Interim Connect and Manage.
Cost Impact Analysis in Scotland – Tranche 2 (Western Isles)
period 2010/11-2014/15.
National Grid

Update: 7th July 2010

1. Executive Summary

Following publication of the Interim Connect and Manage (ICM) tranche 1 report for Scotland[1], this report focuses on the economic impact of connecting all the new plant in area 1 of Scotland. For the purpose of this report area 1 is known as the Western Isles and for avoidance of doubt includes the regions of Skye and Lochaber. Area 1 can be seen in figure 2 which shows the different regions within Scotland for the purpose of economic assessment and the major planning boundaries B01 to B06.

This Cost Benefit Analysis has been undertaken to support Ofgem's assessment of the derogation submitted for the Western Isles; the Western Isles is nested behind the B01 boundary in the far North West of Scotland.

This report supplements the report published on 1st July 2010: ICM Cost Benefit Analysis in Scotland Tranche 1. The updates provided in this report are as follows:

- Detailed analysis undertaken for the area 1 (Western Isles) part of network behind the B01 boundary.
- Boundary capabilities updated for the B06 boundary.
- Revision of generic outage assumptions for the B06 boundary.

This report notes that Ofgem has approved the connection of new plant in the Kintyre region based upon the cost benefit report previously submitted and provides no further analysis for the Kintyre region at this time. Generation separated in the tranche 1 published report has now been included within the baseline for this work on the assumption it connects under the ICM arrangements.

New generation contracted up to November 1st 2009 is assumed to fall under the ICM regime. Some embedded plant with contracts before the start of ICM have been accounted for within the week 24[2] data submissions from the Scottish DNO companies. Large generation in this area has been included in the background for this analysis but is not advanced under ICM and hence all advanced ICM projects within this report are embedded.

Our analysis suggests that, as we had expected, the overall constraint cost increase in Scotland associated with the new embedded generation in the Western Isles will continue to rise over time, driven by the connection of additional generation in advance of wider

[1] The ICM Cost benefit report can be found on the National Grid website in the following location: http://www.nationalgrid.com/uk/Electricity/Codes/gbsqsscode/DocLibrary/

[2] Week 24 data submissions are provided by Users to National Grid on an annual basis in accordance with the Planning Code in the Grid Code. Week 24 data submissions are provided by Users to National Grid on an annual basis in accordance with the Planning Code in the Grid Code.

reinforcement. In this instance, additional constraint costs will be somewhat offset by the carbon benefit arising from the connection of additional low carbon generation but will in any event reduce once the wider reinforcement works are completed. Furthermore, such costs do not take account of the more qualitative benefits of increased competition which might come from bringing in new entrants, enhanced security of supply and greater certainty of meeting legally binding climate change targets.

Introduction

In response to a derogation request from SHETL relating to export issues surrounding the connection of additional generation in the Western Isles, National Grid has undertaken a cost benefit analysis to assess the impact.

The Western Isles is currently served by a single overhead circuit as shown in Figure 1a below. A new HVDC link has been proposed between Stornoway and Beauly to be completed in autumn 2013, after which SHETL will then disconnect the link between Harris and Ardmore. The configuration of the Western Isles network after the completion of the new HVDC link is shown in Figure 1b.

Figure 1a: The Western Isles Network before autumn 2013.

