

Distribution Transformers

How to meet energy efficiency regulation requirements

Since 2003, distribution transformers sold or hired in New Zealand must, by law, meet [minimum energy performance standards \(MEPS\)](#). This document outlines the requirements and how to meet them if you import or manufacture distribution transformers in New Zealand.

Why have MEPS for distribution transformers?

Distribution transformers convert high voltage electricity from the national grid into usable voltage levels for home and business use so there is significant potential for energy savings nationally even with small efficiency improvements in these products.

Which distribution transformers are included?

Minimum energy performance standards (MEPS) for distribution transformers covers:

Single- and three-phase, dry, and oil-immersed transformers with a power rating between 10kVA and 2500kVA, which are designed for 11kV and 22kV networks.

What do I need to do to comply with the law?

Importers and manufacturers of distribution transformers, are required to:

- [Step-1](#) Ensure each distribution transformer model has been tested to **AS 60076.11:2006** for dry type transformers, or **AS 60076.1:2005** for other transformers; and has efficiencies that meet or exceed the minimum energy performance levels specified in **AS 2374.1.2:2003 inc. amd. 1:2005**.
- [Step-2](#) Energy Rating Labelling: **N/A**
- [Step-3](#) Register each distribution transformer model through the energy rating website.
- [Step-4](#) Provide EECA with product sales, import and export data each year.

Retailers are required to check their products are registered on the [energy rating website](#).

See the questions and answers below for more information

Which distribution transformers are excluded?

All other transformers that are **not** single- or three-phase, dry, or oil-immersed with a power rating between 10kVA and 2500kVA, designed for 11kV and 22kV networks.

Which standards apply?

AS 60076.1–2005: Power transformers—Part 1: General

AS 60076.11–2006: Power transformers—Part 11: Dry-type transformers.

AS 2374.1.2:2003: inc. amd. 1:2005 Power transformers—Minimum Energy Performance Standard (MEPS) requirements for distribution transformers.

Standards are available for purchase from www.standards.co.nz and for inspection at [EECA's head office](#).

How is distribution transformer efficiency calculated?

The transformer power efficiency value is calculated as the ratio of output power to input power expressed as a percentage.

(a) The power efficiency can be calculated in terms of output in kilowatts:

$$\eta = \frac{\text{Output}}{\text{Input}} \times 100\% = \frac{\text{Output}}{\text{Output} + \text{Losses}} \times 100\%$$

(b) The power efficiency at any load and power-factor can be expressed as follows:

$$\eta = \frac{L \times S_r \times \cos \phi}{L \times S_r \times \cos \phi + L^2 \times P_1 + P_0}$$

(c) For the MEPS requirement of power efficiency at 50% load and unity power factor the expression for efficiency becomes:

$$\eta_{50\%} = \frac{0.5 \times S_r}{0.5 \times S_r + 0.25 \times P_1 + P_0} \times 100\%$$

How do I register a distribution transformer on the Energy Rating website?

If the distribution transformer you are about to register is already registered you are not required to register it. To check, search for the model at:

reg.energyrating.gov.au/comparator/product_types.

If it is not already registered download our quick start guide at:

www.eeca.govt.nz/resource/online-product-registration-guide.

If you haven't used the energyrating.gov.au website before, follow these instructions:

Step 1 Open the registration page: reg.energyrating.gov.au/accounts/register.

Step 2 Create an account and log in.

Step 3 Create an applicant, add contact people etc. as required.

Step 4 Create a new product registration (you will need a test report).

Step 5 Select 'Distribution Transformer (DT)'.

Step 6 Follow the steps outlined in the left hand column until all fields are complete.

Step 7 Once submitted you will be e-mailed a Registration ID. Record this as you will need it to provide sales data each year.

Note: A range of distribution transformers models, manufactured in multiple configurations or styles, may be registered as a product "family" or series if the family definition (below) is met.

What is a family of models?

A range of distribution transformer models, manufactured in multiple configurations or styles, may be registered as a product "family" and identified & tested based on a single representative model if all models have the same kVA rating and the same power efficiency level. Models within a "family" may have different designs including input and output voltages.

What about the proposed MEPS increase?

Distribution transformers sold in New Zealand have been subject to MEPS since 2003, and high efficiency levels are currently voluntary. It is planned to increase MEPS levels in the near future and also include 33 kV networks as well as wind energy networks in the proposed new MEPS for distribution transformers.

EXAMPLE OF PROPOSED MEPS REQUIREMENTS @ 50% LOAD FOR OIL-IMMERSED TRANSFORMERS

Type	kVA	Proposed New MEPS Requirements
		11 kV, 22 kV and 33 kV networks
Single phase and SWER	e.g. 50	99.00 (currently 98.90)
Three phase	e.g. 100	99.00 (currently 98.76)

What information do I need to provide to EECA each year and how do I do it?

Importers and manufacturers are required, by law, to provide statistical information on sales, import and export data annually to EECA.

Data needs to be submitted every year by 1 August, for the period 1 April to 31 March. For example, data from 1 April 2013 to 31 March 2014 must be received by 1 August 2014. The information is submitted through the EECA website where you need to:

Step 1 Set up a user account at www.eeca.govt.nz/webform/request-user-account.

Step 2 Once approved, log in at www.eeca.govt.nz/user/register/supplier/login.

Step 3 When logged in follow the links and instructions for the EECA sales data return tool.

Step 4 Enter your product data - you will need your Registration ID number - the following information is required for each registered model:

- Sales in New Zealand between 1 April and 31 March.
- Imports into New Zealand between 1 April and 31 March.
- Exports from New Zealand between 1 April and 31 March.

Where do I get additional information?

More information about regulated products and how to meet your legal obligations can be found at www.eeca.govt.nz/product-standards.

See the [running costs calculator](#) to find out how choosing a higher star rating can reduce the running costs of products.

There is also information on the energy rating website at www.energyrating.gov.au.

If you have any questions, please email us at compliance@eeca.govt.nz, or phone EECA on **0800 358 676**.