RIIO T1

Section 4 Load Related Expenditure

Formal Issue: 28 July 2011

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CONTENTS

1 EXECUTIVE SUMMARY (LOAD RELATED INVESTMENT)

Our investment plans over the RIIO-T1 period from 2013 to 2021 will

- Deliver EU, UK and Scottish government targets for renewable generation
- Reduce cumulative constraint costs to customers by £1.7bn from £2.3bn to £0.6bn by 2021.
- Provide payback to customer on our £1.3bn load investment, solely through prevention of constraints, before the end of RII-T1.
- Without investment the cumulative additional constraints costs to customers would rise from £2.3bn in 2021 to £16bn by 2030.
- Connect over 11GW of wind generation in Scotland
- Provide 6GW of boundary transfer to England

This investment plan reflects the "blueprint" we have developed over the past 5 years working through ENSG with Ofgem, DECC and other stakeholders to ensure that Scottish, UK and EU government targets for renewable energy are achieved. It will also help manage uncertainty of the future generation portfolio (thermal plant closures in Scotland) through two way flow on new HVDC links.

At a detailed level the investment plan will provide the following outputs aligned to our stakeholders expectations

- Capability to accommodate generation above the ENSG blueprint, with a Best View of over 5GW of renewable generation in our area, and ability to ramp up to 10GW of known new generation within our area.
- A capacity increase (MW) in the boundary transfers through our wider reinforcement programme to facilitate bulk energy transfer from North to South through our area, increasing
    - SSE / SPTL Boundary (B4) : From 1,700MW to 3,500MW
    - SPTL Central Boundary (B5) : From 3,650MW to 4,250MW
    - SPTL/ NGET Boundary (B6) : From 3,150MW to 6,600MW
- We also intend to deliver a large strategic capacity reinforcement of our Dumfries & Galloway network, to meet EU requirements for 450MW bi-directional capability of the Moyle interconnector & provide capacity for renewable generation.
- Deliver a programme of demand led reinforcement involving increasing capacity at less than 10% of our substation which reflects particular load hotspots and where supply security compliance is required.

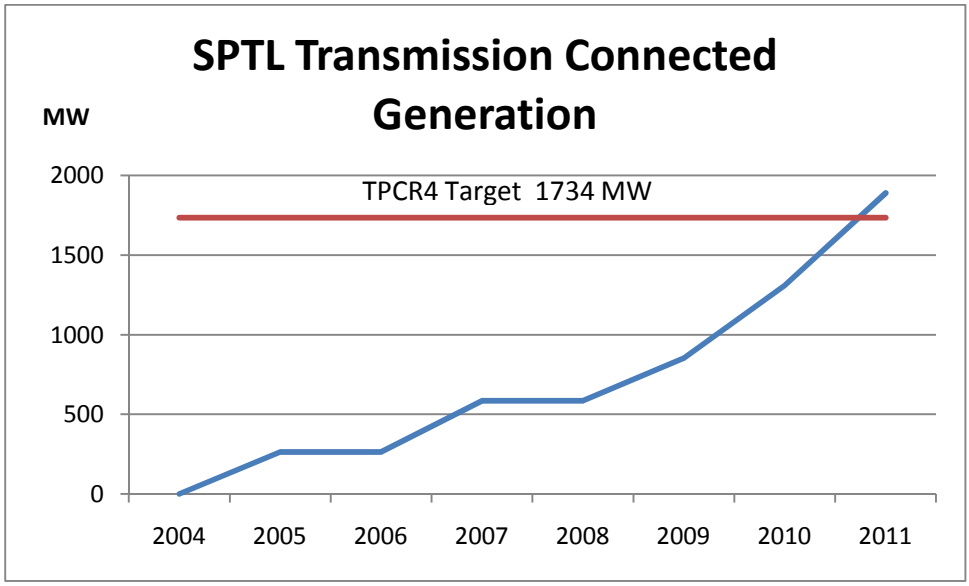
To deliver the outputs detailed above will involve over 60% of our forecast investment through RIIO-T1 to 2021 comprising £1.3bn This is necessary to support the large-scale development of renewable energy in Scotland to meet Government targets.

To avoid high upfront costs to customers we have identified a minimum ex-ante baseline of £0.3bn with the majority of our investment funded through volume drivers & trigger mechanisms, which will only require funding once these projects are formalised towards construction. We also believe that the connection of generation can be done more efficiently during RIIO-T1 than TPCR4, and proposed reducing the £/MW figure from £62/MW to £48/MW (09-10 prices).

2 INTRODUCTION

The existing network in Scotland has a maximum demand of around 6GW, with the central Scotland (SPTL) area having a maximum demand of demand of 4GW. This demand in Central Scotland has historically been provided by a generation portfolio of 2.2GW of Nuclear capacity and 3.4GW of coal, with further capacity being available through pumped storage, industrial gas CHP, and through interconnection with the north of Scotland, England & Northern Ireland.

Over the past 5 years this has been supplemented by a growing portfolio of directly connected wind generation heading towards 1.9GW within SPTL. This is shown on the graph below



The graph illustrates the successful implementation of our investment plans during TPCR4, where we will have exceeded our target of connecting 1734MW during TPCR4.

2.1 National Blueprint for Generation & Demand (Section 3)

Within this document (in Section 3) we will explain the "blueprint" for the network we have developed over the past 5 years working through ENSG with Ofgem, DECC and other stakeholders to ensure that Scottish, UK and EU government targets for renewable energy are achieved. This describes the 3 scenarios called "Slow Progressions", "Gone Green" and "Accelerated Growth" which the industry is using as the key plans for network development.