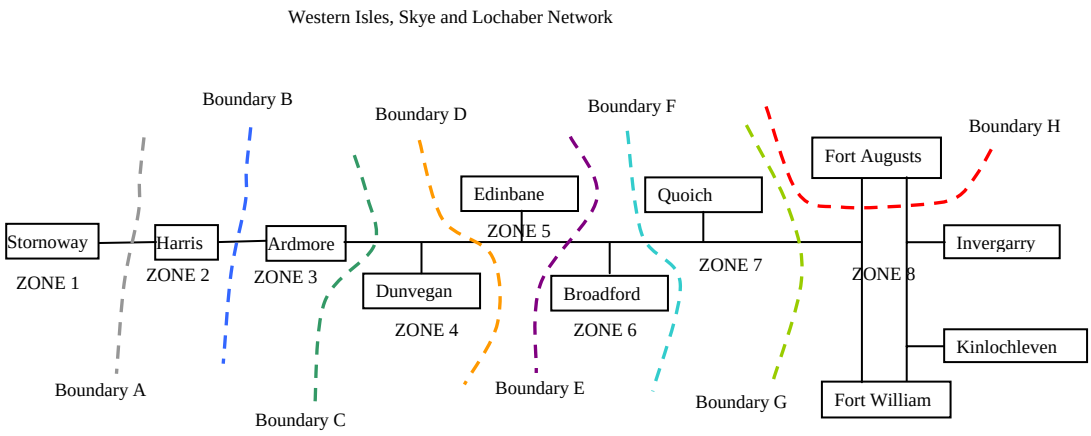
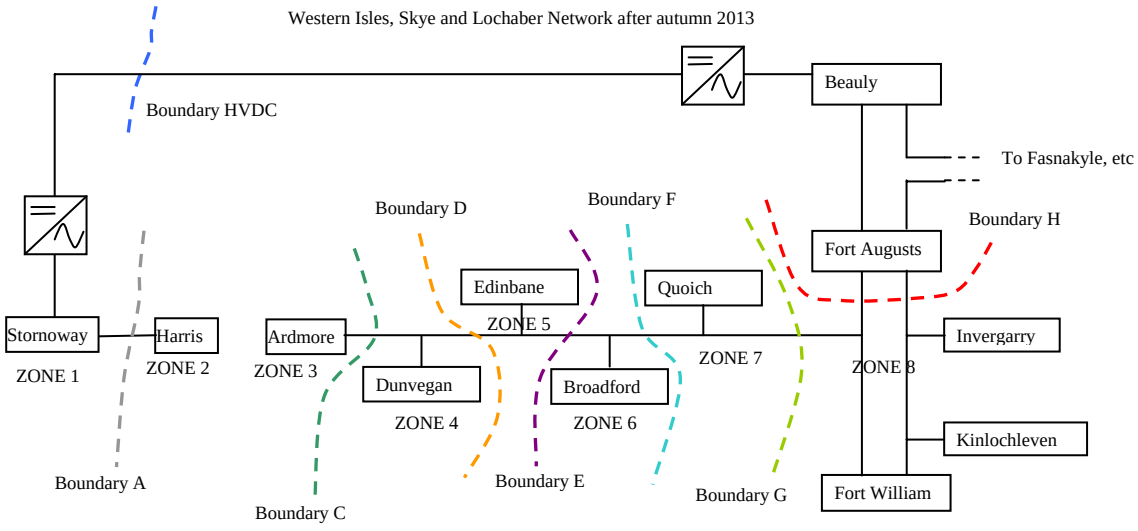
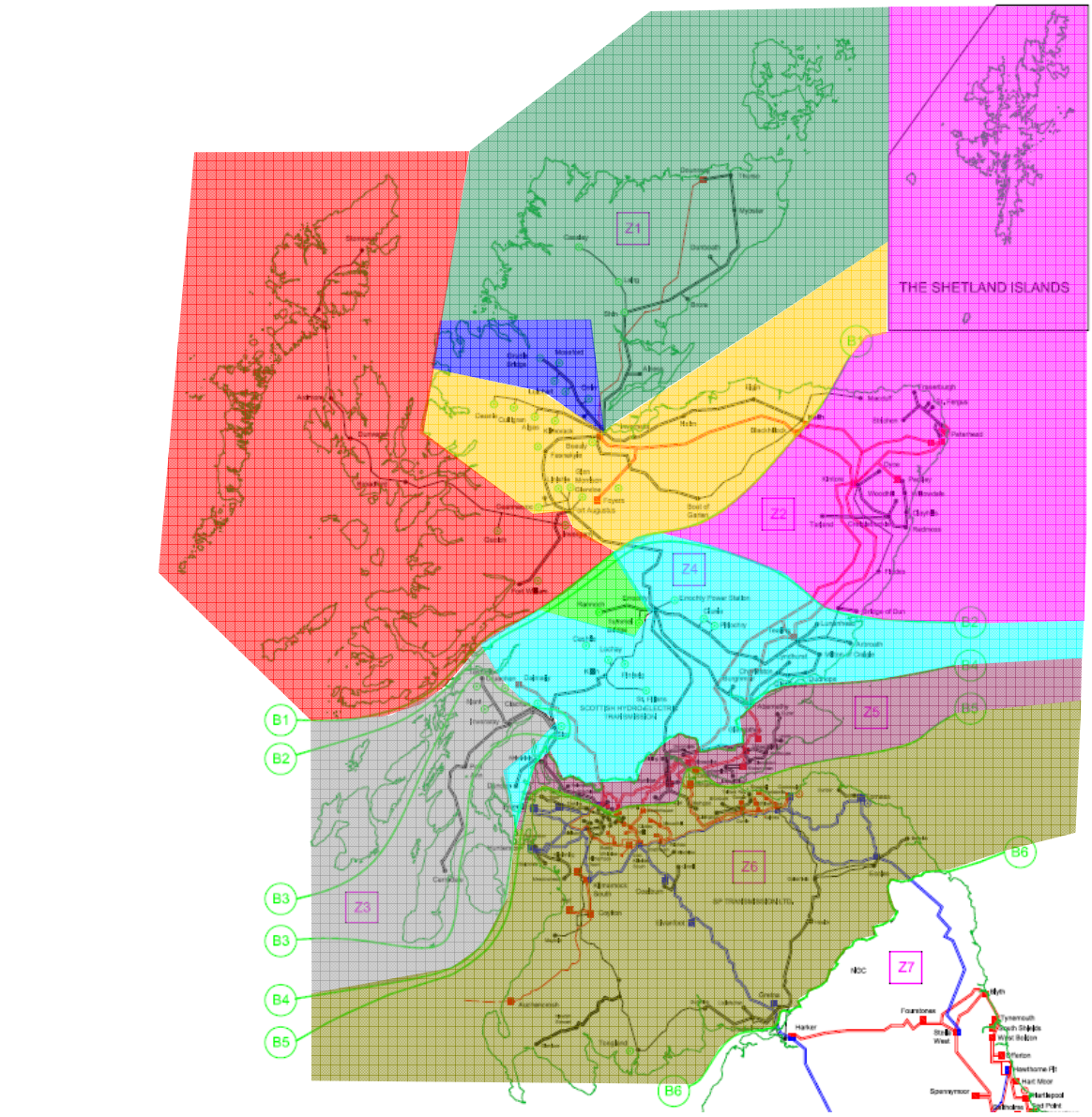


Figure 1b: The Western Isles Network after autumn 2013.



The Western Isles, Area 1, nests behind the B1 boundary. The division of Scotland by boundary and area is shown in figure 2 below.

Figure 2: Boundaries within Scotland.



