



# INDEPENDENT ASSURANCE REPORT

for SSEN July 2024 DNOA Outcomes

*November 2024  
Version 2 Draft*





# Introduction

## Statement of Purpose and Scope of this Report

This Report summarises key findings from independent assurance checks undertaken on a sample of DNOA outcomes taken from the DNOA Outcomes Report July 2024 published by SSEN Distribution. The scope relates to 9 DNOA outcomes with a project value above £2M (5 in SEPD and 4 in SHEPD). The conclusions from these checks have been reviewed by the DSO Advisory Board.

## SSEN DNOA Reports

SSEN Distribution publishes a DNOA Outcomes Report on its website each quarter. This describes its plans for meeting network needs for the next 7 years, in the North of Scotland (SHEPD) and South of England (SEPD) distribution licensed areas. These plans (known as schemes) have been taken through the SSEN Distribution Network Options Assessment (DNOA) Methodology, published in its final version in 2023.

## Requirement for independent assurance

The DNOA methodology outlines an independent assurance process for schemes with a value over £2M. The objective being to ensure that the DNOA methodology has been applied to the assessment of these schemes and that there is transparency in how outcomes are reached.





## Introduction (continued)

### Threepwood Consulting and our role

Threepwood Consulting has been appointed by SSEN Distribution to conduct the independent assurance checks required. We are an industry respected consultancy that has expertise in distribution network planning and audit/assurance activities. We have a proven track record in providing independent assurance of network related processes and operations like those required in the DNOA methodology.

### Nature of the assurance review

This assurance review is an independent check of a selected number of schemes with a value above £2M.

Schemes are selected by Threepwood from a list of schemes provided by SSEN. They ensure that both license areas are covered, different options (flexibility procurement and/or reinforcement) are reviewed and schemes from different planning departments are checked.

There are two types of review: A 'Sample' type review is focused on reviewing the Engineering Justification Papers (EJPs), CBA and CEM deterministic tools associated with each scheme. A 'Deep Dive' type review involves greater scrutiny of the content of the EJPs, CBA and CEM and seeks further evidence of how the process has been applied and decisions have been reached. The 'Deep Dive' includes interviews with engineers that have evaluated the solutions and proposed the recommended solution.

Threepwood independently and randomly choose which schemes are reviewed as Samples or Deep Dives based on achieving a balance of flex and asset solution schemes across both areas.

The assurance review is carried out every quarter to align with the publication of the latest DNOA Outcome Report.





## Overall Summary of Findings

### DNOA Scheme Reviewed

Findings Topic	1	2	3	4	5	6	7	8	9
Have future forecasts of demand and generation been done and have system needs been suitably identified (capacity)?									
Have suitable flexibility and asset options been identified and developed?									
Have the options been suitably assessed taking into account strategic requirements etc?									
Does the DNOA outcome report adequately reflect the assessment carried out?									

#### RAG status:

	Requirement not met (to the degree that the outcome could be materially affected or is inaccurate)
	Requirement partially met (process not robust, opportunities for improvement identified but the deficiency is not material and the outcome wouldn't change or its accuracy not affected)
	Requirement fully met



## Overall Summary of Findings (...continued)

### General Points:

The schemes checked were found to follow the DNOA process. All of the options proposed (flex and/or assets solutions) were determined as being correctly identified/assessed. In all cases, the “Do nothing” option is ignored in this report, as the requirement to “do something” is a given.

Good practices were common across different licensed areas and planners, including the use of a centrally managed/updated load model and cost database and considering outputs from stakeholder engagement. Several opportunities for improvement were identified in relation to the level of detail and consistency of information in the EJPs, CBA and CEM tools and the DNOA Outcome Reports. However, these do not have a material impact on the outputs. Improvement opportunities include: greater visibility of liaison and feedback from the DNO (in the EJP), greater visibility of social and economic considerations and alignment of estimated demand and capacity between the DNOA Outcome Report and the EJP.

The DNOA Outcome Report template is somewhat limited, particularly with respect to communicating strategic approaches and investment beyond 2031 and conveying non load related schemes. Better use of the limited available space in the report and deleting unused parts of the report, where possible, would improve communication of information. There is scope to improve descriptions in the report to better reflect the constraints and proposed options.

DFES scenario Customer Transformation (CT) has been applied in all cases. This is considered the most likely and realistic future scenario by most DSOs at present.

Throughout the assurance reports, an SSEN process known as DGIF (Distribution Governance Investment Framework) is mentioned. DGIF is a staged process which ensures that DNO input to the scheme proposals is sought at the earliest stages of a project. Meetings will take place between the DNO and DSO, where DNO engineers’ local knowledge can be considered and, if necessary, site visits will be organised.