2.2 Generation Connection Plans (Section 4)

Our RIIO-T1 plans for renewable generation connections are explained in Section 4. These plans build on the successful delivery during TPCR4 of 1.8GW of renewable generation.

This investment plan, reflect known generation projects where we have ongoing and effective dialogue with developers.

Stakeholder Input

- *The Scottish Governments policy expects 15GW of renewable energy in Scotland by 2020, with renewable technologies being seen as a key element in underpinning Scotland's economic growth*
  - *The 15GW of Onshore & Offshore renewable is to meet their target of 100% energy consumption provided by renewable sources by 2020 (taking into account the intermittency of these technologies).*
- *The UK government expects 15% of energy to be produced from renewable sources by 2020*
- *The EU expects 20% of energy to be produced from renewable sources by 2020.*

- During RIIO-T1 renewable generation will have increased to 11GW in remote areas in Scotland, with 4 -8GW being within the SPTL area. Carbon Capture & Storage (CCS) will also start being applied to the remaining coal generation fleet.
- Conventional generation will reduce by 2GW, due to the closure of Hunterston & Cockenzie power stations.

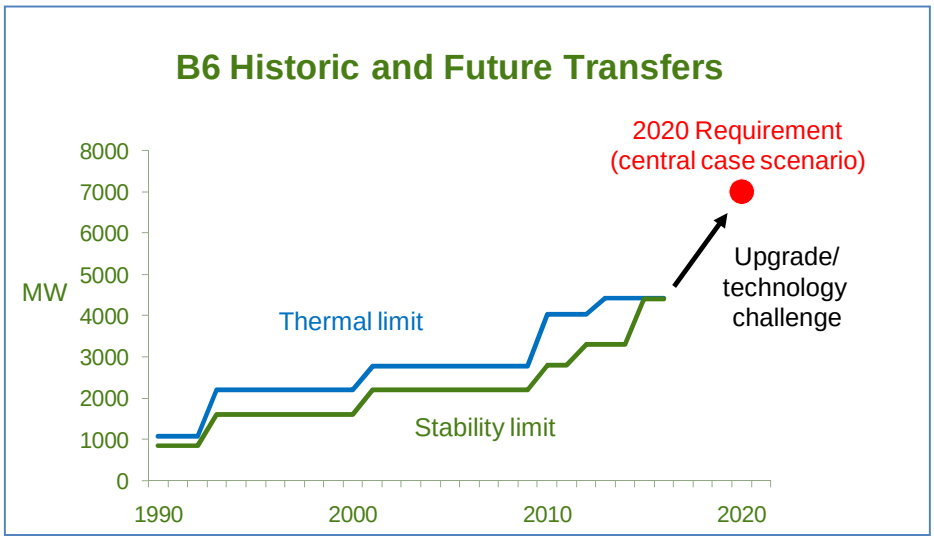
2.3 Export Capacity / Boundary Capacity (Section 5)

Within Section 5 of this document we will explain the requirements to reinforce the network to accommodate this large portfolio of renewable generation through

- the provision of a dramatically increased large export capacity for this renewable generation (above the 6GW Scottish demand) through the SPTL area to the load centres in England & Wales.

Over recent years our investment programme has already delivered a 250% increased export capacity to England from 850MW in the early 1990s to 2200MW today.

- Our plans are already actively progressing a further 200% increase by 2015 to 4400MW. This is shown in the diagram below.



2.4 Demand Growth led reinforcement (Section 6)

Within Section 6 we will explain the drivers, and the investment required to deal with the impact of changes in behaviour of demand customers, which requires reinforcement of the existing network.

2.5 Investment Plan & Uncertainty Mechanisms

To minimise costs to customers our submission has been built up from;

- a baseline ex-ante view, involving a "lower" minimum investment case,
- flexibility to scale up through the use of volume drivers and trigger mechanisms to provide both our "Best View" of our likely investment plans,
- and the capability to deliver our upper cases as required.

Each section describes how uncertainty mechanisms are applied.

Stakeholder Input

- *Customers are concerned about increasing energy costs.*

3 NATIONAL BLUEPRINT FOR GENERATION & DEMAND

The national Ofgem / DECC agreed "blueprint" was developed to identify the generation and network capacity needs of the complete UK wide transmission network to meet EU and government policy for renewable generation. It has been developed through the ENSG working group over the past 5 years, which has been jointly chaired by DECC and Ofgem. It has involved extensive consultation between NGET, SPTL, SHETL and through ongoing dialogue, with industry partners, project developers and other relevant stakeholders

In the main, the ENSG Terms of Reference [1] were,

- Develop and promote a "vision" of the UK electricity networks that will effectively and efficiently facilitate the increase in renewable and other low-carbon generation necessary to meet the EU2020 renewables target and longer term energy and climate change goals
- Develop an understanding of the implications of policy for our electricity networks, identifying potential technical, commercial and regulatory barriers to meeting the UK renewables target and provide strategic advice on possible solutions.
- Maintain an overview of activities and developments that have potential to impact on realisation of the vision and advise on whether they provide a complete and coherent delivery and development path against the targets.

