

Investment Decision Pack
NGET A14.12 IT System Health
Replacement
December 2019

As a part of the NGET Business Plan Submission

| Engineering Justification Paper IT System Health Replacement | | | |
|---|--|-----------|-----------|
| Asset Family | <i>IT System</i> | | |
| Primary Investment Driver | Maintaining the resilience of ET's IT systems and ensuring that they are fit for purpose in the next regulatory periods. | | |
| Reference | A14.12 | | |
| Output Asset Types | IT System | | |
| Cost | £109m (ET share – some systems are shared with other functions) | | |
| Delivery Year(s) | 2021-2026 | | |
| Reporting Table | D4.3A | | |
| Outputs included in RIIO T1 Business Plan | NA | | |
| Spend Apportionment | T1 | T2 | T3 |
| | NA | £109m | NA |

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Executive Summary

This paper details the Electricity Transmission's Direct IT 'Asset Health' investments proposed in the next regulatory period. These investments are essential to the safe, secure, reliable and economic operation of the Electricity Transmission business.

Our IT strategy has been created in response to the needs of our stakeholders, particularly on the need for a safe, reliable and resilient network. We have also addressed the need to make it easy to connect to the Electricity Transmission network and to deliver our commitments in RIIO as efficiently as possible. In addition to that our strategy centres around the following elements:

- Consolidation and exploitation of fewer strategic core platforms and applications.
- Sharing platforms and applications with other business areas (e.g. GT) where possible and economically viable.
- Planning investment in the current platforms and applications in line with NG's IT Asset Health policy¹.
- Minimising cost, risk and complexity through moving to an optimised asset health policy where possible so we can maintain the current estate with refreshes prior to end of life/end of vendor support.
- Greater collaboration, data exploitation and automation.

We identified and analysed options across 12 core IT capabilities. We did this against overall total cost of ownership, business strategic fit, the extent to which the option meets customer's needs, an overall risk perspective and National Grid's capacity to deliver. From this analysis, we have recommended a plan with investments totalling £109m that:

- Maintains the health of our core work and asset management systems that enable us to provide a safe and reliable service to our customers and stakeholders
- Improves our safety and operational efficiency, maintenance compliance and NARMS delivery through targeted use of automation, workflow and analytics capabilities
- Continues to invest in our Digital Customer journey to make it easy to connect to and use our network.

We have reviewed our investment plans internally, and asked Gartner to benchmark each investment line. The total investment benchmarked within the peer group comparator range in Gartner's independent assessment and we reduced our overall investment by approximately £12m [reflecting individual projects that were out of range]. We have also assessed our plan's deliverability and have prioritised investment to ensure we have a realistic plan that manages the impact of change on key stakeholders. These systems support the core work and asset management processes and are key enablers for our digital strategy. Overall, this investment is required to enable Electricity Transmission to continue to provide services to customers and stakeholders and represents value for money in the next regulatory period.

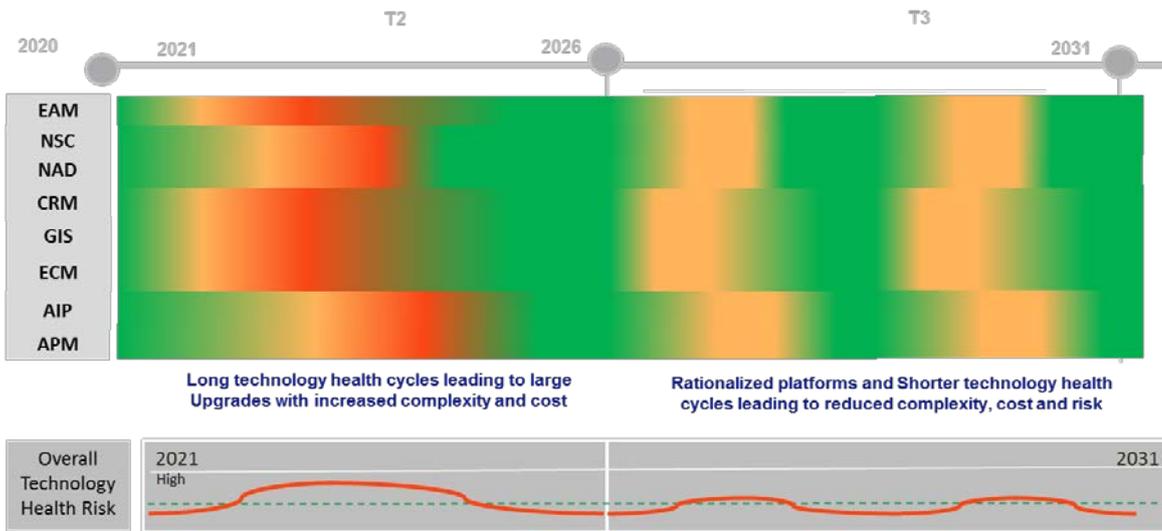
Introduction

IT is increasingly enabling us to deliver our stakeholder priorities in a safe and effective way; providing sustainable improvements in value for money for our customers. Throughout the T1 period, we have made significant progress in improving business performance through investments in technology. We have mobilised our operational field force through investment in work management applications and infrastructure

¹ We define a refresh as the replacement of hardware with comparable, supportable hardware and / or an upgrade to a current (supported) version of system software and application software. Upgrading to a current version of software ensures the availability of maintenance and security patches, it may also bring increased system capability, but that will be a by-product of the upgrade and not its primary purpose. A full replacement differs from a refresh, in that the usual trigger for a full replacement of an IT system with a new system will be to develop new or changed business capabilities. The business requirements will have changed to an extent that it is not considered possible or cost effective to accommodate the new and changed requirements through changes to the existing system and the procurement of an entirely new system is considered the best option in terms of the business benefits delivered versus the cost. The business requirements that drive such a replacement may be functional (e.g. a new process has to be supported) or non-functional (e.g. a substantial increase in user numbers, resilience required or transaction throughput).

that has enabled us to digitise key processes around the way we carry out work and capture data. This data is processed through new technology and analytics platforms that enable efficient day-to-day decision making based on the health of our assets.

