

Black Start Allowed Revenue Report 2019/20

Executive summary

ESO incurred £54,912,744.25 for Black Start costs in respect of Relevant Year April 1st 2019 to March 31st 2020.

Background

National Grid Electricity System Operator Limited (NGESO) has produced this report in accordance with Special Condition 4G, Part E of its electricity transmission licence. Special Condition 4G.13 states that the licensee NGESO shall prepare a report in respect of total costs incurred in respect of Black Start in this Relevant Year 1st April 2019 to 31st March 2020.

This Black Start Allowed Revenue Report will set out how NGESO has;

1. Calculated the total costs incurred.
2. Validated the data used to determine the total costs.
3. Complied with the Black Start Strategy and Procurement Methodology when incurring the total costs.

This report was accompanied by a statement from an independent auditor confirming that the report is accurate detailing the auditor's independent assessment of the extent to which NGESO has complied with the Black Start Strategy and Procurement Methodology.

1) Calculation of Total Costs¹

The total costs incurred for the provision of Black Start for the Relevant Year 2019/20 is **£54,912,744.25**. There are a number of areas of costs associated to Black Start as identified in the Procurement Methodology, which can be categorised into the following elements. This section will explain how these costs are calculated.

Breakdown of Costs (£)	
Availability Payments	£40,330,496.12
Capital Investment	£8,879,754.29
Feasibility Studies	£69,815
Testing	£462,437.75
Warming	£5,170,241.09
Total	£54,912,744.25

- 1. Availability Payments:** These are paid to the service provider to maintain capability throughout the year. During contract negotiations, NGENSO and the provider agree a fixed price to be paid annually, this is then worked out into a £/settlement period and paid monthly to the provider. Providers are only paid for settlement periods when they have declared they are available. There is a defined business procedure that NGENSO follows to determine the monthly payment based on availability declarations received from the provider. The contract data including availability payment per settlement period and if necessary any indexation data is taken from the signed Commercial Services Agreements between NGENSO and the service provider and the monthly payment determined.
- 2. Capital Investment:** New Black Start services are likely to require significant capital investment as outlined in the Procurement Methodology. This is typically agreed at the start of the contract and is either paid upfront before the service commences, smeared over the duration of the contract or at pre-agreed intervals. Each contract will include a breakdown of costs including where necessary a milestone payment schedule. In either case payment is dependent upon the receipt of valid invoices, though sometimes invoices can be received a number of years after a service commences, in the case where the capital is for ongoing work.
- 3. Feasibility Studies:** NGENSO will ensure any costs incurred by service providers have been procured in an economic manner. NGENSO will expect the service provider to demonstrate why they have awarded the study work to a contractor. The feasibility study costs are agreed in the commercial side letter between NGENSO and the provider and we will only pay up to the agreed amount subject to valid invoices. For the agreements as part of the tenders for SW & Midlands and the Northern regions (Scotland, NE and NW), this cost has been capped at £150,000 per Feasibility Study 2.
- 4. Testing:** In accordance with the Procurement Methodology, NGENSO will work together with the provider to develop a strategy to test the unit at the most economic and efficient time, mitigating any distortion to the market. Like the feasibility study costs, we agree the basis of payment in a commercial side letter and will only pay the agreed amount subject to valid invoices.
- 5. Warming Requirements:** Black Start providers must be able to respond in a specified time, (normally within two hours), to be deemed available for Black Start. If service providers of certain technology types have not generated for a period, the units may not be warm enough to meet that response time. In such circumstances, NGENSO will assess the overall availability in the zone, and may instruct a capable unit for warming to maintain the minimum service level. This is typically during summer months when demand is lower and contracted stations are on outage or out of merit. Spend on warming may be instructed through the Balancing Mechanism (BM), trades, or by forward contracting. The costs are calculated based on what has been agreed either through a forward's contract or in the case of a trade through a Schedule 7A or in the BM through a Bid-Offer price (BOA) and like availability payments, the cost is paid monthly.

The following table 1 demonstrates the total costs in respect of availability and warming since 2012/13.

Table 1

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Availability	£15,450,690	£16,542,675	£23,275,720	£18,886,830	£114,347,564	£35,392,352	£38,503,951	£40,330,496
Warming	0	0	0	0	£3,987,200	£19,903,961	£5,710,374	£5,170,241

¹ All Ancillary Services costs are reported exclusive of VAT

2) Validation of Total Costs

NGESO will ensure through a robust validation process that all reported costs are accurate for each cost element.