1

http://webarchive.nationalarchives.gov.uk/20100919181607/http:/www.ensg.gov.uk/assets/ensg_terms_of_reference_ensgr_200802

The ENSG working group proposed three generation and demand scenarios to investigate the requirement for further UK Transmission System reinforcement. These planning scenarios have been developed by National Grid Electricity Transmission in line with STC Procedure 16-1 Investment Planning. In each of the tables, the generation background does include Large Power Stations embedded within distribution systems, but does not include small or medium sized power stations contracting directly with Distribution Network Operators.

The UK Government has committed to meeting the targets set by the European Union and in Scotland, the base line target is to support and meet the UK targets, however the Scottish Government has elected to set more onerous targets as show in tables 2 & 3 below.

Energy Produced / Consumed from Renewable Sources

Government Targets	2011	2020	2030	2050
European	-	20%	-	-
UK	-	15%	-	-
Scottish*	57.6%	100%	100%	100%

Table 2

Reduction in CO_2 Output (from 1990 baseline)

Government Targets	2020	2030	2050
European	20%	60%	80% - 95%
UK	20%	-	80%
Scottish	42%	-	80%

The development of our Load Investment plan has been informed by using the scenarios within this blueprint as the key reference tool. The three scenarios are discussed further in the next few pages. They are called

- **Slow Progression** : Slow development of renewable generation, which would **fail to meet EU, European and Scottish government targets**
- **Gone Green** : Minimum, base position to **meet EU, European and Scottish government targets**
- **Accelerated growth** : Faster deployment of offshore wind generation which **exceeds EU, European and Scottish government targets**

These scenarios are referenced throughout our Load Related submission, and have formed the key starting point for the development of our

- Generation Connection investment plans.

- Export / Boundary Capacity investment plans to increase the capacity of the network to accommodate the revised generation mix, and export its energy to the load centres in England.
- Demand Growth investment plans

However we have additionally considered ongoing stakeholder dialogue, other local sources of intelligence and data to develop the specific detail of our investment plans against these reference positions.

3.1 Slow Progression Scenario

Slow development of renewable generation, which would fail to meet EU, European and Scottish government targets

The Slow Progression scenario assumes no major changes to the policy or market framework from the current approach and reflects current developments of both thermal and renewable generation. It shows demand recovering slowly from the impact of economic recession. It also assumes increasing energy efficiency, higher energy prices and a growth in embedded generation. Little or no impact of growth areas, such as electric vehicles, is factored in.

In this scenario the emphasis is on a Slow Progression towards the EU 2020 targets for renewable energy, carbon emissions reductions and energy efficiency improvements, and the UK's unilateral carbon emissions reduction targets. This scenario has been developed against a background of lower carbon prices. This results in a slower build up of lower carbon generation and a greater reliance on gas-fired plant. The scenario also assumes slower advances with regard to new technology, with carbon capture and storage (CCS) proving to be uneconomical for large scale coal plants. In this scenario the EU 2020 renewable targets are not met until around 2025.

Transmission Area	Fuel Type	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
NGET	Biomass	0	0	0	0	0	290	640	640	930	930	930	930
	Interconnector	0	0	-500	-500	-500	-400	-400	-400	-300	-300	-300	-250
	Thermal	57,081	56,860	59,037	54,786	55,819	52,785	54,974	56,294	57,409	56,109	56,306	54,796
	Wind	470	1,415	2,439	2,943	3,090	3,375	3,517	3,913	5,146	7,856	11,160	13,564
	Nuclear	8,552	8,267	7,642	7,162	7,162	7,162	5,901	5,901	4,820	2,410	2,410	4,080
	AGT	0	0	0	0	0	0	0	0	0	0	0	0
	Pumped_Storage	2,004	2,004	2,004	2,004	2,004	2,004	2,004	1,820	2,004	2,159	2,004	2,004
	Thermal	387	288	242	559	0	389	0	184	195	0	5	615
	Marine	0	0	0	0	0	0	0	0	0	0	0	0
NGET Total		68,494	68,834	70,863	66,954	67,575	65,605	66,636	68,352	70,204	69,164	72,515	75,739
SHETL	Hydro	1,037	1,037	1,085	1,085	1,093	1,093	1,093	1,093	1,093	1,093	1,099	1,099
	Thermal	1,202	1,202	1,202	1,202	1,202	1,202	1,202	1,202	1,202	1,202	1,202	1,202
	Wind	936	1,337	1,523	1,738	1,997	2,285	2,653	2,900	3,903	4,314	4,464	4,464
	Pumped_Storage	300	300	300	300	300	300	300	300	300	300	300	300
	Marine	10	10	10	10	10	10	10	10	10	10	10	10
SHETL Total		3,485	3,886	4,121	4,335	4,602	4,890	5,258	5,505	6,508	6,918	7,074	7,075
SPT	Biomass	45	97	97	97	97	97	97	97	97	97	97	97
	Hydro	33	33	33	33	33	33	33	33	33	33	33	33
	Interconnector	-400	-500	-500	-500	-500	-400	-400	-400	-300	-300	-300	-250
	Thermal	3,629	3,506	2,955	2,404	2,404	2,404	2,404	2,404	2,404	2,404	2,404	2,404
	Wind	1,362	1,713	2,150	2,545	2,893	3,169	3,634	3,889	4,038	4,188	4,271	4,296
	Nuclear	2,289	2,289	2,289	2,289	2,289	2,289	1,215	1,215	1,215	1,215	1,215	1,215
	Pumped_Storage	440	440	440	440	440	440	440	440	440	440	440	440
SPT Total		7,398	7,578	7,464	7,308	7,656	8,032	7,423	7,678	7,927	8,077	8,160	8,235
GB Total		**79,377**	**80,298**	**82,448**	**78,597**	**79,833**	**78,527**	**79,317**	**81,535**	**84,638**	**84,159**	**87,749**	**91,048**

Table 4 Slow Progression Background, data freeze May 2011

3.2 Gone Green Scenario

Minimum renewable generation position to meet EU, European and Scottish government targets in 2020 and maintains progress towards the UK's 2050 carbon emissions reductions target.