Our current support contracts and product roadmaps provide an indication of when the required system will be approaching end of life or support and as technology evolves, we will review opportunities to consolidate and simplify our current IT systems and infrastructure as part of a refresh or replacement decisions. The below figure demonstrates the relative asset health of our core capabilities and is a key driver for the timing of our investment plan.

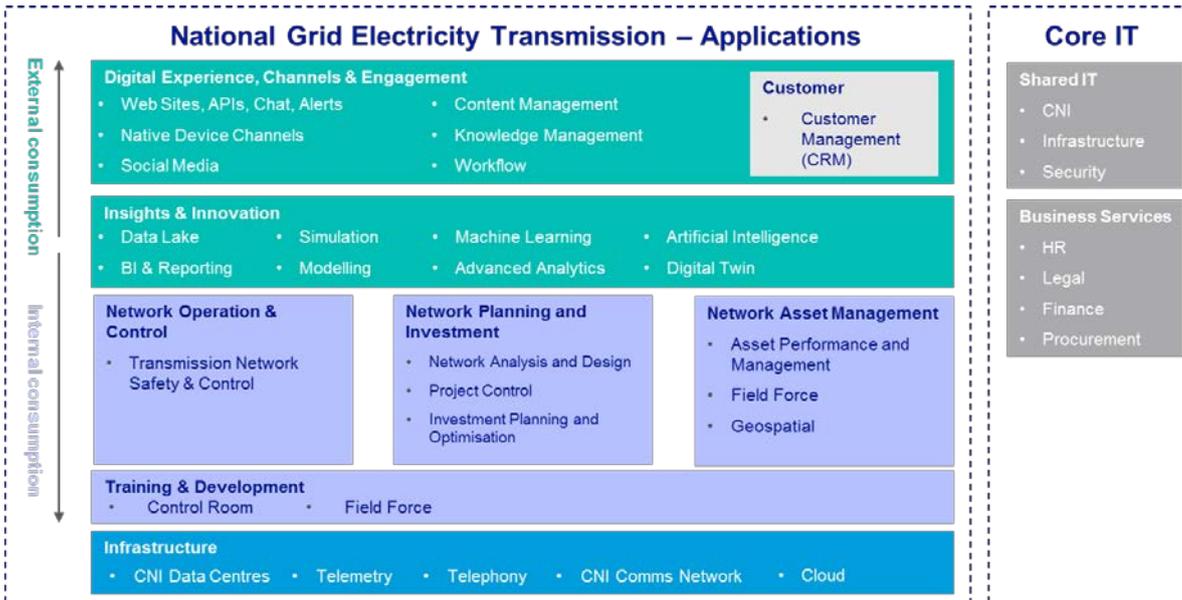


ET Technology Asset Health Heatmap 2019

In the lead up to each end of life scenario we will conduct a detailed assessment of the system to derive one or more of the following decisions:

- Refresh current system and move to the latest supported version.
- Replace with a new system to support change in business requirement / capability needs.
- Decommission systems where requirement no longer exists or functionality has been replaced by another system following a refresh or replacement.
- Consolidate multiple systems to drive efficiencies and align to future IT enterprise architecture.

The diagram below shows our IT landscape, with each box representing the key platforms for Electricity Transmission. A platform is a group of technologies that work together to provide a basis to build applications or services to meet multiple needs. Infrastructure, core IT and significant investments (Ellipse, iEMS) are covered in separate justification reports.



Background Information

Our proposed RIIO-T2 investments were market tested against industry benchmarks by Gartner, both in terms of business requirement and forecast cost. As a result, some projects were combined to offer delivery efficiencies, and in the majority of cases where costs were above benchmark, the costs were revised to align with benchmark costs.

Proposed IT investments are challenged and reviewed by the Electricity Transmission Investment Committee to test the need case, delivery approach and efficiency of forecast costs. Sanctioned projects are then allocated to a suitable framework provider, who has been appointed through a competitive process.

The below details each of ET’s IT capabilities and represents the future state capabilities of the business.

Asset Performance Management

Scope and Investment Driver

Understanding the condition and failure mode of our assets is key to ensuring we maintain reliability and risk across the electricity network. In RIIO-T1 we developed the Strategic Asset Management (SAM) platform, with approximately £27.5m of allowed funding, to combine condition monitoring data with asset information, operational conditions and maintenance history. This enabled the development of a comprehensive, preventative maintenance, monitoring and replacement plan, resulting in more efficient asset management. The platform was first developed as part of an innovation project in 2004 and in 2011 IBM were contracted to develop a full corporate solution. This was transitioned to our Insights platform in 2018 to mitigate the IT asset health of SAM, reduce IT license costs and improve flexibility of future development. There will be no activities deferred to RIIO-T2.

In RIIO-T2 our primary investment driver will be to maintain the asset health of our APM solution that utilises the Insights platform, Optimiser and outsourced analysis and allow for the onboarding of an increasing amount and variety of data before moving to an integrated industry standard APM tool towards the end of the regulatory period. The timelines are consistent with our asset health policy and supports our overall approach to providing a safe and reliable network.

Investment Costs, Benchmark and Cost Profile

| Asset Performance Management | | | | | | | Bencharking |
|------------------------------|---------|---------|---------|---------|---------|--------------|-------------|
| Investment (£m) | FY21/22 | FY22/23 | FY23/24 | FY24/25 | FY25/26 | Totals | |
| CAPEX | 1.3 | 1.33 | 2.11 | 4.45 | 4.25 | 13.47 | In range |

This consists of three projects with the largest being [REDACTED] to move to an industry standard APM tool at the end of RIIO-T2 when our current bespoke tool reaches its end of life. The costs are within the Gartner recommendation based on equivalent projects in the Gartner database. The costs are estimated based on equivalent technology health projects in T1 and the expected Insight platform development required to cater for an increase in condition monitoring activities.

