Physical Security Upgrade Programme

Re-opener Submission

May 2015

Project Name	**Physical Security Upgrade Programme (PSUP)**
Document Name and Issue Number	**PSUP Re-opener May 2015 Submission – Issue 1.1**
Date	**28/05/2015** **27/7/2015 – Redacted version**

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Executive Summary

This document is the formal submission to Ofgem to request funding for the 'Physical Security Upgrade Programme' (PSUP) totex costs incurred and forecast during the RIIO period under the regulatory approved re-opener mechanism (detailed on Page 6 of this document). As PSUP activities are managed as a single programme in National Grid, this submission document covers National Grid's Electricity Transmission, Gas Transmission and Gas Distribution businesses.

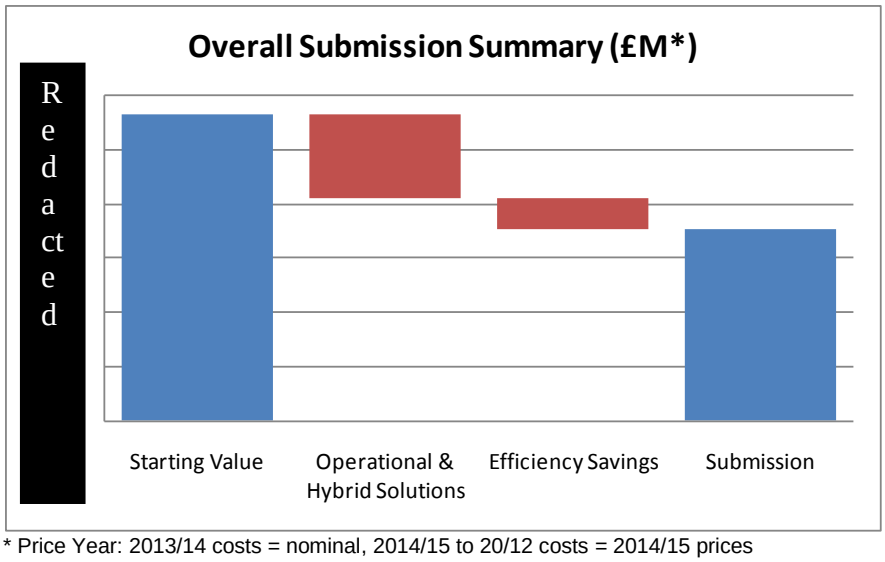
PSUP is a national government managed programme to protect critical national infrastructure (CNI). The PSUP programme has a history characterised by continuous uncertainty and changes to the programme specification, scope and scale, with the number of approved CNI sites increasing from Redacted in 2005 to Redacted at the end of TPCR4 / GDPCR1.

The first two years of the period covered by this submission has been defined by the extended DECC review of CNI sites, which has led to a large net increase in the number of CNI sites to Redacted, with a number of sites also falling off the site list. In parallel, National Grid introduced the concept of 'operational solutions' (which avoids the need for a physical build at some of the CNI sites), and 'hybrid solutions' (which results in a reduced build at some other sites), and thus achieves major savings through avoided costs.

DECC and their security advisors, the Centre for the Protection of National Infrastructure (CPNI), are the relevant parties for stakeholder engagement and National Grid has worked closely with them to develop and define the programme. For reasons of national security, it has not been appropriate to engage more widely with the stakeholder community.

With the DECC review completed there is now a large future work programme, with scope, volumes and delivery timescales much more certain than has been the case historically. This has allowed National Grid to develop new delivery strategies that will provide significant efficiency savings, which are in addition to the avoided costs from the operational and hybrid solutions.

In total, the submission amounts to £Redacted (in 2014/15 prices) of totex costs over the total RIIO period, which includes total savings of £Redacted (or 38%). £Redacted (27%) of these savings have been achieved through implementing operational and hybrid solutions. £ Redacted (11%) of the savings are forecast to be achieved through new strategies to deliver the physical security works at sites. This is summarised in the chart below.



