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<b>Meeting name</b>	BSC Panel
<b>Date of meeting</b>	14 December 2006
<b>Paper title</b>	Settlement of Microgeneration Export
<b>Purpose of paper</b>	For Information
<b>Synopsis</b>	Modification Proposal P81 was implemented in September 2003, and was intended to facilitate the settlement of electricity exported by microgenerators. However, few Suppliers have made use of this functionality, and most microgeneration export is still not recorded in settlement. This paper provides an update on some of the obstacles that may prevent Suppliers from settling microgeneration, and current industry discussions on removing those obstacles.

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## 1 Introduction

1.1 The ELEXON report to the 9 November meeting of the BSC Panel (120/01) reported that ELEXON had attended meetings of an Electricity Networks Strategy Group (ENSG) project team investigating obstacles to the settlement of microgeneration export. The Panel asked that ELEXON provide further information on this at a subsequent meeting. This paper is intended to fulfil that action. It provides an update on the current level of microgeneration entering settlement, and the issues that may be keeping this level low. It discusses some of the solutions that have been proposed to these issues, and outlines their potential impact on the BSC and related configurable items.

## 2 Background

2.1 Microgeneration is the production of electricity by small-scale distributed generators (including domestic customers). The Energy Act 2004 defines microgeneration as having a generation capacity of less than 50 kW. However, it should be noted that not all generation below 50 kW is treated in the same way, and in some contexts other capacity thresholds are important:

- The capacity limit for connecting to the distribution system without prior approval from the Distributor is 16 amps per phase (i.e. about 3.5 kW for a single-phase supply).
- The capacity limit for settling generation using Non Half Hourly meter readings has been set by the BSC Panel (with the approval of Ofgem) to 30 kW.

2.2 Currently, the volume of microgeneration installed is very low. In March 2006, the Department of Trade and Industry (DTI) published a Microgeneration Strategy, which gave the following figures for the numbers of installations in the United Kingdom:

Microgeneration Technology	Current UK Installations
Micro-wind	650
Micro-hydro	90
Solar PV	1,301
Micro CHP	990

Microgeneration Technology	Current UK Installations
Fuel Cells	5
TOTAL	3,036

2.3 Government policy (as outlined in the 2003 Energy White Paper and the 2006 Microgeneration Strategy) is to encourage greater use of microgeneration, because of its potential role in reducing carbon emissions. In keeping with this policy, the government and the electricity industry have already made a number of changes that are intended to remove obstacles to the use of microgeneration, including the following:

- Engineering Recommendation G83/1 has introduced a streamlined procedure for connection of microgeneration to distribution networks, and removed the requirement for prior approval from the distribution company (for microgeneration with a capacity of less than 16 amps per phase);
- BSC Modification Proposal P81 (which was implemented on 28 September 2003) allows microgenerators (below a capacity threshold set by the BSC Panel) to settle their Export without needing a Half Hourly Meter; and
- The Renewables Obligation (Amendment) Order 2004 allowed Renewable Obligation Certificates (ROCs) for microgenerators to be issued on the basis of annual rather than monthly generation. Prior to this amendment, generators producing less than 0.5 MWh per month were not able to obtain ROCs.

2.4 The remainder of this paper provides further information on the changes that have already been made, the obstacles that may remain, and the steps industry is taking to address those obstacles. It focuses in particular on those issues that fall within the scope of the BSC, and is structured as follows:

- Section 3 provides an overview of the Non Half Hourly trading arrangements for microgeneration export introduced by Modification Proposal P81;
- Section 4 describes some potential problems with the P81 solution, which may explain why the level of uptake of the P81 functionality has so far been extremely low; and
- Section 5 describes work currently being undertaken by the Electricity Network Strategy Group (ENSG) Export Reward project, which is likely to lead to a BSC Modification Proposal addressing some of these issues with the P81 solution.

### 3 Modification Proposal P81

3.1 The purpose of Modification Proposal P81 (which was implemented on 28 September 2003) was to provide a cost-effective mechanism for Suppliers who purchased electricity from microgenerators to have those purchases taken into account in settlement. If such a mechanism does not exist, microgeneration export benefits all Non Half Hourly Suppliers in the GSP Group, seriously weakening any commercial incentive for Suppliers to purchase microgeneration export.