This scenario includes a more rapid build up of wind generation from the slow progression scenario. It anticipates a strong supply chain in renewable generation, and growth in offshore wind, which is maintained post 2020. Nuclear AGR plant is

assumed to receive ten years life extension, maintaining the level of nuclear capacity until the advent of new nuclear plant, and assisting in lowering the level of carbon emissions from the generation sector. CCS plant is envisaged at both coal and gas plants into the future, with thermal plant developed after 2023 required to have CCS technology. The increased lifespan of the AGR plant results in existing CCGT plant closing earlier than in the other scenarios. This scenario is set against a background of predominantly higher energy prices with the price of carbon and the level of government subsidies stimulating low carbon generation and increasing the levels of energy efficiency.

The impact of the electrification of heat and transport has been assessed, with demand increasing towards the end of the period post 2025. This includes an assessment of the impact of smart metering and time of use tariffs which are assumed to flatten the load profile.

This scenario envisages 4GW of directly connected renewable generation within the SP Transmission [SPT] License area by the end of the RIIO-T1 period and further capacity from off-shore generation and non-renewable sources. This scenario envisages the export capacity across the B6 Anglo-Scottish boundary will rise from 2.8GW to 6.6GW. Table 5 details the generating capacity by area and fuel type in the Gone Green scenario.

Transmission Area	Fuel Type	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
NGET	Biomass	0	0	0	0	290	939	939	1,229	1,229	1,229	1,229	1,528
	Interconnector	0	0	-500	-500	-500	-400	-400	-400	-300	-300	-300	-250
	Thermal	57,468	57,148	59,278	55,345	55,819	52,188	51,924	51,695	50,295	51,164	42,814	46,446
	Wind	470	1,415	2,439	2,943	3,340	4,974	7,024	8,274	9,726	11,830	14,034	16,234
	Nuclear	8,552	8,267	7,642	7,162	7,162	7,162	7,162	7,162	7,162	8,832	10,032	10,441
	AGT	0	0	0	0	0	0	0	0	2,206	0	3,633	0
	Pumped_Storage	2,004	2,004	2,004	2,004	2,004	2,004	2,004	2,004	2,004	2,004	2,004	2,004
	Marine	0	0	0	0	0	0	0	0	25	61	86	111
NGET Total		68,494	68,834	70,863	66,954	68,115	66,867	68,653	69,964	72,346	74,820	73,531	76,514
SHETL	Hydro	1,037	1,037	1,085	1,085	1,093	1,093	1,093	1,093	1,093	1,093	1,099	1,099
	Thermal	1,202	1,202	1,202	1,202	1,202	1,202	1,202	1,202	1,202	1,202	1,202	1,202
	Wind	936	1,337	1,523	1,850	2,264	2,911	4,059	4,273	5,357	6,118	6,698	6,998
	Pumped_Storage	300	300	300	300	300	300	300	300	300	300	300	300
	Marine	10	10	10	10	10	40	90	160	283	410	560	770
SHETL Total		3,485	3,886	4,121	4,447	4,868	5,545	6,743	7,027	8,234	9,122	9,858	10,368
SPT	Biomass	45	97	97	97	97	97	97	97	97	97	97	347
	Hydro	33	33	33	33	33	33	33	33	33	33	33	33
	Interconnector	-400	-500	-500	-500	-500	-400	-400	-400	-300	-300	-300	-250
	Thermal	3,629	3,506	2,955	2,404	2,404	2,404	2,404	2,404	2,404	2,404	2,404	2,404
	Wind	1,362	1,713	2,150	2,614	3,154	3,363	3,840	4,160	4,384	4,451	4,976	5,501
	Nuclear	2,289	2,289	2,289	2,289	2,289	2,289	2,289	2,289	2,289	2,289	2,289	1,215
	Pumped_Storage	440	440	440	440	440	440	440	440	440	440	440	440
	Marine	0	0	0	0	0	0	0	0	0	0	10	10
SPT Total		7,398	7,578	7,464	7,377	7,917	8,226	8,703	9,023	9,347	9,414	9,949	9,700
GB Total		**79,377**	**80,298**	**82,448**	**78,778**	**80,901**	**80,639**	**84,099**	**86,014**	**89,927**	**93,355**	**93,337**	**96,581**

Table 5 Gone Green Background, data freeze May 2011

3.3 Accelerated Growth Scenario

Faster deployment of offshore wind generation which exceeds EU, European and Scottish government targets

The Accelerated Growth scenario assumes significant wind generation connecting to the transmission system within the period to 2025. It assumes that electricity demand recovers slowly from economic recession, with any future demand growth due to the improving economic background being offset by higher energy prices, increasing efficiency measures and growth in embedded generation. Growth in the use of electric vehicles is anticipated, and there is also additional demand through heat pumps, in this scenario.

The Accelerated Growth scenario uses the Gone Green onshore background as a base with the assumption that offshore generation builds up far more quickly due to a rapidly established supply chain, higher carbon prices and strong government stimulus. The key differences in the onshore background are that the AGR plant is consistent with the SP scenario (AGR nuclear plant receive

five-year life extensions unless otherwise announced) and that existing gas plant remains open for longer to maintain the plant margin and act as a back-up for the significant amount of wind generation.