Options

| Option Description | Benefits | Negatives |
|--|---|--|
| Minimal asset health investment – Run systems past end of life dates and use third party support in RIIO-2. Do not develop core systems | <ul style="list-style-type: none"> Lower Capex investment required. | <ul style="list-style-type: none"> As outlined in our IT Asset Health policy an increased exposure to risks including; cyber threat, business disruption and poor user experience. Would not respond to requirements for an increase in condition monitoring activities and would likely drive data analytic activities outside of core systems resulting in reduced productivity and increase Opex. |
| Update systems to supported levels in line with manufacturer support roadmaps and continue to develop core systems on a value case driven approach (RECOMMENDED) | <ul style="list-style-type: none"> Standard system refreshes only, allowing system to remain operational and supportable in line with our IT Asset Health policy. Enables ET to continue to meet the minimum safety and condition monitoring requirements Expected reduction in TOTEX from increase in condition monitoring activities | <ul style="list-style-type: none"> Higher Capex investment required |

Asset Investment Planning

Scope and Investment Driver

Asset Investment Planning (AIP) tools cover all capabilities that allow ET to optimise their portfolio of investments. Given the large scale of investment proposed in RIIO-T2, these set of capabilities are fundamental to our commitment to deliver our plans as efficiently as possible. Allowances for AIP tools was minimal in RIIO-T1 (£0.4m) but through our Asset Management Planning and Delivery Programme (AMPD) we delivered Oracle Primavera Portfolio Management (OPPM), Single View of the Plan (SVOP) and later our Portfolio and Circuit Optimisation tool, Optimiser. Although part of a larger programme this was approximately £10m across 2014-19. This allowed ET to move away from a tactical solution of workflow and basic interaction management software to standard investment portfolio management and optimisation solutions. It also introduced sophisticated visualisation for all works in our planning and delivery teams.

In RIIO-T2 our primary investment driver will be to move away from generic portfolio management tools and consolidate the AIP landscape on an "asset aware portfolio management" product. This will drive a large part of the investment 2022-24. The timelines are consistent with our asset health policy and supports our overall approach to providing a safe and reliable network.

Investment Costs, Benchmark and Cost Profile

| Asset Investment Planning | | | | | | | Totals | Benchmarking |
|---------------------------|---------|---------|---------|---------|---------|--------------|--------------|--------------|
| Investment (£m) | FY21/22 | FY22/23 | FY23/24 | FY24/25 | FY25/26 | | | |
| CAPEX | 0.25 | 4.53 | 4.28 | 1.13 | 1.13 | 11.32 | Out of range | |

The costs are outside of Gartner’s recommendation based on equivalent projects in the Gartner database. This is largely driven by a £5.8m difference in our plan to consolidate ET’s investment portfolio management tool (OPPM) and the Single View of the Plan (SVOP) into one platform alongside ET’s Portfolio Optimisation tool (Copperleaf). Gartner considered standard AIP implementations in comparable industries however the heavy customisation of SVOP and OPPM would increase the complexity of migration to a new tool. The

forecasts have been built using costs from both the implementation and recent enhancement projects on both platforms.

Options

| Option Description | Benefits | Negatives |
|---|---|---|
| Minimal asset health portfolio management, maintain comparatively high ET resource requirements to manually capture and process data | <ul style="list-style-type: none"> Lower Capex investment required. | <ul style="list-style-type: none"> As outlined in our IT Asset Health policy an increased exposure to risks including; cyber threat, business disruption and poor user experience. Would constrain ability to deliver ET's capital programmes efficiently, impacting network reliability and performance. |
| <p>Update systems to supported levels in line with manufacturer support roadmaps and continue to develop core systems on a value case driven approach</p> <p>Move away from generic portfolio management tools and consolidate AIP landscape to one or two "asset aware portfolio management" products at appropriate time (RECOMMENDED)</p> | <ul style="list-style-type: none"> In addition to having a fully operational and supported system, we will enhance our reactive maintenance and investment planning capability. In addition to the above, we can enable a safer and more efficient process to managing the network that will better support ageing infrastructure. Required to support the NARMS methodology. Better enabled to exceed stakeholder requirements. Enable optimisation of the type and timing of asset interventions to realise greatest value from assets. Improved safety and reliability due to sophisticated asset risk modelling and condition assessment. | <ul style="list-style-type: none"> Higher Capex investment required |

Digital Experience

Scope and Investment Driver

This covers an integrated set of technologies, based on a common platform, that provides employees and external audiences (stakeholders and customers) with consistent, secure and personalised access to information and applications across many digital touchpoints.² This section covers technology that supports employees as external audience technology is captured in the CRM section and the Transform justification report A14.13. Ensuring our employees, whether they are in the field or the back office, have a simple and efficient experience is critical to ensuring we can serve our customers and consumers efficiently.

In RIIO-T1 we developed the Transmission Front Office (TFO) and deployed mobile devices, with approximately £13m of allowed funding, to develop a suite of mobile applications for the field force to manage their day to day tasks. This allowed a move from a largely manual and paper based system and supported efficiency improvements in the field. There are approximately 15 applications in the field that will require consolidation and in RIIO T2 we will put in place a digital experience platform to improve internal and external interactions, and to support overall employee experience.

Investment Costs, Benchmark and Cost Profile

| Digital Experience | | | | | | | Bencharking |
|--------------------|---------|---------|---------|---------|---------|--------------|-------------|
| Investment (£m) | FY21/22 | FY22/23 | FY23/24 | FY24/25 | FY25/26 | Totals | |
| CAPEX | 3.21 | 2.86 | 4.04 | 4.94 | 3.82 | 18.87 | In range |

² Note, this investment is focused on apps while the separate End-User Compute investment is focused on the devices that access these apps.

This consists of five investment lines with the most significant developing the field force work management applications and supporting mobile platform. The costs are inside of Gartner’s recommendation based on equivalent projects and user numbers in the Gartner database.

Options

| Option Description | Benefits | Negatives |
|--|--|--|
| Minimal investment but comparatively high resource requirements to manually process tasks. | <ul style="list-style-type: none"> Lower Capex investment required. | <ul style="list-style-type: none"> As outlined in our IT Asset Health policy an increase exposure to risks including; cyber threat, business disruption and poor user experience. Likely increase in IT Opex to mitigate end of life applications. Would constrain ability to deliver ET’s work efficiently, impacting network reliability and performance. |
| Update systems to supported levels in line with manufacturer support roadmaps and continue to develop core systems on a value case driven approach (RECOMMENDED) | <ul style="list-style-type: none"> Highly scalable architecture Improved user experience Enables future innovation, particularly in the field. Maintains mobile field force capabilities for substation and overhead line teams. Delivers personalised content, showing the right content at the right time, to the right individuals | <ul style="list-style-type: none"> Higher Capex investment required |

Transmission Network Safety and Control

Scope and Investment Driver

The Transmission Network Control Centre (TNCC) was established in 2013 with the merging of electricity safety switching tasks, carried out by the Network Operations Centre (NOC) at Warwick, and operational switching that was carried out at the ENCC at Wokingham. Its primary system is iEMS which is covered in justification report A.14.10. This section covers all capabilities outside of iEMS.

