



Calculation of MIC for General Purpose Customers

**Issued by: Distribution System Operator
ESB Networks**

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1.0 About this document

This document provides an overview of the development of Load Factors for application across the non-domestic General Purpose (GP) customer category. As part of the EU Order, CER is required to approve these Load Factors for the various bands of consumption.

For the purposes of this document, the Load Factor shows the relationship of the Average Demand to Maximum (Peak) Demand at the customer's premises, i.e. $[\text{Average Demand}/\text{Maximum Demand}]\%$. Therefore as the customer operates at a higher average demand for longer periods of time his Load Factor will increase.

This document also describes the proposed rollout of the deemed MIC to the GP customers.

1.1 Context

As the designated Collection Agent, DSO has an obligation to collect the correct PSO Charging Regime¹ from each customer.

30kVA is the specified threshold for the 'medium-large' accounts, for the charging of PSO. This includes customers in the non-domestic GP customer category (DG5), the majority of which do not have MD meters installed. The process, to facilitate the application of the correct PSO Tariff to the GP customer category in January 2003, includes:

- MD meter reading for customers in DG5, where an MD meter already exists.
- Analysis of these sample readings for trends to determine Load Factors (see 2.0), leading to the assignment of an MIC to all GP customers.
- CER approval of the resultant Load Factors, as per article 4 (b) (ii) of Schedule 2 of the Electricity Regulation Act, 1999, (Public Service Obligation) Order 2001.
- The Approved Load Factors are then applied to the non-domestic Non MD population to determine their MIC.
- Letters issued from DSO to customers who require a deemed MIC.
- DSO Billing systems updated with deemed MIC to facilitate the issue of PSO bills, commencing in January 2003.
- DSO provides list of deemed MICs to Suppliers for their particular customers in advance of January 2003.
- The PSO money amounts for all accounts will be included in the monthly DUoS Bills to Suppliers.

¹ Refer to Table 3 Appendix 3 for further details on the different charging regimes.

- DSO will invoice suppliers in accordance with the CER Approved 'PSO Invoicing and Collection Procedure'.

1.2 Scope

This document specifies the Load Factors for CER Approval (refer to Tables 1 and 2 below). It also describes the proposed MIC rollout procedure (refer to clause 3.0) for CER Approval.

2.0 Analysis

The following steps were taken in the overall analysis:

- MD Meter readings were received for approx 1,300 accounts.
- Having eliminated various anomalies and accounts with consumption readings for less than 1 year, the sample was refined down to a 'clear' sample of approx 1,100.

2.1 Flat Rate (Day & Night Accounts):

Out of a population of approximately 22,000 customers, a sample size of approximately 1,030 with multi function meters containing demand information in the memory of the meter was analysed. To minimise distortion of the final results, this sample was further refined to approximately 600 customers with a recorded maximum demand reading of 28 kW (30kVA) or greater.

The parameters for the analysis were set by the general terms of the Calculation of Deemed MIC (see Appendix 1, approved by CER in March 2002). To satisfy these parameters a number of approaches were adopted to examine the existence of any trends between consumption (total / day only) and measured MD². The best-fit pattern, as set out in table 1 below, was obtained by association of the frequency distribution of customers based on their Total Annual kWh with associated Load Factors based on Day kWh. The 3 load factors chosen were taken as 'best fit' for the agreed model. It must be pointed out that a margin of error is expected due to some overlapping of consumption ranges with similar load factors.

Table 1. Load Factor Bands: Day & Night Accounts

Threshold	Load Factor % ³	Annual D+N Consumption Range
1 ⁴	20	25,000 ⁵ to 99,999 kWh

² For the purposes of the calculating the Load Factor (LF) for each customer in the sample, the following formula was used: $LF = [Consumption/Max. Demand * Running Hours]\%$

³ This will be the 'Day Load Factor' as described in Appendix 1 for 'Night Saver' Customers

⁴ The calculated MIC will be capped at 48kVA.

Table 1. Load Factor Bands: Day & Night Accounts

Threshold	Load Factor % ³	Annual D+N Consumption Range
2 ⁶	40	100,000 to 199,999 kWh
3	60	Greater than 200,000 kWh

2.2 Flat Rate (24hour Accounts):

With an approximate population of 140,000 customers, the returned sample size of 50 was deemed an insufficient sample size to carry out any meaningful analysis. Therefore, based on the fact that these customers do not have a suitable profile to adopt a Day & Night tariff, a standard Load Factor of 25% is proposed⁷. This is underlined by the clustering of customer numbers, in the Day and Night customer sample, with load factors in the range of 30%.