Availability Payments: Following the defined business procedure outlined in the calculation of costs, the settlements team will send a preliminary statement to the provider informing them how much they are expected to receive. The provider has a number of days to review before NGESO will send a final statement which forms the payment the provider will receive.

Capital Investment: This is paid upon the submission of valid invoices to NGESO and in accordance with the signed sanction papers and Commercial Service Agreements(CSA). The provider may incur these costs before recovering them from NGESO and they may be collated and submitted by the provider in tranches throughout the service term. Therefore, NGESO could receive invoices dated for the previous Relevant Year, which it may not have received until following Relevant Year. Once received, invoices are reviewed and validated against the agreed spend in the contract. This validation includes a review of the invoice against the contract or milestone schedule and the type of works to ensure it meets with our expectations. Only then will a Purchase Order be raised for payment.

Feasibility Studies: Similarly, to capital investment, the feasibility study costs are paid upon the receipt by NGESO of valid invoices in accordance with the signed sanction papers and feasibility study contracts with the service providers. NGESO will receive invoices from third parties if appropriate and a specific invoice from the provider listing all activities required for the study.

Testing: This is paid either through a negotiated fixed price or through a market mechanism and agreed with the service provider. NGESO and the provider will look at the most cost effective solution for the test. The invoices received will again be validated against the commercial side letter as agreed between NGESO and the provider. In 2019/20 NGESO developed a cost reimbursement methodology further described in Appendix 1 that can be used for certain tests where the provider may be more exposed to market spreads.

Warming Requirements: This is paid through the following methods.

- Payments made in the BM or through Trading on actions taken to warm Black Start capable plant to ensure we have enough service providers in a state of readiness. These payments are actuals and are carried out in real time and paid per settlement period.
- Short term warming contracts with a provider of Black Start to reduce the cost of trading in advance of taking actions in the BM. This will typically be in the form of a fixed price to run the station at agreed intervals to maintain warmth over the duration of the contract.
- Payments made to a provider of a Black Start capable plant as part of a contract to ensure that the plant will be available and running during the Relevant Year. Some providers have a warming contract within the Commercial Services Agreement to mitigate the risk of not running in the market and therefore not being in a state of readiness. In this case the payment will be paid as part of the availability payment and validated against the defined business procedure.

3) Compliance with the Black Start Strategy and Procurement Methodology

As the licensee, NGENSO must also demonstrate how any new contracts including, renewals, warming contracts, testing and feasibility studies comply with the Black Start Strategy and Black Start Procurement Methodology approved by the Authority on the 31st July 2019. Many of the existing Black Start contracts were awarded prior to the publication of the methodologies and are therefore out of the scope of this audit, though the principles of the Black Start Strategy and Procurement Methodology were applied. This section will also provide an update on the competitive procurement of Black Start and is made up of three parts as follows:

- a. Competitive Procurement
- b. Contracts
 - i. For service delivery in 2019/20
 - ii. For service delivery from 2020/21
- c. Payments

3a) Competitive Procurement

On the back of the Expression of Interest (EOI) that was launched in Feb 2019 for services in the SW & Midlands we launched a second competitive event with an EOI in August 2019 for services in the Northern Region.

Currently we are expecting commercial submissions from providers in the SW & Midlands by no later than July 31st 2020 and expect to award contracts in Oct 2020 for services to start no later than July 2022. In the Northern region, we received 22 EOIs from 11 technology types and we are now at the stage where we have invited 13 individual projects to move forward and complete full feasibility studies and commercial submissions, expected in Oct 2020.

We are intending to develop the market approach further and plan to launch a further competitive event in Q2 2021 for services in the South-East region.

It is also worth noting that the outcome of the Distributed Re-start project will be known in the medium to longer term in accordance with the Black Start Strategy and Procurement Methodology. In this timeframe, we expect to be running fully competitive Black Start procurement process with submissions from a wide range of technologies connected at different voltage levels on the network, with DNOs playing a more active role in the restoration approach.