There was limited investment made to integrate TNCC with the wider ET landscape in RIIO-T1 and most of the allocated £4.1m funding was associated with field force safety management and telephony systems that support the control centre. In RIIO-T2 our investment drivers are to maintain the health of the Control Centre’s critical systems, decouple systems that are shared with ESO and integrate TNCC into the wider ET landscape.

Investment Costs, Benchmark and Cost Profile

| Transmission Network Safety and Control | | | | | | | Benchmarking |
|---|---------|---------|---------|---------|---------|--------------|--------------|
| Investment (£m) | FY21/22 | FY22/23 | FY23/24 | FY24/25 | FY25/26 | Totals | |
| CAPEX | 2.13 | 2.13 | 2.5 | 3 | 1.5 | 11.26 | In range |

This consists of five investment lines and excludes investment in iEMS which is covered in justification report A.14.10. The costs are within the Gartner recommendation based on equivalent projects in the Gartner database. The costs are estimated based on equivalent technology health projects in T1.

Options

| Option Description | Benefits | Negatives |
|--|--|---|
| Minimal asset health investment, run systems past end of life dates and use third party support in RIIO-2. Do not develop core systems | <ul style="list-style-type: none"> Lower Capex investment required. | <ul style="list-style-type: none"> As outlined in our IT Asset Health policy an increased exposure to risks including; cyber threat, business disruption and poor user experience. |
| Update systems to supported levels in line with manufacturer support roadmaps and continue to develop core systems on a value case driven approach (RECOMMENDED) | <ul style="list-style-type: none"> Standard system refreshes only, allowing system to remain operational and supportable in line with our IT Asset Health policy. | <ul style="list-style-type: none"> Higher Capex investment required |

Project Control and Delivery

Scope and Investment Driver

This covers several capabilities relating to our Capital Delivery organisation such as project scheduling and delivery, resource management, Cost management and control and project delivery assessment and performance analysis. Very little was funded explicitly for Capital Delivery in RIIO-T1 with £0.5m allocated for Primavera. The forecast to maintain core systems and capabilities in RIIO-T1 is £7m with nothing deferred to RIIO-T2. These capabilities are key to maintaining and improving the Capital Delivery project budgeting and forecasting, cost management and control and overall project delivery assessment and performance analysis. Doing so underpins ET's commitment to renew and modernise the ageing network as well as making it easier and more cost effective for Customers to connect to the network.

In RIIO-T2 our primary investment driver will be to;

- Maintain the asset health of Primavera P6 as a core project scheduling and delivery tool.
- Implement a robust solution for project delivery assessment, performance analysis and decommission COBRA etc.
- Enable a mobile workforce for effort and cost tracking and collaboration.
- Develop a centralised capability to manage collaboration, knowledge share and search capabilities.

Investment Costs, Benchmark and Cost Profile

| Project Control and Delivery | | | | | | | Benchmarking |
|------------------------------|---------|---------|---------|---------|---------|-----------|--------------|
| Investment (£m) | FY21/22 | FY22/23 | FY23/24 | FY24/25 | FY25/26 | Totals | |
| CAPEX | 1 | 1.5 | 2 | 2.75 | 2.75 | 10 | In range |

This consists of four investment lines covering contract management, cross project collaboration, project delivery and reporting and analytics. The costs are within the Gartner recommendation based on equivalent projects in the Gartner database. The costs are estimated based on equivalent technology health projects in T1.

Options

| Option Description | Benefits | Negatives |
|--|--|--|
| Minimal asset health investment – Run systems past end of life dates and use third party support in RIIO-2. Do not develop core systems | <ul style="list-style-type: none"> Lower Capex investment required. | <ul style="list-style-type: none"> As outlined in our IT Asset Health policy an increase exposure to risks including; cyber threat, business disruption and poor user experience. |
| Update systems to supported levels in line with manufacturer support roadmaps and continue to develop core systems on a value case driven approach (RECOMMENDED) | <ul style="list-style-type: none"> Standard system refreshes only, allowing system to remain operational and supportable in line with our IT Asset Health policy. | <ul style="list-style-type: none"> Higher Capex investment required |

Enterprise Asset Management

Scope and Investment Driver

Enterprise Asset Management covers all systems that manage the work scheduling and aspects of the mobile workforce. The cost included in this paper excludes Ellipse which is covered in justification report A1.14. Funding in RIIO-T1 was approximately £38.9m including refreshes of Ellipse. At that time the submission was not broken down into enough detail to compare directly with this capability but overall there was a heavy investment in RIIO-T1 (approx. £50m) comprising the upgrade of Ellipse from V6 to V8 and surrounding applications, implementation of the Transmission Front Office and refresh of scheduling and planning capabilities. In RIIO-T2, our field force work management applications will be nearing end of life, creating a risk to our ability to carry out asset health maintenance programmes whilst increasing running costs and performance issues of the IT system. We will therefore refresh our Work Management Systems to ensure the safe and efficient management of our assets. Due to the similar nature of work, we share our core work management systems with NGG for synergies and efficiencies.

Investment Costs, Benchmark and Cost Profile

| Enterprise Asset Management | | | | | | | Benchmarking |
|-----------------------------|---------|---------|---------|---------|---------|------------|--------------|
| Investment (£m) | FY21/22 | FY22/23 | FY23/24 | FY24/25 | FY25/26 | Totals | |
| CAPEX | 1.35 | 0.45 | 0 | 2.25 | 3.75 | 7.8 | In range |

This consists of three investments lines, excluding Ellipse. The largest investment is in the work management and scheduling landscape at the end of RIIO-T2 at a cost of █. The costs are within the Gartner recommendation based on equivalent projects in the Gartner database. The costs are estimated based on equivalent technology health projects in T1.