Transmission Area	Fuel Type	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
NGET	Biomass	0	0	0	0	290	939	939	1,229	1,528	1,528	1,528
	Interconnector	0	0	-500	-500	-500	-400	-400	-400	-300	-300	-300
	Thermal	57,468	57,148	59,278	55,345	55,819	52,188	53,174	53,174	54,494	53,559	50,811
	Wind	470	1,415	2,439	3,090	5,435	8,497	12,384	15,534	18,184	21,484	25,708
	Nuclear	8,552	8,267	7,642	7,162	7,162	7,162	5,901	5,901	4,820	4,080	5,280
	AGT	0	0	0	0	0	0	0	0	0	0	0
	Pumped Storage	2,004	2,004	2,004	2,004	2,004	2,004	2,004	2,004	2,004	2,004	2,004
	Marine	0	0	0	0	0	0	36	61	86	111	136
NGET Total		68,494	68,834	70,863	67,101	70,210	70,390	74,038	77,503	80,816	82,466	85,167
SHETL	Hydro	1,037	1,037	1,085	1,085	1,093	1,093	1,093	1,093	1,093	1,093	1,099
	Thermal	1,202	1,202	1,202	1,202	1,202	1,202	1,202	1,202	1,202	1,202	1,202
	Wind	936	1,337	1,523	1,850	2,364	4,206	5,749	6,153	6,837	7,498	8,038
	Pumped_Storage	300	300	300	300	300	300	300	300	300	300	300
	Marine	10	10	10	10	10	65	135	250	570	900	1,170
SHETL Total		3,485	3,886	4,121	4,447	4,968	6,865	8,478	8,997	10,001	10,992	11,808
SPT	Biomass	45	97	97	97	97	97	97	97	97	97	347
	Hydro	33	33	33	33	33	33	33	33	33	33	33
	Interconnector	-400	-500	-500	-500	-500	-400	-400	-400	-300	-300	-300
	Thermal	3,629	3,506	2,955	2,404	2,404	2,404	2,404	2,404	2,404	2,404	2,404
	Wind	1,362	1,713	2,150	2,614	3,154	4,043	5,270	6,250	7,434	8,251	8,276
	Nuclear	2,289	2,289	2,289	2,289	2,289	2,289	1,215	1,215	1,215	1,215	1,215
	Pumped Storage	440	440	440	440	440	440	440	440	440	440	440
SPT Total		7,398	7,578	7,464	7,377	7,917	8,906	9,059	10,039	11,323	12,140	12,415
GB Total		**79,377**	**80,298**	**82,448**	**78,925**	**83,096**	**86,162**	**91,575**	**96,539**	**102,140**	**105,597**	**109,389**

Table 6 Accelerated Growth Background, data freeze May 2011

3.4 Demand Assumptions within Scenarios

As described above, in addition to the consideration of the changing profile of generation, the three industry planning scenarios also considered the future demand that the electricity transmission would need to accommodate.

This analysis considered a range of inputs including projections for the economy, embedded generation and energy efficiency measures. In addition potential new sources of demand such as ground source heat pumps and electric vehicles were considered.

Slow Progression

Transmission Area		2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
NGET		52,503	52,450	52,606	52,617	52,657	52,488	52,393	52,283	52,192	52,062
SPT		4,032	4,023	4,034	4,042	4,049	4,037	4,027	4,018	4,001	3,994
SHETL		1,565	1,611	1,616	1,617	1,617	1,612	1,608	1,604	1,601	1,596
GB Total		**58,100**	**58,085**	**58,256**	**58,275**	**58,324**	**58,137**	**58,027**	**57,905**	**57,794**	**57,652**

Gone Green / Accelerated Growth

Transmission Area		2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
NGET		52,503	52,492	52,501	52,549	52,504	52,509	52,320	52,214	52,127	51,838
SPT		4,032	4,026	4,026	4,037	4,038	4,039	4,021	4,012	3,996	3,977
SHETL		1,565	1,613	1,613	1,615	1,613	1,613	1,606	1,602	1,599	1,589
GB Total		**58,100**	**58,130**	**58,140**	**58,201**	**58,155**	**58,161**	**57,947**	**57,829**	**57,722**	**57,404**

Table 7 GB Demand Profile for each of the three scenarios

The demand profiles for Gone Green and Accelerated Growth are identical and rise to 58.2GW in 2017/18 before falling to 57.1GW in 2020/21.

The key point within these scenarios, which we discuss in section 6, is that although overall network demand is flat, the dynamics of new development, load movement, increased energy efficiency, increased electric vehicles and micro generation all drive local issues that require reinforcement.

4 GENERATION CONNECTIONS

This section explains the development of our investment plans to connect generation to the SPTL network over RIIO-T1. It describes our plans and strategy to connect renewable generation to meet EU, UK and Scottish government policy. Our strategy is predicated by our licence requirement in respect of the connection of generation, and to facilitate a wider GB strategy of a move towards a low carbon generation mix.

Our plans have been developed through extensive stakeholder involvement

- Which includes the nationally debated & agreed blueprint providing three planning scenarios
- Which is refined though extensive one to one discussions with developers
- Our best view takes into account our ongoing dialogue with developers, which has varied the mix from the national "Gone Green" scenario, which provides the main reference for our plans.
- These plans meet both the Scottish and UK Government policies for both the 2020 and 2050 renewable generation and carbon emission reductions targets.