Table 2. Load Factor Bands: 24hr Accounts

Load Factor % ⁸	Annual Consumption Range
25%	Greater than 50,000 kWh ⁹

There is a small number of customers (approx 300) with an MIC > 30kVA, which have 24 hour, Day and Night meters installed. The following procedure will be adopted to calculate the applicable Load Factor and MIC:

- Calculate % Day and % Night based on total of Day + Night consumption recorded.
- Apply the resultant %Day to the 24hour consumption recorded to give D1.
- Add D1 to the Day Consumption (from the day meter) to give D2
- Resultant MIC = $D2 / (5475) * \text{Load Factor}$
(where Load Factor is based consumption band calculated from Day+Night+24hr)

⁵ On examination of the sample of accounts with a MD reading of 28kW or greater, the minimum annual consumption was 26,000 kWh.

⁶The calculated MIC will be capped at 75kVA.

⁷ Based on a Single Shift operation (8/24hrs) running 5 days per week, 49 weeks per year: $33.33\% * (5/7) * (49/52) = 22.4\%$ Rounded to 25%.

⁸ This will be the 'Load Factor' as described in Appendix 1 for Standard Customers.

⁹ This is based on an Annual Consumption = $28kW * 5475hrs * 0.25$.

3.0 Roll-Out of the Deemed MIC

As described in 1.1 above, DSO proposes to issue letters to customers who require a deemed MIC, i.e. those customers who have not already agreed an MIC with DSO.

Letters will be issued to customers with a deemed MIC of 30kVA or greater. This will amount to approximately 13,200 letters. The proposed letter is in Appendix 1.

Upon receipt of their letters and deemed MIC, the following process is proposed to expedite customer requests to change their deemed MIC:

- 1) For changes less than or equal to 3kVA , The revised MIC will be effective upon receipt of a signed Connection Agreement / Acceptance of Offer (whichever is relevant).
- 2) For changes greater than 3kVA:
 - Customer is asked what are their production/running hours (i.e. number of shifts per day & number of days per week)
 - Customer asked to discuss the MIC level with their electrical contractor
 - If the customer is still unhappy with the deemed MIC then a recorder is installed¹⁰. The customer is informed that the measured MIC (whether greater or less than the deemed MIC) will be used for future bills and previous bills will be corrected. This may result in an increase or decrease in their electricity bills. If the difference between the measured MIC and the calculated MIC is greater than 10%, the customer will not be charged for the installation of the recorder. For deviations less than 10%, the customer will be charged.
 - The revised MIC will be effective upon receipt of a signed Connection Agreement / Acceptance of Offer (whichever is relevant).

¹⁰ Customers that request a recorder will be charged for the installation / analysis costs (€265 excluding VAT) if there is less than a 10% difference between the calculated MIC and the recorded MIC. For the duration of this meter installation, the deemed MIC will apply to all bills.

Appendix 1. Calculation of Deemed MIC

1. In situations where there is an agreed Maximum Import Capacity (MIC), that MIC will be used. In other situations, where there is no agreed MIC and a meter that records Maximum Demand (MD) exists, the Capacity will be determined by the formula:

MIC (kVA) = highest MD (kW) recorded / 0.95 (where 0.95 is the standard factor currently used to convert kW to kVA). The capacity value will be calculated initially based on the last billing period before application of the PSO levy. The capacity value may be re-calculated annually.

2. Where an existing meter only records consumption the MIC will be calculated by the formula:

Standard Customers (night load not separately metered):

MIC (kVA) = consumption (kWh) / (8760 x Load Factor) / 0.95

Night Saver Customers:

MIC (kVA) = [Day consumption (kWh) / (5475 x Day Load Factor)] / 0.95

(where annually 5475 hours of usage are charged at day rates - 15 hrs/day)

Specific Load Factors for customers in each of the following consumption ranges will be derived from existing General Purpose customers who currently have meters that record Maximum Demand installed.

- 25,000 kWh to 99,000 kWh
- 100,000 kWh to 199,000 kWh
- Greater than 200,000 kWh

These Load Factors so derived may be revised from time to time with the approval of the Commission.

Maximum Demand is the maximum load used by the customer integrated over a fifteen-minute period.

