

**The Voice of the Networks**



# **Energy Networks Association**

**Transmission and  
Distribution Interface  
Steering Group Report**

**May 2016**

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## 1. Introduction

This report has been prepared by Energy Networks Association (ENA) on behalf of electricity transmission and distribution licensees<sup>1</sup> including the National Electricity Transmission System Operator. The report is in response to Ofgem's letter to companies dated 4<sup>th</sup> December 2015 'the roles and responsibilities of network companies in managing the impact of embedded generation (EG) across the electricity network'.

Ofgem's letter asked distribution and transmission companies to work together more closely to consider how they could tackle the whole system impact of EG or distributed generation (DG).<sup>2</sup> Ofgem noted ENA's proposals to form a Transmission Distribution Interface (TDI) Steering Group and requested a report from the group outlining how issues are being resolved by the 31<sup>st</sup> May 2016. This document represents that report.

## 2. Challenges and Opportunities

The unprecedented increase in DG has meant that in a short space of time, Distribution Network Operators (DNOs), Transmission Owners (TOs) and the System Operator (SO) have had to respond and change the way that they work together to maintain an economical and secure network. DNOs have connected approximately 27.8GW of DG in total to the distribution networks. Much of this has connected in the last 2 years. One of the challenges has been that for every 10 DG applications, there is only one project which accepts an offer to connect to the network. This means that the volume of work DNOs, TOs and SO are undertaking in processing applications and design is significantly beyond that required to connect the actual DG on the system.

Networks (DNOs and TOs) and the SO are working to resolve this challenge while also responding to an unprecedented number of applications from DG customers and increasingly storage providers, where over 19 GW has requested to connect to the distribution network.<sup>3</sup> In parallel, there has been a fall in demand across the networks which has presented additional issues, that while not unique internationally, are a major challenge for power system networks and the SO. The scale of the change in the industry is posing new challenges and opportunities to manage the system efficiently. The SO, TOs and DNOs, are working closely together to address short term issues, but also to develop medium and long term enduring approaches to managing whole of system issues.

## 3. Governance

This chapter provides an overview of the additional governance measures that have been put in place since Ofgem's letter in December 2015. These measures are designed to ensure the immediate challenges identified in this document, as well as medium and long term challenges will be addressed in a timely and efficient manner. The SO, TOs, and DNOs recognise the importance of developing enduring approaches to management of the challenges to ensure that the long term interests of customers are protected.

### General

The developments outlined above present a significant challenge to the industry. Historically, each network operator has largely been able to focus on the issues which impact them and their sector. This is reflected in the structure and governance of industry codes – at distribution level DNOs can make changes to commercial arrangements through the distribution use of system agreement (DCUSA). At transmission level, TO and SO commercial arrangements are governed through the connection and use of system code (CUSC) and the System Operator -Transmission Owner Code (STC). For technical related changes, there are separate codes at distribution and transmission level. Equally, price control

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<sup>1</sup> These companies are: National Grid Electricity Transmission plc, SP Transmission plc, Scottish Hydro Electric Transmission plc, Electricity North West Ltd, Northern Powergrid, Scottish and Southern Energy, Scottish Power Energy Networks, UK Power Networks and Western Power Distribution.

<sup>2</sup> From this point on we refer solely to DG

<sup>3</sup> As of April 2016.

reviews for distribution and transmission (including system operation) have had policy developed separately, by separate teams and have control periods which run to different timescales.

These mechanisms have worked well in a world where the majority of issues faced by DNOs, TOs and the SO are predominantly separate. However, the issues which are now emerging require co-ordination between the separate governance streams. The challenge is around identifying the issues which require this co-ordination and ensuring that the implications for all network operators and the SO are analysed and considered before policy changes are progressed through the existing industry codes. Given the pace of change and increasing capability to solve system challenges on a whole system basis, increased transparency and co-ordination between SO, TO and DNOs is required.

### Objective

There is a commitment among network companies to work together to solve these issues. They are no longer issues for the future. Engagement in this area is the only way to deliver the levels of customer service on connections which were envisaged at the time of submitting RII0 business plans and which are enshrined in the price control package. As such this is a high priority for companies and a key focus of attention going forward.

Consequently, DNOs, TOs and the SO have put a variety of measures in place to meet the challenges presented.