Area 1: Lochaber/Skye/Western Isles
Area 2: Caithness
Area 3: Beauly – Grudie Bridge
Area 4: Remainder behind B01
Area 5: Between B01 and B02
Area 6: Kintyre
Area 7: Errochty/Tummel/Rannoch
Area 8: South SHETL (between B02 and B04)
Area 9: North SPT (between B04 and B05)
Area 10: South SPT (between B05 and B06)

This document provides a cost benefit analysis focusing on the Western Isles. The work considers the constraint costs incurred by the advancement of generation projects ahead of the wider system works being complete. The list of new generation can be found in Appendix 3. This report also looks at the impact of these Western Isles connections on the other interactive boundaries within Scotland.

This report is supplemental to the report published on 1st July 2010[1] for tranche 1 of the connection offers and should be read in conjunction with that main report which outlines the methodology and the generic assumptions for this work.

This work supplements the derogation submitted by Scottish Hydro-Electric Transmission Limited (SHETL) to Ofgem for the Western Isles. The derogation is attached for reference in Appendix 1. The derogation request is re-produced as submitted to Ofgem.

3. Modelling Data

3.1. Demand Data

The demand behind each boundary was determined and forecast by considering the relevant distribution company submissions for week 24[2].

The demand increases year on year have been calculated as follows:

Table1 – Demand Assumption

2010/11	2011/12	2012/13	2013/14	2014/15
Reference	As 2010/11	Reference * 1.0018	Reference * 1.0036	Reference * 1.0072

To produce the constraint cost, yearly demand profiles were applied behind each boundary. The demand data used was based on half hourly demand throughout the year, which has been increased in line with the above figures in table 1 for future years.

3.2. Generator Data

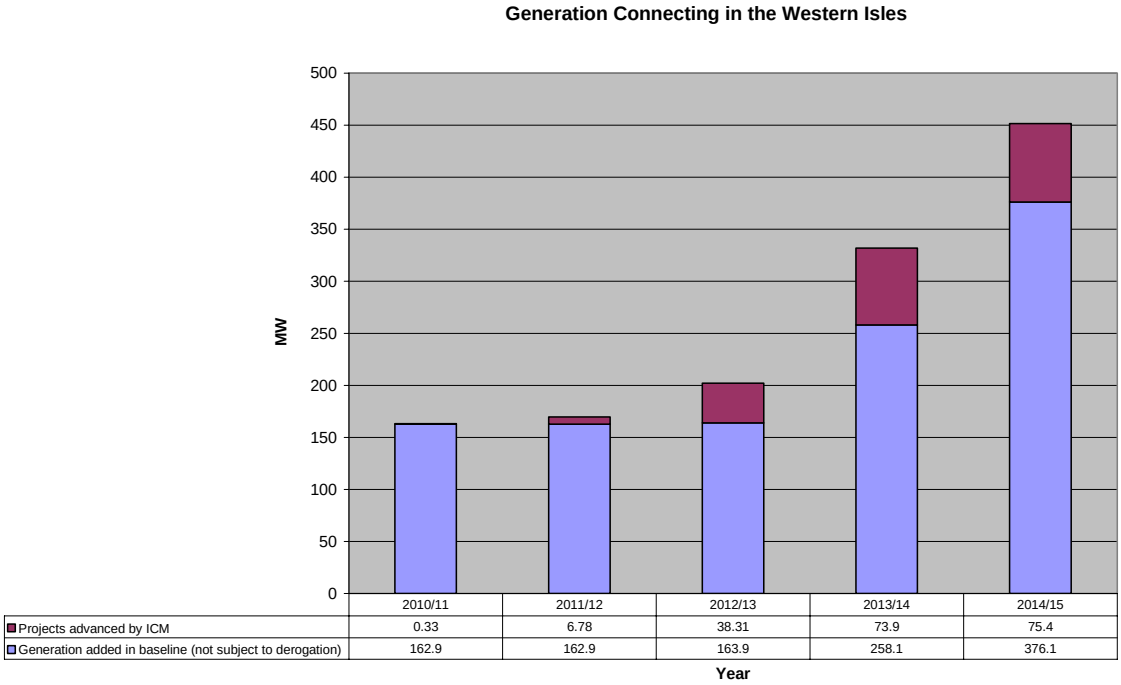
Graph 1 shows the MW volume of projects connecting in the Western Isles year on year. The baseline level shows the volume of generation already connected or contracted to connect before the Western Isles network becames non compliant and a derogation is required. The ICM level of generation shows the MW added to a non compliant network but that has been allowed to advance due to ICM.

Plant above 10MW in the SHETL network or above 30MW in the SPT geographical area is classified as large generation (level is 100MW in England and Wales) and is reflected in the contracted background.

Appendix 3 shows the new plant connecting into the Western Isles area. All the generation listed in Appendix 3 has been modelled explicitly for the economic assessment and has assumed to have been advanced under ICM.

The projects shown in Appendix 2 will appear within the baseline of generation as they are not advanced under ICM and hence do not incur additional constraint costs due to ICM. These projects have been offered connection dates prior to ICM subject to the completion of the HVDC link . The HVDC link offers these projects a compliant connection.

Graph 1: Generation Connecting in the Western Isles.



Graph 1. MW of Generation added in Western Isles by year.

3.3. Boundary Capabilities and Generic outage patterns

In order to assess the cost of constraints along the Western Isles route, the circuit has been split into the zones shown in figures 1a and 1b with the pre fault rating of each zonal section of the circuit being considered in the assessment of the circuit loadings and the subsequent constraints cost along the route. The boundary capabilities are shown on table 2 below.

