UK Power Networks
Business plan (2015 to 2023)
Annex 11: IT Strategy

March 2014

66 A reliable... an innovative...
and the lowest price electricity
distribution group. 99

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Document History

Version	Date	Revision Class	Originator	Section Update	Details
1.0	03/02/2014	N/A	Adrian Searle	N/A	Initial version (ED1 July 2013 submission baseline)
1.1	28/02/2014	N/A	Kevin Sampson	1.1 Executive Summary	Expenditure profile
1.1	28/02/2014	N/A	Kevin Sampson	1.1 Executive Summary	Bullet point on operational capex investment
1.1	28/02/2014	N/A	Kevin Sampson	6.0 IT Strategy Summary	Introduction Update
1.1	28/02/2014	N/A	Kevin Sampson	7.0 / 7.1 IT Capital Expenditure	Update to clarify operational and non operational investment
1.1	28/02/2014	N/A	Kevin Sampson	7.3 Operational Capital Investment	Revised Section detailing capital investment requirement for Operational IT and Telecoms
1.1	28/02/2014	N/A	Kevin Sampson	8.0 Operating Expenditure	Revision to ED1 cost profile following discussions with key stakeholders
1.2	04/03/14		Paul Curran	All	Minor formatting changes
1.3	10/03/14		Adrian Searle	N/A	Added Mar 2014 front cover

Contents

1 Executive summary

1.1 Introduction

The Information Systems (IS) directorate provides support across all of UK Power Networks. In order to meet the output targets defined within our ED1 submission we will require a total expenditure of £541.85million.

In return for this level of expenditure, we are committed to delivering the following – further details of which are provided within this business plan:

- Delivery of efficiencies against non operational IT expenditure totalling 3.4% over the ED1 period, driven through contract renewals, continuous improvements and business transformation. Discretionay Capex Investment is targeted at yielding efficiencies towards UK Power Networks efficiency targets

- Contribution and enablement of the business to realise their outputs whilst also ensuring the delivery of cross business direct and indirect efficiencies

- Rationalise and simplify the IT estate supporting the business, leveraging the platforms put in place through Business Transformation

- Delivery of IT investment programmes which will see a robust and reliable service provided to the business within the technology infrastructure and IT platforms

- Convergence of managed service providers to increase service levels in a more cost-effective way

- Delivery of an investment programme to replace / upgrade the software and hardware which is responsible for managing the electricity network, the Remote Terminal Units (RTUs) which control the electricity hardware and the telecommunications mechanisms which connect the operational systems

A summary of our planned expenditure can be seen in Table 1 below:

Table 1 Summary of IT expenditure

	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	ED1 Total
IT & Telecoms Capital Expenditure	25.80	44.17	38.83	38.21	38.77	37.69	35.19	33.39	292.05
IT & Telecoms Operational Expenditure	31.78	31.92	30.83	31.05	31.11	31.07	31.00	31.04	249.80
Totals	57.57	76.09	69.65	69.26	69.88	68.76	66.19	64.43	541.85[1]

Note [1] Opex is inclusive of growth for Smart Metering and Smart Grid

In this summary of the IT business plan, we have provided details on a number of key areas and demonstrate the robust process which we have been through in order to establish the plan. Chapter 2 provides information on the approach taken to the RIIO-ED1 Business Plan for IT, and how the various outputs combine in order to create the overall plan. We have described previous regulatory periods and articulated a vision of the IT landscape at the beginnning of ED1 in chapter 3. Chapters 4 and 5 provide details of the major influences on IT investment within the ED1 period, and how the themes of investment which IT will adopt will allow those opportunities and challenges to be met. We have summarised our IT strategy in chapter 6 and provided details on the investment which we will make in chapter 7. We provide details of how we execute the strategy in chapter 9.

We have identified a number of external, internal and technology drivers which have a bearing and influence on the IT Strategy and investments which we will make. These drivers represent major shifts in the industry, which will effect either DNOs on their own or the whole energy industry, such as Smart Metering, as well as those drivers which are important to UK Power Networks. We will embrace the rapid and ever changing world of technology, and maximise the opportunities which arise from it in order to provide the right solutions and service to the business for the right cost.

In order to meet these needs, additional IT priorities and demands on the estate our investment objectives for RIIO-ED1 are as follows:

- **We recognise the need to change the focus from DPCR5**: Following on from the intended DPCR5 investment strategy of leveraging the IT assets and focusing on the refresh of a limited number of key applications, the ED1 investment strategy is to maximise the use of and exploit the investment in the integrated SAP platform delivered through a shareholder funded Business Transformation programme and ensure risks and costs are minimised within IT – outlined further within chapter 6

- **A simpler estate will be easier to manage:** Whilst Business Transformation will deliver a base level of efficiencies, and establish the IT architecture to deliver business services, UK Power Networks IS will focus on ensuring that the IT estate is further simplified and rationalised throughout the ED1 period

- **Rationalisation and integration of applications:** Data rationalisation and the eradication of information siloes will be achieved through the replacement, decommissioning and integration of applications into the SAP suite

- **The right solution for business and IT:** Solution options will be explored at the relevant point in the delivery cycles to ensure that optimum use of core systems, best of breed application and cloud technology will ensure a high quality, least cost, service for the business is provided

- **Mitigate risk through refresh:** Within Infrastructure Services, there will be a greater focus on the mitigation of technical risk and the reduction in extended support fees through the technical refresh of applications and infrastructure

We have developed a vision of the architecture which we will require to deliver and support the business outputs, and established a detailed IT Strategy for each of the business, IT and technology services which underpins the investment which we will make. The following is a high level summary of the IT Strategy:

- In DPCR5 UK Power Networks is embarking on a shareholder funded Business Transformation Programme which will deliver a more streamlined and efficient IT estate by the beginning of ED1. This will include the decomissing of aging legacy systems and investment in a wider SAP based archictecture

- Post-Transformation, the investment in SAP to support core business operations will be extended through additional Enterprise Resource Planning (ERP) development or niche integration tools to maximise the initial investment and to minimise the legacy systems in the estate

- DPCR5 investment in digitisation of the current raster Geographical Information System (GIS) records will continue early in the period to enable additional benefits and capabilities to the leveraged. Future ways of working will be orientated towards a geospatial toolset, with a modular approach taken to extending the functionality available from desktop, web and mobile GIS to include design & estimation, network modelling and analysis and geospatial reporting

- Greater focus on embedding and using the additional information gained from Smart Meters and network instrumentation in network modelling, design and asset information

- Advanced asset maintenance capabilities will be introduced in order to provide a more mature maintenance approach that ensures maintenance, reliability, effectiveness and value for money

- Decommissioning of systems will be required in order to ensure that operating costs are minimised and information siloes do not manifest

- Throughout the period, applications will be refreshed in order to mitigate technical risk, enable business capabilities through functional enhancements and reduce opex through intelligent and innovative use of on-premise vs cloud based applications

- Continual investment in ensuring that the IT estate remains secure and robust through renewal of infrastructure and investment in IT Security enhancements to enable protection against cyber security threats

- Recognition and includion of alternative service delivery models and solution architectures such as cloud, software as a service and open source options

Our plan shows that we will invest £152million in our IT estate, with an average non operational capital expenditure of £19million per annum throughout the period. IT & Telecoms non operational capital expenditure is split between Discretionary and Non-Discretionary investment. Non-Discretionary investment is focused on maintaining and refreshing the estate, securing the infrastructure and applications from external and internal threats and maintaining compliance with regulatory and legal obligations. The purpose of Discretionary investment is to provide new or enhance existing capabilities for the business, and will be directly linked to business benefits. Discretionary investment will also contribute to the UK Power Networks efficiency targets, however it should be pointed out that frequently IT enabled change which enables reduced costs within the business results in an uplift to IT operating expenditure.

