

# Report on the Connect and Manage Regime

## Interim Outturn Report

### Quarter 4: January 2015 – 31 March 2015

## CONNECT & MANAGE OUTTURN REPORTING

This document reports on the performance of plant currently connected under the Connect & Manage regime with regard to Financial Year 2014/15 and includes the summary of Q4.

### Connected C&M Generation

The table below shows generation projects which have been connected under C&M terms since 2010. The aggregate contracted capacity of 1.77 GW is an increase of 349MW compared to the last quarter with 554MW of new contracted capacity added in the year as a whole. This increase in the year has largely been driven by the connection of Westernmost Rough and Humber Gateway offshore wind farms, with the latter connecting in Q4.

| Project                                 | Fuel Type     | Contracted Capacity (MW) | ETYS Zone | Generation Zone | Connection Month |
|---|---------------|--------------------------|-----------|-----------------|------------------|
| Fasnakyle G4                            | Hydro         | 8                        | T1        | 3               | Oct 2010         |
| Novar 2 Wind Farm Alness                | Onshore Wind  | 32                       | T5        | 1               | Oct 2011         |
| Hill of Towie (Drummuir)                | Onshore Wind  | 48                       | T1        | 1               | Oct 2011         |
| Whitelee Extension                      | Onshore Wind  | 238                      | S1        | 7               | Dec 2011         |
| Beinn an Tuirc 2                        | Onshore Wind  | 6                        | T3        | 5               | Dec 2011         |
| Glendoe                                 | Hydro         | 100                      | T1        | 3               | Apr 2012         |
| Baillie Wind Farm Stage 1               | Onshore Wind  | 25                       | T5        | 1               | Dec 2012         |
| Rosehall                                | Onshore Wind  | 25                       | T5        | 5               | Dec 2012         |
| Kildrummy Wind Farm                     | Onshore Wind  | 18                       | T2        | 4               | Dec 2012         |
| Cairn Uish (Phase 2)                    | Onshore Wind  | 41                       | T1        | 1               | Feb 2013         |
| Baillie Wind Farm Stage 2               | Onshore Wind  | 28                       | T5        | 1               | May 2013         |
| Calderwater                             | Onshore Wind  | 32                       | S4        | 7               | May 2013         |
| Camster                                 | Onshore Wind  | 50                       | T5        | 1               | May 2013         |
| Pentland Road Stage 1                   | Onshore Wind  | 14                       | T1        | 3               | Jun 2013         |
| Harestanes Stage 1                      | Onshore Wind  | 111                      | S1        | 7               | Sep 2013         |
| West of Duddon Sands Stage 1            | Offshore Wind | 206                      | R5        | 9               | Oct 2013         |
| Berry Burn                              | Onshore Wind  | 67                       | T1        | 1               | Nov 2013         |
| Gordonsttown Hill                       | Onshore Wind  | 13                       | T2        | 1               | Nov 2013         |
| Markinch Biomass CHP Plant              | Biomass       | 3                        | S5        | 6               | Nov 2013         |
| Lochluichart Windfarm Stage 1           | Onshore Wind  | 51                       | T1        | 1               | Nov 2013         |
| Mid Hill Wind                           | Onshore Wind  | 75                       | T2        | 1               | Dec 2013         |
| Tullo II                                | Onshore Wind  | 25                       | T2        | 1               | Mar 2014         |
| Westernmost Rough                       | Offshore Wind | 205                      | P8        | 9               | Aug 2014         |
| Humber Gateway Offshore Wind Farm BMU 1 | Offshore Wind | 108                      | P8        | 9               | Jan 2015         |
| Humber Gateway Offshore Wind Farm BMU 2 | Offshore Wind | 111                      | P8        | 9               | Jan 2015         |
| Stroupster Wind Farm                    | Onshore Wind  | 32                       | T5        | 1               | Feb 2015         |
| Burn of Whilk Wind Farm                 | Onshore Wind  | 23                       | T5        | 1               | Mar 2015         |
| Strathy North Wind Farm                 | Onshore Wind  | 76                       | T5        | 1               | Mar 2015         |
| Total Contracted Capacity (MW)          |               | 1,769                    |           |                 |                  |

Note: New TNUoS Zones were introduced in 2013/14. For consistency with prior years this report summates to the pre-2013 zones.