Options

| Option Description | Benefits | Negatives |
|--|--|--|
| Minimal asset health investment – Run systems past end of life dates and use third party support in RIIO-2. Do not develop core systems | <ul style="list-style-type: none"> Lower Capex investment required. | <ul style="list-style-type: none"> As outlined in our IT Asset Health policy an increase exposure to risks including; cyber threat, business disruption and poor user experience. |
| Update systems to supported levels in line with manufacturer support roadmaps and continue to develop core systems on a value case driven approach (RECOMMENDED) | <ul style="list-style-type: none"> Standard system refreshes only, allowing system to remain operational and supportable in line with our IT Asset Health policy. | <ul style="list-style-type: none"> Higher Capex investment required |

Comprehensive Integration Platform

Scope and Investment Driver

Comprehensive Integration Services (CIS) is an integration platform that allows us to create consistent, efficient and centrally operated exchange of data between systems and services (both Internal and external to NG). The current integration platform has separate components for data integration (Data stage), application integration (Fusion and PI) and limited capability to integrate time series data or videos/images captured from different locations. This use case is to deliver an integration platform as a service over Cloud to support all use cases and thereby driving consolidation.

As ET's understanding of its asset condition matures during RIIO-T2, we will look more to leveraging data across multiple systems to enable ET to make informed tactical and strategic decisions. Continued investment in this capability ensures that data flows between systems are maintained to meet service levels and security requirements. The continued investment enables ongoing reuse of designs and helps to minimise the impact of large changes across the systems landscape.

Investment Costs, Benchmark and Cost Profile

| Comprehensive Integration Platform | | | | | | | Benchmarking |
|------------------------------------|---------|---------|---------|---------|---------|-------------|--------------|
| Investment (£m) | FY21/22 | FY22/23 | FY23/24 | FY24/25 | FY25/26 | Totals | |
| CAPEX | 1.5 | 2.41 | 2.02 | 0.33 | 0.33 | 6.59 | In range |

This consists of three investment lines with the most significant the initial delivery of iPaaS at [REDACTED]. The costs are within Gartner's recommendation based on equivalent projects in the Gartner database. This is based on a large platform implementation and integration projects costed and ongoing maintenance and enhancement @ 15% per annum.

Options

| Option Description | Benefits | Negatives |
|--|---|--|
| Minimal asset health and increase ET resources to manually capture data | <ul style="list-style-type: none"> Lower Capex investment required. | <ul style="list-style-type: none"> As outlined in our IT Asset Health policy an increase exposure to risks including; cyber threat, business disruption and poor user experience. Would constrain ability to deliver ET's capital programmes efficiently, impacting network reliability and performance. |
| Update systems to supported levels in line with manufacturer support roadmaps and continue to develop core systems on a value case driven approach Move to an API centric integration platform and governance rather than service centric (RECOMMENDED) | <ul style="list-style-type: none"> Hybrid integration platform (both data and application integration) are becoming increasingly prevalent, offering ET a consolidation opportunity. This will allow different types of data integration and application to be integrated together. Reduced Opex expected from reduction costly and complex integration changes currently seen. | <ul style="list-style-type: none"> Higher Capex investment required |

Geospatial Information System

Scope and Investment Driver

Because we run and maintain assets both above and underground, it is essential that we can visualise where our assets are and the environment around them. This ensures that we can keep members of the public and our employees safe by understanding the location and risks associated with our assets.

Geospatial Information System (GIS) provides a map-based view of our assets, allowing us to understand proximity to other features such as housing, river crossings, motorways and the topography of the land and enabling us to specifically record where issues with our assets are. This enables us to provide information to customers and other third parties and minimise risk of third party damage/injury. In RIIO-T1 we implemented ESRI and GeoCortex and decommissioned several satellite mapping applications. Funding was approximately £1.1m in RIIO-T1 though investment far exceeded that at approximately £7m. This was driven by the need to consolidate multiple solutions and reduce Opex.

Beyond 2022 the technology risk surrounding these solutions will demand additional investment as current solution reaches end of life. This will also provide an opportunity to improve the capability further to better understand and visualise risk, hazard and asset health to drive business efficiency and safety.

Our strategy for the RIIO-2 period is centred around sustaining performance of our current GIS solution whilst broadening the range of applications exploiting the existing functionality. By designing new processes and performing data collection projects using field staff we can further resolve data accuracy and integrity issues, delivering an improvement in spatial data location quality. We will also develop further Geospatial reporting and layers and deliver an improved capability to manage modern data types, such as LIDAR and 3D models, more effectively. This will allow us to better visualise our assets and make it part of the overall digital experience for our users. GIS is required to support the implementation of recommendations of the Energy Data Task Force (EDTF).

Investment Costs, Benchmark and Cost Profile

| Geospatial Information System | | | | | | | Benchmarking |
|-------------------------------|---------|---------|---------|---------|---------|-------------|--------------|
| Investment (£m) | FY21/22 | FY22/23 | FY23/24 | FY24/25 | FY25/26 | Totals | |
| CAPEX | 4.57 | 0.22 | 0.22 | 0 | 0 | 5.01 | Above range |

This consists of three investment lines with the largest being the management of the technology risk of the current GIS platform at [REDACTED] (which is within range). The costs are slightly above the Gartner recommendation based on equivalent projects in the Gartner database because of the complexity of current types. The costs are estimated based on equivalent technology health projects in T1.