Records of the meetings and any site visits are kept and are available to review as necessary. Outputs from this process are only recorded in the EJP by exception, i.e. high-risk issues, known operational issues, SSSIs, protected species, etc.



# Assurance Review Methodology

## Summary

- The same methodology applies to the assurance check irrespective of the type of review carried out.
- A standard question set is used to ensure all relevant requirements of the DNOA methodology are checked. There are 32 questions in total. These cover the four steps that make up the decision-making process: 'Identifying Future Load Related System Needs', 'Developing Options', 'Assessing Options' and 'Update Plan & Deliver'.
- For each scheme, an assessor reviews the EJP and supporting information and records findings.
- The findings against each question are recorded in a standard template and the assessor assigns a score depending upon the degree to which the requirement has been met. For 'Deep Dive' type reviews, the assessor documents any further evidence or clarifications required from the SSEN engineer(s).
- Scores are assigned as either 'Red', 'Amber' or 'Green' according to the criteria shown in the 'Overall Summary of Findings' slide in this Report.
- For each 'Deep Dive Review', the assessor conducts a detailed interview with the relevant SSEN engineer(s) to seek further clarification / evidence in order to conclude whether the process has been followed.
- Based on the recorded scores, the assessor concludes whether each key step in the decision-making process has been adequately followed and the outcome is valid.
- Opportunities for improvement and enhancement are identified from the Assurance but it is for SSEN to consider these suggested areas and take them forward to solutions.



## DNOA Outcome Schemes Reviewed

Ref	DNOA Scheme Name	Type	Area	Type of Review
1	Denham BSP Reinforcement	Asset Solution	SEPD	Deep
2	Winchester BSP Reinforcement	Asset Solution	SEPD	Sample
3	Rownhams BSP Reinforcement	Procure Flex	SEPD	Deep
4	Fulscot & Cholsey 33kV Reinforcement	Procure Flex	SEPD	Sample
5	Ashton Park (East Trowbridge) Phase 2	Procure Flex	SEPD	Deep
6	Ashludie - Milton of Craigie	Procure Flex	SHEPD	Sample
7	Newtonhill PSS	Procure Flex	SHEPD	Sample
8	Stoneywood PSS (Persley GSP)	Procure Flex	SHEPD	Sample
9	Dunoon GSP 33kV Circuit Reinforcement	Asset Solution	SHEPD	Deep

All SSEN July 2024 DNOA Outcome Schemes reviewed have been developed to Strategic Justification Validation stage. This is prior to a completion of detailed asset optioneering and feasibility design.



# Findings - 1. Denham BSP Reinforcement (Deep Dive Review)

## Scheme Details

Ref:	Scheme Name:	Scheme Title:	Planning Area:
1	Denham BSP	Denham BSP Reinforcement	SEPD

### Identifying Future Load Related System Needs

- Future load modelled using DFES scenarios beyond ED2 (up to 2050).
- CT future scenario used for developing and assessing options.
- Future load including committed connections (load and generation) and output from stakeholder engagement accounted for.
- P2/8 compliance under certain outage conditions (thermal overload) and fault level issues have been identified as key constraints.
- Eliminating an existing non-standard system voltage was also addressed.

### Developing Options

- Three possible actions were considered in reasonable detail.
- Only two options addressed the thermal and fault level issues, and these were taken forward to CBA.
- Flexibility was discounted, as it was deemed too complex to apply given the nature of the programme of works.

### Developing Options (...continued)

- Reinforcement of Denham BSP's 132kV and 22kV networks and constrained Primary substations on the 22kV network were considered.
- A strategic and proactive investment approach, allowing for future load growth and extension, has been considered by including the commencement of a voltage rationalisation process to change parts of the 22kV network to a standard 33kV level.
- The age and conditions of the existing switchgear and transformer assets on the affected network taken into account.
- Site input by the DNO was not transparent in the EJP, however, the engineer confirmed a site meeting with the DNO had taken place but because there were no major issues, this was not highlighted. Issues are only reported by exception.
- Meeting notes are kept for future reference.
- SSEN stated confidence in the preferred option was medium, due to the challenging nature of the proposed programme.

### Assessing Options

- The CBA tool was correctly used to support the proposed solution. There is scope to populate more detail in the CBA, although this would not materially affect the outcome.
- As flexibility was not practicable, the CEM tool was not used.
- Deliverability and operability risks were identified.
- A reinforcement only approach with some network voltage rationalisation was identified as the preferred option. As flexibility was not practicable, deferral was not possible.
- Meeting whole system requirements beyond ED2 (up to 2050) was a factor in the proposed solution.
- Social and environmental aspects were not covered in detail. However, it is recognised that SSEN's DGIF process addresses this in more detail at the next stage.
- No social or environmental aspects are believed to materially change the decision.
- DNO feedback on the proposed options was not specifically mentioned in the EJP. However, the planner confirmed that DNO staff had input at the initial stage, as described in the DGIF process. The engineer confirmed that the DNO had not highlighted any safety concerns.
- The correct signature protocol for approving the EJP appears to have been followed.