It should be noted that although all sites are connected to the NETS not all are fully operational. In particular wind farms can often take a period of time (of >1 year duration) to ramp up to full generation output. Most C&M generators are located in Scotland and their outputs are subject to transmission constraints within the Scottish network and at the Cheviot boundary while works are underway to reinforce those networks.

Metrics relating to the outturn of connected units are tabulated below (Table 1) and discussed in the following paragraphs.

## Connect and Manage Outturn

Table 1: Connect & Manage Outturn Data Summary

| Connect & Manage Outturn Summary   | Financial Year (Apr-Mar) | National | By Generation Zones |        |        |       |       |        |        |       |         |   |
|--|--------------------------|----------|---------------------|--------|--------|-------|-------|--------|--------|-------|---------|---|
|  |                          |          | 1                   | 2      | 3      | 4     | 5     | 6      | 7      | 8     | 9 Other |   |
| Metered Output of C&M (GWh)  | 2011-12                  | 126      | 7                   | -      | 116    | -     | 3     | -      | -      | -     | -       | - |
|  | 2012-13                  | 442      | 120                 | -      | 108    | 1     | 26    | -      | 188    | -     | -       | - |
|  | 2013-14                  | 1,702    | 668                 | -      | 317    | 54    | 69    | 6      | 555    | -     | 33      | - |
|  | 2014-15                  | 3,163    | 940                 | -      | 355    | 48    | 130   | 192    | 671    | -     | 827     | - |
|  | 2014-15 Q1               | 494      | 131                 | -      | 64     | 4     | 17    | 52     | 117    | -     | 109     | - |
|  | 2014-15 Q2               | 512      | 148                 | -      | 54     | 9     | 21    | 43     | 97     | -     | 140     | - |
|  | 2014-15 Q3               | 965      | 299                 | -      | 109    | 15    | 40    | 57     | 198    | -     | 248     | - |
|  | 2014-15 Q4               | 1,192    | 361                 | -      | 128    | 20    | 52    | 41     | 260    | -     | 330     | - |
| Total to date  | 5,433                    | 1,735    | -                   | 896    | 103    | 228   | 198   | 1,414  | -      | 860   | -       |   |
| Carbon Abatement due to running of C&M units (Avoided CO2) (Thousands of Tonnes) | 2011-12                  | 114      | 7                   | -      | 105    | -     | 3     | -      | -      | -     | -       | - |
|  | 2012-13                  | 389      | 151                 | -      | 85     | 10    | 16    | -      | 126    | -     | -       | - |
|  | 2013-14                  | 1,379    | 497                 | -      | 334    | 38    | 49    | 24     | 436    | -     | 0       | - |
|  | 2014-15                  | 2,518    | 741                 | -      | 362    | 36    | 74    | 220    | 600    | -     | 487     | - |
|  | 2014-15 Q1               | 429      | 125                 | -      | 67     | 4     | 13    | 66     | 104    | -     | 50      | - |
