. The consortium members asked Regen SW to act as the agent. If and when the offer was accepted the offer could then be transferred to the new SPV. This approach was accepted by WPD.

This experience suggests that at the point of application, it is unlikely a consortium will want to have gone through time and effort to incorporate. The approach of an unincorporated joint venture with an agent making the application is, therefore, an important step in making the consortium approach work. The trial suggests that consortium members will not be comfortable with one of them acting as the agent and that a third party will be required.

Each of the consortium developers had existing grid connection offers under s16 of the Electricity Act. It was agreed with WPD that these would remain in place until a new s22 offer was accepted by the consortium, at which point the s16 would be relinquished. The confirmation that the s16 offers would remain in force until the s22 application was accepted was vital to the developers progressing.

The grid connection application under s22 was submitted to WPD by Regen SW in May 2015. A grid connection offer was made to the consortium by WPD in August 2015. The s22 offer is to the consortium, but specifies the individual connections that will also have individual connection agreements.

Changes to the Consortium

Following the application for the s22 offer, another developer expressed interest in joining the consortium. Given their location, and scale of potential generation, this was likely to improve the viability of the consortium and members were therefore keen to explore the potential of including the new developer.

The issue of how changes to a consortium are handled is an important one. An obvious risk is one of the consortium developer projects dropping out, leading to the reinforcement no longer being viable for the other developers. A way for developers to mitigate this risk would be to be able to replace a project that does not progress with another substituted project. If they cannot do this, their sunken investment to date will be lost.

There are two potential ways of seeing a consortium:

- 1) as analogous to an independent network, i.e. a set amount of capacity that can be used by the consortium as it chooses, or;
- 2) as a set of defined projects that will each have to restart the grid application process if there are significant changes.

WPD concluded that a new project coming into the consortium (unless it is in the same location, capacity, technology type etc. as the original) can completely change the network required once thermal, voltage and fault level issues have been checked and, therefore, the second option above applies and a new application would be required.

The challenge of making changes to a consortium application is a major barrier and is likely to mean they will only be viable in unusual circumstances. Developers are highly unlikely to progress with an investment if they have no way of managing or mitigating the risk of one or more parties dropping out of the consortium.

Review of s22 offer

The consortium reviewed the WPD offer and decided not to proceed. The following reasons were given by the developers:

- 1) Changes in government policy meant some of the projects were no longer viable or faced long delays. In particular, the Ministerial statement on planning for wind is a major challenge to the two wind schemes in the consortium.
- 2) The issues surrounding a new consortium member joining the scheme, as set out above, meant little opportunity for changing the consortium to address the challenges for some projects, without restarting the application process.
- 3) The consortium application offer under the s22 application was also slightly higher than the previous individual offers for each of the separate developers, thereby negating the original premise of a consortium approach reducing costs by sharing a grid connection and re-enforcement costs. The reasons the s22 grid offer being higher were:
 - The 11kV BNRG scheme was changed to a 33kV scheme, with the inherent increase in cost.
 - Combining 33kV cable routes for the different sites required additional 33kV switchgear, adding to the cost.
 - The 33kV cable route between EDF and Ecotricity sites required the crossing of the M5 motorway and a railway line, whereas the separate cable routes did not have these major infrastructure crossings.
 - Cable costs had increased between receiving the individual connection offers and the consortium offer.

Conclusions and Recommendations

Viability of consortium approach

The potential for consortia to overcome grid capacity barriers is limited by a number of factors:

- A consortium approach to a network connection has potential to bring down high connection costs for distributed generation, in particular through shared cable routes. However, this depends on the specific circumstances and routes involved and will not become clear until the s22 connection offer is made.
- The cost of connection work needs to be viable (a ceiling of £100k per MW has been mentioned by developers, but this would vary between specific projects) and within a reasonable timescale (2-3 years was the general view of developers). Major reinforcements, in particular of the 132 kV network, are very unlikely to be viable.
- The new transformer required in the Bridgwater example is considered a 'sole use asset' and the cost, therefore, falls to the consortium in full. If other developers take up excess capacity from the transformer within a five year period, some of the cost would be recovered for the consortium. But there is no guarantee that this would happen. However, if the transformer was treated as reinforcement work, the consortium would only pay a proportion of the cost making the consortium approach more viable.
- A consortium needs to be made up of projects that are broadly aligned in timescales and ability to commit financially to reinforcement works. In order for meaningful consortium discussions to be held, our experience is that each site would need to have existing individual grid connection offers and either be in the planning process or already have planning permission. Developing a consortium of aligned projects has been very difficult when considering the short term deadlines developers face associated with government subsidies. Consortia are likely to be more viable if and when distributed energy projects are viable without subsidies.
- There was concern around the cumulative impact of developing a cluster of sites and how this would affect planning decisions. The view of local planning authorities, who were consulted as part of the process, was that a consortium approach would help them to assess a number of sites together, rather than several over a longer

period of time. But it has not yet been tested in practice whether applying for planning as a consortium would be beneficial or detrimental for developers. Therefore, success of consortia is likely to vary between local planning authorities. Those with a more strategic approach are more likely to be more supportive, such as Swindon Borough Council, which issued a call for solar farm sites in November 2014 to benefit from a low carbon Local Development Order.

Establishing a successful consortium

- During the trial Regen SW undertook the initial process of engaging developers, provided the independent third party brokering discussions, organising an NDA and acting as an agent for the s22 grid application. This role took longer and was more onerous than initially expected. Given commercial sensitivities it seems unlikely a consortium could develop without an independent trusted third party to broker discussions. As a result Regen SW established a Renewable Energy Grid Collaboration Service, which holds site information in confidence and looks for collaboration opportunities. As of the end of 2015, 14 developers have signed up to this service, representing 78 development sites.
- Until an s22 offer has been made that is acceptable to the consortium partners, the cost and time of establishing an SPV is unlikely to be viable. The approach taken in the trial was for the partners to sign an NDA at the time of applying for a s22 grid offer, and to make that application as an unincorporated joint venture with a third party acting as agent.

Recommendations

The following measures, enacted by Ofgem and DNOs, would support the development of consortia:

- Define assets paid for under a consortium approach as reinforcement rather than sole assets, so that the consortium only pays a proportion of the cost.
- Where there is evidence of further demand beyond the consortium, DNOs could share some of the investment risk and create extra capacity. This measure could become easier for DNOs following Ofgem's paper on "Quicker and more efficient connections –next steps".
- Establish a process for substituting new schemes into existing consortia along given guidelines. This would allow consortia to remain valid should partners fail to develop their projects.
- Ensure DNOs have a process of supporting potential consortia with information on possible schemes in the early stages of discussion. This will enable developers to assess the risks and benefits of the approach in particular locations.

Appendix 1 – Map of Bridgwater sites



Title: Bridgwater Grid Collaboration Trial	
Project Ref No: 1124	DRG Ref:
Drawn By: Joel Venn	Date: 04/02/2015
Checked By:	Date: 04/02/2015
BNG Ref:	OS Map Ref:

EDF site

●

BNRG site

●

Ecotricity site

●

Substation

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