In Operational IT and Telecoms, we will spend a total capital investment of £139.7million on our network control systems, and providing the communications infrastructure for our SCADA network. This includes the costs for maintaining and running our systems as well as the necessary upgrades to the applications and infrastructure which support our control systems and the operational telecommunications hardware / software.

Our baseline IT & Telecoms operational expenditure for ED1 is forecast to be £249million, with an additional growth of £20million through the period in order to accommodate the uplift from investments in Smart Metering and Smart Grid activities. We have identified a total of £8.5million efficiencies in our baseline operating costs, though a combination of sourcing decisions, Business Transformation and continuous efficiency improvements. This is offset by a growth in operational expenditure resulting from capital investment in the IT estate. This increase in baseline costs will be £10million over the period. We are dedicated to achieving additional efficiencies in the operating costs of the IT estate through various means, and opportunities to invest in the estate in order to reduce running costs will be explored throughout the period.

In order to validate our costs we have used a variety of methods to benchmark our required spend using industry analysis and an independent organisation called ImprovIT to compare our managed service costs and capital expenditure to a variety of similarly sized organisations across different industries. The peer group spanned the following sectors: Utilities (14% of peer group), Telecoms (15%), Transport (9%), Financial Services (17%), Manufacturing (22%) and the Public Sector (23). There is no direct comparison to other Distribution Network Operators included within this benchmarking exercise. We have used the benchmarking exercise in order to prioritise overall IT expenditure in running and maintaining the IT estate.

In summary, we have developed a robust business plan which will enable IT to respond to the changing needs of the business, support the delivery of the required outputs in a cost effective and efficient manner and to prepare the power network for future innovation. We will invest in the IT estate in order to maintain a high quality service to our users, and will continually look for ways to reduce our running costs of the estate through technological and commercial mechanisms. All of our investments are underpinned by an IT Strategy and an end state vision which provides guidance and direction to the service which we are providing.

2 Development of the IT business plan

We have taken a robust and traceable approach to the production of our business plan, which has been developed from the ground up utilising a number of key inputs. Figure 1 illustrates the model which we used to develop the plan, and highlights the critical inputs and the integration between the various outputs.

Figure 1 IT business plan development model
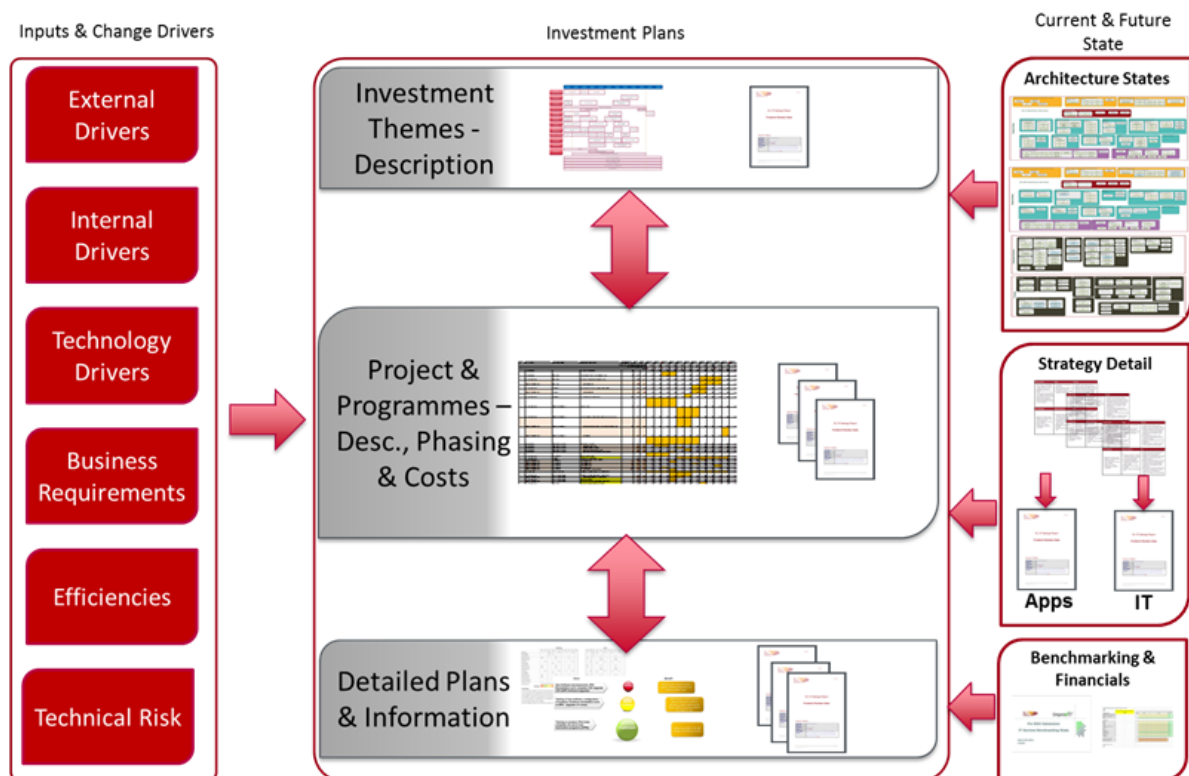
The major components which make up the overall business plan are as follows:

- **Inputs & Change Drivers:** A number of internal and external factors influence the IT estate and the investment requirements for the future. More detail on the change drivers are provided in chapter 4. Additional inputs include the requirements and targeted efficiencies of the business over the medium-long term, which provided the main input regarding the strategic goals and objectives which IT capabilities will need to support. From the IT perspective, the forward projection of technical risk was used in order to determine the application and infrastructure refresh requirements.

- Investment Plans
  - **Investment Themes:** Described in more detail in chapter 5, these logical groups of activities address key areas of importance within the business and enable co-ordinated investment activities.
  - **Projects & Programmes:** A detailed list of projects and programmes, with associated costs and mapping to regulatory cost classifications and business benefit areas, has been pulled together in order to define the plan of work which will take place through the ED1 period.
- **Detailed Plans:** In a number of areas, detailed plans have been drawn up which depict the activities which need to take place at an individual application or component level. This is especially relevant in the development of technology refresh plans.
- Current and Future states
  - **Architecture States:** In order to provide a vision and guidance for the end state architecture which we are aiming for, we have established and documented a number of architectural states as part of the business plan. Settling on the exact architecture which will be in place in 2023 is not possible, nor desirable, and therefore a degree of ambiguity is factored into the end states and the investment plans to accommodate the changes in industry and business needs through the period.
  - **Strategy Detail:** For the business, IT and technology services we have developed and validated detailed objectives and plans which address the trends and issues which influence and challenge each area.
  - **Benchmarking:** In order to validate the planned expenditure, we have invested in benchmarking activities with a third party organisation who have reviewed and compared our capital and operating expenditure against similar organisations both inside and outside the utilities industry.