|  | 2014-15 Q2               | 434      | 140                 | -      | 39     | 7     | 14    | 73     | 86     | -     | 74      | - |
|  | 2014-15 Q3               | 756      | 217                 | -      | 114    | 11    | 23    | 45     | 185    | -     | 162     | - |
|  | 2014-15 Q4               | 899      | 258                 | -      | 141    | 14    | 24    | 36     | 224    | -     | 201     | - |
| Total to date  | 4,400                    | 1,395    | -                   | 886    | 84     | 142   | 243   | 1,162  | -      | 487   | -       |   |
| C&M Output Contributing to System Constraints (GWh)                              | 2011-12                  | 71       | 2                   | -      | 67     | -     | 2     | -      | -      | -     | -       | - |
|  | 2012-13                  | 96       | 26                  | -      | 9      | 2     | 7     | -      | 53     | -     | -       | - |
|  | 2013-14                  | 1,224    | 488                 | -      | 249    | 39    | 53    | 4      | 388    | -     | 3       | - |
|  | 2014-15                  | 1,395    | 555                 | -      | 246    | 27    | 70    | 60     | 406    | -     | 31      | - |
|  | 2014-15 Q1               | 138      | 49                  | -      | 31     | 1     | 6     | 9      | 34     | -     | 7       | - |
|  | 2014-15 Q2               | 82       | 31                  | -      | 12     | 2     | 5     | 1      | 31     | -     | 0       | - |
|  | 2014-15 Q3               | 568      | 213                 | -      | 89     | 11    | 29    | 28     | 176    | -     | 21      | - |
|  | 2014-15 Q4               | 607      | 261                 | -      | 114    | 13    | 29    | 22     | 164    | -     | 3       | - |
| Total to date  | 2,786                    | 1,071    | -                   | 571    | 67     | 132   | 64    | 847    | -      | 34    | -       |   |
| Constraint Costs Attributable to C&M units (£k)                                  | 2011-12                  | 2,432    | 72                  | -      | 2,236  | -     | 124   | -      | -      | -     | -       | - |
|  | 2012-13                  | 5,645    | 1,664               | -      | 785    | 58    | 294   | -      | 2,845  | -     | -       | - |
|  | 2013-14                  | 71,760   | 28,976              | -      | 16,948 | 1,661 | 3,616 | 89     | 20,366 | -     | 103     | - |
|  | 2014-15                  | 99,717   | 31,336              | -      | 17,644 | 1,543 | 5,165 | 2,441  | 39,810 | -     | 1,778   | - |
|  | 2014-15 Q1               | 6,840    | 2,514               | -      | 1,778  | 38    | 330   | 215    | 1,756  | -     | 210     | - |
|  | 2014-15 Q2               | 7,908    | 2,801               | -      | 1,243  | 159   | 364   | 93     | 3,233  | -     | 15      | - |
|  | 2014-15 Q3               | 45,101   | 14,287              | -      | 7,212  | 759   | 2,319 | 1,363  | 17,695 | -     | 1,465   | - |
|  | 2014-15 Q4               | 39,868   | 11,734              | -      | 7,411  | 586   | 2,153 | 770    | 17,126 | -     | 89      | - |
| Total to date  | 179,555                  | 62,048   | -                   | 37,613 | 3,261  | 9,199 | 2,530 | 63,021 | -      | 1,882 | -       |   |