* Price Year: 2013/14 costs = nominal, 2014/15 to 20/12 costs = 2014/15 prices

Converting the submission to 2009/10 prices results in a request for a relevant adjustment to the levels of allowed expenditure in relation to PSUP totex costs of £Redacted, with each network meeting the materiality threshold, as shown in the table below (for reference, the PSUP costs are referred to in the National Grid licences as Enhanced Physical Site Security Costs).

Networks	Totex Costs by Year (£m – 09/10 prices)									
	2014	2015	2016	2017	2018	2019	2020	2021	Total	Materiality threshold
Electricity Transmission	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Transmission	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - North West	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - London	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - East of England	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Programme Total	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	

The negative values for Gas Distribution relate to reversal of accrued costs

A summary of the key points covered within each section of the document is presented below:

Section 1: Summary of Costs Included in the Submission (page 6 to 9)

- The PSUP programme meets the licence conditions for the recovery of the PSUP costs, which includes a formal recommendation from the Secretary of State to undertake the work (see the letter from DECC in Appendix D).
- The submission amounts to £Redacted of totex costs over the RIIO period £Redacted of capex and £Redacted of opex) and covers National Grid's Electricity Transmission, Gas Transmission and Gas Distribution businesses.
- The impact of the submission value on consumer bills is estimated at £Redacted /year for electricity transmission, £Redacted /year for gas transmission and £Redacted /year for Gas Distribution.
- National Grid is seeking an allowance for the totex costs; for actual costs incurred in the first 2 years of RIIO, and an ex-ante allowance for the remaining 6 years of RIIO.

Section 2: Background and Context for the PSUP programme (page 10 to 15)

- PSUP is a national programme initiated by the Home Secretary to protect critical national infrastructure Redacted.
- The programme evolved during the TPCR4 / GDPCR1 period, with the programme characterised by uncertainty and change to site scope and volumes.
- The latest DECC review of CNI criteria started in November 2013 with the final list agreed with DECC in May 2015.
- National Grid has been instrumental in proposing alternatives to full physical solutions for protecting the CNI sites. This has resulted in a total of Redacted sites avoiding any physical build and Redacted sites with limited physical build, out of a total of Redacted CNI sites.
- The total CNI site list includes sites owned by third parties, but which contain National Grid Gas Transmission assets. This submission does not include any of these third party owned sites, as the responsibility for undertaking the work is currently unclear. If appropriate these sites would be included in the May 2018 re-opener. For clarity, National Grid Distribution sites that are shared with National Grid Gas Transmission are included in this submission using the principle that the delivery responsibility and all spend resides with the site owner, (until the responsibilities around undertaking work at shared sites are agreed).
- The physical security for any DNO assets and buildings at National Grid electricity sites are the responsibility of the DNO and any associated costs are not included in this submission.

- With the site review completed, we therefore now have greater certainty of scope and timescales to develop a future programme of work, and an associated robust funding request.

Section 3: Capex Costs for 2013/14 & 2014/15 (page 16 to 27)

- Within the context of the extended DECC site review during the first 2 years of RIIO, the principle followed was to continue construction and closure activities for sites that meet the new criteria, efficiently stand down work on sites that do not meet the new criteria and not commence construction work on new sites.
- Pre-construction work has progressed on new sites, which included development of operational and hybrid solutions and accelerated development of site scopes.
- In total, capex costs of £Redacted have been incurred in the period. The efficiency of the incurred costs is supported by the results of value for money (VFM) audits, and the efficient management of the commercial and operational activities.