3 Historic performance and current state

During DPCR4 the focus of IT investment was in establishing the four cornerstone systems which underpin the business today for back office support, asset management, GIS and network control. These systems have effectively supported the business operations to date. Missed opportunities to integrate the systems, coupled with the bespoke development of standalone development have created information silos, a lack of trust in the data and issues with processes and reporting.

The DPRC5 IT submission focused on investment requirements for Technology refresh. The principles of the IT strategy were to focus on the integration, standardisation and consolidation of the core IT systems. In reality, the activities of the business and IT during DPCR 5 have focussed on the following:

- Preparation for Sale – seeing a tail off in investments made in IT and business change
- The sale process – ensuring the successful business separation and initial post-sale activities were delivered, and the establishment of a new IT department
- IT Separation – migration of IT Services from the previous owner into our service provider's data centres and transitioning support arrangements
- London 2012 – fulfilment of our IT obligations in order to enable the successful delivery of the Olympics readiness, especially in the area of Control Systems and Security
- Business Transformation – supporting the business in their delivery of the business transformation programme, and the delivery of a suite of systems to support the business outcomes

We have assumed that the IT estate, and the service provided to the business, is dramatically different at the start of the ED1 period when compared to the beginning of the last regulatory period. Not least because of the rationalisation of systems which has taken place through the shareholder funded Business Transformation Programme. The cornerstone systems of SAP, SmallWorld GIS and Enmac PowerOn have been integrated and the capabilities provided through these systems broadened in order to rationalise and begin to reduce the complexity of the IT landscape. SAP provides core front and back office capabilities to the business, following the migration of the Enterprise Asset Register from Ellipse. Additional mobile, scheduling and GIS capabilities have been delivered and provide the backbone for the IT estate in ED1.

We have started the process of digitising our linear asset records, and harmonised the geospatial tools used across the business. The digitisation effort will continue at the beginning of ED1, setting a platform which will enable further investment to improve capabilities in a number of areas as well as being the foundation for making optimal use of the data arising from Smart Metering and Smart Grid initiatives. A number of capabilities have been delivered during DPCR5 and Business Transformation including collaboration and Business Process Management tools.

Whilst the IT estate has been enhanced in order to improve the capabilities provided to the business, we have also invested in ensuring a stable and reliable infrastructure and a robust set of platforms created in the post-separation era.

4 Drivers of IT strategy

A number of external, internal and technology drivers influence the operation of the business and therefore the IT estate needs to respond accordingly through the investments which are made. We have undertaken a validation exercise with a third party organisation to gain industry expertise on future technology trend's and have used this information to further validate our IT strategy.

More details of the drivers and the impact on UK Power Networks are detailed below.

4.1 External drivers

Table 2 External drivers

Driver	Description
Demand Response	The changes in energy usage patterns, introduced through various initiatives and mechanisms, will see load shifting on the electricity network. UK Power Networks will be able to challenge traditional load models for network planning, and will need to enable more active network management capabilities
Electric Vehicles	Whilst currently small, it is expected that the market for electric vehicles will grow rapidly over the ED1 period, which will place additional high voltage demands on the electricity network that will need to be modelled and factored into reinforcement plans
Smart Metering	Mass rollout and adoption of Smart Metering is expected to commence by 2015 and complete by 2020. Along with other industry participants there we will need to make a number of changes to maintain compliance, exploit opportunities and support the deployment of the new meters
Smart Grids	Smart Grids will be a major consideration over both the ED1 and ED2 period. Innovation activities will continue to be undertaken during ED1, in order to qualify the impact and opportunity which Smarter Networks will bring. Proven Smart Technology will require further rollout, and embedding into the electricity and IT systems
Lane Rental	Further rollout of Lane Rental into Greater London and surrounding areas will bring additional constraints for planned work on the electricity network
Energy Efficiency	Increasingly challenging carbon reduction targets are driving a proliferation in the number and variety of Energy Efficiency programmes which are enforced or voluntarily undertaken by all organisations
Distributed Generation	The scale of Distributed Generation schemes being undertaken will increase over the ED1 and ED2 period, which places additional burden on the electricity network. Traditional approaches to Network Strategy and Design will need to be challenged in order to mitigate the risk of extensive network reinforcement expenditure
Customer Expectation	The scale of social media along with the consumerisation of technology has led to an increase in customer expectations regarding levels of service and information. Across ED1 the challenge for DNO's will be to embrace opportunities to meet and exceed customer expectations in relation to fault related work (progress of restoration, proactive customer contact from Smart Metering last gasp) and new connections (real time quotations and customer portals).

4.2 Internal drivers

Table 3 Internal drivers

Driver	Description
Asset Health Indices	Asset Health is a regulatory output which is measured throughout the price control period, and drives a significant portion of the capital investment in the electricity network. Reducing the overhead of producing the index is critical to enable more proactive measurement and monitoring of Asset Health
Capital Programme Outputs	The delivery of our Capital Works Programme is key in the delivery of our license obligations, with significant advantages for ensuring efficiencies are realised in the delivery of our commitments
Opportunities from Smart Metering	The UK Smart Metering Rollout will present a number of challenges and opportunities for UK Power Networks. Utilisation of Smart Meter data will bring customer service, network planning and network visibility benefits to UK Power Networks
Direct and Indirect Cost Efficiencies	UK Power Networks is committed to ensuring its operations are effective and efficient, with an annual commitment to reducing direct and indirect costs in the business
Opportunities from Future Networks	Future Networks are tasked with undertaking trials and investigations into smarter network technology, and taking the learning's and applying them to the whole electricity network and control systems
Integration	Key to ensuring effective ways of working and end to end processes is the integration of our data, information and systems. The principles established during Business Transformation will need to be applied across UK Power Networks in order to maintain integrity
Transformation	UK Power Networks is embarking on a shareholder funded transformation programme with the key aim of the programme to simplify the processes and systems used by the organisation on a day to day basis in order to deliver the desired outcomes
Data Quality	With the increase in complexity and volume of data expected during ED1, UK Power Networks need to put the necessary tools and procedures in place in order to ensure the quality and integrity of the data remains in place

4.3 Technology drivers

Table 4 Technology drivers

Driver	Description
Security	UK Power Networks need to respond to the increased theft risk of physical assets and intellectual property, and the on-going cyber threat which exists for any Critical National Infrastructure
Low Carbon Technologies	Low Carbon Technologies in generation and demand influence the investment in the electricity network and the capabilities which are required in Advanced Network Management
Smart Metering	Smart Metering will drive a number of updates to existing technology in the estate, and introduce new capabilities and integrations between applications. Smart Meters will also generate a significant volume of data, which will need to be embedded in the IT estate and information models in order to deliver value for UK Power Networks
Smart Grids	The enablement of Smarter Networks through Smart Grid technologies will drive increases in the technology and security demands which are placed on the IT estate, and the distribution of more intelligent and accessible devices outside of the data centre. Industrialisation of innovation trials will also need to take place, as well as embedding increasingly advanced network management and control capabilities