- At senior management and director level, bilateral SO/DNO and SO/TO meetings are taking place. Until now, these have been arranged on an ad hoc basis, but going forward, regular meetings are being arranged. It is intended that these would take place every 6 months.
- Regular meetings already take place between National Grid and each DNO in England and Wales. These are referred to as Joint Technical Planning Meetings (JTPMs). JTPMs are working level meetings to consider regional issues around demand security, new connections and system development. There is also regular interaction between the SO and DNOs in Scotland through STC and Grid Code processes.
- Bi-lateral meetings take place from time to time to address specific issues. For example, additional meetings have taken place to consider emerging issues around voltage management and increasing levels of distributed generation.
- A strategic level steering group under ENA (the Transmission Distribution Interface –TDI-steering group) has been established to take a whole system view of interface issues and identify how to take work forward. This is attended by DNOs, TOs and the SO.

The TDI group is tasked with being a central body to undertake the following:

- i. Provide the strategic direction for other ongoing SO, TO, DNO work affecting the T-D interface
- ii. Finding effective whole system solutions, that ensure a co-ordinated approach to planning, operation and investment both in networks and balancing services
- iii. Identifying the issues which require whole system co-ordination at an early stage
- iv. Ensuring there is a commitment among SO, TOs and DNOs to work together to solve these issues
- v. Ensuring that the implications for SO, TOs and DNOs are appropriately analysed and considered before policy changes are progressed through existing industry codes (e.g. data, cost benefit analysis etc.)
- vi. Ensuring that actions to be taken for efficient whole system solutions are discussed and have the correct forum to ensure that they are addressed in an efficient time scale

We should be clear that the TDI steering group is not the vehicle to change policy to resolve the issues it identifies. There are existing channels for this through the industry code panels (CUSC, DCUSA, Gridcode, STC and Distribution code); Ofgem policy development which can lead to any required licence modifications; and/ or DECC policy development which can lead to any required legislative changes.

Alongside overseeing the delivery of the above, the steering group will undertake horizon scanning to identify upcoming issues and make sure that solutions are being developed well in advance of when those issues start to impact networks and their customers. Members of the group will then progress changes to the appropriate framework to take solutions forward as appropriate. The TDI group then provides a further opportunity for network owners and the SO to discuss progress on these initiatives and identify any further interactions and barriers to progress.

### Leadership and commitment

The TDI steering group has been established as a permanent group within ENA. Annex 2 to this report identifies the member organisations and how the TDI group is governed within ENA. It is chaired by a member of ENA's most senior engineering group (the Electricity Networks Futures Group - ENFG). It reports to the ENFG quarterly which in turn reports to ENA's board. There are regular updates and a link to ENA's Electricity Regulation Group (ERG) to pick up commercial and regulatory aspects of the issues. Companies will ensure that the TDI group and other fora looking to tackle interface issues have the resources required to do so.

### Monitoring and reporting

Meetings take place on at least a quarterly basis and Ofgem and DECC are invited observers<sup>4</sup> of the steering group. The TDI steering group is monitoring the work underway on interface issues and tasked with ensuring timely delivery. Annex 1 to this report is a work plan which has been developed and agreed by the SO, TOs and DNOs to develop a tool box of solutions to the interface issues emerging today and those identified as being on the horizon.

The ENA will provide a progress report to Ofgem every 6 months. This will highlight progress against the deliverables outlined in annex 1 and also highlight any emerging issues which have been identified and how companies plan to deal with them. We will submit the next report to Ofgem by the end of December 2016.

## 4. How governance is working

Annex 1 to this report provides a work plan that DNOs, TOs and the SO are now working collaboratively to deliver. It is worth picking up some examples to outline how the measures companies have put in place are working in practice:

### a) Enhanced Frequency response and DNO storage applications

**Issue:** In September 2015, the SO indicated that it was planning to tender for a new service for enhanced frequency response. The SO indicated that it was seeking to contract for 200MW of this service, as part of a small roll out to learn lessons for a potentially wider tender in a few years' time. The speed of the frequency response required by the SO (100% active power output at 1 second (or less) of registering a frequency deviation) is more suited to battery storage than other forms of generation. The timing of the tender coincided with Government announcement on reducing subsidies available for solar PV generation. Consequently, many solar PV developers are choosing to switch to battery technology and plan on bidding for the enhanced frequency response tender to secure a revenue stream.