Section 4: Future Capex Costs: 2015/16 to 2020/21 (page 28 to 47)

- With the completion of the DECC site review coupled with learnings from delivery of sites to date, the scope, scale and timescales of the future programme is much more certain than has been the case previously.
- This has allowed National Grid to develop new main works contractor (MWC) and project management strategies which are anticipated to reduce the costs of the future programme.
- The cost estimates in the future programme are based on estimates provided from a site survey and estimating exercise conducted by external contractors, plus an efficiency overlay based on the new contracting strategies.
- Overall, the future capex programme has a cost of £Redacted, which includes efficiency savings of £Redacted, as well as £Redacted of avoided costs from the 'operational and hybrid solutions'.

Sections 5 & 6: Opex Costs: 2013/14 to 2020/21 (page 48 to 55)

- The PSUP opex costs reflect the activities required to maintain the PSUP assets and to provide 24/7 surveillance of the sites, via data communication systems and the alarm receiving centre (ARC).
- The driver of the opex costs over the period is the number of PSUP operational sites that has increased from Redacted at the start of the RIIO period and will reach Redacted by the end of the RIIO period.
- Overall, the opex costs are forecast to be £Redacted for the RIIO period.
- We are only seeking incremental costs that were not included in the RIIO price control settlement.

Section 7: Conclusion and Submission Exclusions (page 56 to 57)

- In summary, the certainty afforded by DECC's confirmation of the future PSUP programme has provided the platform to develop a fully costed programme with embedded efficiency savings.
- This is turn provides the basis for National Grid to request and Ofgem to approve allowances for these costs, within the framework of the PSUP specific licence conditions.
- There are a number of areas that do not have the same level of cost certainty, and are therefore not included within this submission: 3rd party owned gas sites, perimeter extensions to existing PSUP sites (e.g. through the Gas Transmission IED programme), and

increased cathodic protection at PSUP sites. If appropriate these costs will be included in the May 2018 re-opener.

- Physical security costs for DNO assets and buildings at Electricity Transmission sites are excluded from this submission.

1. Summary of Costs Included within the Submission

This submission represents a total of £ Redacted of PSUP totex costs

1 The Physical Security Upgrade Programme (PSUP) is a national programme led by DECC. For reference, the PSUP costs are referred to in the National Grid licences as Enhanced Physical Site Security Costs. The PSUP costs included in this re-opener submission relate to costs in the RIIO-T1 & RIIO-GD1 periods (i.e. 2013/14 to 2020/21), and are covered by the following licence conditions:

- *Electricity Transmission Licence:* August 2014 (v7.5), Special Condition 6H: Arrangements for the recovery of uncertain costs. NGET meets all the conditions specified in Para 6H.5.

- *Gas Transmission Licence:* July 2014 (v10.2), Special Condition 5E: Arrangements for the recovery of uncertain costs. NGGT meets all the conditions specified in Para 5E.6.

- *Gas Distribution Licence:* April 2015 (v6.5), Special Condition 3F: Arrangements for the recovery of uncertain costs. The National Grid Gas Distribution Networks meet all the conditions specified in Para 3F.6.

2 The PSUP programme meets the conditions for the recovery of the PSUP costs, which includes a formal recommendation from the Secretary of State to undertake the work (see the letter from DECC in Appendix D). An assessment against the conditions specified in the relevant licences and a formal statement of the proposed adjustments is contained within Appendix E2 / E3.

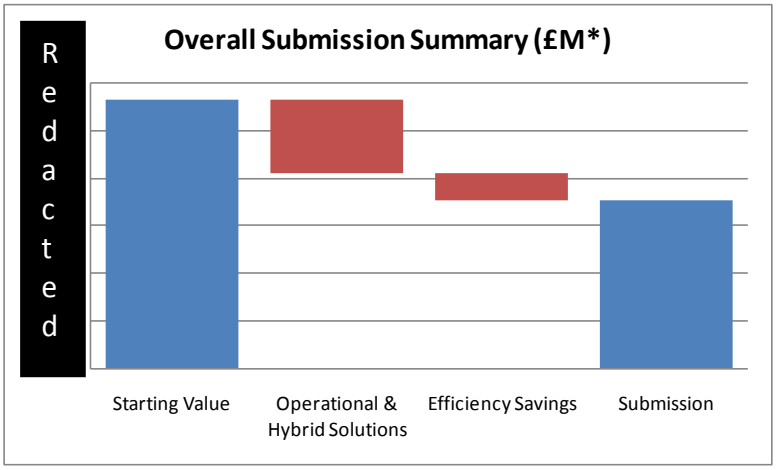
3 This submission represents a total totex submission of £Redacted of PSUP costs. Throughout the document the 2013/14 costs are stated in nominal prices (for consistency with the 2013/14 RRP) and the remaining years are in 2014/15 prices, unless otherwise stated.