Note: All quarters in 2014/15 have been recalculated in the table above based on the latest data available as at 15<sup>th</sup> April 2015. In addition the generation zone of some of the units has been updated.

## Comparison to History

### Metered Output

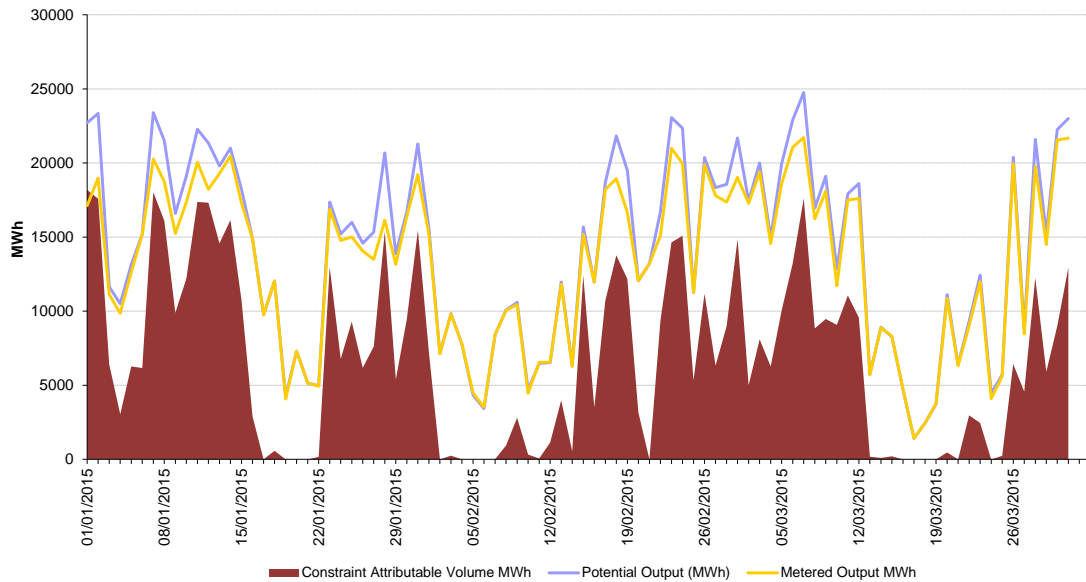
As per Table 1, output from the C&M units in Q4 was 1.2TWh and increase of some 227GWh compared to Q3. This is a reflection of the weather conditions and increasing installed capacity at the connected sites.

Of the metered output in Q4, 607GWh is attributable to system constraints versus 553GWh for the same quarter in the previous year. For the year as whole 1.4TWh of C&M output where attributable to system constraints compared to 1.2TWh in 2013/14. This is in part a reflection of where the new connections have been made with the large offshore units feeding into less congested regions than majority of the onshore units connected so far. In addition, increased output from C&M units within

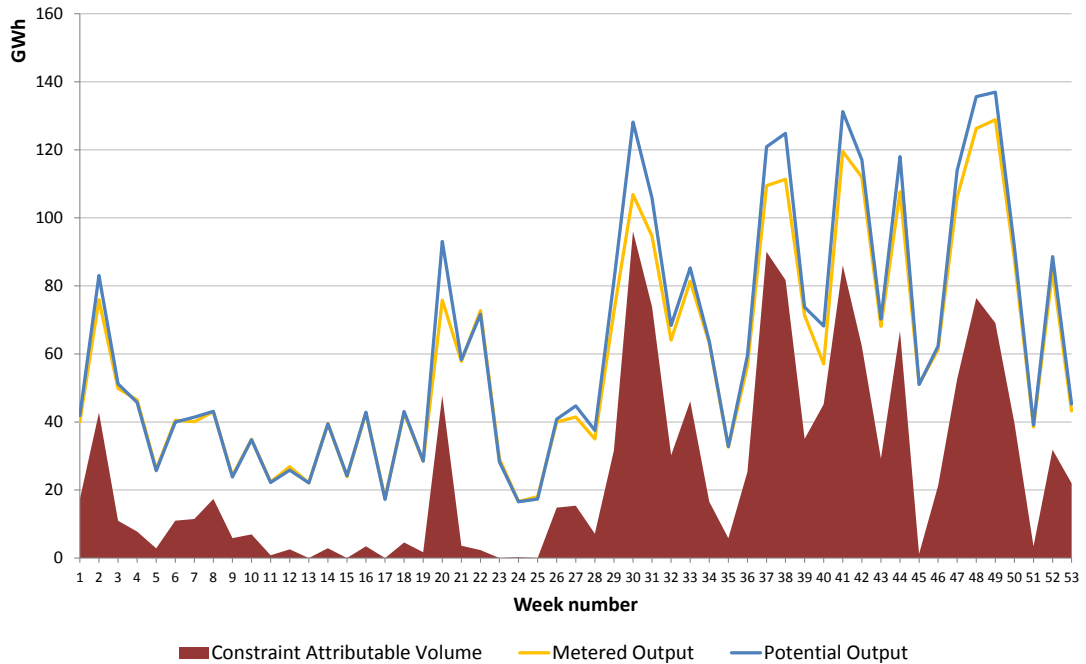
zones 1 to 8 has been offset by reductions in other non-C&M generation output and increased transmission capacity as wider reinforcement works continue.