## Findings - 1. Denham BSP Reinforcement (Deep Dive Review) *continued...*

Scheme Details			
Ref:	Scheme Name:	Scheme Title:	Planning Area:
1	Denham BSP	Denham BSP Reinforcement	SEPD

### Update Plan and Deliver

- Key driver correctly identified as P2/8 compliance (thermal overload) with some fault level issues.
- Two practicable options that address these constraints were put forward to CBA.
- The preferred solution includes network reinforcement and partial rationalisation of the 22kV network to a standard level of 33kV.
- Flexibility was not practicable, so the constraint management timeline only includes operational management of the thermal constraint.

### Good Practices

- System model includes DFES forecasts, committed connections etc.
- NDR is centrally owned and managed by the Modelling and Reporting Team.
- Stakeholder engagement feeds into load and generation forecasts.
- Future load growth takes account of DFES scenario CT.
- Strategic and whole system aspects have been considered beyond ED2 (up to 2050).
- Flexibility has not been exploited to defer reinforcement, as it was deemed to complex.
- Deliverability and operability issues have been adequately considered.
- High level risks have been assessed and documented in the EJP.

### Opportunities for Enhancement

- Output from DNO liaison under DGIF process and feedback on the proposed network options are not generally shown in the EJP.
- Issues are only reported by exception.
- Capturing DNO feedback in EJP – noting this is recorded in meeting notes, which are available for future reference.
- Better visibility of social and environmental considerations from the DGIF process in the EJP and CBA.
- Completeness of fields and detail in the CBA tools.

### Summary

- Future forecasts of demand and generation beyond ED2 (up to 2050) have been suitably considered and whole system needs (i.e. network capacity) have been suitably identified.
- Flexibility options were not developed, as it was deemed too complex to apply on this scheme.
- The presented options were suitably assessed, considering strategic requirements, etc.
- The DNOA outcome report generally reflects the assessment carried out.

## Findings - 2. Winchester BSP Reinforcement (Sample Review)

### Scheme Details

Ref:	Scheme Name:	Scheme Title:	Planning Area:
2	Winchester BSP	Winchester BSP Reinforcement	SEPD

#### Identifying Future Load Related System Needs

- Future load and generation growth, including committed connections and output from stakeholder engagement accounted for.
- DFES scenario CT used in forecasts.
- Committed projects considered.
- Main driver was fault level.
- Load, voltage and fault levels were analysed.
- No thermal or voltage constraints were found.

#### Developing Options

- Two asset investment options analysed, proposing replacement of existing overstressed open-terminal outdoor 33kV switchgear.
- One option proposes like for like replacement of 33kV outdoor switchgear. This was not progressed due to the complexity, risks of delivery and that it was not future proof.
- The preferred option was to build an indoor 33kV GIS switchboard offline. This option has less outage risk, although it does require extra land to be procured .

#### Assessing Options

- Stakeholder engagement was conducted.
- Age and condition of assets accounted for.
- Strategic and economic aspects considered.
- DNO input captured, high risks would be highlighted.
- Generation flexibility not currently an option in SEPD, so, flexibility not considered and CEM tool not used.
- Only the preferred solution taken to CBA.
- Deliverability and operability risks identified; this included additional to provide room for proposed new 33kV switchhouse.
- Meeting whole system requirements beyond ED2 (up to 2050) were a factor in the proposed future proof solution.
- DGIF process considers social, economic and deliverability issues.
- The correct signature protocol for approving the EJP appears to have been followed.

#### Update Plan and Deliver

- Key driver correctly identified as fault level.
- The DNOA Outcome Report correctly captures the flexibility and reinforcement solution up to 2031.

#### Good Practices

- Stakeholder engagement feeds into load and generation forecasts.
- Future load growth takes account of the forecasted DFES scenario (CT).
- Strategic and whole system aspects have been considered beyond ED2 (up to 2050).
- High level risks have been assessed and documented in the EJP.

#### Opportunities for Enhancement

- More visibility of DNO liaison and feedback on the proposed network options, rather than just reporting on aspects by exception.
- However, notes of meetings with DNO are kept for future reference as part of DGIF.
- Better visibility of stakeholder engagements in the EJP.
- More detail in the EJP of environmental aspects covered.
- Better visibility of social and environmental considerations in the CBA and CEM.
- Possibility of introducing technology for generation flexibility for future schemes.