4 The submission brings together solutions for securing CNI sites which started with the DECC CNI criteria review in November 2013. Since then National Grid has actively sought to minimise the amount of physical build through the development of operational and hybrid solutions. This initiative was instigated by National Grid as a means of achieving the security resilience outputs required by DECC, whilst minimising the cost to consumers.

5 The initiative started in early spring 2014 with discussions and meetings with DECC to persuade them to look at alternatives to physical hardening. Extensive work by National Grid and further meetings with DECC concluded in May 2015 with Redacted sites avoiding any physical security upgrade and Redacted sites with a reduced physical upgrade, resulting in a saving to the consumer of £Redacted. The letter from DECC, dated 19 May 2015, contains the number of sites now requiring a physical build solution.

6 Where a physical build is required National Grid has developed a model that will deliver the scope as efficiently as possible, with £ Redacted of efficiency savings embedded in the submission.

7 The net result is that the submission value includes total savings of £Redacted, as illustrated in the graphic below.



* Price Year: 2013/14 costs = nominal, 2014/15 to 20/12 costs = 2014/15 prices

Totex: Total of £Redacted over the RIIO period

8 The table below summarises the total totex cost in the period by network, and by year. The table also shows that the submission meets the materiality threshold for each network.

Networks	Totex Costs by Year (£m)										
	2014	2015	2016	2017	2018	2019	2020	2021	Total	Total 09/10	Materiality threshold
Electricity Transmission	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Transmission	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - North West	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - London	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - East of England	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Programme Total	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	

The negative values for Gas Distribution relate to reversal of accrued costs

9 There are no submission costs for 'Gas Distribution – West Midlands', as operational solutions have avoided the need for any physical build in this network.

10 Whilst no allowance has been made in the RIIO period to cover PSUP costs, there were some allowances that covered general asset health and security activities. Where these allowed costs are used to deliver PSUP work they have been subtracted from the PSUP costs to produce the net submission position, as presented in the table above (the determination of these substituted costs is presented in Appendix F).

11 Converting the submission costs to 2009/10 prices results in a request for a relevant adjustment to the levels of allowed expenditure in relation to Enhanced Physical Site Security Costs (i.e. PSUP costs) of £Redacted, as shown in the table below.

Networks	Totex Costs by Year (£m – 09/10 prices)									
	2014	2015	2016	2017	2018	2019	2020	2021	Total	Materiality threshold
Electricity Transmission	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Transmission	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - North West	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - London	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - East of England	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Programme Total	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	

The negative values for Gas Distribution relate to reversal of accrued costs

Capex: Total of £Redacted over the RIIO period

12 The table below summarises the total programme capex costs by network, and shows the total capex for the RIIO-T1 period is £Redacted.

Networks	Capex Costs by Year (£m)								
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Electricity Transmission	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Transmission	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - North West	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - London	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - East of England	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Programme Total	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted

The negative values for Gas Distribution relate to reversal of accrued costs

13 The capex costs are discussed in Sections 3 and 4. The capex costs by individual site over time are presented in Appendix A, and the breakdown of the capex cost by site is presented in Appendix B.