3.2 Prior to the implementation of P81, generation could only be taken into account in settlement if a Half Hourly meter was installed. For microgeneration (where the total annual export might be just a few MWh) the extra metering and data collection costs associated with this type of metering are likely to be prohibitive. Modification Proposal P81 sought to address this issue by allowing microgeneration export to be settled on the basis of Non Half Hourly meter readings.

3.3 It should be noted that, even before the introduction of Modification Proposal P81, some Suppliers did offer to purchase microgeneration export from their customers. The terms of such schemes vary from Supplier to Supplier: in some cases a payment is made for each unit of export

metered, while in others a fixed annual payment is made (without any need for an export meter reading). However, the benefit to the Supplier of buying microgeneration export in this way is greatly diminished in the absence of a suitable settlement mechanism. As the imbalance settlement system does not credit the Supplier for any microgeneration export purchased, the Supplier is in effect forced to buy the same energy twice over.

3.4 The key features of the P81 settlement process can be summarised as follows:

- It applies only to those customers whose total generation capacity is less than a threshold value set by the BSC Panel. This threshold is referred to as the Small Scale Third Party Generating Plant Limit (SSTPGPL), and is defined in Section L1.5 of the BSC. The SSTPGPL was originally set to 16 amps per phase (i.e. about 3.5 kW for a single-phase supply), but has since been increased (with the approval of Ofgem) to 30 kW;
- Any Supplier who wants to settle a customer's microgeneration Export must first request an additional Meter Point Administration Number (MPAN) from the distribution company. This is because the Master Registration Agreement (MRA) does not allow a single MPAN to be used for both Import and Export.
- The Supplier must then appoint Supplier Agents (i.e. Meter Operator, Data Collector and Data Aggregator) to this MPAN (as they would for any other SVA Metering System);
- The Supplier's appointed Meter Operator must then ensure that appropriate Import/Export metering is installed (in accordance with Code of Practice 9). This could take the form of a single meter (with separate registers for Import and Export), or two meters (one measuring Import and the other Export). Note that the Import and Export registers are always treated as two separate MPANs, even if they are combined into a single physical meter;
- The Supplier's appointed Data Collectors and Data Aggregators process Export meter readings in exactly the same way as Import meter readings. Meter readings are converted to meter advances, and thence to Estimated Annual Consumption (EAC) or Annualised Advance (AA) values. These values are then passed to the Supplier Volume Allocation Agent (SVAA) for use in settlement;
- In order to signal to the settlement system that these readings are Export (and should be netted off the Supplier's demand), the Supplier must assign the Export MPAN to a Standard Settlement Configuration (SSC) reserved for Export use<sup>1</sup>; and
- Like all EAC and AA values, those for Export must be converted to half hourly values using an appropriate profile. Appendix A to this paper provides more detail on the profiling techniques used for microgenerators.

## 4 Possible Problems with the P81 Solution

- 4.1 To date, the uptake of Modification Proposal P81 by Suppliers has been very limited. It was not until June 2005 (nearly two years after the implementation of P81) that the first Non Half Hourly Export MPAN entered settlement. The number of MPANs settled has increased gradually since then, but remains less than twenty.
- 4.2 From this month onwards, ELEXON proposes to include data on the volume of Non Half Hourly microgeneration entering settlement in the Trading Operation Report.
- 4.3 Through discussion with Suppliers, ELEXON has become aware of a number of possible issues that may be contributing to the low level of usage of the P81 functionality. Some of these could be regarded as 'teething problems' associated with the introduction of a new process, and might reasonably be expected to resolve themselves once the level of usage grows. Others may be

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<sup>1</sup> The SSC is one of the items of data held for each SVA Metering System in the Supplier Meter Registration Service (SMRS). It is the responsibility of the Supplier to allocate an SSC to each SVA Metering System, in accordance with the rules in BSC Procedure BSCP516.

indicative of more serious problems that potentially require further change to the BSC arrangements to solve.