Appendix 2: Proposed Letter to GP Customers

«Contact_Name_1» «Contact_Name_2» «Contact_Name_3»
«COMPANY_NAME»
«Site_Address_1»
«Site_Address_2»
«Site_Address_3» <<Date>>
Account Number: «New_ZGC» Ref: GP/ MIC/PSO

RE: Maximum Import Capacity and Public Service Obligations Levy

Dear «Contact_Name_1» «Contact_Name_3»,

On the 19th February 2000 competition was introduced to the Irish electricity market for Customers. Under the arrangements, an increasing number of customers will be able to buy electricity from the supplier of their choice.

ESB Networks will continue to provide you with distribution network services such as line maintenance, fault repair and quality of supply. ESB Networks will continue to be responsible for your electricity connection regardless of your choice of Supply Company.

One important element of your connection is the **Maximum Import Capacity (MIC)**. This is calculated based on the total electrical load installed at your premises and the timing of the operation of this load. It is the upper limit on the total electrical demand you can place on the Distribution System, so it should be high enough to meet the requirements of your business.

Based on your consumption records and using a formula approved by the Commission for Energy Regulation (CER) (see www.cer.ie) your MIC is deemed to be << **Deemed MIC** >> **kVA**. (1kVA is approximately equal to 1 kW)

The MIC is an important quantity for two reasons. Firstly, this is the level of capacity that you can rely on as being provided by ESB Networks at all times. Secondly, it will form the basis of a new charge, the Public Service Obligations (PSO) Levy, which will be approved by the CER annually.

As you may be aware from your electricity supplier, Government policy requires ESB to produce or buy electricity generated from peat and other environmentally friendly (wind, hydro and CHP) forms of energy in the interests of the environment and security of supply. The PSO levy will be used to compensate ESB for the additional costs incurred in respect of these public service obligations.

For the purposes of PSO, you have been categorised as a medium – large account as your MIC is deemed to be in excess of 30kVA. This will be reflected as a separate line item on your electricity bill from your supply company from January 2003.

For advice on the electrical load at your premises, your electrical contractor may be of assistance to you.

For any queries relating to your electricity tariff and PSO levy please contact your supply company.

For any queries in relation to your level of MIC please contact ESB Networks at 1850 372 472.

Yours faithfully

Appendix 3: Public Service Obligation

On May 23, 2002, SI 217 of 2002, Electricity Regulation Act 1999 (Public Service Obligations) Order 2002 was signed by the Minister for Public Enterprise. This Order charged the Commission for Energy Regulation (CER) to impose a public service obligation (PSO) on ESB. This obligation requires ESB to purchase electricity from certain generating stations using peat and renewable, sustainable or alternative fuel sources.

The PSO Levy is a charge to be paid by all final customers of electricity in respect of this obligation imposed on ESB.

Basis of the PSO charges for final customers

The amount of the charge is to be approved annually by CER in a manner defined by the Order. CER will then allocate the PSO levy among the customer categories on the basis of the maximum demand attributable to each category as a proportion of the aggregate of the maximum demand for all users, as directed by the Order.

These categories / allocation methodologies are:

- **Domestic Account Holders.**
The total Domestic Account Holder PSO levy is divided by the number of Domestic Account Holders to give a standard charge per customer.
- **Small Account Holders**
Small customers who are not Domestic Account Holders having a network connection capacity level of less than thirty (30) kilovolt amperes ("kVA") e.g. small local shops. The total Small Account Holder PSO levy is divided by the number of Small Account Holders to give a standard charge per customer.
- **Medium-Large Account Holders**
Customers with a network connection capacity level equal to or in excess of thirty (30) kVA. The total Medium-Large Account Holder PSO levy is divided by the sum of the network connection capacities for such account holders, to give a standard charge per kVA to be applied to each individual account holder's registered maximum import capacity (MIC) or network connection capacity.

This means that there are three distinct charging regimes under the levy. The PSO charging regimes are summarised in Table 3 below.

Table 3. PSO Charging Regimes

PSO Group	Description	Charge Mechanism
PG1	Domestic	Charge per customer
PG2	Small Non-Domestic	
PG3	Medium Large	Charge per kVA of capacity.

In most cases the relevant Public Service Obligations (PSO) charge can be inferred from the DUoS group. However there are important exceptions. One of these is the General Purpose DUoS tariff (DG5) where customers with an MIC over 30 kVA are treated differently from customers with an MIC lower than 30 kVA.

The concept of PSO Groups is used to denote the type of PSO charge to apply. The rules for applying the PSO Group are summarised in Table 6.