14 The driver of the capex (and opex) costs is the number of sites that undergo a physical security upgrade. The number of sites on the DECC list that have completed or are forecast to complete an upgrade within the PSUP programme is presented in the table below, and shows that a total of Redacted sites will be complete by the end of the RIIO period, with Redacted of these sites forecast to complete within the RIIO period.

Networks	Site Volumes at Year End								
	2013	2014	2015	2016	2017	2018	2019	2020	2021
Electricity Transmission	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Transmission	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - North West	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - London	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - East of England	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Programme Total	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted

Opex: Total of £Redacted over the RIIO period

15 After a PSUP site has completed its construction stage, there are opex costs associated with operating, maintaining and repairing the PSUP assets. Operation of the PSUP assets is managed on a 24/7 basis by the Alarm Receiving Centre (ARC), the maintenance and repair of assets is managed via Post Delivery Service Agreements (PDSAs), with assets 'fixed on fail', which at present is more efficient than replacement based on time or usage.

16 The table below summarises the total programme opex costs by network, and shows the total opex for the RIIO period is Redacted.

Networks	Opex Costs by Year (£m)								
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Electricity Transmission	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Transmission	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - North West	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - London	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Gas Distribution - East of England	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted
Programme Total	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted	Redacted

17 The opex costs are discussed in Sections 5 and 6. The opex costs by individual site are presented in Appendix C.

Impact on Consumer Bills

18 The table below shows the impact of the submission on consumers' bills, based on the totex costs and the number of consumers by network.

Network	Impact on Consumer Bills (£/yr)
Electricity Transmission	Redacted
Gas Transmission	Redacted
Gas Distribution	Redacted

Proposed Regulatory Treatment of Costs

19 National Grid is seeking an allowance for the totex costs; for actual costs incurred in the first 2 years of RIIO (i.e. 2013/14 & 2014/15), and an ex-ante allowance for the remaining 6 years of RIIO (i.e. 2015/16 to 2020/21).

2. Background and Context for the PSUP programme

The scale and scope of the programme is driven by government requirements

Summary

20 This section describes the context for the PSUP programme and includes a description of how the programme has evolved, the results of the latest DECC site review, and a description of the operational and hybrid solutions that National Grid has developed to avoid or minimise the need for a physical build to meet the CNI requirements. To provide further background and context, this section also describes the typical elements of a PSUP solution, and the key stages in the project lifecycle.

21 PSUP is a national programme initiated by the Home Secretary to protect critical national infrastructure (CNI) Redacted.

22 The programme evolved during the TPCR4 / GDPCR1 period, with the programme characterised by uncertainty and change to site scope and volumes. The latest DECC review of CNI criteria started in November 2013 with the final list agreed with DECC in May 2015.

23 National Grid has been instrumental in proposing alternatives to full physical solutions for protecting the CNI sites. This has resulted in a total of Redacted sites avoiding any physical build and Redacted sites with limited physical build, and leaves Redacted new sites on DECC's CNI list to be constructed in the remainder of the RIIO period.

2.1 The Needs Case, and Evolution of the Site List and Scope: *a government programme characterised to date by change and uncertainty*

Needs Case

24 Following a series of attempted terrorist attacks on some of the UK's major energy infrastructure assets in the 1990s and early 2000s, the government recognised the need to review and improve the physical security at key infrastructure locations.

25 A national programme, initiated by the Home Secretary, overseen by the CONTEST Board and led by the Department of Trade and Industry (as was), and involving all the major utilities, was established to identify critical sites and ensure delivery of the security enhancements. DECC is now the government lead for the programme.

26 DECC and their security advisors, the Centre for the Protection of National Infrastructure (CPNI), are the relevant parties for stakeholder engagement and National Grid has worked closely with them to develop and define the programme. For reasons of national security, it has not been appropriate to engage more widely with the stakeholder community.

