

# APPENDIX 1

## KEY

Method	Method name
<b>Method 1</b>	Conversion of telecom cable repair vessel so that it can undertake telecom and power cable repairs equally well, combined with development of a universal joint for offshore three core AC cables at 132-150kV and provision of jointers.
<b>Method 2</b>	n/a
<b>Method 3</b>	n/a

## Electricity NIC – financial benefits

Financial benefit (£m)								
Scale	Method	Method Cost	Base Case Cost	Benefit			Notes	Cross-references
				2020	2030	2050		
<b>Post-trial solution</b> <i>(individual deployment)</i>	Method 1	n/a	n/a	n/a	n/a	n/a	On completion of the project, the modified vessel and the universal joint will immediately be available for use by all relevant licensees. Therefore the sub-scale “post-trial” phase is not relevant	
<b>Licensee scale</b> <i>If applicable, indicate the number of relevant sites on the Licensees’ network.</i>	Method 1	n/a	n/a	n/a	n/a	n/a	On completion of the project, the modified vessel and the universal joint will immediately be available for use by all relevant licensees. Given the dramatic reduction in repair times and costs made possible by the project, there is not expected to be a period during which the solution is applied by the licensee but not by other OFTOs.	
<b>GB rollout scale</b> <i>If applicable, indicate the number of relevant sites on the GB network.</i>	Method 1	n/a	n/a	£10m	£119m	£443m	<p><i>Number of sites: for cables the length in km is a more appropriate measure than the number of sites. The length of OFTO cable is 920km today. This is assumed to rise to 2,470km in 2020 and 7,480km in 2030 (for details see section 2). For conservatism other cables types are not included even though they should also benefit from faster repairs.</i></p> <p>Base Cost and Method Cost data has not been entered here since the Base Cost and Method Cost of repairs depend on the number of repairs and hence vary from year to year. Detailed source data is available in Section 3.</p> <p>Calculations are conservative (i.e. tend to underestimate the benefits), as explained in Section 3. Particular points of note:</p> <ul style="list-style-type: none"><li>* Benefits from faster repair of non-OFTO transmission cables (interconnectors, bootstraps, island connections) not included.</li><li>* Benefits from improved design of windfarm connections (i.e. fewer but higher-capacity cables) not included.</li><li>* Benefits from cheaper and faster repair of faults during wind farm construction are not included.</li></ul> <p>Cable lengths are based on “Slow progression” – in effect National Grid’s central case scenario. However very fast payback still applies even if no new cables are built (see section 3).</p>	<p>Benefit figures for each year are calculated by linearly interpolation between the results for individual years calculated in Section 3.</p> <p>Annual benefits after 2030 are assumed to equal the 2030 benefit.</p> <p>Results for individual years are summed to yield cumulative benefits to 2020, 2030 and 2050. The cost of the project is spread over 7 years (2018-2024, and again in 2031-37 given the age of the vessel by then and the expected progress in jointing techniques)</p>

### **Electricity NIC – carbon and/or environmental benefits**

Capacity released and/ or environmental benefit (kVA/ kWh)								
Scale	Method	Method Cost	Base Case Cost	2020	2030	2050	Notes	Cross-references
<b>Post-trial solution</b> ( <i>individual deployment</i> )	Method 1	n/a	n/a	n/a	n/a	n/a		
<b>Licensee scale</b> <i>If applicable, indicate the number of relevant sites on the Licensees' network.</i>	Method 1	n/a	n/a	n/a	n/a	n/a		
<b>GB rollout scale</b> <i>If applicable, indicate the number of relevant sites on the GB network.</i>	Method 1	n/a	n/a	64 GWhr	505 GWhr	1,746 GWhr	<i>Cumulative increased generation from offshore wind – note that the financial benefit of this increased generation is already included in the financial table above.</i>	
<i>If applicable, indicate any carbon and/or environmental benefits which cannot be expressed as kVA or kWh.</i>	<b>Post-trial solution:</b> [Explain any carbon and/ or environmental benefits which cannot be expressed as kVA or kWh]  n/a							
	<b>Licensee scale:</b> [Explain any carbon and/ or environmental benefits which cannot be expressed as capacity or kVA or kWh]  n/a							
	<b>GB rollout scale:</b> [Explain any carbon and/ or environmental benefits which cannot be expressed as kVA or kWh]  Reduction of CO2 emissions by: 27kt (years to 2020) 217kt (years to 2030) 752kt (years to 2050)							