Driver	Description
Mobility 4G	Mobile Technology is fast paced and driven primarily by consumer demand, and will provide UK Power Networks with additional opportunities for the mobilisation of process and data to field workers as well as the replacement of operational telecoms technologies as they become obsolete
Monitoring / Control Technologies	Driven through a number of agendas, including Smart Grids, we will see an increase in the availability of advanced ways of seeing, controlling and managing the electricity network through intelligent RTUs and de-centralised network control and decision making. Making best use of these capabilities, whilst maintaining security controls will be of paramount importance
Cloud Technologies	As the range of public and private cloud technologies, and Software as a Service offerings become more prevalent UK Power Networks will need to adapt and embrace the changes in order to provide a balanced, fit for purpose and cost effective IT service
Data Volume and Growth	The exponential growth in data, through the increased complexity of systems and the changes in the industry will place a significant burden on the IT estate. Records and Information Management will become paramount. The value of information will also increase, especially as tighter integration between systems enables insight which was not previously possible

5 Investment themes

In order to address the needs of the business, and to meet the demands placed on us by the drivers above, we have grouped our IT Capital Investment into 16 themes, which are explained briefly in Table 5 below. The table identifies the Discretionary and Non-Discretionary investment areas, which are discussed in more detail in chapter 7.

Table 5 UK Power Networks IS investment themes

Theme	Description
Customer	Projects and initiatives associated with driving improvements Customer Service
Workforce	Projects and programmes associated with delivering change in work management, field processes and mobile technology
Mapping Geospatial	On-going investment in the delivery of change related to geospatial technology including digitisation of records
Industry Management	Investments aimed at enhancing the interfaces with and management of the industry bodies, including Income Management and Billing
Asset Information Modelling	Initiatives focussed on the management of information associated with our electricity distribution assets, and the use of information within the wider business for modelling
Smarter Network Control	Investment in the electricity control systems and associated operational technologies which deliver an improved network function, including those linked to Smart Grid
Support Services	Projects and programmes which address the needs of back office support functions
Reporting	On-going Investment in the improvement of our reporting capabilities in order to meet new demands, e.g. regulatory reporting changes, or streamline the reporting process
Collaboration	Investment in our tools and process which support the interaction and collaboration of our users
Telecoms	Investment in enhancing the telecommunications infrastructure and applications used by the business users and in customer interaction
IT Security	Initiatives and investments in ensuring the IT estate remains secure from attack and in accordance with CPNI guidelines
IT Infrastructure	On-going investment in ensuring that the technology components in the IT estate are periodically refreshed to minimise risk and provide a robust platform for the provision of business services
Legal, Regulatory	Investments aimed at ensuring on-going compliance with license conditions and other legislation.
IT Maintenance IMACs	Provision for Installs, Moves and Changes and the delivery of Small Change as requested by the business users
Application Upgrades & Refresh	Investment in the refresh of core application services and platforms which form the application infrastructure for the provision of business services
IS & IT Contract Renewals	Investment which enables the re-tendering and migration of Managed Service contracts

6 IT strategy summary

We have developed a comprehensive IT Strategy to underpin the investment which will be made during the RIIO-ED1 period, and identifies the high level investments which will deliver benefits through capability enhancement in each business and IT service. This continued investment will ready the IT estate for the adoption of future innovation, in support of our organisational Innovation and Smart Grid strategy. There will also remain a continual investment in ensuring the IT estate remains secure and robust through renewal of infrastructure and investment in IT Security enhancements to enable protection against cyber security threats. This investment will also minimise the technical risk in the estate brought about through aging infrastructure or applications in extended support agreements.

The IT Strategy we have developed will continue investment in a few of long running programmes from DPCR5 into ED1, including:

- Business Transformation Programme Stabilisation & Optimisation – whilst the main Transformation Programme will enable the realisation of the DPCR5 objective of migrating core business functions into a single SAP ERP based application, a period of stabilisation and optimisation will follow to ensure the delivery of the desired business outcomes and to begin additional exploitation of the available capabilities

- GIS Digitisation - DPCR5 investment in the digitisation of raster GIS records will continue early in ED1 to enable additional benefits and capabilities to the leveraged. Future ways of working will be orientated towards a geospatial toolset, with a modular approach taken to extending the functionality available from desktop, web and mobile GIS to include design & estimation, network modelling and analysis and geospatial reporting

- Smart Meter Readiness – adapting the IT and business in order to embrace the changes introduced by the UK Smart Meter rollout

The overall IT Strategy can be summarised as follows:

- Maximise the opportunities presented by the SAP based Enterprise Asset Management, Work and Customer Management platform delivered through Business Transformation in order to deliver advanced functionality and continuous efficiencies e.g. Advanced Asset Maintenance capabilities

- Develop the capabilities in Network Systems following the digitisation of linear network assets through network connectivity models, advanced planning and design and publishing of geospatial data into the field through mobile technology

- Maintain Information Management and governance to ensure that the integrity and quality of data is not compromised, and information siloes do not establish following Business Transformation

- Incorporate and utilise the wealth of information provided through Smart Meters and Smart Grid infrastructures in the development of network models in order to optimise network load calculations and develop optimal future investment plans

- Enable business planning and economic modelling within core ERP platform, supported by investment optimisation tools as required

- Produce regulatory and statutory reporting outputs in a streamlined and efficient manner, ideally through "push-button" reporting

- Provide and support multi-channel interaction with customers, including extensive customer self-service, and establish enhancements to customer systems which support the business in delivering excellent customer service

- Enhance our income management systems in order to remain compliant with industry obligations and mandated change, whilst ensuring technical risk is mitigated in critical systems

- Maintain alignment with new versions of Enmac PowerOn which become available, to mitigate support risks and enable the functional enhancements required for Smarter Network Control

- Deliver technology proven through innovation into control systems in order to deliver Advanced Network Management capabilities

- Increase the scope of integration between the Asset Register, Linear Assets, Control Systems and SCADA data in order to improve network information models and planning decisions

- Rationalise the range of tools used for network modelling and analysis, integration with geospatial data and the inclusion of additional data from SCADA and Smart Meter sources

- Enhancements in the inspections and maintenance capabilities to shift from a time-based maintenance regime to more cost-effective and efficient approaches

- Maximise the use of central planning tools, including the integration to outage planning and outage management systems

- Enable the Connections business to function in a competitive market, whilst maintaining compliance with new regulatory requirements

- Take full advantage of the suite of capital programme planning, portfolio management and delivery tools introduced through Business Transformation, in order to enable additional business efficiencies

- Expose supply chain and procurement capabilities through intranet and mobile technology, in order to streamline ordering processes and increase visibility