The result is that since autumn last year, DNOs have received over 1000 applications from storage providers totalling over 19GW. It is likely that the SO will require providers to offer the enhanced frequency response service 24 hours a day, 7 days a week. This means that the storage provider

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<sup>4</sup> We recognise that Ofgem and DECC can't be active members of the group given their regulatory and legislative roles. They will be looking to use the discussions at the steering group and outputs of the work programme to help inform their work.

must be able to reach its maximum import and export at any one time. Consequently, the majority of storage developers request firm connection to the distribution network and do not consider alternatives (flexible connection agreements). There are few places on the distribution network which can accommodate this without requiring reinforcement. As a result, storage providers have submitted numerous speculative applications trying to identify the few areas on the network where reinforcement won't be required. This is a heavy volume of work for DNOs and exacerbates the issues they are already experiencing with high volumes of DG applications.

**Actions being taken to prevent a similar occurrence:** Through the governance processes set up, network companies and the SO are taking a number of actions to learn from the experience.

- i) SO is consulting with DNOs on terms of service contracts before they go to tender

This will allow DNOs to highlight the impact the terms will have on DNO connected parties providing the service and an opportunity to address any issues before a full tender is run. This is a process we will look to put in place prior to all future tenders for new services.

- ii) ENA working group looking to align service requirements (shared services working group)

ENA's shared services working group has a set of deliverables looking at the current and future services which DNOs and SO require, parties which can provide those services and the timing on when they are required. This will help identify where multiple services can be provided by the same party and allow contracts to be designed accordingly. This should allow DNOs to offer flexible connections and avoid reinforcement to connect parties that wish to provide services to the SO. Full details of the deliverables are in annex 1.

- iii) The SO is looking to develop the System Operability Framework (SOF) over 2016 and 2017 to provide a broader T-D perspective of future operability challenges. This will enable a more joined up view of the transmission and distribution service requirements.

This will help provide a complete picture of the range of services parties can bid for and will use some of the outputs of ENA's shared services working group.

### **b) Different charging arrangements between transmission and distribution**

**Issue:** In the most constrained parts of the distribution network, it is not uncommon for connection requests from DG customers that will trigger transmission reinforcement. This includes much of Scotland where the transmission network starts at 132kV. It can be difficult to explain to DG stakeholders how the interaction between the two different sets of charging arrangements works. In some circumstances the two methodologies do not neatly fit together and result in the customer being caught in the middle, paying a level of costs which they would not do if they were connecting directly to the Transmission network. This can act as a distortion in discussions on where DG should connect.

For example, at distribution level, a connecting customer pays a share of any reinforcement costs up to one voltage level above the point at which they connect to the network. This protects LV customers from picking up a share of EHV reinforcement on the basis that it would provide far greater benefits to other users than it would to the LV customer. At transmission level, reinforcement costs are spread across all transmission generators and suppliers, unless they are deemed as sole use reinforcement, connection or one-off works. At the transmission level where any assets are classed as connection or one-off, these costs will be passed through to the DNO who will pass these on to the DG customer. The enduring cost of additional works beyond connection are not passed on to DNOs and are charged to transmission generators and suppliers through TNUoS (i.e. not to the majority of DG even those connected one voltage level below transmission). However, prior to connection, the DG causing the reinforcement may be required to place security through the DNO to the transmission company. The transmission arrangements have been developed to support third party access (promote competition) and also to protect end consumers from stranded assets.

When a DG customer triggers transmission works, the DNO is the contracting party with NGET. The DNO will therefore pick up any securities (and liability) in relation to any transmission reinforcements required to connect the DG which is then passed onto to each DG customer via CMP223

arrangements.<sup>5</sup> Where any identified works (for example upgrades to a GSP) result in additional capital costs, the DNO is also liable for these. As the DNO has no mechanism to recover these costs, the only option available to the DNO is to pass the cost onto DG customers in full. Where however there are a number of DG customers and are dependent upon the same works, some DNOs will allocate these costs to generators based on a £/kW basis. It is often the case that the securities combined with the additional capital costs means that the DG project cannot progress.