#### Summary

- Future forecasts of demand and generation have been suitably considered and whole system needs have been correctly identified.
- Due to the nature of the scheme, only two practicable asset investment options were identified and developed.
- Flexibility was not an option, as generation flexibility is not currently available on the SEPD network.
- The DNOA outcome report reflects the chosen asset intervention.

# Findings - 3. Rownhams BSP Reinforcement (Deep Dive Review)

## Scheme Details

Ref:	Scheme Name:	Scheme Title:	Planning Area:
3	Rownhams BSP	Rownhams BSP Reinforcement – Romsey and North Baddesley	SEPD

### Identifying Future Load Related System Needs

- Future load modelled using DFES scenarios beyond ED2 (up to 2050).
- CT future scenario used for developing and assessing options.
- Future load growth including committed connections (load and generation) and output from stakeholder engagement were all accounted for in the process.
- P2/8 compliance (Thermal Overload) was identified as the primary driver, with fault level being a secondary constraint.
- Operational issues on the 33kV network were also highlighted.
- No voltage issues were reported.
- Some of the assets to be replaced as part of the proposed reinforcement are nearing the end of their expected operational lives and have high HI and CI scores. This further supports the need for investment.

### Developing Options

- Suitable reinforcement options were adequately considered, three options were studied in detail.
- Flexibility was considered to defer investment, and this was included as part of the preferred solution.
- Engagement with regional councils and community energy groups was conducted to ensure alignment of aspirations.
- Information on the age and condition of existing network assets is available to the DSO via the DNO INVEST asset database.
- Identified risks include the requirement for extra land to extend existing sites and the condition assessment of existing 33kV overhead line poles to withstand new heavier conductor.
- Strategic and economic aspects were considered for the reinforcement options, i.e. asset ratings and cost.
- Site input by the DNO would only be captured in the EJP if any high risks had been identified under DGIF.
- Confirmed that liaison with the DNO had taken place, which comprehensively considered the merits of the options put forward.
- Notes of meetings with the DNO are kept for future reference as part of DGIF.

### Assessing Options

- CBA and CEM tools were used correctly.
- Deliverability and operability risks were identified.
- Reinforcement by uprating existing 33kV circuits and transformers, plus the addition of an additional 33kV circuit, with deferral by flexibility was identified as the preferred option.
- This accounts for whole system requirements beyond ED2 (up to 2050).
- Environmental aspects were not covered in detail. However, it is recognised that the DGIF process addresses this in more detail at the next stage. No environmental aspects were believed to materially change the decision.
- DNO feedback on the proposed options was not specifically mentioned in the EJP but notes of meetings with DNO staff are kept for future reference.
- It was confirmed that DNO staff had an input at this initial stage, as described in the DGIF process.
- The engineer confirmed that the DNO had not highlighted any safety concerns.
- The correct signature protocol for approving the EJP appears to have been followed.



## Findings - 3. Rownhams BSP Reinforcement (Deep Dive Review) *continued...*

Scheme Details			
Ref:	Scheme Name:	Scheme Title:	Planning Area:
3	Rownhams BSP	Rownhams BSP Reinforcement – Romsey and North Baddesley	SEPD

### Update Plan and Deliver

- Key driver correctly identified as P2/8 compliance (thermal overload) with some fault level issues.
- Three practicable options that address these constraints were put forward to CBA.
- The preferred solution includes flexibility to defer investment for three years.
- The Outcome Report correctly shows the Constraint Management Timeline completed to show the deferral period.
- Estimated peak MW firm network capacity was shown as exceeded under DFES CT & LTW scenarios by 2028.

### Good Practices

- System model includes all FES, connections etc. and the network model is centrally owned and managed by Modelling and Reporting Team.
- Stakeholder engagement feeds into load and generation forecasts.
- Future load growth takes account of DFES scenarios.
- Strategic and whole system aspects have been considered beyond ED2 (up to 2050).
- Deliverability and operability have been adequately considered.
- High level risks have been assessed and documented in the EJP.

### Opportunities for Enhancement

- Better visibility of DNO liaison (site visits, etc.) and feedback on the proposed network options, rather than just reporting on aspects by exception.
- Notes of meetings with DNO are however kept for future reference.
- Visibility of stakeholder engagements in the EJP.
- More detail in the EJP of environmental aspects covered.
- Visibility of social and environmental considerations in the EJP and CBA.

### Summary

- Future forecasts of demand and generation have been suitably considered and whole system needs have been suitably identified.
- Suitable asset options have been identified and developed. Deferral using flexibility was included.
- The options have been suitably assessed, considering strategic requirements etc.
- The DNOA outcome report generally reflects the assessment carried out.