We explain through this section

- A summary of our generation investment plans
- The progress to date in the connection of renewable generation
- Our approach and the analysis we have carried out to identify the projects for RIIO-T1
- How stakeholder engagement has influenced our plans
- Our strategy for RIIO-T1 for connection of generation
- The resultant investment plans detailing the projects for inclusion in RIIO-T1
- Our approach to allowances and uncertainty mechanisms for connection of generation in the RIIO-T1 process

4.1 Summary

In summary our Load Related Generation Investment plan delivers:

- An additional 2.5GW of wind generation, our Best View, connecting by 2021, giving a total of 4.4GW of directly connected wind generation in our area. Taking into account embedded generation, gives a figure of over 5GW.

This aligns with the expectations of the Gone Green scenario

This will be funded though

- A minimum baseline ex-ante allowance of **£43m** to fund H1 Sole Use infrastructure to connect **1.62GW** generation capacity.
- An uncertainty mechanism through a volume / revenue driver to scale up to meet planned renewable development capabilities. We have analysed the expected cost to connect those project beyond the 1.62GW minimum and thereafter derived a revenue driver mechanism based upon **£50k/MW** to fund construction of those projects to meet both our "Best View position" of **2.5GW,** taking us to a cumulative total of over 5GW including existing and embedded generation and to be scalable to meet the upper case scenario
- A minimum ex-ante allowance for capital investment in electricity infrastructure, for collectors, of **£118m** based upon our 'Best View' assumptions.

- In addition, our upper case scenario, which is credible given the active dialogue & commitment shown by developers, reflects a further 6.9GW including **5GW** of wind generation (primarily off shore) connecting by 2021. This would be funded via the revenue driver mechanism at **£50k/MW** for wind generation**.**

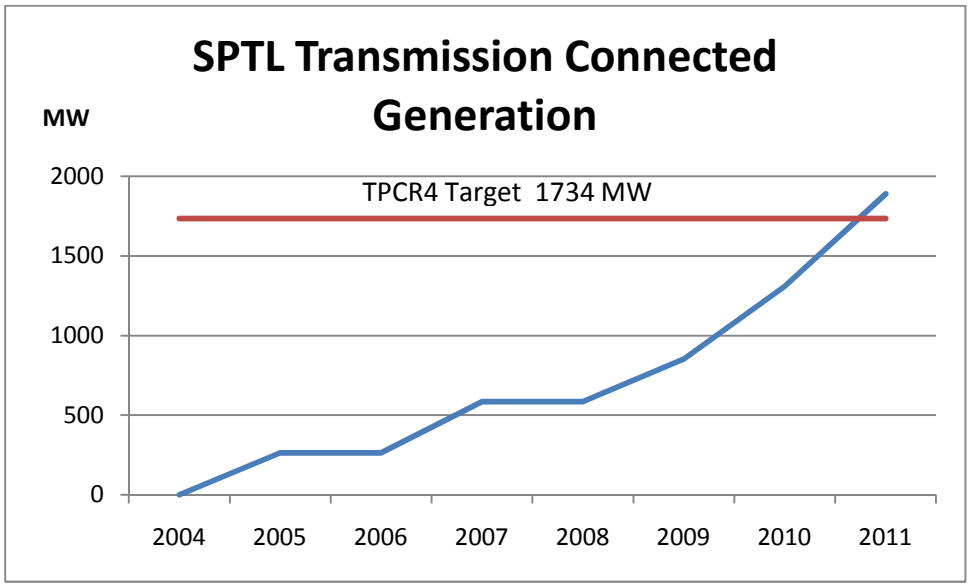
In addition we expect, as an excluded service, to invest £75m of sole use customer work, either directly funded by the customer (£30m), or paid through annual charges.

4.2 Progress to Date/ Current Environment

Over the current price control period, we have seen a significant rise in the number of generation projects seeking connection to the transmission network.

The graph below shows ***the successful implementation of our investment plans during TPCR4, where we will have exceeded our target of connecting 1734MW during TPCR4.***

By March 2012 the total transmission connected renewable generation in SPTL's area will be 1.89GW, and when embedded generation connections are included, this totals in the order of 2.6GW.



The demand for renewable generation connections in our licensed area remains high with our total contracted transmission renewable generation connection portfolio totalling almost 9.4GW. We also have several offshore connections within our generation portfolio totalling over 4GW. This forecast is in line with the ENSG Gone Green scenario on which our overall load investment is based.

Our generation portfolio includes applications in respect of clean coal CCS connection application at Hunterston for 1.70GW which is contracted to connect in 2015, and Longannet for 571MW in 2020. In addition, we have an offshore Affected TO Construction Agreement for 1GW for Argyll Array to complete by 2017. Both of these developments are not currently included in the Gone Green scenario however if they go ahead, they will impact significantly on SPT's load investment requirements and are therefore reflected in our upper view scenario.