Metered output for Q4 is charted below, together with the estimated potential output that could have been achieved had no constraint actions been necessary, and also that part of the output which contributed to system constraints.

**Connect & Manage Plant: Jan 15 Mar 15 Daily Constraint Attributable Volume, Actual MWh Output of Unit (may be constrained), Unconstrained Potential Output**



**Connect & Manage Plant: Weekly total volumes, 2014/15**



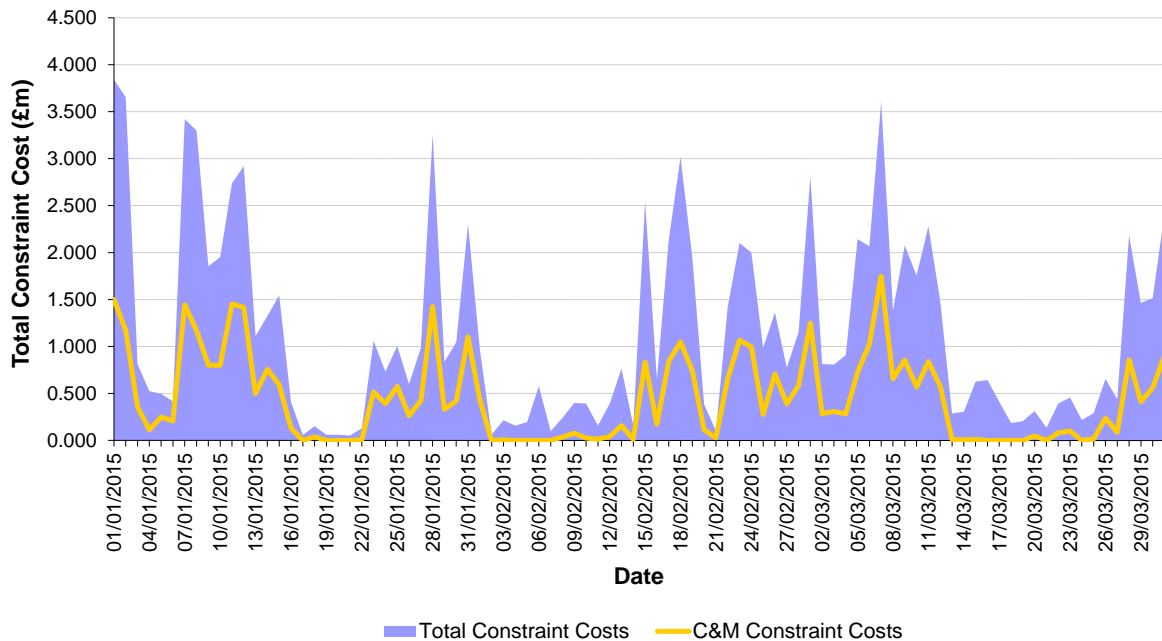
## Constraint Costs

Constraint cost attributable to the C&M plant in the quarter was £39.9m which brings the total for 2014/15 to £99.1m against the forecast cost of £95.8m for the year. This quarter has seen higher output from C&M units and also an increase in the volume attributed to constraints however costs for managing this increase has reduced compared to the previous quarter. This is due to the location where some of the additional generation has connected not being within particularly congested zones and also the availability of cheaper replacement generation in Q4 compared to Q3.