4.4 Examples of 'teething problems' with the P81 process reported to ELEXON by Suppliers include the following:

- Difficulty in finding Meter Operators who can provide Import/Export meters. Because the demand for such metering is currently low, some Meter Operators appear to be citing long lead times for providing it. Other Meter Operators seem able to provide the metering, but then have difficulty producing the associated data flows (e.g. Meter Technical Details);
- Difficulty in getting Distributors to allocate Export MPANs. Distribution company staff may be unfamiliar with the process, and do not understand why a second MPAN is required at a property; and
- Some Suppliers have not yet upgraded their own billing and registration systems to handle microgeneration, and are not therefore in a position to register Export MPANs.

4.5 ELEXON is actively attempting to address these issues by providing guidance on P81 requirements to industry participants where requested. ELEXON also plans to publish guidance on the process for settling microgeneration on its website.

4.6 Other problems reported by Suppliers may be symptomatic of more serious problems. In particular, discussion of microgeneration at the MRA Issues Resolution Expert Group (IREG) has focused on the difficulties that Suppliers and their Agents are likely to encounter if a customer's Import MPAN goes through a Change of Supply process without the Export MPAN (or vice versa). Some Suppliers may not wish to buy Export without the corresponding Import (and may structure their contracts with customers accordingly), but the industry processes required to sort out the issue if it does arise are potentially complex.

## 5 The ENSG Export Reward Project

5.1 For Suppliers, the issue of microgeneration has been given extra urgency by the Climate Change and Sustainable Energy Act (2006). This Act provides the government with powers to impose licence conditions on Suppliers, obliging them to offer to acquire microgeneration export from their customers, should this be necessary to increase the amount of electricity generated by microgeneration. Ofgem has stated (in their document *Ofgem and microgeneration: Next Steps*) that they would prefer to see Suppliers develop a suitable scheme for rewarding export themselves, avoiding the need for regulatory intervention.

5.2 In order to provide a mechanism for Suppliers to debate these issues, and come up with appropriate amendments to industry processes, the ENSG ([www.ensg.gov.uk](http://www.ensg.gov.uk)) has set up a project to develop a 'Scheme to reward microgenerators exporting excess electricity'. The ENSG is chaired jointly by Ofgem and the DTI, and its purpose is to provide advice to DTI, Ofgem, Defra, the Scottish Executive and the Welsh Assembly on issues associated with the development of networks. It includes senior representatives from industry participants (e.g. network companies, generators and Suppliers).

5.3 The ENSG has separate Working Groups for Transmission and Distribution, and each of the Working Groups has a number of workstreams and projects underneath it. The Export Reward project falls under the Distribution workstream, and its terms of reference are available on the ENSG website (<http://www.ensg.gov.uk/index.php?article=76>). The project has no decision making powers, but can recommend changes to industry codes (which Suppliers or other industry

participants may then choose to progress through normal industry change processes). ELEXON has been attending project meetings in order to provide technical advice on settlement issues.

5.4 The project team has met three times, and has now agreed its conclusions, which will be published in a final report later this month. One of the key issues discussed by the project is that (in the view of most Suppliers on the project team) the cost of settling microgeneration is artificially increased by the requirement to have separate MPANs for Import and Export. This increases the cost to Suppliers by:

- Necessitating more complex industry processes (as explained in paragraph 4.6 above); and
- Increasing the charges levied by Supplier Agents (who typically charge Suppliers on a per MPAN basis).

5.5 In summary, therefore, the view of the project team is that P81 has lowered the transaction costs involved in settling microgeneration, but that these need to be lowered further still by allowing Import and Export to be settled on a single MPAN. This was expressed in one of the project's working papers as follows<sup>2</sup>:

*Suppliers should initiate the change management procedures required to progress Option 1 (allowing suppliers to register a customer's export and import under a single registration (a single MPAN)) through the industry's normal change management procedures*

5.6 One of the Supplier representatives on the project has already volunteered to raise this change. ELEXON understands that the Supplier will be discussing this with other Suppliers in January, and will then raise it through the normal MRA and BSC change procedures. Changes that would be required include the following:

- An amendment to Schedule 8 of the MRA (which defines the rules distributors follow in allocating MPANs); and
- Amendments to the Supplier Volume Allocation Agent (SVAA) and Market Domain Data Management (MDDM) system, to allow a single Standard Settlement Configuration to have both an Import register and an Export register.