- Alignment of procurement and contract management capabilities through consolidation of systems, in order to improve supplier relations and enable contract performance management

- Reduce the burden of back office processes on the wider staff through enhanced self-service capabilities and online performance management

- Migration of interfaces currently supported on legacy integration platforms onto new platforms introduced to support Business Transformation

- Exploitation of advanced storage and information management capabilities, including public and private cloud, in order to provide a platform which is fit for purpose in the short-medium term, will grow with the business and accommodate the growth expected in network information

- Refresh end user computing and mobile technology platforms, ensuring suitable devices are deployed to mobile workers, and embracing and expanding the support for Bring Your Own Device whilst maintaining security constraints

- Include cloud based and open source options when determining new solution architectures

- Maintain continuous investment in securing the IT estate from internal and external security threats

- Upgrade and refresh of LAN and WAN links, in order to improve the performance and reliability of network performance across all properties

- Ensuring that systems are decommissioned when required in order to ensure that operating costs are minimised

Figure 2 Future state architecture: Business Services

Business Services

Strategy, Stakeholder Management & Regulatory Affairs
- Business Planning — Business Planning
- Corporate Strategy & Policy — Network Modelling
- Stakeholder Management — Network Modelling
- R&D — R&D

Industry Interaction & Income Management
- Industry Data Flows — Industry Data Flows
- Billing — UMSIPS, DUOS, Billing
- Meter & Device Management — Meter & Device Mgt

Customer Engagement
- Customer Interaction — Customer Interaction
- Customer Management — CRM, Customer Portal
- Call Centre Management — Call Centre Management, Multi-channel Contact Centre

Control & SCADA
- Distribution Management — ENMAC
- Outage Management — Network Modelling
- Devices — Devices
- Demand Response — Demand Response
- Energy Management — Energy Management

Asset Management
- Asset Information — SAP EAM
- Asset Strategy & Policy — Asset Strategy & Policy

Network Modelling
- Network Modelling — Network Modelling
- Network Connectivity — Network Connectivity
- Power Analysis — Power Analysis

Inspections & Maintenance Delivery
- Inspection — Inspection
- Un-Planned Maintenance — Un-Planned Maintenance
- Planned Maintenance — Planned Maintenance

Operational Planning & Scheduling
- Work Planning — SAP PM
- Wayleaves & Consents — Wayleaves & Consents, Mayrise
- Work Assignment — SAP PM, SAP MIRS
- Work Dispatch — Work Dispatch
- Outage & Shutdown Planning — Outage & Shutdown Planning
- Traffic Management — Traffic Management

Connections Delivery
- Quotation Management — SAP CRM
- Jeopardy Management

Faults Management
- Incident Management — ENMAC Troublecall
- Jeopardy Management
- Fault Diagnosis — Fault Diagnosis

Capital Programme Delivery
- Project Management — Primavera, SAP PS
- Programme Management — Primavera
- Portfolio Management — Primavera

Design
- Design Management — Design Management
- Network Design — Network Design
- Construction Design — Construction Design
- Estimating — Estimating

General Enquiry

Supply Chain & Logistics
- Materials Management — SAP
- Logistics — SAP
- Warehouse Management — Warehouse Management

Sourcing & Procurement
- Sourcing Strategy — Sourcing Strategy
- Sourcing Management — Sourcing Management
- Contract Management — Contract Management
- Procurement — SAP SRM

Figure 3 Future state architecture: Enterprise Services

Enterprise Services

Financial Management

Payment / Settlement
- Payment Gateway

Revenue Management
- SAP
- MAVIS

Payroll
- SAP

Billing and Accounting
- SAP

Pensions
- Pensions

Treasury
- SAP
- Treasury

Internal Controls
- SAP

Debt Collection
- Debt Collection

Expense Management
- Expense Management

HSS

Health & Safety
- Health & Safety

Business Assurance
- Business Assurance

Sustainability
- Sustainability

People & Skills

Education / Training
- Education / Training

Organization Management
- Organization Management

Skills Management
- Skills Management

Career Development and Retention
- Career Dev & Retention

Travel Management
- Travel Management

Workforce Acquisition
- Workforce Acquisition

Personnel Administration
- SAP

Time & Expense Reporting
- Overtime Approval
- Time & Expenses

Resource Planning and Allocation
- SAP
- Scheduling

Benefit Management
- Benefit Management

Support Services

Facilities Management
- Travel Management

IS Service Management
- IT Assist

Property Management
- Property Management

Fleet Management
- Fleet Management

Governance, Risk & Control
- GRC

Legal
- Legal

Corporate Communications
- Corporate Comms

Figure 4 Future state architecture: IT Services

IT Services

Business Process Services
- BPMS
  - BPMS
- BAM
  - BAM

Collaboration Services
- Email
  - Microsoft Exchange
- Voice Conferencing
  - Voice Conferencing
- Instant Messaging
  - Instant Messaging
- Web Conferencing
  - Web Conferencing
- Video Conferencing
  - Video Conferencing
- Unified Comms
  - Unified Comms

Analytic Services
- Reporting
  - MS SQL
  - Regular Reporting
- Data Analysis
  - Data Visualisation
  - BI

Geographic Information Services
- GIS Data Capture
  - GIS
- GIS Data Presentation
  - GIS
- GIS Data Analysis
  - GIS

Integration Services
- Application Integration
  - Application Server
  - Reliable Messaging
  - Enterprise Service Bus
- Data Integration
  - Data Integration
- Orchestration
  - Orchestration

Information Services
- Content Capture
  - Capture
- Document Management
  - DMS
- Web Content Management
  - WCM
- Search & Retrieval
  - Federated Search
- Knowledge Management
  - Federated Search
- Intranet
  - Browser

Data Management Services
- Data Mgt
  - PI Data Historian
  - Data Quality Management
  - Master Data Management
  - Identity Management
- Data Storage
  - Archival Management
  - Backup Management
- Query
  - MS SQL

Device Services
- Device Control
  - Mobile Device Management
- Device Monitoring
  - Mobile Device Management

Security Services
- Identity Mgt
- Access Mgt
  - Industrial Defender
- Information Security
  - Information Security
- Protection
- Response
- Detection
- Vulnerability Management

7 IT & telecoms capital expenditure

7.1 Overview

There are a number of influences on our expenditure in providing new, enhancing or refreshing the IT enabled business services and infrastructure which are available to our users. This expenditure is split between operational and non operational expenditure. From the non operational expenditure perspective this is further split by Non–Discretionary i.e. that mandatory spend that is required to ensure the effective running and maintenance of the IT estate, and Discretionary spend which is a level of targeted investment required to affect a change within the business linked to a tangible benefit. The shareholder funded transformation programme which completes in 2015/16, results in a lower Discretionary capital expenditure than experienced in DPCR5. The level of required spend can be summarised as:

- The level of additional change which is required by the business in key operational areas to deliver tangible business benefits
- Enhancement in business capability through exploitation of systems introduced from previous investment
- The level of technical risk which is acceptable surrounding out of support, or near end of life, applications and infrastructure
- Software vendor upgrade requirements to maintain compliance
- Periodic refresh cycles for applications and infrastructure

Operational Capital expenditure for the IT and Telecoms landscape for ED1 will remain based on the ENMAC/PowerOn Network Management System, Remote Terminal Units (to which sensors and power equipment controls are connected) and supporting telecommunications. On-going investment is required to keep this estate serviceable. During ED1 we plan to renew the client and server infrastructure underpinning the Network Management System and to undertake a major renewal of Remote Terminal Units in all three network areas to replace equipment at end of life. Remote stations using older telecommunication mechanisms such as Paknet are also being upgraded to cellular communications and other modern alternatives.