**Actions being taken:** ENA's TDI steering group has initiated the following work to help assess the issue and potential solutions:

- i) Summary of key charging issues for the SO and DNOs

This has helped to brief all parties on elements of the charging methodology which are being looked at for change. The SO has outlined that it plans on undertaking a wide ranging review of its charging framework to check it continues to place the correct economic incentives on customers going forward.

- ii) Establishment of cross-industry task force

The TDI group identified that there was no existing working group or code panel which could take the required whole systems approach to connection and use of system charging issues across transmission and distribution. Consequently it has established a task force to assess these issues.

This is not an area which is simple to address in the near term. Some of the drivers of differences can be traced back to what has been funded in separate price controls for DNOs and the SO. Nonetheless, network companies want to try and understand the options available to help resolve the issues; the impact those options would have on the current commercial arrangements; and any barriers to implementing those options within the current regulatory or legal frameworks. This task force will report to the TDI steering group drawing upon charging expertise across network companies. It will seek views from established charging forums including the Distribution Charging Methodologies Forum and the Transmission Charging Methodologies Forum, and will provide regular updates to wider stakeholder forums. Its conclusions will help feed into existing work underway on charging issues – both the EHV Distribution Charging Methodology (EDCM) review at distribution level and National Grid's proposed review of transmission charging arrangements that is currently being scoped. The deliverables for the task force are set out in annex 1.

### c) High Voltage Management

**Issue:** Due to progressive changes in reactive power requirements across the system, system voltages during periods of minimum demand (load) have changed significantly, presenting planning and operational challenges for the System Operator, National Grid (Great Britain). High voltage excursions have been increasing in frequency. High voltage management has evolved from being a summer challenge that mainly affected the South of the country, to being a year-round national issue.

Although these voltage excursions primarily impact the high voltage transmission system<sup>6</sup>, the issue can affect electrically distant, low voltage areas (which can be influenced by approaches across all voltage levels, both transmission and distribution) as well as regional transmission and distribution systems.

In line with the spirit of section 9 of the Electricity Act, the Distribution Network Operators (DNOs) will, where the SO makes a reasonable request, work with the SO to determine the most appropriate cost effective solution, whether that includes work on the Transmission or Distribution System.

The current challenge is that in some cases the most economical solution may be on or connected to the distribution network, and the existing system, processes and regulation does not lend itself to assessing the cost benefits of implementing these versus existing balancing services costs.

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<sup>5</sup> CUSC modification CMP223 ensures that DG deemed to have an impact on the electricity transmission network are not faced with undue discrimination in the way security requirements under the CUSC Section 15 are passed on by DNOs.

<sup>6</sup> This is due to the philosophy of voltage control across transformations where reactive reserves at the higher voltage are used to support a defined voltage profile of lower voltages.

### Actions being taken:

The following actions commenced in August 2015, and were completed in May 2016:

- a) DNOs, TOs and SO established a working group to identify viable short, medium and long term whole system solutions to the high volts issue, and assess their feasibility, and
- b) Publish a detailed report on options, conclusions and recommendations.

Businesses are already implementing some of the options considered in this High Voltage Feasibility report. The report provides a list of recommended next steps and are provided in Annex 3. These next steps will be considered by the Transmission Distribution Interface Steering Group in June 2016 and include recommendations on work to assess:

- Network Planning;
- Whole system CBA;
- Implementation of identified high voltage management solutions;
- Stakeholder engagement;
- Legislative, regulatory changes/assessment required;
- Data exchange;
- Innovation, and
- Commercial arrangements.

The High Voltage Management work is being used as a test case for whole system cost benefit analysis.

## 5. Potential regulatory and legal barriers

As part of the work which networks have been progressing, they have identified some issues which may require changes to the regulatory or legal framework. These might be issues that companies need to work with DECC and Ofgem to resolve.

- i) Differences between charging arrangements at distribution and transmission

As explained above, the current arrangements can lead to some perverse incentives for customers and in some cases are preventing the most efficient outcomes. The TDI charging task force will assess the various options in full and highlight any regulatory and legal barriers. Without fully anticipating the outcome of work which needs to take place, this could look at how the current dislocation of DNO and SO price controls treats investments separately, creating the opportunities for investment gaps to emerge which must then be funded solely by connecting parties. The task force will produce a report which will be published.