The map below provides an overview of the generation load activity currently seen on our transmission network and depicts the increasing number of schemes from 2006 through to 2011 that SPT has or is, connected, in construction, or has been issued with a connection offer

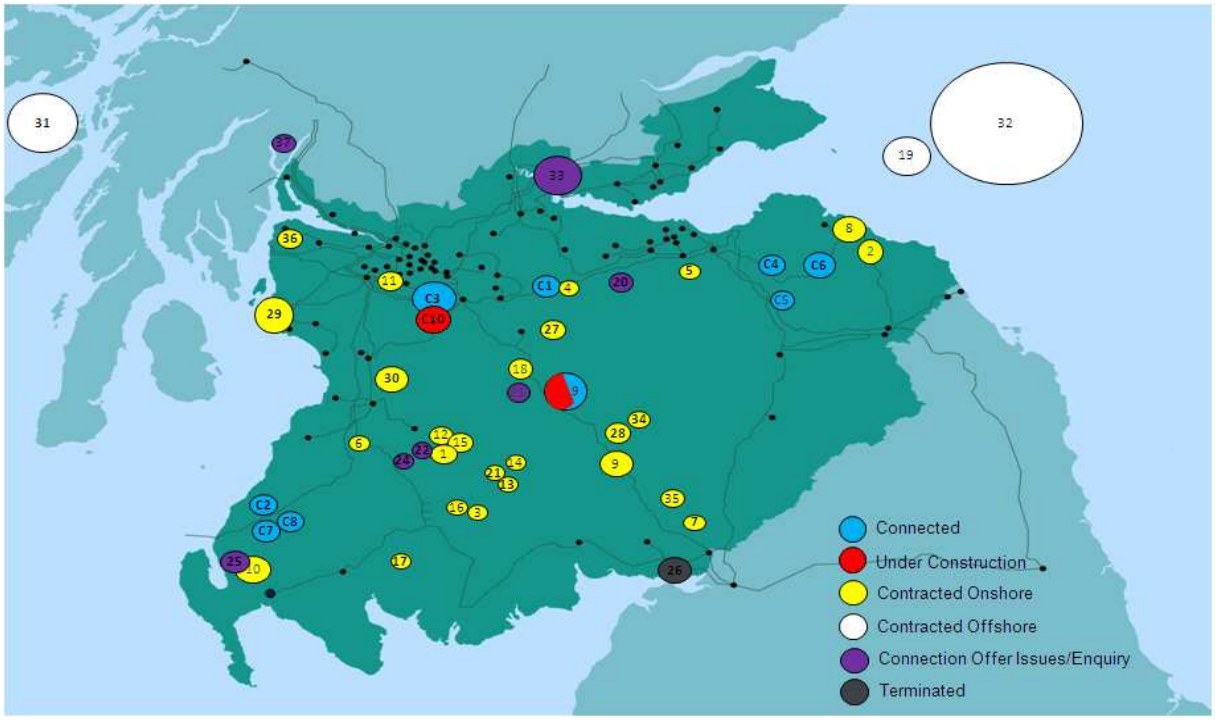


Diagram 1

Based upon our experience to date,

- we have a high degree of confidence that our plans are deliverable
- have reflect our best view of the number of schemes that will come forward to delivery.

This is further highlighted by the fact that

- Our current forecast of connecting 1.89GW by the end of the current period, represents a higher deliverable than the target set by Ofgem at the commencement of TPCR4

As can be demonstrated we have seen a significant shift in the named schemes that have developed through to construction over the course of the TPCR4 period, however we have still achieved our 1.73GW target. We expect that a similar scenario will unfold over the RIIO-T1 period whereby, named schemes shown in our RIIO-T1 investment plans, will be substituted by further schemes that come forward over the period but still deliver our forecast GW of generation capacity.

Out of the 7.8GW existing power stations within the transmission licence area of SPT over 2GW (25%) of generation will close by 2021, with a further 3.5GW (50%) planned to close or change to Carbon Capture by 2030. The future of electricity generation in Scotland will be critical for both economic growth and climate change over the next few years.

Within the transmission licence area of SPT, the following assumptions have been made with regard to the availability of the major thermal power stations currently connected to our network, aligned to the Gone Green scenario;

<Table removed>

The plant assumptions above represent approximately 6GW of generation capacity that is likely to be unavailable by 2021. Conventional generation closure in Scotland is still dwarfed by the 10-15GW of renewable generation that is likely to connect into the SHETL and SPT areas, against a Scottish maximum demand of 6GW (4GW within SPTL).

4.3 SPT Approach & Analysis for Generation

We believe that the environmental targets set by both the UK and Scottish Government to 2020 and progression towards the UK's 2050 carbon emissions reductions are challenging but achievable with the right level of regulatory support from Ofgem and the planning authorities and we have developed our load investment plans on the basis of those targets being met.

Our approach in establishing our generation load investment plan has been to

- Consider the 'Gone Green' scenario initially as a starting position, as all stakeholders believe this to be a credible scenario to deliver government policy. This approach, developed in conjunction with industry partners, has taken into account the existing contracted generation background and takes a national view on the likelihood of each project progressing through construction to connection.
- In addition, we have further refined our forecast through stakeholder engagement to reflect latest information & a local perspective, which is expanded further below, considering how well developed the wind farms are in their planning process, considering those that are
    - Relatively Certain to connect during the period, or have
    - Advanced plans developed, that give confidence that they will connect during the period, or those that are
    - Prospective connections which have less well developed plan currently for connection during the RIIO-T1 period.

This local view has enabled us to develop our plans for RIIO-T1 built up in 3 levels

- Baseline (or lower case) position where we expect ex-ante funding to connect projects which we believe have a Relatively Certain connections within the RIIO-T1 period. This delivers a total of 3.3GW of directly connected transmission wind by 2021.
- A "Best View" position, which is aligned to the Gone Green scenario (Over 5GW wind). This considers Relatively Certain and Advanced plans generation sites. The 1.4GW increase above baseline would be funded by a revenue driver based on a £/MW approach, with infrastructure for collectors being funded similarly to TPCR4. This will deliver a total of 4.4GW of directly connected transmission generation by 2021. Adding embedded wind align to the Gone Green position of 5GW.