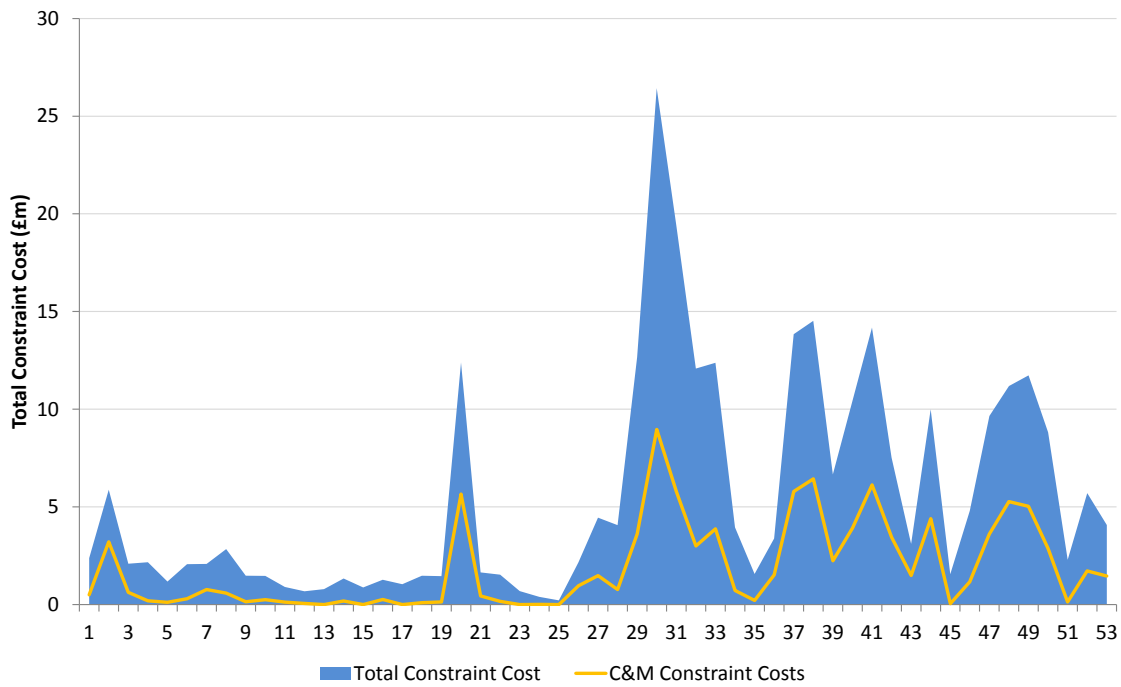
For the financial year as a whole constraint costs attributable to C&M units have increased from £72m in 2013/14 to £99m in 2014/15. This is broadly in line with the forecast for the year. A large proportion of this increase has been attributed to C&M generation in zone 7 reflecting the cost of managing constraints in southern Scotland and between Scotland and England, into which these units feed, rather than those further north in Scotland which are unaffected by output from these units. This changing pattern of constraints reflects the outage programme of the year, generation background and the impact of reinforcement works completed in previous years.

As would be expected the costs attributed to C&M units are proportional to the volumes of constraint actions allocated, as shown in the graph below.

Daily Constraint Costs, Jan to Mar 2015



Weekly Constraint Costs, 2014/15



### Carbon Abatement

The carbon benefit (avoided CO<sub>2</sub>) calculations are based on our estimate of the conventional fuel (e.g. coal, gas) that is displaced by the output from the C&M units.

Table 1 shows that the estimated CO<sub>2</sub> saved by output from the C&M units, as opposed to other generation which would otherwise have run, is estimated at 899,376 tonnes in the quarter bringing the total to 4.4 million tonnes since the beginning of the C&M regime.

## Appendix A: Generation Zones

The generation zones used in this report correspond to the zones defined for TNUoS charges prior to 2013/14. From 2013/14 the TNUoS zones were redefined and additional zones added however this report retains the previous definitions in order to allow direct comparison to the historical C&M data.

*Zones used in this report*

| Zone ID | Description                  |
|---------|------------------------------|
| 1       | North Scotland               |
| 2       | Peterhead                    |
| 3       | Western Highland & Skye      |
| 4       | Central Highlands            |
| 5       | Argyll                       |
| 6       | Stirlingshire                |
| 7       | South Scotland               |
| 8       | Auchencrosh                  |
| 9       | Humber, Lancashire           |
| Other   | Remainder of England & Wales |