- ii) Lack of incentives on DG to manage the balancing costs they impose

Some of the additional balancing costs which the SO is incurring are caused by DG on the DNO system. Yet DG customers are not balancing mechanism units (BMUs) and do not pay balancing use of system charges (BSUoS), indeed through netting associated Supplier volumes they receive a benefit. Therefore DG have little incentive to limit export to times which impose the least costs on the system as a whole. This is something which network companies and the SO will likely highlight in response to the forthcoming call for evidence by DECC and Ofgem on flexibility and smart systems. Companies are committed to work with both parties to look at solutions.

- iii) Lack of DNO legal powers in claiming back existing customer's unused capacity

As part of a body of work on DNO queue management, DNOs are investigating the powers they have under the National Terms of Connection and under the Electricity Act to claim back capacity from existing customers which has never been used. Having the right to retain this capacity could help reduce constraints on the distribution network and resolve some of the interface issues highlighted in this report. While companies are still looking into these issues and may seek external legal advice on initial conclusions, indications are that DNOs legal powers are limited to simply requesting that customers hand back capacity. Experience to date has shown that customers are unlikely to hand this capacity back and have little incentive to do so. DNOs have identified a number of customers that are using less than 75% of their entitled capacity. Research from 3 of the 6 DNOs has shown that if DNOs

could reclaim the unused capacity from these customers it could equate to 812 MW which could be freed up for other customers to use.<sup>7</sup> This would enable a more efficient operation of the network. Should external legal advice confirm the initial conclusions, DNOs would be keen to work with DECC and Ofgem to investigate where changes to the regulatory and legal framework could be made.

iv) Dislocation of price controls

The assessment of expenditure for the RIIO-T1 and RIIO ED1 price controls was undertaken separately and business plans submitted over 24 months apart. For the RIIO-2 controls, we may need to ensure that the process for distribution and transmission is more aligned and that assessment of efficient expenditure is looked at from a whole systems perspective. The current approach does not make it practical to try and align charging arrangements between Distribution and Transmission. Major changes such as to charging boundaries could only be implemented at the start of new price controls, as they impact the activities which need to be funded through allowed revenue. The current regulatory timetable means that there will always be a gap between Distribution and Transmission price controls. Alignment of price controls could also allow incentives across Distribution and Transmission to be considered in the round.

v) Inability to charge upfront for connection assessment and design (A&D) fees

DNOs are unable to levy any charges to reflect the costs they incur assessing applications to connect to the network and providing a quote. Despite all DNOs having published heat maps to help stakeholders understand where there is spare capacity, DNOs have received numerous speculative connection applications. These take time to process and reduces the time that DNOs are able to spend on serious applicants to provide better quality, more bespoke information. Being able to levy a charge for A&D would act as a disincentive on parties who can request scores of quotes trying to establish the optimum place to connect<sup>8</sup>. Further, the costs of processing these applications falls on those customers who do proceed with a connection. This does not seem fair or reasonable to those customers.

We are aware that following a case put forward by ENA, DECC has now consulted on whether DNOs should be able to charge for A&D fees. We look forward to working with DECC to take this work through to implementation.

## 6. Next Steps

The main priority for network companies and the SO is to continue to bed down the new governance processes put in place and ensure that they are identifying potential future issues and delivering on the work programme to resolve those ahead of time. The known existing challenges will continue to be addressed as a priority.

Annex 1 outlines some key deliverables across the priority work areas identified. It will be the focus of companies to ensure that there are adequate resources for these pieces of work and that where relevant the outputs of that work are progressed to implementation.

As part of ensuring that future issues are co-ordinated efficiently, there are a number of other areas which network companies and the SO will look to take forward:

- Helping to put in place a transmission and distribution whole system view of system operability framework;
- Completing work to identify and implement additional T&D solutions for managing high voltage on the transmission network;
- Helping to create a process for co-ordination of the use of flexible services between DNOs, TO and SO;

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<sup>7</sup> These figures come from WPD (250MW), UKPN (350MW) and NPg (212MW).

<sup>8</sup> One DNO received 240 application requests from a single customer who did not proceed with any of them.