# Findings - 4. Fulscot & Cholsey 33kV Reinforcement (Sample Review)

## Scheme Details

Ref:	Scheme Name:	Scheme Title:	Planning Area:
4	Fulscot & Cholsey	Fulscot & Cholsey 33kV Reinforcement	SEPD

### Identifying Future Load Related System Needs

- Future load modelled beyond ED2 (up to 2050) based on all four DFES scenarios.
- Future load and generation, including committed connections, accounted for.
- Thermal overload was stated as primary driver.
- No voltage or fault level issues identified.

### Developing Options

- Three reinforcement options, including flexibility procurement to defer reinforcement, were considered in suitable detail.
- Load transfer was also considered but discounted.
- A proactive investment to allow for future growth and extension was selected.
- The conditions of the existing assets (using the DNO's INVEST database) and the physical constraints for installing new network assets were considered in the options.

### Assessing Options

- CBA tool was correctly used on two options.
- CEM tool was used to determine flexibility effects.
- The most beneficial solution, including deferment of reinforcement using flexibility was selected as the preferred option.
- Deliverability and operability risks have been identified, including the need for extra construction space and the need to carry out an HDD under a rail line for a new cable circuit.
- A combined flexibility and reinforcement approach was correctly identified as the preferred option, considering whole system requirements beyond ED2 (up to 2050).

### Update Plan and Deliver

- Key driver correctly identified as thermal overload.
- The DNOA Outcome Report correctly captures the flexibility and reinforcement solution up to 2031.

### Good Practices

- Stakeholder engagement feeds into load and generation forecasts.
- Future load growth takes account of the forecasted DFES scenario (CT).
- Strategic and whole system aspects have been considered beyond ED2 (up to 2050).
- High level risks have been assessed and documented in the EJP.

### Opportunities for Enhancement

- More visibility of DNO liaison and feedback on the proposed network options, rather than just reporting on aspects by exception.
- However, notes of meetings with DNO are kept for future reference.
- Better visibility of stakeholder engagements in the EJP.
- More detail in the EJP of environmental aspects covered.
- Better visibility of social and environmental considerations in the CBA and CEM.

### Summary

- Future forecasts of demand and generation have been suitably considered and whole system needs have been suitably identified.
- Suitable flexibility and asset options have been identified and developed.
- The options have been suitably assessed, considering strategic requirements etc.
- The DNOA outcome report adequately reflects the assessment carried out up to 2031.

# Findings - 5. Ashton Park (East Trowbridge) Phase 2 (Deep Dive Review)

## Scheme Details

Ref:	Scheme Name:	Scheme Title:	Planning Area:
5	Ashton Park	Ashton Park (East Trowbridge) Phase 2	SEPD

### Identifying Future Load Related System Needs

- Predicted load and generation growth, with DFES future scenario (CT), used for developing and assessing options.
- It was not obvious in the EJP that already committed new connections have been considered, although the engineer did confirm this was the case.
- Outputs from stakeholder engagement were also accounted for in the process.
- Load, voltage and fault level were all analysed.
- Main driver was identified as thermal overload.
- No fault level or voltage issues were reported.
- Network complexity (P18 compliance) was also raised as an issue to be resolved .

### Developing Options

- Three investment options were analysed in adequate detail.
- Options considered included network reconfiguration and reinforcement by adding additional 33kV circuits.
- Flexibility was correctly considered to defer investment and was included in the preferred option.

### Developing Options (...continued)

- Engagement with regional councils and community energy groups was conducted to ensure alignment of aspirations.
- The age and condition of existing network assets were considered; this information is available to the DSO via the DNO INVEST asset database.
- Strategic and economic aspects were considered for the reinforcement options (i.e. asset ratings and cost) as part of the stakeholder engagement process.
- Site input by the DNO was captured in the EJP, any high risks would then be identified and highlighted.
- The engineer confirmed that liaison with the DNO had taken place, which considered the merits of the options put forward comprehensively.
- Notes of meetings with the DNO are kept for future reference.
- Flexibility to defer investment was correctly considered and applied.

### Assessing Options

- Two asset investment options were taken to CBA, one with and one without flexibility.
- The CEM tool was correctly applied to check the viability of flexibility.
- Deliverability and operability risks were identified; these included the risk to network security which will be present until the new 33kV circuits are commissioned and the unknown health status of a redundant overhead line due to be recommissioned as part of the proposals.
- Meeting whole system requirements beyond ED2 (up to 2050) were a factor in the proposed future proof solution.
- A rigorous process (DGIF) considers social, economic and deliverability issues (although this was not all recorded in the EJP, as issues are only recorded by exception).
- Environmental impacts, including, for example, land use, protected land, SSSIs noise mitigation, nearby residential properties, public rights of way, using non-SF6 equipment where possible, etc, are all captured in the DGIF process.
- It was confirmed that the DNO had not highlighted any safety concerns.
- The correct approval protocol appears to have been followed.

