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Information

Enhanced Capital Allowances Scheme

Application Procedures for Water Technology List

Irrigation

More efficient irrigation systems deliver water to the crop or landscape in a very targeted manner and hence less water is used. More efficient irrigation can help reduce water use in two ways:

> Targeted delivery: the system delivers water to plants in a highly targeted manner and thus uses less water.
>
> Improved irrigation scheduling: better scheduling of water delivery can result in water use savings.

Irrigation technology that meets certain criteria (see below) will be eligible for the Enhanced Capital Allowance (ECA).

Control valves and water fittings will be required to implement changes in irrigation and these must comply with the Water Fittings Regulations where fitted to the mains water supply to avoid contamination of the water supply. The cost of water break tanks is not eligible for the ECA as these are required by the Water Fittings Regulations.

Control management systems are listed as a separate item and are not included in the individual irrigation system definitions though their use is strongly recommended with such systems to ensure optimum performance.

Pumps, motors and drives are not included as eligible products under irrigation as they appear on the Energy Technology List.

False claims on the part of manufacturers and suppliers may lead to prosecution.

Drip Irrigation

A new system that includes:

- *Distribution system (pipework and fittings after the water break tank);*
- *Filtration system;*
- *System or zone controls;*
- *Delivery system with drip tape or drip lines, and drippers or emitters;*

And achieves at least an emission uniformity of 85% will qualify for the ECA. Second hand or reconditioned equipment will not qualify for the ECA under any circumstances.

Where a user buys the above equipment in order to install it him/herself, then the delivery system should have a declaration of emission uniformity of at least 85% on the product technical information in order to qualify. The manufacturer/ supplier should include a note on the invoice listing that the required items were supplied and that the system has an emission uniformity of at least 85%.

If the user gets a manufacturer/supplier to install the equipment then the invoice must clearly state that the system has been installed to achieve an emission uniformity of at least 85%. This is the European industry accepted standard for efficiency. It is understood that many systems are not installed to this standard as yet. We propose to accept this standard and look over time to raise the performance level.

British Standards exist for irrigation (BS 7562 parts 1 to 5) and are specifically written for UK conditions. It is a requirement of qualifying systems that they are built to these standards and this should also be included as a statement on the invoice. If installed by a supplier/manufacturer then the equipment must also be installed to this standard and the invoice must also include a statement to this effect.

ECAs may also be claimed on:

- *Specialist installation and extraction equipment for drip tape.*

Boom Irrigation

One of the most efficient methods of effectively delivering water to plants is via an overhead boom irrigator. With a series of nozzles spaced across a length of pipe, the resulting band of water these nozzles apply is remarkably uniform. Due to this uniformity, booms are able to apply water far more efficiently than fixed sprinkler systems. We define boom irrigation for the purposes of an ECA as:

An overhead boom irrigator that has a series of nozzles spaced across a length of a hose reel boom. These may be centre pivot or linear systems. The nozzles must be adjustable to match variable crop spacings.

The boom system must achieve at least a distribution uniformity of 85% and must be new to qualify. Second hand or reconditioned equipment will not qualify for the ECA under any circumstances.

Manufacturers/suppliers must state on their invoice that the boom will achieve a distribution uniformity of at least 85%. This is an Industry accepted standard. British Standards exist for irrigation (BS 7562 parts 1 to 5) and are specifically written for UK conditions. It is a requirement of qualifying systems that they are built to these standards and this should also be included as a statement on the invoice.

An electronically controlled hose reel boom carrier may also qualify for the ECAs. The following definition will apply:

A boom may be coupled to a motorized carrier riding on some form of track system. The carrier must be a dedicated boom carrier in order to qualify for the ECA. The carrier must be able to provide speed compensation within 5% in order to qualify. Any motors, drives or pumps used must be eligible for the Energy Technology List.

Solid set and micro-sprinkler systems
These systems may be used where drip may not be appropriate (especially for sports turf and golf courses as well as arable applications) and can provide efficiency savings if set to the appropriate uniformity.

A solid set and micro-sprinkler system includes all of the following:

- *Distribution system (pipework and fittings after the water break tank);*
- *Filtration system;*
- *System or zone controls;*
- *Sprinkler nozzles;*

To qualify the system must be new and have a distribution uniformity of at least 85%. Second hand or reconditioned equipment will not qualify for the ECA under any circumstances. Sprinklers should have the facility to be individually controlled and have pressure regulation.

Where a user buys the above equipment in order to install it him/herself, then the delivery system should have a declaration of distribution uniformity of at least 85% on the product technical information in order to qualify. The manufacturer/supplier should include a note on the invoice listing that the required items were supplied and that the system has a distribution uniformity of at least 85%.

If the user gets a supplier to install the equipment then the invoice must clearly state that the system has been installed to achieve a distribution uniformity of at least 85%.

British Standards exist for irrigation (BS 7562 parts 1 to 5) and are specifically written for UK conditions. It is a requirement of qualifying systems that they are built to these standards and the product technical information must state that this is the case.

If the equipment is installed by a supplier/manufacturer then the equipment must also be installed to this standard and the invoice must also include a statement to this effect.