Options

| Option Description | Benefits | Negatives |
|--|---|---|
| Minimal investment – Run systems past end of life dates and use third party support in RIIO-2 Period. | <ul style="list-style-type: none"> Lower Capex investment required. | <ul style="list-style-type: none"> Increased risk to consumer benefits, impacting reliability and safety. Creating significant safety risk to employees and public. ET at risk of breaching safety compliance and legislation. Exposed to risks including; cyber threat, business disruption, poor productivity, poor user experience and increased Opex. Limits our ability to implement EDTF recommendations. |
| Invest to maintain systems to supported levels, in line with manufacturer support roadmaps, and delivery of required enhancements. (RECOMMENDED) | <ul style="list-style-type: none"> Systems and capabilities to remain safe, efficient, operational and supportable in line with our IT Asset Health policy. Enables ET to meet safety requirements and remain compliant. Additionally, this investment will enable opportunities for better safety and risk management, as we leverage improvements and enhancements in the GIS capability. | <ul style="list-style-type: none"> Increased Capex investment required. |

Insights

Scope and Investment Driver

Our Insights platform and data lake implemented during RIIO-1 gave ET the foundational capability to perform analytics against consolidated data from multiple different systems. It offers a platform to perform information management, advanced modelling and analysis of our asset data and underpins critical operational and financial information in ET. No direct funding was associated with Insights in RIIO-T1. As ET looks to move to more mature asset management models (time, condition, risk, predictive and financially optimised), the increased use of data and analytics to enable informed decision making will be essential. Our Insights platform also provides our core reporting to support asset management decision making as well as the efficient and safe operation of our network. We use the platform to ensure the governance of our data and create quality rules and metrics to enable us to improve our datasets.

In RIIO-T2 we see an increase in the amount and diversity of data we will capture as we on-board new sources of data and make use of unstructured data to better understand our asset infrastructure and respond to the challenge Ofgem has set the industry with respect to data effectiveness and analysis.³ We will therefore need to invest in the technology health of these systems and plan to build out from this capability over the RIIO-2 period to maintain the current network and meet the levels of service expected by our stakeholders. This will be achieved by bringing together and building on the foundations of the Insights platform and existing analytics capabilities, with additional data capabilities through Asset Performance Management (APM) and Asset Investment Portfolio Optimisation (AIP). Our Insights platform is a key component of our digitalisation strategy enabling us to harvest and analyse asset and other data to deliver EDTF recommendations and meet customer and stakeholder requirements.

Investment Costs, Benchmark and Cost Profile

| Insights | | | | | | | Totals | Benchmarking |
|-----------------|---------|---------|---------|---------|---------|-------------|-------------|--------------|
| Investment (£m) | FY21/22 | FY22/23 | FY23/24 | FY24/25 | FY25/26 | | | |
| CAPEX | 1.95 | 0 | 0.38 | 0.38 | 1.4 | 4.11 | Above range | |

This consists of four investment lines with the largest being the management of the technology risk of the current Insights platform at █████ – an activity Gartner was unable to benchmark. The other costs are slightly above the Gartner recommendation based on equivalent projects in the Gartner database. The costs are estimated based on equivalent technology health projects in T1.

Options

| Option Description | Benefits | Negatives |
|--|--|---|
| Minimal investment – Run systems past end of life dates and use third party support in RIIO-2 Period. | <ul style="list-style-type: none"> Lower Capex investment required. | <ul style="list-style-type: none"> Increased risk to consumer benefits, impacting reliability and safety. Creating significant safety risk to employees and public. ET at risk of breaching safety compliance and legislation. Exposed to risks including; cyber threat, business disruption, poor productivity, poor user experience and increased Opex |
| Invest to maintain systems to supported levels, in line with manufacturer support roadmaps, and delivery of required enhancements. (RECOMMENDED) | <ul style="list-style-type: none"> Systems and capabilities to remain safe, efficient, operational and supportable in line with our IT Asset Health policy. Removes requirements of additional resources and | <ul style="list-style-type: none"> Increased Capex investment required. |

³ See for example: <https://www.ofgem.gov.uk/publications-and-updates/modernising-energy-data-digitalisation-strategy>.

| | | |
|--|---|--|
| | investment on assets to maintain network availability and safety. <ul style="list-style-type: none"> • Ability to provide early insights into asset performance, resulting in decreased risk to network reliability and safety. • Key component of digital strategy delivering service improvements and efficiencies to our customers | |
|--|---|--|

Network Asset Design

Scope and Investment Driver

Our Network Analysis and Design (NAD) systems provide capabilities that perform network, engineering design (physical) for optioneering, cost estimation and management of construction delivery. We use a shared system with ESO to provide a fit for purpose network model and to conduct analysis on the network. Our focus in ET is to understand the impact in the long term by assessing various scenarios that will better inform any investment decisions and changes to our assets and network. This provides the capability to demonstrate managing statutory and legal requirements for network configuration and Investment Planning to meet customer needs.

In RIIO-T2 our investment driver will be to

- Maintain the health of current NAD capabilities (e.g. DigSILENT Powerfactory)
- Look to logically separate from ESO where viable and cost effective
- Explore enhancements that support improved engagement with DNOs and deliver reduced connection times for customers.
- Respond to changes in modelling and analysis requirements due to changes in supply and demand characteristics.

Investment Costs, Benchmark and Cost Profile

| Network Asset Design | | | | | | | Benchmarking |
|----------------------|---------|---------|---------|---------|---------|-------------|--------------------|
| Investment (£m) | FY21/22 | FY22/23 | FY23/24 | FY24/25 | FY25/26 | Totals | |
| CAPEX | 2.0 | 1.63 | 0.38 | 1.65 | 1.65 | 7.31 | Above range |

This consists of four investment lines with the largest being the management of the asset health of the current Powerfactory platform at █. The costs are slightly above the Gartner recommendation based on equivalent projects in the Gartner database. The costs are estimated based on equivalent technology health projects in T1.