7.2 IT & telecoms non operational capital investment

Our Non-Operational IT&T investment in ED1 is split into three top level categories, two of which are maintained throughout the period.

The three investment categories are described as follows:

- **Transformation Optimisation** – limited investment in the year following the Business Transformation Programme stabilisation, in order to capitalise on previous investments and deliver additional short term capabilities and upgrades to the core SAP platform
- **Discretionary** – investment activities which will deliver new services or upgrades to existing services which are directly linked to benefits and/or efficiencies within the business
- **Non-Discretionary** – initiatives which are considered essential for the successful and reliable operation of the IT estate, addressing technical risk and ensuring on-going compliance with legal and regulatory requirements

Table 6 IT & telecoms Non Operational Capital Expenditure Summary

£m	2015/ 2016	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020	2020/ 2021	2021/ 2022	2022/ 2023	ED1 Total
Transformation Optimisation	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
Discretionary	6.50	11.11	13.19	10.40	10.20	13.90	9.70	4.00	79
Non-Discretionary	6.70	13.20	6.93	10.50	10.37	4.75	5.45	9.45	68
Capex Total	13.20	29.31	20.12	20.90	20.57	18.65	15.15	13.45	152

More information regarding Discretionary and Non-Discretionary investment is provided below.

7.2.1 Discretionary investment

Discretionary spend increases in 2016/17 due to planned investment in additional technologies to support the strategic geospatial needs of the organisation. There is additional investment to optimise business capability improvements from the implementation of the core SAP platform in DPRC5. In 2017/18 Discretionary expenditure increases owing to additional investment requirements in business benefit and efficiency linked projects. Overall, the capital expenditure has a downward trend during the period as opportunities are realised to prolong the life of the current assets.

Figure 5 shows the distribution of Discretionary Capital Expenditure against the RIIO output categories and an additional Efficiencies category. The delivery of new or updated business capabilities, enabled by technology, will ensure that our target of a continuous 1% efficiency across the business will be realised. Whilst our shareholder funded Business Transformation Programme will enable specific outputs, and deliver a capable technology platform from which to base additional investment, there will be more opportunities to improve business operations through the ED1 period. All Discretionary expenditure will be predicated on the delivery of business benefits, including the realisation of efficiencies in the wider business. Over 50% of the discretionary expenditure will contribute to the 1% year on year efficiency target.

Under guidance from ImprovIT, our third party benchmarking organisation, we have not undertaken a benchmarking exercise on discretionary investment. This is on the basis that every organisation has a different approach to discretionary investment.

Figure 5 Discretionary IT & telecoms capital expenditure distribution
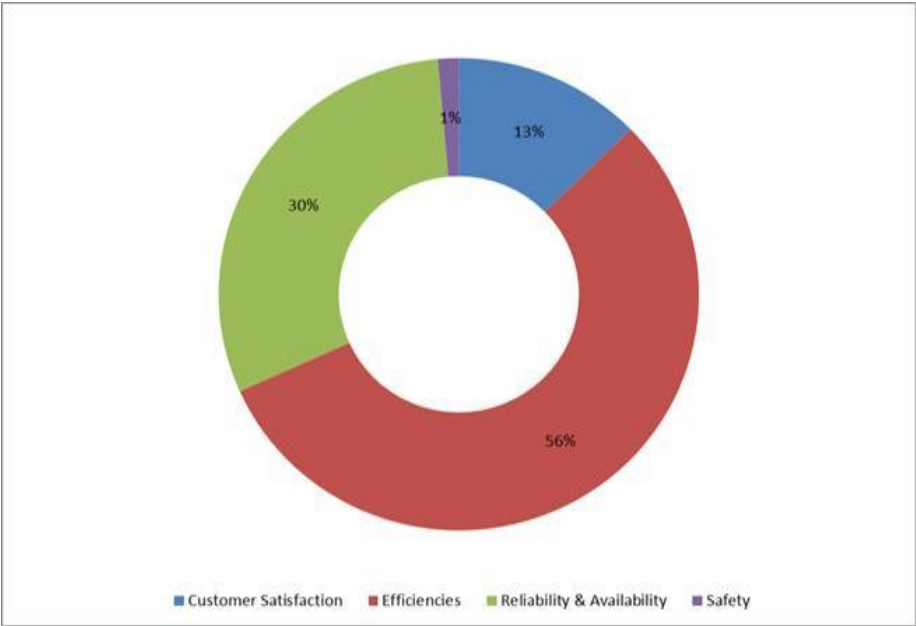
7.2.2 Non-Discretionary investment

Non – Discretionary spend increases in 2016/17 due to a refresh of ageing and obsolete hardware including the data centre infrastructure. Post this in 2017/18 Non–Discretionary spend decreases to the maintenance of the newly refreshed hardware and then remains fairly static for the remainder of the period as the focus remains on maintenance.

The majority of Non-Discretionary capital expenditure will be utilised in ensuring that the infrastructure and application platforms are refreshed and up-to-date, which ensures compliance with optimal vendor support pricing and provides opportunity for enabling functional enhancements available through new software versions. The investment required to "keep the lights on" will also ensure optimal operational expenditure through the avoidance of premium extended maintenance and support fees and mitigation of risk posed by applications and infrastructure being out of support.

Approximately 25% of the Non-Discretionary investment is to fulfil business users BAU demands such as providing hardware and software for a new joiner, additional installations of software required to meet a business need or the provision of changes required due to a change of location. The remainder of the expenditure in this area, ~10%, is to enable compliance with changing regulatory and industry legislation and response to changes in the environment which we need to work in, for example Lane rental and Traffic Management Act changes.

Our Non-Discretionary investment has been validated through the external benchmarking. Against 2012/13 forecast outturn benchmark, our average Non-Discretionary expenditure is approximately £2.15million pa above the peer group[1]. This increase over the peer average is justified in the nature and complexity of our IT estate which will need to be refreshed and maintained through the period, this is a legacy from previous owners and will take time and investment in order to become more cost effective to operate and maintain. Through project rationalisation and consolidation we will look to close the gap to the benchmark figure.

Please note the Improve IT Benchmarking report is available on our internet under the RIIO ED1 Business web page, and can be accessed via this link: UKPN IT Benchmarking

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[1] The ImprovIT benchmarking peer group spanned the following sectors: Utilities (14% of peer group), Telecoms (15%), Transport (9%), Financial Services (17%), Manufacturing (22%) and the Public Sector (23%)

7.3   IT & telecoms operational Capital Investment

7.3.1   Investment strategy

Whilst a large proportion of this expenditure is non-discretionary, there are several ways in which the upgraded estate will support incremental business improvement during ED1 as well as providing a foundation for the Smart Grid.