Before the HVDC link reinforces the group, for a fault on the single circuit out of the Western Isles all or part of the group will be disconnected from the system and no constraint costs will be incurred. For a fault on either circuit between Fort Augustus and Fort William a proportion of generation will be disconnected and the remaining circuit will carry an increased flow. The post fault ratings given for these circuits match the pre fault ratings. The current model is unable to model the complexities described above so a simplified model has been used which considers constraints of the intact network only. It is expected that this may lead to different constraint costs as there may be periods during the year when plant is not able to generate, or incur constraint payments, due to circuit unavailability. However, this impact on constraint costs is not expected to be significant. Where users are connected to single circuits it is assumed that their contracts will allow for the outage of that single circuit at zero cost to the industry.

It has been assumed that the proposed HVDC link between the Western Isle and Beauly will be completed by end 2013. There may, however, still be constraint costs associated with the network configuration as shown in figure 1b.

Table 2: Boundary Capabilities for the Western Isles

	N-0 Capabilities (MVA)		
	Winter	**Spring/Autumn**	**Summer**
Boundary A	83	77	67
Boundary B	21	21	21
Boundary C	83	77	67
Boundary D	83	77	67
Boundary E	83	77	67
Boundary F	83	77	67
Boundary G	111	103	89
Boundary H	222	206	178
Boundary HVDC	600	600	600

Table 3: Boundary Limits for B01

Season	**Outage**	**2009/10** (with Inverarnan)	**2010/11 – 2012/13** (plus Knocknagael)	**2013/14** (plus Beauly-Denny)	**2014/15** (plus Beauly-Blackhillock)
Summer	N-D	350	360	1150	1800
	N-1-D	215	280	650	1100
Spring/ Autumn	N-D	400	430	1200	1800
	N-1-D	220	300	650	1100
Winter	N-D	400	450	1300	1800
	N-1-D	280	320	660	1100
Planned Outage Assumption		15 weeks/year			

The boundary capabilities for B06 are shown in tables 4. The B06 group is designed to Chapter 4 of the NETS SQSS.

Table 4: Boundary Limits for B06

Season	**Outage**	**Before Autumn 2010**	**Autumn 2010 - Autumn 2012**	**Beyond Autumn 2012**
Winter	N-D	2200	2800	3300
	N-1-D	1390	1970	2210
Spring	N-D	2022	2574	3033
	N-1-D	1280	1870	2130
Summer	N-D	2000	2461	2900
	N-1-D	1110	1710	1980
Autumn	N-D	2111	2687	3167
	N-1-D	1280	1870	2130
Planned Outage Assumption		25 weeks/year		8 weeks/year

Generic outage patterns have been reviewed for this report. Following the reinforcement works on B06 it has been assumed that there will be 2 weeks of maintenance outages on each of the B06 boundary circuit every 3 years; there are 6 boundary circuits. The maintenance will be for switchgear rather than overhead lines as it is assumed that any

line maintenance will take place whilst the circuits are out for the construction works. Other non boundary circuits may influence the capability of a boundary to transport power and as such additional outage weeks have been included.

This update aims to better represent the future outage pattern reflective of the work which needs to be undertaken at each boundary, year on year, to reinforce the Scottish system. The number of outage weeks assumed each year is included at the bottom of the capability tables above. The number of outage weeks assumed for the B06 boundary has been reduced from 26 weeks post reinforcement works to 8 weeks.

4. Cost-Benefit

The cost benefit analysis compares the cost of additional constraints due to advancing connections under ICM with the carbon benefits of advancing the new generation. As in the previous report the carbon benefit is calculated as £29k MW/year.

5. Results from the Cost Benefit Analysis

This section attempts to show the impact of advanced projects in the Western Isles upon future constraint costs. For each boundary subject to a derogation application, two tables are presented – one for Business as Usual and one representing the revised contracted connection dates offered through ICM. The tables show the following:

- **Costs for [boundary] Baseline**: These are the background constraint costs that are forecast to occur with the network as now (i.e. either compliant with NETS SQSS or as already derogated).

- **Additional Costs due to new generation in the Western Isles:** These are the additional constraint costs caused by the commissioning of the new generation connecting under ICM and contracted prior to 1 November 2009. These connections will cause the boundaries to be non compliant and hence a derogation has been submitted to reflect and manage this non compliance.

- **Carbon Benefit of new generation**
  This considers the carbon benefit of the new generation which is assumed to be renewable. The carbon benefit is associated with the overall constraint costs and therefore it is only included in the overall Scotland table.

Results from this analysis differ from the results forecast in the published tranche 1 report (1st July 2010)[1] for the following reasons:

- Outage patterns and capabilities for the B06 have been revised.
- The Western Isles has been modelled in more detail and additional generation identified in this area. More generation is constrained locally within this area and this will impact costs further south at the B01 and again at the B06.
- Cost benefit is shown as a total for Scotland only as the carbon benefit for the Western Isles would also be included in the figures for the B1 boundary and hence double counting could occur.