- Addressing the commercial barriers created by the interface between T&D;
- Agreeing the way forward for Low Frequency Demand Disconnection (LFDD);
- The need or otherwise for establishing operational interfaces or platforms between DNOs, SO, TO and suppliers;
- On embedded generation: how T&D could work closely to create visibility of embedded generation and ANM within the distribution networks building on work done by the Statement of Works group to ensure a more effective operation and utilisation of the assets. Obtaining Feed in Tariff (FiT) data on locations of connected solar PV from Ofgem would help with this;
- Knowledge sharing – using the TDI group to disseminate knowledge from innovation projects and trials on interface issues which are led by individual companies.

Companies and ENA are keen that both Ofgem and DECC continue to attend the TDI steering group where much of the work will be discussed. It is a useful forum to highlight the work underway and hopefully allow Government and the Regulator to get early sight of key issues identified and how companies plan to deal with them.

## 7. Wider engagement

Through ENA, network companies are also using the work undertaken to feed into European policy developments. The issues which we are experiencing in GB are replicated throughout Europe. While there are often important differences in industry structures and commercial arrangements in other countries, we are making sure that we are leveraging any learning from how other European network companies are managing these issues. We are also using the work on revising the statement of works process and high voltage management to feed into policy debates with the European Commission on data management between distribution and transmission companies.

ENA's DG DNO and DG Technical groups have attendance from external stakeholders. Networks will also engage with stakeholders through the Distribution Code and Grid Code governance practices. These forums allow networks to consult with industry on a wider scale.

ENA and member companies also plan to engage with wider stakeholders specifically on the ongoing transmission distribution interface work and will organise a forum session by December 2016.

## 8. Annex

### Annex 1 - Key transmission distribution interface deliverables

Issue	Owner	Deliverables	Timescales
<b>Finding efficient whole system solutions</b>	High Volts working group (for trial)	Identify 3 solutions from the recently published High Volts report to use as test case for whole systems solution	July 2016
		Design a trial process to undertake whole system CBA on each solution	February 2017
		Run the trial of whole system CBA on each solution	April 2017
		Produce a short report on lessons learned from the trial and recommendations on how the process could be rolled out	September 2017
<b>Providing DG customers with better upfront information on likely Transmission impacts</b>	Statement of works group	Updates to be provided at ENA DG Fora and feedback collected from DG stakeholders	September 2016
		Draft modification proposals outlining revised process to go to the Connections implementation steering group (CISG) and Grid Code review panel	October 2016
		Update report on trials and plan for widespread roll. Report to be published with updates provided to DG-DNO steering group	December 2016
<b>Extracting and sharing data for network operation purposes</b>		Develop picture of detailed SO/DNO services and requirements (time) in short/medium term including the circumstances under which services will be called and the technology types which can provide services.	September 2016

	Shared Services Group	Develop matrix of where services are compatible and can be provided by single party and where they can't.	December 2016
		Options for designing connection/service contracts which allow parties to provide different services to different parties at different times.	September 2017
		Concluding report which captures the work undertaken and reflects on roles and responsibilities of DNO and SO. Also outlines next steps on how services offered by other parties (suppliers and aggregators) could fit into the contractual framework.	February 2018
<b>Sharing forecasting information for network planning</b>	TDI Steering group	Hold a forum to review forecasting approaches and identify any challenging areas and steps required to address them	September 2016
<b>Understanding the impact of different on customers of different commercial arrangements at Transmission &amp; Distribution</b>	TDI charging task force	To identify any problems caused for customers through the interaction of current charging arrangements across Transmission and Distribution	September 2016
		To succinctly capture the root causes of these problems	December 2016
		To develop a range of high level options which could solve the problems identified	April 2017
		To highlight the implications to existing arrangements of each option identified and the steps needed to implement each option (Report which combines previous papers with recommendations)	June 2017
<b>Managing flexible connections for both Distribution and Transmission purposes</b>	ENA active network management group	Principles for the co-ordination of TSO and DNO constraints and the management thereof and TO ANM principles of access	September 2016
		Recommendations on which party owns and maintains: <ul style="list-style-type: none"> <li>• Monitoring equipment associated with constraints on TO side</li> <li>• Communications equipment between TO and DNO</li> </ul> And the cost allocation for the equipment between companies and customers who benefit from the ANM scheme.	December 2016