The newer versions of PowerOn software extend monitoring, control and analysis functionality into the low voltage network, which will be a key enabler for the Smart Grid given the expected deployment of low carbon technologies at low voltage. We are testing these new features in our innovation projects in readiness for the appropriate times to deploy the associated Smart Grid interventions to the power network. Within our indirect costs for DPCR5 and early ED1 we have major, complementary initiatives to improve the quality and completeness of asset data for the low voltage network. The upgraded PowerOn systems are also capable of greater automation at all voltage levels, enabling schemes to improve quality of supply. In our PowerOn environment we have made provision for the secure hosting and integration of sub-control systems associated with innovation schemes (for example active network management controllers). The integration, both business and technical, of distributed, autonomous control into our main operation will be a key challenge of the Smart Grid. Table 7 summarises the overall profile of direct expenditure through the ED1 period.

Table 7 Operational capital investment expenditure summary

£m	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	ED1 Total
Substation RTUs, marshalling kiosks, receivers	8.91	9.94	11.26	12.07	13.21	13.86	14.05	13.99	97.29
Communications for switching & monitoring	2.32	3.27	4.26	3.48	3.33	3.46	4.00	3.98	28.09
Control centre hardware & software	1.37	1.65	2.19	1.76	1.66	1.72	1.99	1.97	14.32
Total capital Expenditure	12.60	14.86	17.71	17.31	18.20	19.04	20.04	19.94	139.70

7.3.2   Operational capital investment strategic drivers

The general trend on the distributed estate is for the number of instrumentation points to increase, for more data to be brought back from each instrumentation point and for more of the data to arrive in real time. There are also more measurements taking place on the low voltage side of our assets to provide greater visibility of network performance at that level. The upgrades to Remote Terminal Units and communication mechanisms support these developments. Older and more limited SCADA protocols are being phased out whilst improved communications bandwidth enables greater data collection. Some of our innovation work is extending data collection towards non-traditional data types (for example disturbance waveforms) that can provide further insight into asset condition and network performance. We are now basing Remote Terminal Units at some of our partner sites (such as generators) as well as our own substations.

8 IT & telecoms operational expenditure

Our costs associated with running the IT estate and providing a stable and reliable service to the business is included within the IT&T Operating Expenditure. Table 8 shows the profile of Operational Expenditure through the ED1 period, and demonstrates the commitment to ensuring a marginal net increase in annual operating costs despite having to accommodate significant growth caused by capital investment in the IT estate.

Table 8 ED1 operating expenditure profile

£m	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	ED1 Total
Baseline Expenditure	30.22	30.07	28.85	28.700	28.30	27.95	27.95	27.95	229.99
Smart Meter Growth	1.28	1.43	1.65	1.80	2.20	2.55	2.55	2.55	16
Smart Grid Growth	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	4
Total	32	32	31	31	31	31	31	31	249.99

Our IS function aims to provide a year on year reduction in baseline operating costs whilst accounting increased volume, automation and complexity introduced through capital investment and the Business Transformation Programme. The need to accommodate the changes introduced through the UK Smart Meter Rollout Programme, and the deployment of Smart Grid technologies into the wider network will attract significant uplift in operating costs.

Figure 6 below illustrates the efficiencies and growth in Operating Expenditure in the ED1 period in order to establish an average annual operating cost of £31.2million.

The efficiencies total £8.5million, and are realised through a combination of Transformation, the implementation of our sourcing strategy and cost reduction based proactive commercial management. These will be achieved throughout the ED1 period, with significant one-off savings and a focus on continuous efficiency targets each year.

Figure 6 IT&T Operating costs waterfall graph
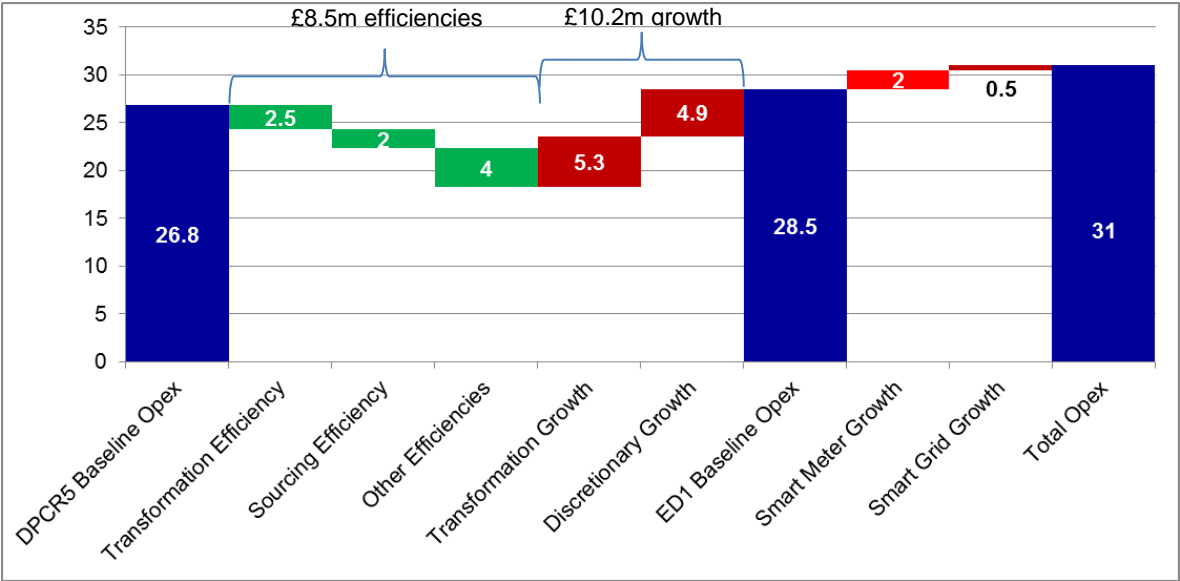
The baseline ED1 Operating Costs represent the comparable costs between DPCR5 and ED1, which include the efficiencies and growth from Discretionary capital expenditure and Business Transformation, but does not include the uplift from major schemes such as Smart Metering and Smart Grid. The baseline ED1 operating costs, the primary growth areas include Business Transformation and discretionary capital expenditure, and are likely to see a £10.2million increase in costs over the period.

Additional growth areas, which total £2.5million, come from the response to Smart Metering and the adoption of Smart Grid technologies which are validated through Future Networks and Innovation investment.
One of the key areas where we will generate savings and efficiencies is through our sourcing strategy for Managed Services. The principle objective of the strategy is to converge all IT Managed Services to a single outsourced service provider for operating and incrementally improving the IT estate. The benefit for us will be to provide a single point of accountability, reduced cost and increased quality of service to the business users. The timeframe for this objective to be realised is 2016/17.

We have established through benchmarking, that our forecast average IT & Telecoms operating expenditure is only 1-2%, or £0.4million, above the peer group. This is justified through the legacy of the IT estate; however we will strive through capital investment and sourcing decisions to reduce the expenditure in maintaining and running the IT estate.