- An "Upper case" position where the £/MW revenue driver & collector infrastructure funding would connect projects which are Prospective to connect within the RIIO-T1 period. This would deliver a total of over 10GW of directly connected transmission generation (in SPTL's area) by 2021.

Through the combination of using the 'Gone Green' scenario and refining it based upon our knowledge of each individual scheme, we consider our Load Related Generation plans reflect our best view of activity over the RIIO-T1 period.

We have also considered our current experience of how load generation has progressed over the TPCR4 period whereby we have used our existing contracted background and knowledge to derive the total GW that we expect to connect over the period and used our cost information to derive a basis for establishing both the **£161m** ex-ante allowance and associated **£50k/MW** revenue driver. Based upon historic information this is the more appropriate method of establishing each of these elements. We are fully aware that over the course of RIIO-T1 a number of schemes referred to in our 'Best View' analysis will not progress to construction, however we are confident that those schemes will be either substituted and replaced by future schemes seeking connection to the transmission network. This is why we have a high degree of confidence in our overall outturn for Load Generation Investment.

4.4 Stakeholder Engagement

In developing our RIIO-T1 investment plan a significance influence comes from our continued engagement with key stakeholders.

- As part of our day to day processes, SPT have regular dialogue with those parties seeking to connect to the transmission network.
- We regularly hold meetings requested by those parties either seeking to connect to the network or engaged in the construction of a live project and have contact with developers throughout the progress of their scheme from initial scoping, connection application, planning through to project delivery.
- Also as a consequence of the transmission model adopted by the UK, our own engagement of the generation developer community is complemented by our regular forums with NGET as system operator who contractually have the direct interface with the end consumer, the generation developers.

4.5 Strategy

We have articulated our programmed delivery target

- to achieve the UK Government targets set for both generation from renewable sources and carbon emission reductions.

Our view of the probabilities of generators connected has been complemented with adjustments based upon our knowledge of when generators are likely to come forward and seek a connection to the transmission network. This has been gained through regular reviews of our contracted position along with regular contact with developers, local government officers and internal intelligence on progress of each project through our own project managers.

4.6 Investment Plan

The map & table below provide an overview of those schemes that form the basis of our RIIO-T1 submission. It should be noted however that through the RIIO-T1 period we expect, as has happened during TPCR4, a number of substitutions of individual schemes to occur. We are confident that our best view of a cumulative directly connected

renewable generation capacity of 4.39GW is achievable.

<Map and table removed>

An example of how the project portfolio will change throughout the period is Number 26 on the list Chapelcross Biomass (250MW). As we have been putting together our plans the developers of that scheme have advised via NGET of their wish to terminate their connection agreement. This is an example of how the generation load portfolio is fluid and will be peppered with substitution and subtractions throughout the period and also demonstrates how effective our ranking of projects has been in developing our plans as the Chapelcross Biomass project had been included within the Upper Scenario and would have been funded via the proposed revenue driver mechanism.

Over the eight year period of RIIO-T1, we recognise the challenge in providing an accurate view of the exact projects that will connect to meet our capacity target which is why we have developed the table below to provide for each project an overview of the project status, and how well developed the project is developing through to connection.

As you will see from the tables below, we have categorised each project as considering how well developed it is towards connection in RIIO-T1

Current – The project is either connected, or will connect prior to RIIO-T1. (shaded blue in the table below (1896MW))

Relatively Certain – The project has a connection offer and has either applied or obtained planning consent. In addition, some of the projects included in this category are either in construction or will be in construction as we enter the RIIO-T1 period. We are confident that these projects will connect during the early or towards the middle years of RIIO-T1. We propose that these projects should be funded via an ex-ante allowance. The list of Relatively certain projects in shown below shaded green in the table below. This provides a further 1620MW of generation, giving a total of 3516MW of wind generation (incl current).

Advanced Plans– These are projects whereby the developer is in the early stages of development. Based upon our knowledge of the projects and the local planning authority areas where they are seeking connection, we have considered these projects more likely to connect towards the end of the RIIO-T1 period. We propose that these projects should be funded via a revenue / volume driver approach allowance. The list of Advanced Plans projects in shown below shaded yellow in the table below. This provides a further 883MW of generation, giving a total of 4400MW of wind generation (incl those above).

Prospective – These are projects that are either in the early stages of development or have held a connection offer for a period of time and have are slow in developing the project. In addition we have considered the projects characteristics and the probability of the project quickly gaining planning consent. We have also considered the factors associating with the project becoming the subject of a public inquiry that would add a significant timescale onto the project timeline. We propose that these projects should be funded via a revenue / volume driver approach allowance. The list of Prospective projects in shown below shaded white with red text in the table below. This provides a further 6865MW of generation, giving a total of 11,264MW of generation (incl those above).

Within our submission tables,

- the "lower case" tables are based solely of those projects identified as being Relatively Certain.
- Our "best view" builds on this and includes those classed Relatively Certain and those with Advanced Plans
- with the "upper case" scenario expanding further on the "best view" through the inclusion of the other Prospective schemes.

We have, assumed that in our 'best view" that Cockenzie is no longer available from 2014 onwards. Whilst it is assumed that under both "lower" and "upper" cases Hunterston is retired from service in 2016/17 and Fife Energy in 2011/12. This aligns with the 3 scenarios within the blueprint

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