5.7 It should be noted that the above list does not include changes to the BSC itself. Strictly speaking, therefore, it might be possible to implement the single MPAN solution without the need for a BSC Modification Proposal. However, there is an additional issue with profiling, in that the current profiling rules couldn't necessarily produce acceptable profiles for a single MPAN with both Import and Export registers. The reasons for this are explained in Appendix 1 to this paper, but can be summarised as follows:

- Using a single MPAN would mean that the same Profile Class (i.e. basic profile shape) had to be used for both Import and Export. This would be inconsistent with the current P81 profiling solution for microgeneration, and would potentially reduce the accuracy of settlement; and
- Using a single MPAN would also prevent the settlement system from allocating both Import and Export energy to the customer in the same half hour. This would again be inconsistent with the current P81 profiling solution, and would arguably not be very realistic (in that microgenerators frequently do import and export electricity in the same half hour).

5.8 Addressing these profiling issues would require a Modification to the profiling rules in Annex S-2 of the BSC. ELEXON therefore recommends that the introduction of a single MPAN solution for

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<sup>2</sup> ELEXON is grateful to Philip Johnson (project manager of the ENSG Export Reward project) for agreeing that we can summarise some of the project's likely findings ahead of the final report's publication (although publication of the final report is imminent, and may in fact have happened by the time this paper is issued). It should also be noted that the report will make a number of other recommendations on topics not directly relevant to the BSC Panel (e.g. Distribution Use of System Charging), and these are not summarised in this paper.

microgeneration would be best progressed through a Modification Proposal, rather than a Change Proposal, in order to ensure that the profiling implications can be properly considered.

- 5.9 The ENSG project team also discussed the potential of smart metering to facilitate settlement of microgeneration. Although the group recognised the potential of this technology to increase the accuracy of data entering settlement and facilitate data collection, they were concerned that it might not be a short term solution for microgeneration, for two reasons:
- There will be extra costs associated with smart metering, and imposing these on microgeneration could be an extra barrier to its use; and
  - Because the wholesale electricity markets place a premium on predictability, profiling microgeneration (rather than using half hourly data) actually increases its value to Suppliers. If the Export is profiled, Suppliers purchasing it know precisely which Settlement Periods the export will be deemed to have occurred in. If the Export is settled on actual half hourly data it becomes much harder to predict the periods in which generation will occur, and the value of the exported units to the Supplier is decreased accordingly. A smart metering solution could therefore reduce the value of microgeneration to Suppliers, and lower the price they were able to offer for it.

## 6 Recommendations

### 6.1 The Panel is invited to:

- a **NOTE that the uptake of Modification Proposal P81 remains extremely low;**
- b **NOTE that, from this month onwards, ELEXON proposes to include information on the volume of Non Half Hourly microgeneration entering settlement in the Trading Operation Report;**
- c **NOTE that some of the Suppliers who have attempted to use the P81 process have reported 'teething problems' with other industry participants not understanding or being ready to use the P81 process;**
- d **NOTE that ELEXON is addressing these issues (where possible) by providing guidance to industry participants, and intends to publish a guidance note on the ELEXON website;**
- e **NOTE that the ENSG Export Reward project is expected to recommend that settlement systems be changed to allow microgeneration Import and Export to be combined into a single MPAN; and**
- f **NOTE that one of the Suppliers on the ENSG project has already volunteered to raise the necessary industry changes, and ELEXON therefore anticipates receiving a Modification Proposal early in 2007.**

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### *List of appendices*

Appendix A: Profiling of Microgeneration

## Appendix 1 – Profiling of Microgeneration

Profiling is the process by which an annualised meter reading is converted into half hourly values. This technique has been used to settle Non Half Hourly demand customers since 1998.