Evolution of CNI Site List and Scope

27 CPNI acts as DECC's security advisors, and identifies sites as Critical National Infrastructure (CNI), based on DECC defined criteria (such as the number of consumers affected by loss of the site). The asset and network data that informs the decision making is provided by the utility.

28 These CNI sites then become eligible for the physical security upgrade programme (PSUP) in order to increase their resilience to security threats.

29 DECC maintains the list of CNI sites, and the site listing was reviewed in 2005, 2009 and 2010/11. The latest review started in 2013 and was completed in December 2014. At each review, the overall net number of sites on the list has increased with some sites taken off the list along the way. Additionally, there was also a requirement introduced during this period to meet a site delivery timetable ahead of the London Olympics.

30 DECC, through their security advisors (CPNI), also sets the overall guidance for the scope of works, based on CPNI's assessment of the probable attack methodologies that a terrorist might utilise.

31 The overall guidance on scope is captured in the Operational Requirements (OR) document, which contains the generic requirements for any CNI site, based on the principle of 'deter, detect, delay' (e.g. camera coverage, intruder time delay required by the perimeter barrier).

32 The net result is that the programme to date has been characterised by uncertainty and continuous change to site scope and volumes.

2.2 DECC's Latest Site Review: *a significant increase in sites requiring physical hardening, but also major avoided costs through operational and hybrid solutions*

33 As referred to above, throughout 2013/14 and 2014/15 National Grid has been working with DECC and CPNI on a DECC led review of which sites should be categorised as CNI (and therefore eligible for enhanced physical security upgrades).

34 Redacted.

35 In April 2014 National Grid met with DECC and proposed potential alternative solutions to achieving security resilience, at a lower cost to consumers. As a result, National Grid proposed to DECC the concept of 'operational solutions' where alternative network pathways can be used in the event of a failure or incident at a given CNI site, which obviates the need for any physical security upgrade at the site. Additionally, where an operational solution is not appropriate, the concept of a 'hybrid solution' was also proposed which looks to minimise the scale of a physical build by only protecting specific critical assets.

36 National Grid developed a methodology for assessing whether an operational or hybrid solution is viable at individual sites, and this involved risk assessments, workshops with experienced network and asset specialists, network analysis and discussions with distribution network operators. This work continued throughout 2014 and completed in April 2015.

37 Following initial discussions, on 31 July 2014 DECC issued its initial guidance on a revised CNI list with guidance on which sites would require physical hardening, sites for which an operational solution would be acceptable, and sites which no longer meet the CNI criteria. For sites which no longer meet the criteria, work was brought to an efficient close.

38 After further discussions with DECC and CPNI, an updated site list was issued on 11 December 2014. Since then, National Grid has continued to work on increasing the number of operational and hybrid solutions.

39 The process has concluded with a letter dated 19 May 2015 from the DECC (see Appendix D) confirming the final sites numbers as summarised below.

Site Categories	No. of Sites
Sites that meet the CNI criteria	Redacted
of which: Sites with an Operational Solution	Redacted
Sites with a Hybrid Solution	Redacted

40 The latest CNI list represents a large increase in site numbers compared to the Redacted sites that were in the programme before the latest review started.

41 The financial benefits from the operational and hybrid solutions are estimated at £Redacted of avoided costs with the consequential benefit to consumers.

42 With the site review completed, we now have more certainty of scope and timescales to deliver an efficient future programme of work.

2.3 Summary of Site Status: *good progress to date, but with a large number of sites to be constructed*

43 Within the constraints of the DECC review, National Grid has made good progress on the PSUP programme, and the table below summarises the status of the programme against the DECC site list at the end of March 2015, by site category.