3b) Contracts

- i) Three new contracts were agreed with providers for service delivery in 2019/20 in accordance with the Black Start Strategy and Procurement Methodology.
 - New full Black Start service that commenced in June 2019 and will provide services for six years in a region where two services are from coal fired power stations which will be unavailable for significant periods of time and therefore would require warming costs to bring them black start available. The contract was signed in 2018 based on a 1st July 2019 service commencement date, however we identified an issue with Black Start availability in this region and we agreed to forward extend this contract to start on the 22nd June saving over £1m on potential warming costs. This is classified as a full service as identified in the Black Start Strategy and Procurement Methodology. This contract includes a Black Start works contribution payment for capital payments and is included in the availability payments.
 - Interconnector Fast Start service, an existing service that was extended for a further year whilst NGENSO and the provider continue to discuss a full Black Start service. This offers a valuable restoration service for the region as it provides additional resilience to those contracted.
 - A new Trip to House Load service for 27 months from Jan 2020 to April 2022. A price and term was agreed that was assessed in accordance with the Black Start Strategy and Procurement Methodology. The term will expire when we expect to have new services from the SW & Midlands tender and the price was assessed and negotiated in accordance with our alternative cost methodology. This offers a valuable restoration service in a region where existing provider's contracts have either expired or the service will not be available and will provide additional resilience and liquidity to drive future diversification and competition.

ii) In 2019/20 NGESO also agreed to eight contract renewals with existing providers that will start delivering from April 2020, although not part of this relevant year for cost recovery, decisions were made to contract with these providers in this year.

- Seven of the contract renewals were part of the NGESO strategy to run a competitive event for services in the Northern Region commencing from October 2021. This competitive event will broaden participation and increase competition for Black Start services in accordance with the NGESO Black Start Strategy and Procurement Methodology the ESO Forward plan, to ensure we could facilitate this event we agreed to renew existing services for 18 months.
- The other contract renewal was in the Midlands and was for a short term of 12 months to maintain capability until 2021 whilst we continue with the SW and Midlands tender process which we expect will replace this contract.

All contracts were negotiated bilaterally and used a combination of the cost-plus and alternative cost methods to assess value but where possible used other mechanisms such as other contracts to benchmark against. Through a robust assessment and strong negotiation, we made significant savings against the original price that the providers were seeking.

NGESO considers alternative options in the area and the time horizons before committing to any contract and will continually review and position ourselves to ensure we can meet Black Start requirements on an enduring basis whether that is through a market mechanism or a bilateral contract. We therefore actively look to find potential new providers to promote competition and mitigate the exposure of future operating costs and will consider the most appropriate mechanism to negotiate a new contract in accordance with the Black Start and Procurement Methodology.

3c) Payments

Availability Payments: When determining the need for specific contracts in 2019/20, we assessed the Black Start Strategy and Procurement Methodology and the impact on the restoration times before committing to negotiating a new contract. Once it was established that there was a need, we assessed the value in accordance with the Procurement Assessment approach in the Procurement Methodology. All new and renewed contracts are outlined above in section 3b.

Capital Investment: In 2019/20 we incurred costs for Capital from four providers: -

- One contract was agreed in 2017 for a maximum of £2.5m for chimney refurbishment and air house filter replacement. Given the nature of the works NGESO received a final invoice for £33,683.21 in 2019/20 as stages of the works were completed.
- The Enhanced Restoration service agreed in May 2018 for 23 months incurred costs for the hiring of diesel generators.
- Two new contracts both agreed in July 2019 for service commencement in Oct 2020 and Jan 2021 respectively.

All invoices received associated with these two new contracts were validated and assessed against the works contributions that were agreed as part of the CSA and in accordance with the milestone schedules contained within.

Feasibility Studies: NGESO has produced a standard outline for feasibility studies to make it easier to compare the content, and therefore to assess the proposed costs. We adhere to the principles outlined in the Procurement Methodology by ensuring that as far as possible any costs of these studies have been procured in an economic and efficient manner and, where feasible, the provider can tender for the study.

The costs for feasibility studies can vary, for instance the size and type of the generator will influence the cost as well as if the Original Engineering Manufacturer (OEM) can use learning from previous studies. On occasions, it can be cheaper for a study to be carried out on a new unmodified generator compared to a retro-fit on a generator that has been modified. In some cases, the providers will tender for the OEM costs where possible which can reduce cost to NGESO and some providers will waive their own internal costs for facilitating the study.

During each assessment, we look at the OEM and size/type of generator and compare the cost against previous or existing studies to ensure there is consistency. We ask for a breakdown of costs against the tasks in the study to

identify any variations and challenge where necessary. We also make it very clear in early discussions the expected cost range for such a study and if we deem that the study cost is inappropriate, the provider is informed.