# Findings - 5. Ashton Park (East Trowbridge) Phase 2 (Deep Dive Review)

*continued...*

## Scheme Details

Ref:	Scheme Name:	Scheme Title:	Planning Area:
5	Ashton Park	Ashton Park (East Trowbridge) Phase 2	SEPD

### Update Plan and Deliver

- Key driver correctly identified as thermal overload with a pre-existing P18 circuit complexity issue further compounding the network constraints.
- Only two of the three investment options fully addressed both network constraints.
- These two options were taken to CBA.
- The preferred option included the use of flexibility to defer investment, giving slightly better value in the CBA.
- The constraint management timeline was correctly completed showing flexibility being utilised to defer the works.
- The estimated peak load was shown as exceeding the network capacity from 2029.

### Good Practices

- The system model includes all DFES, connection projections and load growth and is centrally owned and managed by the Modelling and Reporting Team.
- Stakeholder engagement feeds into the load and generation forecasts.
- Strategic and whole system aspects have been considered beyond ED2 (up to 2050).
- Flexibility was correctly exploited to defer reinforcement.
- Deliverability and operability issues have been adequately considered.
- High level risks have been considered and documented in the EJP.
- Environmental impacts were assumed to be considered.

### Opportunities for Enhancement

- Better visibility in EJP of DNO liaison (site visits, local knowledge, etc.) and feedback on the proposed network options, rather than just reporting on aspects by exception.
- However, notes of meetings with DNO are kept for future reference.
- More clarity on whether committed new connections have been allowed for.
- Visibility of social and environmental considerations would be beneficial.
- Completeness of fields and more detail in the CBA tool.
- Availability of correctly signed and approved document versions.

### Summary

- Future forecasts of demand and generation have been suitably considered and whole system needs have been correctly identified.
- Due to the nature of the scheme, only two practicable asset investment options were taken through to CBA.
- Flexibility was correctly applied to defer investment.
- The DNOA outcome report adequately reflects the chosen asset intervention.



## Findings - 6. Ashludie - Milton of Craigie (Sample Review)

Scheme Details			
Ref:	Scheme Name:	Scheme Title:	Planning Area:
6	Ashludie	Ashludie - Milton of Craigie GSP	SHEPD

### Identifying Future Load Related System Needs

- Future load modelled beyond ED2 (up to 2050) based on Consumer Transformation (CT-W) scenario from DFES. This was deemed the most appropriate load scenario.
- Future load includes committed connections and load growth, identified through stakeholder engagement.
- Three large BESS connections were accounted for.
- Thermal overloads were identified as the primary driver, with some voltage issues also identified.
- No fault level issues were identified.
- Limited space at Ashludie was highlighted as an issue in the EJP, which discounted one option.

### Assessing Options

- CBA tool correctly used to determine the most beneficial whole system solution.
- Optimum solution was reinforcement of circuits to and assets at Ashludie, plus flexibility.
- CEM tool was correctly used to check viability of flexibility to defer investment.
- Operability and deliverability risks were identified and addressed.
- Existing asset condition accounted for.
- The transparency of DNO feedback on the network options could be improved in the EJP including commentary on safety aspects.
- DNO feedback is recorded from meeting notes.

### Good Practices

- Stakeholder engagement feeds into load and generation forecasts.
- Future load growth takes account of the forecasted DFES scenario (CT).
- Strategic and whole system aspects have been considered beyond ED2 (up to 2050).
- High level risks have been assessed and documented in the EJP.

### Opportunities for Enhancement

- More visibility of DNO liaison and feedback on the proposed network options, rather than just reporting on aspects by exception.
- However, notes of meetings with DNO are kept for future reference.
- Visibility of fault level studies in EJP
- Better visibility of stakeholder engagements in the EJP.
- More detail in the EJP of environmental aspects considered.
- Better visibility of social and environmental considerations in the CBA and CEM.

### Developing Options

- Suitable reinforcement options and flexibility procurement were adequately considered.
- Flexibility was included in the preferred option, to defer investment.
- No material environmental, social or economic aspects were stated in EJP.
- Strategic proactive options were considered to create headroom beyond ED2 (up to 2050).

### Update Plan and Deliver

- The DNOA Outcome Report captures the scheme and reinforcement solution correctly up to 2031 and shows that flexibility to defer investment is viable.

### Summary

- Future forecasts of demand and generation have been suitably considered and system needs have been suitably identified (capacity).
- Suitable flexibility and asset options have been identified and developed.
- The options have been suitably assessed, taking into account strategic requirements etc.