The implementation of Approved Modification P81 in September 2003 extended the use of profiling to microgeneration Export. However, P81 did not introduce any new profiling rules into the the BSC. Instead, the approach taken by the P81 Modification Group was to re-use elements of the existing demand profiling solution.

This Appendix describes the current method of profiling for microgeneration, explains why it may be inadequate when Import and Export are treated as a single MPAN, and describes one possible solution to this issue.

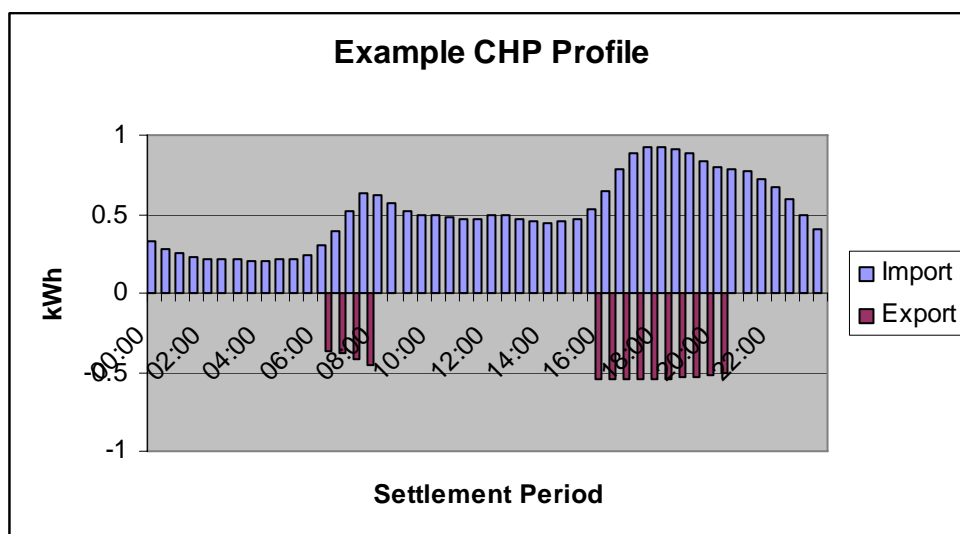
### Current Method of Profiling Microgeneration

The current profiling method for microgeneration customers can be summarised as follows:

- The Import MPAN is profiled using the normal demand profile for the customer’s Profile Class i.e. the Import is profiled in exactly the same way that it would have been had the customer not had microgeneration.
- The Export is allocated to ‘deemed’ Export times, calculated by ELEXON as being the time Export is most likely to occur, and agreed by the Panel (or, in practice, SVG with delegated Panel authority). For example, the agreed Export times for a micro-CHP unit in a domestic (Profile Class 1) property are as follows:

Month	Export Times
April - September	06:00 – 08:00 15:30 – 20:30
October	06:00 – 08:00 16:00 – 20:30
November - February	07:00 – 09:00 16:30 – 21:00
March	07:00 – 09:00 17:00 – 21:00

Within these agreed times, the Export is settled using the appropriate part of the Profile Class 8 profile (regardless of the customer’s own Profile Class):