In 2019/20 we incurred costs for feasibility studies from only one provider, this is because we launched the SW & Midlands and Northern Tender (“Tenders”) to facilitate competition in accordance with our Procurement Methodology and the ESO Forward Plan 2019-21. This one bilateral study was agreed prior to the launch of the Tenders and the potential provider will be able to fill a service gap prior to delivery of the services from the Tenders. We compared the cost to previous studies over the past couple of years and out turned to be the lowest cost in comparison, mainly due to the provider agreeing to cover all internal costs and using an experienced OEM with knowledge of the station.

NGESO expect to receive a number of Feasibility Studies in 2020/21 from the tenders therefore the costs to be recovered in 2020/21 will be greater than this past year.

Testing: As per OC5 of the Grid Code, NGESO must test existing Black Start providers to prove their capability to Black Start in accordance with their contractual terms and the Grid Code requirements where appropriate. NGESO will work together with the provider to develop a strategy to test the unit at the most economic and efficient time, informing the market and mitigating any distortion in accordance with the Procurement Methodology.

In 2019/20 we tested seven providers, but one test was at no cost to NGESO. Given the nature of the technology types and size of the stations, some assurance tests cost considerably more than others. We would expect to cover the cost of any lost generation opportunity and the actual cost of running the units to meet with the agreed test programme. We developed a cost reimbursement methodology used for those tests that would be impacted greater by market spreads in a fair and transparent way and successfully trialled this with two providers which helped to understand the true cost for the provider to facilitate the test, fully described in Appendix 1.

Warming: In 2019/20 NGESO further evolved its warming strategy to continue to drive costs down, resulting in a further reduction in costs from the previous year. However, NGESO still required to take a number of actions over the summer to warm Black Start capable stations to maintain Black Start readiness.

Most of the actions were taken by the NGESO trading team in collaboration with the Black Start technical team and in accordance with the warming strategy to maintain the Restoration Time and the Minimum Service Level.

There was a short term warming contract that was put in place in the Summer of 2019 to ensure we maintained Black Start availability in one region when a number of outages to capable providers overlapped. We reviewed options in accordance with the warming strategy and assessed the most economical solution was to contract and run the provider in the BM.

When actions are taken to warm plant for Black Start readiness, the voltage or any other secondary benefit is taken out and recovered through the Balancing Services Incentive Scheme mechanism. Accordingly, in respect of Black Start total costs, NGESO is recovering the warming cost only. The Procurement Methodology explains the concept of secondary benefit.

In addition to what we spent, we also saved approx. £1m by forward contracting one of the new providers as stated above.

General Provisions

Generally, NGESO publish information on the Balancing Services we intend to procure and subsequently do procure. In doing so, we seek to provide market participants and other interested parties with sufficient information without compromising the commercial position of any contracting party.

Disclaimer

All information published or otherwise made available to market participants and other interested parties pursuant to this Black Start allowed revenue is done so in good faith. However, no warranty or representation is given by National Grid Electricity System Operator Limited., its officers, employees or agents as to the accuracy or completeness of any such information, nor is any warranty or representation given that there are no matters material to any such information not contained or referred to therein. Accordingly, no liability can be accepted for any error, misstatement or omission in respect thereof, save in respect of a misrepresentation made fraudulently.

Appendix 1

Lost Generation Costs = MAX (0, (Power Price - Gas cost -Carbon cost -Fixed cost)) * (Capacity – MEL) * H

Where:

Power Price	is the hourly N2EX UK Day Ahead Auction Price (£/MWh)
Gas cost	= (Gas price/Gas conversion factor * 10)/ Gross Unit efficiency factor
Carbon cost	= (CPS rate + (EUA price/FX)) * Emission factor
Fixed cost	is []/MWh
Capacity	is [] MW
MEL	is the Maximum Export Limit of unit (MW)
H	is the number of hours during which the relevant unit within the Power Station is made unavailable due to Black Start testing.
Gross Efficiency Factor	is []%
Emissions Factor	is []
Gas Conversion Factor	is 29.3071 (therms to kWh)
CPS rate	is UK Carbon Price support rate (£/tonne)
Gas Price	is the hourly UK NBP Natural Gas Forward Day Ahead price (p/therm)
EUA Price	is ICE ECX Emission December 2020 commodity (£/MWh)
FX	is the £/€ daily rate from the Bank of England

Exercise Payment = Start cost + Auxiliary unit cost

Where:

Start Cost	is Fixed cost of no more than [TBC] if the unit is running prior to the test
Auxiliary Unit Cost	is (10000 therms*Gas Price)/100