		Site Numbers by Project Phase					
	Type of Site	Construction Complete (built)	Construction (being built)	Pre-Construction (to be built)	Operational Solution (doesn't need to be built)	Stopped / Removed	Total
CNI Sites	CNI - Gas Transmission	Redacted					
	CNI - Electricity Transmission						
	CNI - Electricity Transmission - Tunnel Head Houses						
	CNI - Gas Distribution						
	CNI - Gas Transmission - Shared (owned by 3rd party)						
	CNI - Control Centres						
	CNI - Nuclear						
	Total						
Other Sites	On DECC Feb 2014 list but no longer meet CNI criteria						
	On previous DECC lists but no longer meet CNI criteria						
	Total						
	Total excluding GT shared sites (owned by 3rd party)						

44 The key observations from the table are:

- Redacted sites are construction complete (Redacted of which were construction complete pre-RIIO).

- Redacted sites are in the construction stage and will mostly complete construction during 2015/16.

- Redacted sites are at various stages of pre-construction. Of these pre-construction sites, Redacted are owned by a 3rd party, but contain National Grid Gas Transmission assets. The responsibility for undertaking the work and the funding arrangements for physical security upgrades at these sites had yet to be finalised at the time of preparing this submission document and therefore they do not form part of this re-opener. Should National Grid be required to deliver and fund these sites then the intention is to make an appropriate submission as part of the May 2018 re-opener. For clarity, National Grid Distribution sites that are shared with National Grid Gas Transmission are included in this submission using the principle that the delivery responsibility and all spend resides with the site owner (until the responsibilities around undertaking work at shared sites are agreed). This leaves Redacted CNI sites at the pre-construction stage that are included within this funding submission (for completeness, there is also one extension to an existing site, Redacted, included in the submission – as it is an extension to an existing completed CNI site it does not count as an 'additional site' on the DECC list).

- In addition to the Redacted CNI pre-construction sites included within this submission, Redacted sites have an agreed operational solution and therefore will not need any physical hardening.

- Work was stopped, or never started, on Redacted other sites that no longer meet the CNI criteria. Most of these sites were in the early pre-construction stage. Any work on these sites was brought to an efficient close.

2.4 A typical PSUP security solution: *involves significant civil and technology works*

45 The PSUP programme in National Grid covers a range of different operational site types, most of which have challenging process safety working environments:

- Redacted
- Redacted
- Redacted
- Redacted

46 Although each site is different, the typical project scope will usually include a mix of the following physical elements:

- Redacted
- Redacted
- Redacted
- Redacted
- Redacted

- Redacted
- Redacted

47 There is also significant associated temporary infrastructure required for the duration of the project e.g.:

- Access and egress e.g. temporary haulage roads and traffic management systems.
- Site establishment (e.g. office cabins, welfare units).
- Temporary security measures to provide site security protection during the construction stage.
- Protective measures when digging over and under services and assets (e.g. high pressure gas mains, high voltage electricity underground cables and overhead lines).
- Environmental protection measures for physical protection of flora and fauna.

48 For all elements of the historic and future works and associated costs, National Grid sets out to meet the security requirements determined by DECC and CPNI.

2.5 The PSUP Project Lifecycle: *follows standard National Grid processes*

49 PSUP projects follow National Grid's standard sanction and controls processes. The schematic below illustrates the key activities during the project lifecycle:

Scoping & Design Development	Detailed Design & Construction	Closure
■ Site requirements ■ Surveys / environmental studies ■ Design development ■ Contract award process	■ Detailed design ■ Detailed planning ■ Mobilisation & set up ■ Construction ■ Commissioning	■ Technical closure (e.g. de-snagging, final drawings) ■ Preparation of data books ■ Commercial settlements (e.g. resolving outstanding claims) ■ Financial closure ■ On-going assurance for DECC

50 After the site works are completed, there are PSUP specific operational and maintenance activities that are captured within the opex costs. These costs primarily relate to the maintenance and repair of the PSUP technology assets (e.g. CCTV systems, communications infrastructure), and operating the ARC on a 24/7 basis. A small element of cost has been included for the ongoing assurance requested by DECC in the letter dated 19 May 2015.