		Develop high level commercial agreements required between SO, DNO and the customer for ANM schemes shared between DNO and SO	March 2017
<b>Thinking longer term about roles and responsibilities for an efficient electricity system</b>	Transmission and Distribution Interface group	Joint response (through ENA) to DECC and Ofgem’s call for evidence on smart systems and flexibility	May – July 2016
		A specific section in each update report provided to Ofgem on learning emerging on longer term roles and responsibilities and the governance process.	December 2016 (and every 6 months)
<b>Establish a whole system view of system operability to identify and prioritise future challenges and opportunities</b>	Network companies supported by Transmission and Distribution Interface group	Include DNO case studies in the 2016 System Operability Framework.	November 2016
		Include a fuller Transmission-Distribution assessment in the 2017 System Operability Framework.	November 2017

**Annex 2 – Membership of ENA TDI group**

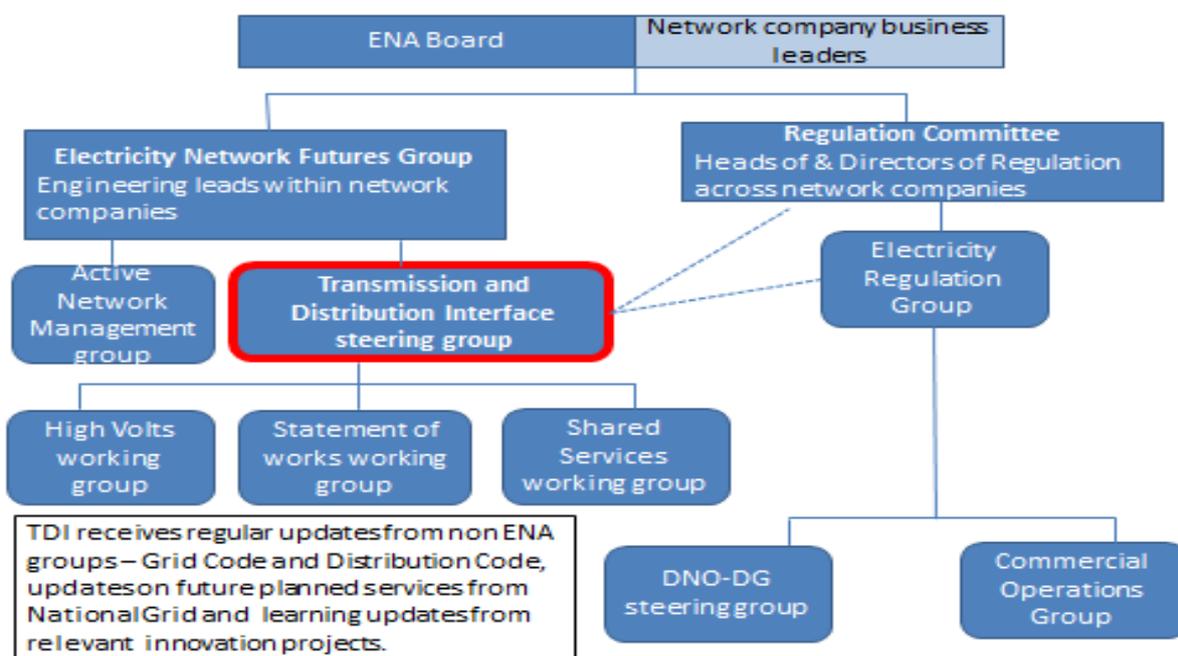
The TDI group is formed of commercial and regulatory as well as technical representatives from DNOs, National Grid, and Transmission companies. It also has Ofgem and DECC attendance. ENA uses the group to co-ordinate Regulatory and Technical work on Transmission interface issues as well as providing secretariat. The group has met 3 times since December.

Table1: Organisations attending ENA’s Transmission and Distribution interface (TDI) group

Organisation
Western Power Distribution (Chair)
SHE Transmission
Southern Electric Power Distribution <sup>9</sup>
Scottish Power Transmission
Scottish Power Distribution
Northern Powergrid
National Grid Electricity Transmission System Operator
National Grid Electricity Transmission
UK Power Networks
Electricity Northwest
DECC (observer)
Ofgem (observer)
Energy Networks Association

The diagram below illustrates how the TDI steering group fits into ENA governance right up to the board and business leader (CEO) level.