## Findings - 7. Newtonhill PSS (Sample Review)

Scheme Details			
Ref:	Scheme Name:	Scheme Title:	Planning Area:
7	Newtonhill PSS	Redmoss, Newtonhill Substation 33KV	SHEPD

### Identifying Future Load Related System Needs

- Future load modelled beyond ED2 (up to 2050) based on Consumer Transformation (CT) scenario from DFES. This is deemed the most likely load scenario.
- Future load forecasts include committed connections and load growth identified through stakeholder engagement.
- Thermal overloads were identified as the primary driver, with some voltage issues also identified.
- An increase in fault levels due to the installation of larger transformers was mentioned.
- One option was stated as requiring additional land for a new Primary Substation.

### Assessing Options

- CBA tool correctly used to determine the most beneficial whole system solution.
- Optimum solution was reinforcement plus flexibility.
- CEM tool was correctly used to check viability of flexibility to defer investment.
- Operability and deliverability risks were identified and addressed.
- Existing asset condition accounted for.
- The transparency of DNO feedback on the network options could be improved in the EJP including commentary on safety aspects.
- But DNO feedback is recorded from meeting notes as part of DGIF.

### Update Plan and Deliver

- The DNOA Outcome Report captures the scheme and reinforcement solution correctly up to 2031 and shows that flexibility to defer investment is viable.

### Developing Options

- Suitable reinforcement options and flexibility procurement were adequately considered.
- Flexibility was included in the preferred option, to defer investment.
- No material environmental, social or economic were stated in EJP.
- Strategic proactive options were considered to create headroom beyond ED2 (up to 2050).

### Summary

- Future forecasts of demand and generation have been suitably considered and system needs have been suitably identified (capacity).
- Suitable flexibility and asset options have been identified and developed.
- The options have been suitably assessed, taking into account strategic requirements etc.

### Good Practices

- Stakeholder engagement feeds into load and generation forecasts.
- Future load growth takes account of the forecasted DFES scenario (CT).
- Strategic and whole system aspects have been considered beyond ED2 (up to 2050).
- High level risks have been assessed and documented in the EJP.

### Opportunities for Enhancement

- More visibility of DNO liaison and feedback on the proposed network options, rather than just reporting on aspects by exception.
- However, notes of meetings with DNO are kept for future reference.
- Better visibility of stakeholder engagements in the EJP.
- More detail in the EJP of environmental aspects considered.
- Better visibility of social and environmental considerations in the CBA and CEM.



## Findings - 8. Stoneywood PSS (Sample Review)

Scheme Details			
Ref:	Scheme Name:	Scheme Title:	Planning Area:
8	Stoneywood PSS	Stoneywood PSS (Persley GSP)	SHEPD

### Identifying Future Load Related System Needs

- Future load modelled beyond ED2 (up to 2050) based on DFES CT scenario. This is deemed the most likely load scenario.
- Future load forecasts allow for already committed connections and worst-case future connections activity and load growth, identified through stakeholder engagement.
- Thermal overload was identified as the primary driver, with some voltage issues also identified.
- Fault levels were not mentioned in the EJP, but the engineer confirmed that these had been carried out and revealed no issues.
- One option required a building extension which was not practicable due to lack of space.

### Assessing Options

- CBA tool correctly used to determine the most beneficial whole system solution.
- Optimum solution was reinforcement plus flexibility.
- CEM tool was correctly used to check viability of flexibility to defer investment.
- Operability and deliverability risks were identified and addressed.
- Existing asset condition accounted for.
- The transparency of DNO feedback on the network options could be improved in the EJP including commentary on safety aspects.
- But DNO feedback is recorded from meeting notes.

### Update Plan and Deliver

- The DNOA Outcome Report captures the scheme and reinforcement solution correctly up to 2031 and shows that flexibility to defer investment is viable.

### Developing Options

- Suitable reinforcement options and flexibility procurement were adequately considered.
- Flexibility was included in the preferred option, to defer investment.
- No material environmental, social or economic were stated in EJP.
- Strategic proactive options were considered to create headroom beyond ED2 (up to 2050).

### Summary

- Future forecasts of demand and generation have been suitably considered and system needs have been suitably identified (capacity).
- Suitable flexibility and asset options have been identified and developed.
- The options have been suitably assessed, taking into account strategic requirements etc.

### Good Practices

- Stakeholder engagement feeds into load and generation forecasts.
- Future load growth takes account of the forecasted DFES scenario (CT).
- Strategic and whole system aspects have been considered beyond ED2 (up to 2050).
- High level risks have been assessed and documented in the EJP.

### Opportunities for Enhancement

- More visibility of DNO liaison and feedback on the proposed network options, rather than just reporting on aspects by exception.
- However, notes of meetings with DNO are kept for future reference.
- Better visibility of stakeholder engagements in the EJP.
- More detail in the EJP of environmental aspects considered.
- Better visibility of social and environmental considerations in the CBA and CEM.