Table 5: Costs for the B01 Boundary to reflect the impact of new generation connecting under ICM and contracted prior to 1 November 2009 in Western Isles Area (Area 1)- Contracted

Contracted Background. Boundary B01	2010/11	2011/12	2012/13	2013/14	2014/15
	£m	£m	£m	£m	£m
Costs for B01 Boundary. Baseline	4.8	3.4	4.1	2.3	1.2
Additional Costs due to new generation in the Western Isles	0.2	0.2	2	0.3	0

Table 6: Costs for the B01 Boundary to reflect the impact of new generation connecting under ICM and contracted prior to 1 November 2009 in Western Isles Area (Area 1) - Business as Usual

Business as Usual Background. Boundary B01	2010/11	2011/12	2012/13	2013/14	2014/15
	£m	£m	£m	£m	£m
Costs for B01 Boundary. Baseline	2.3	3.1	3.8	0.5	1.3
Additional Costs due to new generation in the Western Isles	0.1	0.3	1.8	2.5	0.0

Table 7: Costs for the Western Isles (WI) Boundaries to reflect the impact of new generation connecting under ICM and contracted prior to 1 November 2009 in Western Isles Area (Area 1) –Contracted

Contracted Background. Boundary Wi	2010/11	2011/12	2012/13	2013/14	2014/15
	£m	£m	£m	£m	£m
Costs for WI Boundary. Baseline	0	0	0	1.5	0
Additional Costs due to new generation in the Western Isles	0	0	32	9.8	0.4

Table 8: Costs for the Western Isles(WI) Boundaries to reflect the impact of new generation connecting under ICM and contracted prior to 1 November 2009 in Western Isles Area (Area 1) -Business as Usual

Business as Usual Background. Boundary Wi	2010/11	2011/12	2012/13	2013/14	2014/15
	£m	£m	£m	£m	£m
Costs for WI Boundary. Baseline	0	0	0	1.5	0
Additional Costs due to new generation in the Western Isles	0	0	32	9.8	0.4

Table 9: Costs for the B06 Boundary to reflect the impact of new generation connecting under ICM and contracted prior to 1 November 2009 in Western Isles Area (Area 1) - Contracted

Contracted Background. Boundary B06	2010/11	2011/12	2012/13	2013/14	2014/15
	£m	£m	£m	£m	£m
Costs for B6 Boundary. Baseline	93.7	202.9	120.0	56.4	107.1
Additional Costs due to new generation in the Western Isles	0.4	2.3	6.7	6.7	8.4

Table 10: Costs for the B06 Boundary to reflect the impact of new generation connecting under ICM and contracted prior to 1 November 2009 in Western Isles Area (Area 1) - Business as Usual

Business as Usual Background. Boundary B06	2010/11	2011/12	2012/13	2013/14	2014/15
	£m	£m	£m	£m	£m
Costs for B6 Boundary. Baseline	71.1	152.0	70.0	29.6	50.8
Additional Costs due to new generation in the Western Isles	0.0	0.1	5.2	4.9	6.0

Table 11: Total cost benefit for Scotland to reflect the impact of new generation connecting under ICM and contracted prior to 1 November 2009 in Western Isles Area (Area 1) - Contracted

Contracted Background. Total Scotland	2010/11	2011/12	2012/13	2013/14	2014/15
	£m	£m	£m	£m	£m
Baseline for all of Scotland.	98.5	206.3	124.1	60.2	108.3
Additional Costs due to new generation in the Western Isles	0.6	2.5	40.7	16.8	8.8
Carbon benefit of new generation for Western Isles	0.0	0.2	1.1	2.1	2.2

Table 12: Total cost benefit for Scotland to reflect the impact of new generation connecting under ICM and contracted prior to 1 November 2009 in Western Isles Area (Area 1) - Business as Usual

Business as Usual Background. Total Scotland	2010/11	2011/12	2012/13	2013/14	2014/15
	£m	£m	£m	£m	£m
Baseline for all of Scotland.	73.4	155.1	73.8	31.6	52.1
Additional Costs due to new generation in the Western Isles	0.1	0.4	39	17.2	6.3
Carbon benefit of new generation for Western Isles	0.0	0.2	1.1	2.1	2.2

6 Discussion from Observed Results

6.1. Total Costs for Scotland

As can be seen, the analysis indicates that the overall constraint cost increase in Scotland associated with the new embedded generation in the Western Isles is higher than the assumed carbon benefits provided. This profile of costs shows the mitigating effect of the wider reinforcements planned for the area.

7. Comparison with BSIS forecasts

This analysis was completed using the same basic model as that used to develop the 2010/11 BSIS constraint forecast. The input assumptions have been used in line with this report to present a view which looks further into the future and which aligns with the derogation requests.

The ICM model only considers the boundaries at which the Scottish TO has requested a derogation. A review and discussion of compliance and requested derogations will take place at least bi-annually.

Whilst using the same model as BSIS, this analysis is based upon a different set of long term planning assumptions as described within this report. The constraint numbers are provided to try and establish a cost benefit associated with advancing projects under ICM only. The constraint costs can not be considered as a longer term BSIS forecast and are expected to see more change over time due to the generic assumptions used and the uncertainties which have been modelled.

8. Conclusion

The analysis indicates that the overall constraint cost increase in Scotland associated with the new generation in the Western Isles is higher than the assumed carbon benefits provided. At this time new generation in the Western Isles advancing under ICM are embedded projects only.

There is further work to undertake in the areas north of B01 and analysis which looks at internal boundaries B02 and B04.

Appendix 1: Western Isles Derogation.