Options

| Option Description | Benefits | Negatives |
|--|---|---|
| Minimal investment – Run systems past end of life dates and use third party support in RIIO-2 Period. | <ul style="list-style-type: none"> • Lower Capex investment required. | <ul style="list-style-type: none"> • Exposed to risks including; cyber threat, business disruption, poor productivity, poor user experience and increased Opex |
| Invest to maintain systems to supported levels, in line with manufacturer support roadmaps, and delivery of required enhancements. (RECOMMENDED) | <ul style="list-style-type: none"> • Systems and capabilities to remain safe, efficient, operational and supportable in line with our IT Asset Health policy. • Integrated process and visualisation for network analysis and investment planning resulting in effective management of upstream network management process. | <ul style="list-style-type: none"> • Increased Capex investment required. |

| | | |
|--|---|--|
| | <ul style="list-style-type: none"> Improved capability of "System Design" and use of BIM across delivery and maintenance to reduce operational cost Model and analyse network resilience to an increasing risk of external threats. | |
|--|---|--|

Enterprise Content Management

Scope and Investment Driver

This scope covers document and records management, content collaboration, content discovery and content integration. Our Enterprise Content Management solution (Opentext) is the system of record for critical drawing and technical documentation across both ET and GT. It supports a wide range of areas in the business across asset strategy, planning and delivery. In RIIO-T1, we were funded £4.1m for a mix of enhancements and upgrades for this system. We have recently completed a previous upgrade and no investment will require deferral into the next regulatory period. In RIIO-T2 our investment driver will be to:

- Maintain the asset health of the current systems
- Improve enterprise content search allowing users to search across multiple core, but disparate, systems.
- Reduce manual processing of unstructured content (Videos, images, design, drawings) through auto recognition, analysis and processing.

Investment Costs, Benchmark and Cost Profile

| Enterprise Content Management | | | | | | | Benchmarking |
|-------------------------------|---------|---------|---------|---------|---------|-------------|--------------------|
| Investment (£m) | FY21/22 | FY22/23 | FY23/24 | FY24/25 | FY25/26 | Totals | |
| CAPEX | 0.2 | 0.73 | 1.78 | 0.2 | 0.2 | 3.11 | Above range |

This consists of two investment lines with the largest being the management of the current Opentext platform at █. The costs are slightly above the Gartner recommendation based on equivalent projects in the Gartner database due to the requirement to implement various workflows which exist in the current solution and controls required to safeguard intellectual property and collaborate with third parties and suppliers. The costs are estimated based on equivalent technology health projects in T1.

Options

| Option Description | Benefits | Negatives |
|--|---|---|
| Minimal investment – Run systems past end of life dates and use third party support in RIIO-2 Period. | <ul style="list-style-type: none"> Lower Capex investment required. | <ul style="list-style-type: none"> Risk of impact to reliability, safety and overall network capability in the absence of a secure and reliable solution to store and access business critical documentation used to manage the network. National Grid non-compliant with legislation. Exposed to risks including; cyber threat, business disruption, poor productivity, poor user experience and increased Opex |
| Invest to maintain systems to supported levels, in line with manufacturer support roadmaps, and delivery of required enhancements. (RECOMMENDED) | <ul style="list-style-type: none"> Systems and capabilities to remain safe, efficient, operational and supportable in line with our IT Asset Health policy. Integrated process and visualisation for network analysis and investment planning resulting in effective management of upstream network management process. Improved capability of "System Design" and use of BIM across | <ul style="list-style-type: none"> Increased Capex investment required. |

| | | |
|--|--|--|
| | delivery and maintenance to reduce operational cost <ul style="list-style-type: none"> • Effective management and impact assessment of policy changes to deliver asset management efficiencies. | |
|--|--|--|

Customer Relationship Management

Scope and Investment Driver

In RIIO-T1, no funding was allocated for CRM or website development in ET. In 2017, following the rapid decentralisation and decarbonisation of the electricity network, the ESO/ET separation and resulting challenge of making it easy to connect customers to the network, ET invested in a CRM platform for basic customer interaction management and in a standalone website and Portal.

In RIIO-T2, our CRM system will underpin how we manage our entire customer connection process. We will need to invest to include more parts of the journey within the CRM system to make sure we can offer a simple and flexible end-to-end service to customers. The CRM system will allow us to more efficiently manage the approximately [REDACTED] we are forecasting to invest connecting customers to the network in the T2 period and to provide timely connections. Our research and recent experience has found the CRM system to be the most efficient and effective way to manage customer data and processes. The CRM system will also underpin our website and proposed Customer Portal investments.

Equally, there are areas of our business that interact with customers outside of the connection process, such as asset protection, the Transmission Network Control Centre (TNCC), outages and land management. Each type of customer expects a different service and experience from us. Our investment driver is to bring these interactions into the CRM system so that we can provide a more complete customer experience – this is a result of direct feedback from our customers. CRM is a fundamental enabler for our ambitious customer experience strategy.

Investment Costs, Benchmark and Cost Profile

| Customer Relationship Management | | | | | | | Benchmarking |
|----------------------------------|---------|---------|---------|---------|---------|------------|--------------------|
| Investment (£m) | FY21/22 | FY22/23 | FY23/24 | FY24/25 | FY25/26 | Totals | |
| CAPEX | 2.3 | 1.9 | 1.9 | 1.9 | 1.9 | 9.9 | Above range |

This consists of three investment lines with the investment in our CRM platform to support the connection of new customers the largest at [REDACTED]. The costs are above the Gartner recommendation based on equivalent projects in the Gartner database however the costs are estimated based on costs of the recent Salesforce implementation and website and Customer Portal (ConnectNow) projects.

Options

| Option Description | Benefits | Negatives |
|---|--|--|
| Minimal investment – Run systems past end of life dates and do not embed CRM functionality further into Customer processes. | <ul style="list-style-type: none"> • Lower Capex investment required. | <ul style="list-style-type: none"> • Year in year increase in manual activity and Opex expected to manage increasing complexity and volume of customer connections. • Likely reduction in customer experience metrics. • Likely increase in time to connect as key customer processes and data are managed outside core systems. • Risk of impact to reliability, safety and overall network capability in the absence of a secure and reliable solution to store and access business critical documentation used to manage the network. |

| | | |
|--|---|---|
| <p>Invest to maintain systems to supported levels, in line with manufacturer support roadmaps, and delivery of required enhancements. (RECOMMENDED)</p> | <ul style="list-style-type: none"> • In line with commitment to make it easy for customers to connect and use the network. • Make Customer central to ET's processes through a digital transformation of associated data and processes. | <ul style="list-style-type: none"> • Increased Capex and Opex investment required. |
|--|---|---|

Optioneering

The following three options are to be considered for each system as they approach the end of their life or support arrangements:

- A. Do nothing – continue to run the current system versions
- B. Defer until RIIO-T3 – would likely include some small investment throughout T2, with the majority spend coming in T3
- C. Refresh or replace current solution – upgrade to the latest version of the system or move to a new, best in class, strategic solution where warranted. **(recommended)**