9 Strategy execution

9.1 Scope of IS services

The role of Information Systems within UK Power Networks is to provide the technology services which support the business in the delivery of their obligations. We do this through the provision of the following services:

1. Planning Business Change and IT Investment

2. Delivery of Projects and Programmes

3. Running the IT Estate

Through close alignment and engagement with the business directorates, we are responsible for developing the annual portfolio of activities which will be undertaken. The scope of the portfolio includes all business change, not just IT enabled change, and IT investment in refresh & renewal and the delivery of new IT platforms.

Through our dedicated delivery, project and programme managers, and where required the utilisation of a flexible resource pool, we are responsible for the successful delivery of the portfolio of projects on an annual basis. We maintain a continuous monitoring and measurement approach to portfolio management, through proactive status reporting and governance compliance assessment. We utilise framework agreements with Systems Integrators and Consultancies in order to access expertise in systems delivery and trusted advisory.

The last area of responsibility is in running the IT estate and enabling the business to perform at the lowest possible cost. We use an outsourced managed service model to run the applications, infrastructure and end user computing. Our internal operations staff manages and oversees the service providers.

9.2 IT operating model and organisation

The IS Operating Model in Figure 7 shows the core functions of the Directorate and the internal and external interactions.

Figure 7 IS operating model
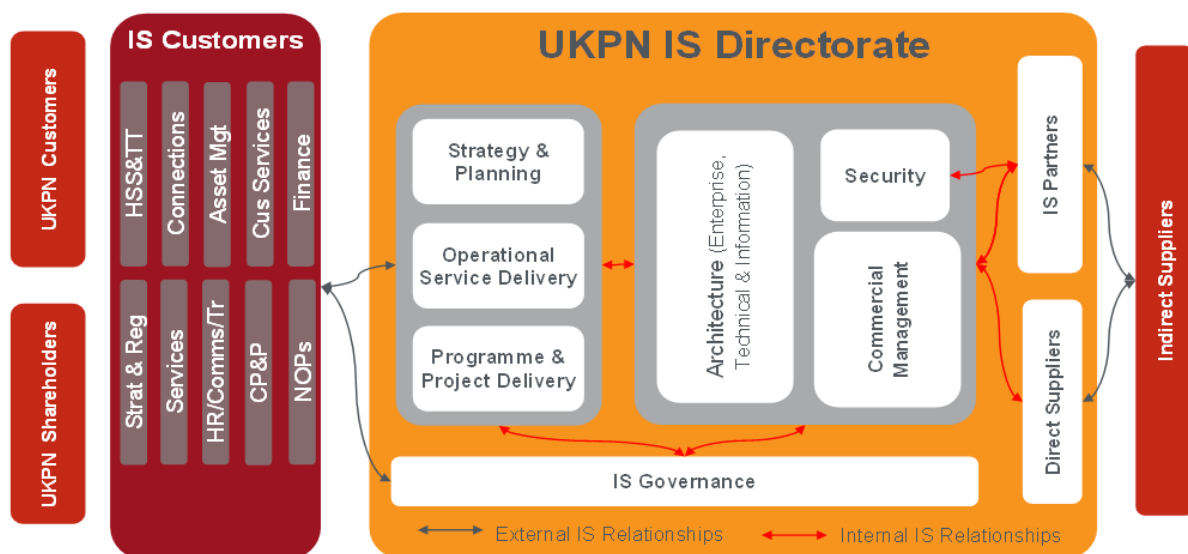
The primary parties in the IS Operating Model are:

- **IS Customers:** Effectively the entire UK Power Networks (UKPN) business that in turn has responsibilities to serve connected customers across the three network regions of EPN, LPN and SPN. IS Customers both consume IS Services and generate demand for IT change.
- **UK Power Networks IS:** Under the leadership of the CIO, UK Power Networks IS serves the IS Customers utilising services from external suppliers both directly and indirectly. The IS Partners, effectively form part of UK Power Networks IS even though they are actually external suppliers.

The operating and organisational model delivers clear accountability for the various IS services provided by the Directorate, and combines the definition and delivery of strategy under a single team and Senior Manager. This lack of cross-team handover in the development of long-medium term strategy & plans, the development of the tactical and annual portfolio and the delivery projects and programmes ensures that strategic intent and objectives are not confused or diluted through to the delivery phase.

External support from the UK Power Networks IS Architecture, Commercial and Service Operations teams brings the necessary inputs and expertise into the development and delivery of strategy as required. Additional expert support, input and delivery from Business Consultancy Framework providers in all stages of strategy development and execution brings key advisor skills to complement the internal resource capabilities. Framework providers for Systems Integration, bring a number of delivery model options to UK Power Networks IS – each with different value propositions and capabilities.

9.3   People & skills

The UK Power Networks IS Directorate is relatively new, having been established in 2010 as part of the separation from previous owners.

Whilst a number of new recruits have been specifically selected to join UK Power Networks IS based on their competencies, there are a number of people who have a long history with UK Power Networks and EDF Energy Networks Branch.

Where additional skills and resources are required, contract and consultant resources are used to complement the internal capabilities.

All people involved with UK Power Networks IS, especially within IS Strategy & Projects and IS Architecture, are experienced delivery professionals, who under the leadership and guidance of the CIO and Senior Management Team have demonstrated the development and execution of IS & IT Strategy since 2010.

Our benchmarking of IT services has shown that the ratio of IT employees to total UK Power Networks staff is lower than the peer group average. The industry maximum is 3.06%; the figure for UK Power Networks is 1.24% which is 0.33% lower than the average IT Employees Ratio.

9.4   Process

The process library within UK Power Networks IS has developed as the maturity of the directorate has increased; the processes which have been adopted and continuously improved are based on standard IT frameworks and reference models such as CoBiT, TOGAF, MSP/PRINCE2 and ITIL.

Where required, the processes are interlocked with policies and standards to ensure compliance with the internal IS requirements.

Our investment control processes will ensure that all discretionary investment will be justified through favourable business benefits and efficiencies which will offset and exceed the uplift in operational expenditure caused by the development and enhancement of the IT estate.

Within the delivery of change, a Business Change Delivery Model has been developed and has been operational since 2011; this delivery model is linked to the Investment Control, Architecture Governance and other Commercial Governance bodies within UK Power Networks.

A continuous improvement approach, linked to the increasing levels of IS maturity, has been adopted with additional facets of capability introduced to the IS Projects & Strategy Services since 2011. An example of this would be the introduction of portfolio compliance KPI's.

9.5   Technology

The UK Power Networks IS Directorate use a number of tools to support the delivery of IT Services to the business, which include IT Service Management (issues management, change management), Corporate Systems (SAP), Architecture Tools (Systems Architect, MS Visio), Productivity Tools (MS Office, MS Project).

The Business Transformation Programme will introduce tighter links and controls between Project Portfolio Management, Investment Optimisation, Project Delivery and Financial Management & Control. The IS Directorate will explore and leverage the opportunities which these capabilities present in order to improve the Portfolio and Project/Programme Delivery services.