SHETL Licence Condition D3 Derogation: SHETL's Skye-Lochaber Boundary

SHETL Skye-Lochaber Network

Relevant Paragraph(s) of NETS Security and Quality of Supply Standard	CAUSE	PART OF SYSTEM AFFECTED	INITIAL CONDITIONS		INTERIM OPERATIONAL SOLUTION	LONG TERM SOLUTION	COMMENTS
			SYSTEM INTACT	CIRCUIT OUTAGE			
NETS SQSS Section 2 Clauses 2.5 to 2.13	Pre-fault power flows on the 132 kV circuit in Skye DA/ED1/BE1/QB1/FQ Post-fault power flows for single circuit fault outage on 132kV OHL between Fort William and Fort Augustus. FFE/FFW	Skye and Lochaber 132kV circuits comprising; (i) 132kV single circuit between Dunvegan and Edinbane (ED1). (ii) 132kV single circuit between Edinbane and Broadford (BE1). (iii) 132kV single circuit between Broadford and Quoich (QB1). (iv) 132kV single circuit between Quoich and Tee with Fort Augustus /Fort William circuit (FQ). (v) 132kV double circuit between Fort Augustus and Fort William (FFE/FFW). Critical conditions are; (i) Pre-fault flows on the 132kV Skye circuit between Dunvegan and the Tee with the Fort William/Fort Augustus circuit. (ii) A 132kV single circuit fault on the eastern circuit between Fort William and Fort Augustus (FFE), causing overload on the northern part of the 132kV circuit between Fort William and Fort Augustus (FFW) north of the Skye Tee.	System intact at ACS peak demand. System conditions expected to arise in course of a year. Contracted generation.	None. Typical planned outage patterns.	NETSO operational measures in operational timescales in accordance with Section 5 of NETS SQSS.	SHETL propose the following incremental steps for transmission reinforcements in this area; (i) HVDC link between Western Isles and Beauly, expected to complete by 2013. (ii) Remove Skye link from Fort William/Fort Augustus circuit (FFW) by either (a) constructing around 9km of 132kV single circuit wood pole overhead line between Fort Augustus and the Tee (estimated completion 2015), or (b) rebuilding around 9km of the double circuit tower route between Ftor Augustus and the Tee with heavy duty 132kV OHL (estimated completion 2015). (iii) Rebuild the 132kV Fort Augustus to Fort William overhead line to heavy duty 132kV construction, estimated completion 2017. * Completion dates subject to consents and regulatory approval.	Derogation is sought until completion of the listed long term reinforcement solutions. This derogation has been triggered due to a combination of large generation and embedded generation on the Distribution networks seeking to connect under the interim connect and manage arrangements introduced by Ofgem in May 2009.

Background to the network demand and generation.

There is a significant growth of generation in the area comprising Lochaber, Skye and the Western Isles. On Lewis, this includes the very large windfarms at Eishken (300MW) and Pairc (98MW), both of which are contingent on the installation of an HVDC link between Lewis and Beauly (estimated completion 2013). One other contracted windfarm, Pentland Road (13.8MW), is also contingent on the HVDC link.

On Skye there are several large operational power stations including the windfarms at Edinbane (42.8MW) and Ben Aketil (28MW). There are also several existing small embedded hydro sites such as Storr Lochs and Nostie.

In the Lochaber area there are three large operational power stations: Quoich (18MW), Kinlochleven (20MW) and Invergarry (20MW). In addition, at Fort William there is a large contracted windfarm, Hanna (81MW).

In addition to these generators there is a significant number of much smaller renewable generation schemes embedded in the Distribution networks on the Western Isles, Skye and Lochaber, including community based schemes, that are urgently seeking connection.

The 132kV radial transmission network in this area is already fully utilised by connected or being built generation up to the limit specified in Section 2 of the NETS SQSS. Consequently, any additional generation seeking connection is required to wait on reinforcement prior to connection. Customer choice for non-firm access ahead would require complex and expensive power management schemes from several 132kV circuit sections to multiple small generators separated by long distances over very difficult and remote terrain including crossing the Minch.

SHETL believes that a significant number of the small generators could be connected to the existing transmission system in this area prior to reinforcement, subject to operational management of the existing large generators. SHETL would consider this to be consistent with the principles of interim Connect and Manage as set out in Ofgem's letter of 8 May 2009.

The critical conditions which limit the transfers across the Lochaber and Skye networks are as follows;

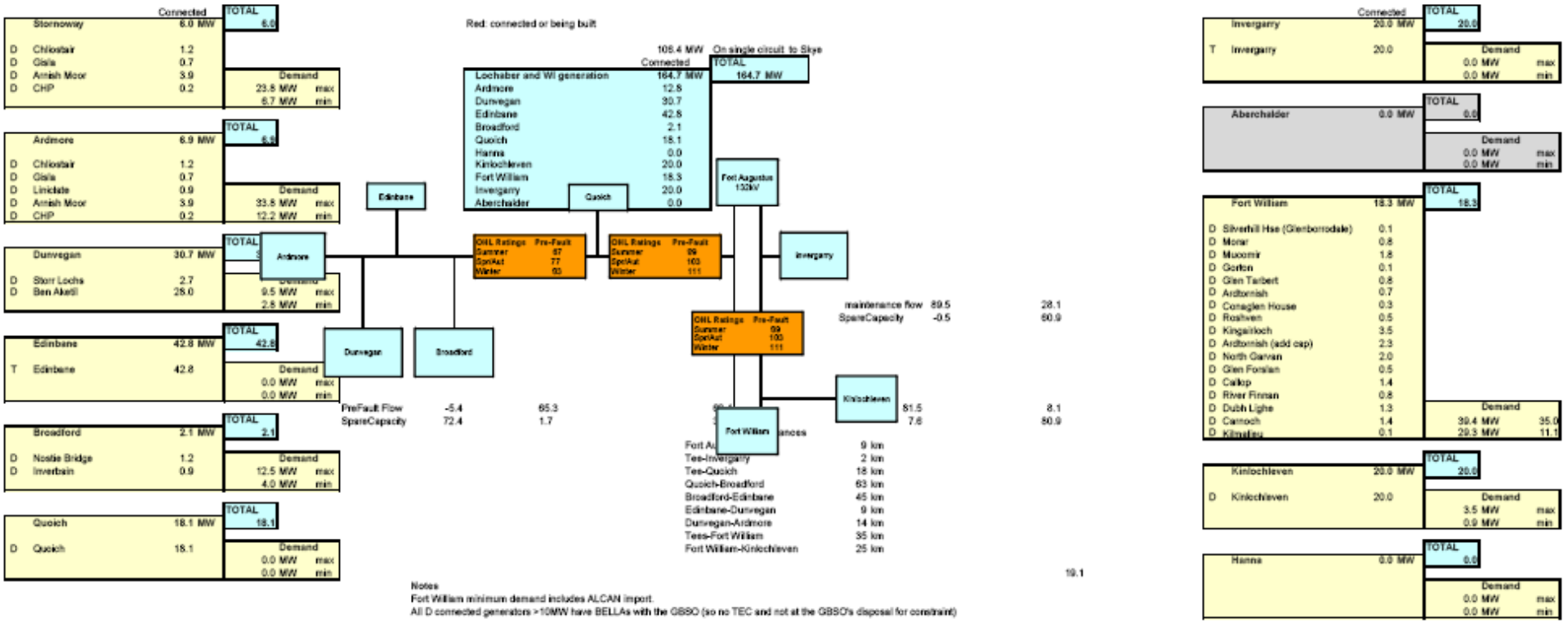
(i) Pre-fault flows on the 132kV Skye circuits between Dunvegan, Edinbane, Broadford, Quoich and the Tee with the Fort William/Fort Augustus circuit.