To assess options we have developed a set of criteria:

- Total cost of ownership – capital investment and associated operating costs borne by consumers
- Capacity to deliver - the level of risk associated with the ability of NG and our supply chain to deliver the option
- Business/strategic fit - the alignment of this option to our overall business direction and other planned investments
- Addressing the problem – how well the option resolves the identified issue
- Risk – the overall risk to the business associated with this option

| Option | * Total Cost of Ownership | Business / Strategic Fit | Risk | Status |
|------------------------------------|---|--|---|--------------------|
| A) Do Nothing | RED <ul style="list-style-type: none"> Likely increase in ongoing Opex costs for support. Likely increase in year on year remediation investment. Likely increase in parallel IT costs such as integration. | RED <ul style="list-style-type: none"> Would place core business processes at risk as system ages. Would expect cyber risk to increase year on year. Would not support any changes in future ET requirements ET put at risk of not being able to meet stakeholder priorities ET unable to deliver asset health plan Foundational systems to support future innovation and enhancement of business capability will not be in place. | HIGH <ul style="list-style-type: none"> Software components will exceed end of life, and / or, product will reach end of life and the vendor may withdraw support for all components. Would put the safety of our employees and public at risk due to not having the right information to hand at the right time to make the most effective decisions. System health issues would increase and would become a serious risk to the business. Exposure to non-compliance for legal and regulatory requirements. System security compromised and cyber threat to application and other systems increased. | REJECTED |
| B) Deferral until RIIO-T3 | RED <ul style="list-style-type: none"> Likely increase in ongoing Opex costs for support. Likely increase in year on year remediation investment. Likely increase in parallel IT costs such as integration. | RED <ul style="list-style-type: none"> Would place core business processes at risk as system ages. Would expect cyber risk to increase year on year. Would not support any changes in future ET requirements ET put at risk of not being able to meet stakeholder priorities until RIIO T3 ET unable to deliver asset health plan until RIIO T3 Foundational systems to support future innovation and enhancement of business capability will not be in place | HIGH <ul style="list-style-type: none"> Software components will exceed end of life, and / or, product will reach end of life and the vendor may withdraw support for all components. Would put the safety of our employees and public at risk due to not having the right information to hand at the right time to make the most effective decisions. System health issues would increase and would become a serious risk to the business. Exposure to non-compliance for legal and regulatory requirements for the duration of RIIO T2. System security (as above). | REJECTED |
| C) Refresh or Upgrade in T2 | AMBER <ul style="list-style-type: none"> Capex investment required to deliver refresh or replacement Opex to remain neutral or target reduction | GREEN <ul style="list-style-type: none"> Opportunity to align systems with IT enterprise architecture | GREEN <ul style="list-style-type: none"> System will remain fully supported up until future refresh or replacement period | RECOMMENDED |

| | | | | |
|--|--|--|---|--|
| | <ul style="list-style-type: none"> Progressive resource and efficiency savings expected through deployment of new systems and processes | <ul style="list-style-type: none"> Opportunity to align to business strategy Opportunity to consolidate, drive efficiencies, productivity and a better experience for our customers Deliver asset health plan and stakeholder commitments in RIIO T2 Ensures the safety of our employees and the public. Keep our systems and network protected from Cyber risk | <ul style="list-style-type: none"> Would address all projected system health issues. Adherence to legal and regulatory requirements | |
|--|--|--|---|--|

Key Assumptions, Risks and Dependencies

Assumptions

- Key business capability requirements will remain generally unaltered
- Investments in technology remains aligned to current vendor roadmaps e.g. SaaS offerings and releases
- ET and GT will continue to share common platforms in RIIO-T2
- Software versions maintained in line with corporate IT asset health polices
- SaaS products subscription costs based upon volumetrics such as number of users or number of transactions remain largely unchanged as no provision for increases are made

Risks

| Risk | Mitigation |
|---|---|
| Cyber and security breaches | Ensure all systems are maintained to latest vendor released versions in a timely manner. Maintain a strong cyber capability within National Grid which regularly assesses the IT landscape for vulnerabilities |
| Avoid financial and reputational penalties | Ensure all systems are maintained to latest vendor released versions in a timely manner. Will ensure the latest patches to cover any changes as a result of legal and legislation requirements |
| Unable to unlock new value | Ensure all systems are maintained to latest vendor released versions in a timely manner. Will reduce the mean time to value in enabling new functionality that automate tasks and assist in releasing ET working to work on higher value tasks. |
| Loss of talent - lack of enablement | Ensure a program of continual improvement is implemented to help retain talent and knowledge within National Grid. |
| Erode the efficiencies made in RIIO T1 | Ensure the IT systems evolve with the business requirements over time to prevent the formulation of offline processes |

Dependencies

- Reliance upon the business change transformation agenda to align changes in business process, culture and behaviours to support in leverage of new technology
- Reliance upon data enhancement strategy in parallel with new system and processes
- Reliance upon vendor product development delivering against roadmaps

Conclusion

Refreshing or replacing our core systems in line with IT policy will ensure that ET retains its and capability to efficiently deliver its load and non-load related capital investment plans and effectively maintain assets to meet the needs of customer and stakeholders. Our ability to maintain an efficient, reliable and safe transmission network that is valued by our customer and stakeholders is underpinned by the availability and resilience of these systems.

The requirement to address the technology health of our core systems throughout the RIIO-T2 period will therefore support:

- The reduction of business and operational risk of not meeting our customer and stakeholder commitments for RIIO T2
- The delivery of ET's customer driven connections and asset health programmes within RIIO-T2
- The reduction of significant exposure to cyber threats
- Consolidation and simplification opportunities that can support Opex reduction
- Improved efficiency and productivity to improve overall experience for customers
- Adherence to legal, regulatory, and safety requirements

Proposed investments have been benchmarked by Gartner and sit within the range of comparative peers, with efficiencies of approximately 20% embedded in the plan. The scale of investment is similar to that delivered during RIIO-T1. We believe this investment is essential to maintaining a safe and reliable network, is deliverable in the RIIO-T2 period and can be delivered at efficient cost.

Outputs included in RIIO T1 Plans

N/A