## Findings - 9. Dunoon GSP (Deep Dive Review)

### Scheme Details

Ref:	Scheme Name:	Scheme Title:	Planning Area:
9	Dunoon GSP	Dunoon GSP 33KV Circuit Reinforcement	SHEPD

#### Identifying Future Load Related System Needs

- Predicted load and generation growth, with DFES future scenario (CT), used for developing and assessing options.
- Three specific contracted projects were allowed for in the load forecasts.
- Output from stakeholder engagement was also taken into account.
- Load and voltage studies carried out.
- Main drivers for investment were identified as thermal overload and voltage.
- No fault level studies carried out, as no agreed transmission system fault levels available.
- No fault level issues were known to exist on this network and the proposed works should not affect fault levels significantly.

#### Developing Options

- Four reinforcement options were analysed in adequate detail.
- Options considered included reinforcement of existing assets, adding new assets and the use of STATCOMS.
- Flexibility was discounted as there was not enough flexibility available on this network.

#### Developing Options (...continued)

- Engagement with regional councils and community energy groups was conducted to ensure alignment of aspirations.
- The age and condition of existing network assets were considered, although the condition of affected OHLs was not mentioned, but this information is available to the DSO via the DNO INVEST asset database.
- Strategic and economic aspects were considered for the reinforcement options (i.e. asset ratings and cost) as part of the stakeholder engagement process.
- Site input by the DNO was captured in the EJP, any high risks were identified and highlighted.
- The engineer confirmed that liaison with the DNO had taken place, and this considered the merits of the options put forward comprehensively.
- Notes of meetings with the DNO are kept for future reference as part of DGIF.
- Flexibility to defer investment was impracticable due to there being insufficient flexibility on the network.

#### Assessing Options

- Only two of the four asset investment options resolved all constraints and were taken through to CBA.
- The CEM tool was not utilised as insufficient flexibility was available on this network.
- Deliverability and operability risks were identified, including long lead times for switchgear and STACOMs
- Meeting whole system requirements beyond ED2 (up to 2050) was a factor in the proposed future proof solution.
- A rigorous process (DGIF) considers social, economic and deliverability issues (although this was not all recorded in the EJP, as issues are only recorded by exception).
- Environmental impacts, including, for example, land use, protected land, SSSIs noise mitigation, nearby residential properties, public rights of way, using non-SF6 equipment where possible, etc, are all captured in the DGIF process.
- The engineer confirmed that the DNO had not highlighted any safety concerns.
- The correct signature protocol for approving the EJP appears to have been followed.

## Findings - 9. Dunoon GSP (Deep Dive Review) *continued...*

### Scheme Details

Ref:	Scheme Name:	Scheme Title:	Planning Area:
9	Dunoon GSP	Dunoon GSP 33KV Circuit Reinforcement	SHEPD

#### Update Plan and Deliver

- Key drivers correctly identified as thermal overload and voltage issues.
- Only two of the four investment options fully addressed both network constraints.
- These two options were taken to CBA.
- The preferred option, giving the best financial benefit was network reinforcement and the installation of two STATCOMs to alleviate the voltage regulation issues.
- The estimated peak load has not been completed on the Outcome Report.
- The Constraint Management table shows operational management only of the constraint, as flexibility was not viable.

#### Good Practices

- The system model includes all DFES, connection projections and load growth and is centrally owned and managed by the Modelling and Reporting Team.
- Stakeholder engagement feeds into the load and generation forecasts.
- Strategic and whole system aspects have been considered beyond ED2 (up to 2050).
- Flexibility was not viable to defer reinforcement.
- Deliverability and operability issues have been adequately considered.
- High level risks have been considered and documented in the EJP.
- Environmental impacts were assumed to be considered.

#### Opportunities for Enhancement

- Better visibility in EJP of DNO liaison (site visits, local knowledge, etc.) and feedback on the proposed network options, rather than just reporting on aspects by exception.
- However, notes of meetings with DNO are kept for future reference.
- Mention OHL condition in EJP.
- Consideration of alternatives to STACOMs, such as SVCs in the EJP.
- Visibility of social and environmental considerations would be beneficial.
- Completeness of fields and more detail in the CBA tool.
- Availability of correctly signed and approved document versions.

#### Summary

- Future forecasts of demand and generation have been suitably considered and whole system needs have been correctly identified.
- Due to the nature of the scheme, only two practicable asset investment options were taken through to CBA.
- Flexibility was not feasible to defer investment, as insufficient flexibility was available on this network.
- The DNOA outcome report adequately reflects the chosen asset intervention.