Figure 1: Governance of ENA’s Transmission and Distribution interface group



<sup>9</sup> Also representing the interests of Scottish Hyro Electric Power Distribution

**Annex 3 – High Volts - Recommended next steps**

Recommended step	Due date	Responsible
<b>1) GSP Planning</b> <ul style="list-style-type: none"> <li>Identify TSO PQ forecast requirements at each GSP</li> </ul>	February 2017	SO
<b>2) Whole System CBA</b> <ul style="list-style-type: none"> <li>Identify three solutions from the report to use as test case for whole systems solutions</li> <li>Complete trial of whole system CBA on each solution and map the process. Also, identify data exchange requirements for T&amp;D on whole system CBA</li> <li>Produce short report on lessons learned from the trial and recommendations on how the process could be rolled out in SO, TOs and DNOs</li> </ul>	July 2016  April 2017  September 2017	HV WG  HV WG  HV WG
<b>3) Option Implementation</b> <ul style="list-style-type: none"> <li>Review short term options and trial/implement as appropriate</li> <li>Complete short term options cost benefit analysis using the new process (action 2) CBA assessment and ensure continued optimum solution for addressing the issue.</li> <li>Review medium and long term options and trial/ implement as appropriate.</li> <li>Complete medium and long term options cost benefit analysis using the new process (action 2) CBA assessment and ensure continued optimum solution for addressing the issue</li> </ul>	April 2017  April 2019  2019 onwards  2019 onwards	SO, TOs, & DNOs  SO, TOs, & DNOs  SO, TOs, & DNOs  SO, TOs, & DNOs
<b>4) Stakeholder Engagement</b> <ul style="list-style-type: none"> <li>ENA to post this report on their website for feedback and also provide to Energy UK for their members information.</li> <li>Identify if customers would like to have more flexible power factor control, and assess network impacts of this.</li> <li>Discussion on services inherent/available now (Customers – Industrial and commercial), where services would require investment, and what signals customers would require for this.</li> </ul>	May 2016  Ongoing  Ongoing	ENA  SO/TOs/DNOs  SO/TOs/DNOs
<b>5) Legislative/regulatory changes</b> <ul style="list-style-type: none"> <li>Agreeing what active/reactive technical requirements are mandated versus what are services (including ensuring that the SO/DNOs don't end up paying users to mitigate system issues that the individual users are causing). Once established, ensure compliance before market participation.</li> <li>DNOs, TOs and NGET to propose options across networks for addressing transmission high voltage issues (based on GSP requirements), including as required derogations that may be required for specific options (e.g. switching out network).</li> <li>Assess whether there are appropriate funding mechanisms in place for addressing this new challenge of high volts efficiently and present a position statement.</li> </ul>	Ongoing/ as required    December 2017   Ongoing	DNOs/SO/ OFGEM    SOs/TOs/DNOs   SO/ OFGEM

Recommended step	Due date	Responsible
<b>6) Data exchange between transmission and distribution for addressing whole system solution for high volts</b> <ul style="list-style-type: none"> <li>Assess requirements both in EU Network codes, and in GB</li> <li>Develop approach and recommendations, including actions relating to data confidentiality</li> <li>Propose code changes as required</li> <li>Address confidentiality issues</li> </ul>	June 2017	TDI Steering group to assign to appropriate group
<b>7) Innovation</b> <ul style="list-style-type: none"> <li>Develop summary paper and scope for TDI/R&amp;D group on the further innovation study required.</li> <li>Procure innovation research into the causes of declining Q/P ratio, and refine forecasting with the TSO, and complete study and present outcomes</li> </ul>	June 2016  Ongoing	HV WG  ENA R&D managers Steering Group
<b>8) Commercial Arrangements</b> <ul style="list-style-type: none"> <li>Review connection agreements, charging mechanisms and for DNOs, TOs and SOs to ensure flexibility when contracting services and that the high-volts issue isn't exacerbated through new connection agreements.</li> <li>Ensuring commercial framework can be developed for flexible and shared services contracts (covering both transmission and distribution system services).</li> </ul>	April 2017  April 2018	HV WG recommendation for COG Connections  Shared Services Group

Indicative timeline that has dependencies on prerequisite recommendations.