(ii) Post-fault flows following a 132kV single circuit fault on the eastern circuit between Fort William and Fort Augustus (FFE), causing overload on the northern part of the 132kV circuit between Fort William and Fort Augustus (FFW) north of the Skye Tee.

SHETL Skye-Lochaber Network

Connected or being built

GB SQSS Section 2 test (maximum generation, minimum demand, summer pre-fault ratings, single circuit on maintenance outage)
Most onerous "fit and forget" test



Impact assessment of the non-compliance						COMMENTS
Consumers	Security of Supply	Competition	Sustainable Development	Health and Safety and the associated risk management measures	Other Parties Affected	
During the derogation there may be an increase in operational constraints and therefore operational costs, however there should not be any impact on the security of supply to consumers.	During the derogation period, the NETSO will continue operate the system in accordance with operational security standards (Section 5 of NETS SQSS). This may result in increased operational constraints and therefore operational costs, however there should not be any impact on the security of supply.	The early access of renewable generation to the network in advance of transmission reinforcement works should be beneficial.	SHETL to progress transmission reinforcements in the form of ; (i) the HVDC link from WI to Beauly, and (ii) install a wood pole 132kV circuit from Fort Augustus to the Skye Tee. (iii) Rebuild the 132kV Fort Augustus to Fort William overhead line to heavy duty 132kV construction, estimated completion 2017. Assuming all the currently known contracted generation materialises, these are the measures required to address the non-compliance in this area.	National Grid and SHETL will ensure that health and safety are not compromised during the derogation period.	There are no other parties directly affected.	

Appendix 2: Baseline Generation in the Western Isles, Skye and Lochaber area

This table shows the generation projects in the Western Isles, Skye and Lochaber area that have been included in the baseline background. This includes small embedded generation, some of which is accounted for in the week 24 submission, large embedded generation and transmission connected generation.

Project	MW	GSP	Type	Contracted Connection Date	Area	Large / Small Generation
Ardtornish	0.7	Fort William	Hydro	Connected	Zone 8	Small
Ardtornish Hydro(additional capacity)	2.3	Fort William	Hydro	Connected	Zone 8	Small
Arnish	3.0	Stornoway	Standby Diesel	Connected	Zone 1	Small
Arnish Moor Wind, Lewis, Western Isles	3.9	Stornoway	Wind	Connected	Zone 1	Small
Barra	2.0	Ardmore	Standby Diesel	Connected	Zone 3	Small
Ben Aketil	28.0	Dunvegan	Wind	Connected	Zone 4	Large
Callop Hydro, Glenfinnan, Ft William	1.4	Fort William	Hydro	Connected	Zone 8	Small
Carnoch Hydro, Glen Tarbert (Add capacity)	1.4	Fort William	Hydro	Connected	Zone 8	Small
Chliostair	1.2	Stornoway	Hydro	Connected	Zone 1	Small
Conaglen Hse Hydro, Ardgour, Ft William	0.3	Fort William	Hydro	Connected	Zone 8	Small
Dubh Lighe Hydro, Glenfinnan	1.3	Fort William	Hydro	Connected	Zone 8	Small
Edinbane	42.8	Edinbane	Wind	Connected	Zone 5	Large
Gisla	0.7	Stornoway	Hydro	Connected	Zone 1	Small
Glen Forslan Hydro, Glen Uig, Moidart	0.5	Fort William	Hydro	Connected	Zone 8	Small
Glen Tarbert Hydro	0.8	Fort William	Hydro	Connected	Zone 8	Small
Gorton	0.1	Fort William	Hydro	Connected	Zone 8	Small
Inverbain Hydro Generation	0.9	Broadford	Hydro	Connected	Zone 6	Small
Invergarry	20.0	Invergarry	Hydro	Connected	Zone 8	Large
Kingairloch Hydro, Morvern	3.5	Fort William	Hydro	Connected	Zone 8	Small
Kinlochleven	20.0	Kinlochleven	Hydro	Connected	Zone 8	Large
Liniclate Wind Generation, Benbecule	0.9	Ardmore	Wind	Connected	Zone 3	Small
Morar	0.8	Fort William	Hydro	Connected	Zone 8	Small
Mucomir	1.8	Fort William	Hydro	Connected	Zone 8	Small
North Garvan	2.0	Fort William	Hydro	Connected	Zone 8	Small
Nostie Bridge	1.2	Broadford	Hydro	Connected	Zone 6	Small
Quoich	18.1	Quoich	Hydro	Connected	Zone 7	Large
Roshven Hydro, Lochailort	0.5	Fort William	Hydro	Connected	Zone 8	Small