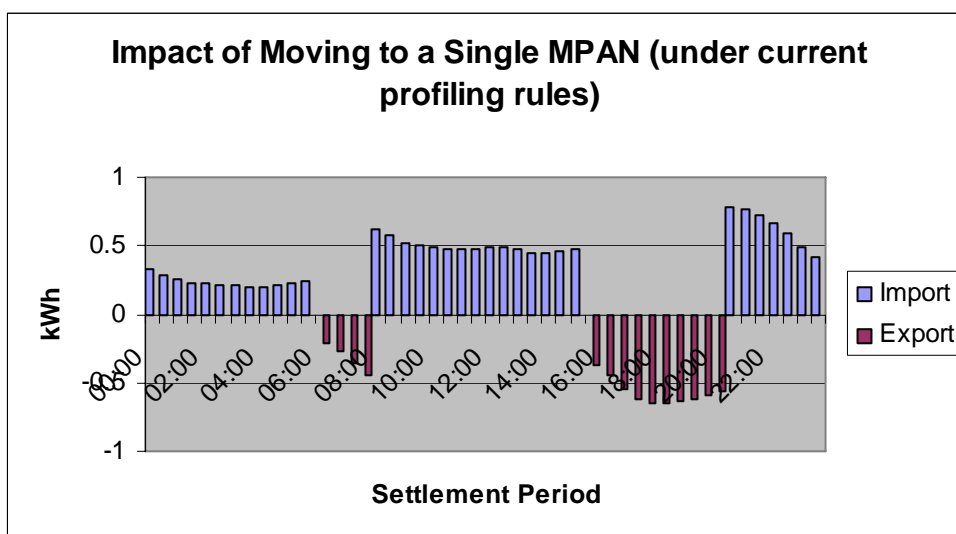


## Impact of Using a Single MPAN

As explained in paragraph 5.7, treating Import and Export as two registers of a single MPAN would prevent the above profiling solution from being used (unless the profiling rules were also changed). There are essentially two reasons for this:

- A single MPAN can only be assigned to one Profile Class (on a given day). Therefore, if Import and Export were treated as two registers of a single MPAN, the BSC would require them to be profiled using the same Profile Class;
- The profiling rules do not allow two registers of a single MPAN to have energy assigned to them at the same times of the day. Therefore, if Import and Export were treated as two registers of a single MPAN, energy could only be allocated to one of the two registers in a given Settlement Period.

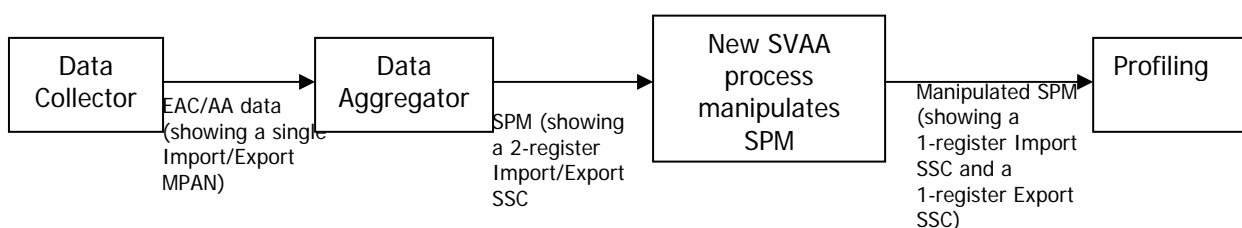
The implication of these constraints is that the Export would have to be profiled on the same Profile Class as the Import, and the Import register would have to be deemed to have zero consumption in Exporting half hours. The profiles would therefore look like this:



ELEXON has some concerns over whether this is an appropriate solution. For micro-wind (for example), the Export is currently spread over all twenty-four hours of the day (reflecting the fact that wind is an unpredictable resource). It is unclear what Export times would be used for micro-wind, if the Import for those customers had to be set to zero during those periods. For this reason, ELEXON believes that it would probably be necessary to make some change to profiling if Import and Export were to be treated as a single MPAN.

## Possible Profiling Changes

ELEXON has not investigated profiling options for a single MPAN solution in detail. However, one possible option discussed at the ENSG project meeting was to manipulate the Supplier Purchase Matrix (SPM) provided by Non Half Hourly Data Aggregators so that the use of a single MPAN is 'hidden' from the profiling component of settlement systems:



In this approach, the SVAA would use a simple arithmetic manipulation of the SPMs received from Aggregators to split the two-register Import/Export SSC into a single-register Import SSC and a single-



register Export SSC (shielding the profiling software from the impact of the change). When reporting the results of the profiling process (to Distributors for DUoS charging, and Non Half Hourly Data Collectors for calculation of Annualised Advances) the reverse manipulation would be applied (shielding industry participants from the manipulation of SPMs going on inside SVAA).

This option would effectively be a 'workaround' that avoids the potentially difficult and expensive task of re-engineering the profiling system by 'hiding' the existence of the single-MPAN solution from the profiling software. It is however just one of a number of possible options that a Modification Group may wish to consider.

Any change to the profiling rules (whether the workaround described above, or a more radical change to the fundamentals of profiling) would require a Modification to Annex S-2 of the BSC.