Project	MW	GSP	Type	Contracted Connection Date	Area	Large / Small Generation
Silverhill House (Glenborrodale)	0.1	Fort William	Hydro	Connected	Zone 8	Small
Storr Lochs	2.7	Dunvegan	Hydro	Connected	Zone 4	Small
River Finnan Hydro, Glenfinnan, Ft William	1.0	Fort William	Hydro	31/03/2012	Zone 8	Small
Parc	94.0	Stornoway	Wind	31/10/2013	Zone 1	Large
CHP Generator, Waste Recycling Plant, Stornoway	0.2	Stornoway	CHP	31/10/2013	Zone 1	Small
Eishken Estate, Isle of Lewis[1]	118.0	Stornoway	Wind	01/01/2014	Zone 1	Large
Pentland Road Wind, Lewis	13.8	Stornoway	Wind	01/01/2016	Zone 1	Large
Hanna	81.0	Fort William	Wind	01/01/2018	Zone 8	Large
Total MW	470.8					

Notes:

1) Eishken Estate has a contracted position of 300MW, but only applied for planned permission for 118 MW.

Appendix 3: Additional Generation in the Western Isles, Skye and Lochaber area

This table shows the new generation projects in the Western Isles, Skye and Lochaber area that have been included in addition to the baseline background under the Interim Connect and Manage principles. This additional generation leads to the NETS SQSS non compliance in the Western Isles, Skye and Lochaber area, which has facilitated the need for the Western Isles, Skye and Lochaber area derogation request.

Project	MW	GSP	Type	Contracted Connection Date	Area	Large / Small Generation
Borinish, Uist, Western Isles	0.33	Ardmore	Wind	30/06/2010	Zone 3	Small
The Brunnery	0.95	Fort William	Hydro	31/03/2011	Zone 8	Small
Allt na H'airigh, Loch Sunart	0.7	Fort William	Hydro	31/03/2011	Zone 8	Small
Liddesdale Burn, Loch Sunart	0.4	Fort William	Hydro	31/03/2011	Zone 8	Small
Allt na Cloiche, Loch Sunart	0.7	Fort William	Hydro	31/03/2011	Zone 8	Small
Keppoch Farm, Roy Bridge	0.1	Fort William	Hydro	31/05/2011	Zone 8	Small
Abhainn Shalacan, Lochaline	0.3	Fort William	Hydro	31/08/2011	Zone 8	Small
Lime Kiln Hydro	0.7	Fort William	Hydro	30/09/2011	Zone 8	Small
Tolsta Community Wind Farm, Isle of Lewis	0.9	Stornoway	Wind	30/09/2011	Zone 1	Small
White Glen Hydro (Gleann Geal)	0.8	Fort William	Hydro	31/10/2011	Zone 8	Small
Horshader Community Wind Farm, Isle of Lewis	0.9	Stornoway	Wind	31/12/2011	Zone 1	Small
Kilmalieu Hydro Scheme, Ardgour	0.05	Fort William	Hydro	31/03/2012	Zone 8	Small
Carnach	0.28	Fort William	Hydro	31/03/2012	Zone 8	Small
Borrodale	0.45	Fort William	Hydro	31/03/2012	Zone 8	Small
Slatach Hydro	0.75	Fort William	Hydro	31/03/2012	Zone 8	Small
Dubh Lighe Additional Capacity	0.3	Fort William	Hydro	31/03/2012	Zone 8	Small
Druim Fada	9.9	Fort William	Wind	30/06/2012	Zone 8	Small
No 7 Borinish, Uist, Western Isles	9.6	Ardmore	Wind	31/10/2012	Zone 3	Small
South Uist Estates Ltd (Loch Carnan)	7.5	Ardmore	Wind	31/10/2012	Zone 3	Small
Cia Aig Hydro	2.7	Fort William	Hydro	31/12/2012	Zone 8	Small
Lochaber Biomass, Fort William	9.99	Fort William	Biomass	31/10/2013	Zone 8	Small
Glen Quoich Hydro Station	3.45	Quoich	Hydro	31/10/2013	Zone 7	Small
Galson Wind, Barvas, Isle of Lewis	2.7	Stornoway	Wind	31/10/2013	Zone 1	Small
Russel Burn Hydro, Kishorn, Skye	0.45	Broadford	Hydro	31/10/2013	Zone 6	Small
Creed Business Park, Stornoway, Isle of Lewis	0.23	Stornoway	Wind	31/10/2013	Zone 1	Small

Project	MW	GSP	Type	Contracted Connection Date	Area	Large / Small Generation
Barra Wind Generating Station, Isle of Barra	0.85	Ardmore	Wind	31/10/2013	Zone 3	Small
Beinn Greidaig Wind Scheme	9	Stornoway	Wind	31/10/2013	Zone 1	Small
Great Bernera, Isle of Lewis	4.92	Stornoway	Wind	31/10/2013	Zone 1	Small
Siadar Gateway Wave Device	4	Stornaway	Wave	31/10/2013	Zone 1	Small
Ardnamurchan Estate	1.5	Fort William	Wind	31/03/2014	Zone 8	Small
Total MW	75.4					