Irrigation Control

Irrigation scheduling involves determining when, and how much to irrigate. The following definition will apply:

A management programme for the day-to-day scheduling of irrigation. The program should use a 'water balance' approach that combines information on the crop, soil and weather to estimate a soil water deficit. This information may come from:

- *Met office data;*
- *Weather station data;*
- *Evapo-transpiration and rain gauge data or:*
- *An array of soil moisture sensors.*

Irrigation is scheduled according to an allowable deficit calculated by the programme, which may also be set by the user that may be varied through the season. The output from the program should consist of clear, concise information on when the next irrigation will be required, based on the current soil moisture status and the expected crop water use over the next 1-10 days, as relevant. The programme must be capable of handling a number of zones so that the land may be irrigated as efficiently as possible. The programme shall specifically:

- *Provide information on millimetres precipitation of water applied over a defined historical period;*
- *Predict what precipitation will be applied in the proposed schedule;*
- *Be capable of easily adjusting the applied quantity;*
- *Be capable of storing data and downloading this as irrigation history reports for example;*
- *Allow water delivery options such as frequent and small applications of water to minimise runoff;*
- *Provide the facility for simultaneous application over different zones.*

The output should also suggest how to change the irrigation strategy if it rains.

An irrigation controller may be a dedicated unit that does a similar job to the software and also controls the water supply to the irrigation system. A definition of this is:

A management unit for the day-to-day scheduling of irrigation. The unit's program should use a 'water balance' approach that combines information on the crop, soil and weather to estimate a soil water deficit. This information may come from:

- *Met office data;*
- *Weather station data;*
- *Evapo-transpiration and rain gauge data or:*
- *An array of soil moisture sensors.*

Irrigation is scheduled according to an allowable deficit calculated by the programme, which may also be set by the user, which may be varied through the season. The output from the program shall consist of clear, concise information on when the next irrigation will be required, based on the current soil moisture status and the expected crop water use over the next 1-10 days, as relevant. The irrigation controller must be capable of handling a number of zones so that the land may be irrigated as efficiently as possible. The controller shall specifically:

- *Provide information on millimetres precipitation of water applied over a defined period;*
- *Predict what precipitation will be applied in the proposed schedule;*
- *Be capable of easily adjusting the applied quantity;*
- *Be capable of storing data and downloading this as irrigation history reports for example;*
- *Allow water delivery options such as frequent and small applications of water to minimise runoff;*
- *Provide the facility for simultaneous application over different zones.*

The output could also automatically change the irrigation strategy if it rains, or provide the operator with such information to allow him to schedule that change.

Soil moisture sensors/Weather Stations/ET and Rain Sensors

Measuring equipment is recommended in order to estimate or measure soil moisture content and support irrigation decisions. Accurate information is a key factor in the scheduling of irrigation. The following equipment will qualify:

Soil moisture sensors capable of transmitting electronic information about soil moisture content will qualify for the ECA (e.g. sensors based on moisture resistance, capillary action, soil capacitance or soil thermal capacity).

Weather stations capable of providing a figure for Evapo-transpiration (ET), either through operator readout or automatically to the irrigation control scheduler will be eligible.

Sensors to simulate the evapo-transpiration of the crop and rain gauges to measure the rainfall will be eligible.

Manufacturers should apply to the Water Technology List and submit evidence that their control software, units or sensors satisfy these criteria.
Users can then choose qualifying products from the WTL.

Capillary systems

Two main types of capillary system have been put forward.

Sand beds are a possible technology which is used as a capillary system in horticulture. This can apparently be quite efficient but is expensive at £6.50 per sq metre hence ECA may encourage more investment. This technology tends to be used in horticulture. The definition of the sand bed is a tank or dug out earth that is lined and filled with sand in its basic form.

Capillary bed specification:

- The site should be level to within a tolerance of +/- 1%
- The sand/media should be of a minimum depth of 60mm
- The capillary bed should be built to a specification approved within the Efford spec (available from the Horticultural Research Institute).
- The water should be applied by drip/trickle or header tank system.
- An low level drain should be fitted to remove excess rain water
- A non-permeable membrane should be fitted to hold a reservoir of water and isolate the sand/media from the soil.

Capillary matting is defined as a material that evenly distributes water from a low-level drip irrigation system and retains water over a given area. Capillary matting is defined as a fabric that evenly distributes water from a low-level drip irrigation system and retains water over a given area.

The matting must be laid on a smooth, graded and firmed surface free from high and low areas. Ground level beds may be gently sloped (typically 1 - 3%) to improve water distribution and enable drainage of surplus water. A non-permeable membrane should be fitted to isolate the matting from the soil and prevent drainage losses and disease contamination. A water permeable fabric should be installed above the matting to protect from abrasion and facilitate cleaning.

Two standards are available to define the capillary matting that could qualify under the ECA Scheme:

- DIN 53923 *'Determination of water absorption of textile fabrics*' and
- DIN 53924 *'Velocity of suction of textile fabrics in respect of water (method determining the rising height).*'

Capillary matting fabric that may qualify for the ECA may be manufactured from natural, artificial or a mixture of fibres. It should be a proprietary product
marketed specifically for use as horticultural capillary matting with the
following specifications:

- A water holding capacity of at least 0.8 litres / m2 (to DIN 53923)
- A vertical capillary lift of at least 20 mm (to DIN 53924)

Manufacturers should apply to the WTL submitting evidence that their product meets these criteria.

Application Procedure

Irrigation scheduling kit including control software, control units and sensors are considered suitable for a product list approach. Manufacturers must apply to Defra with evidence that their kit meets the criteria set out. A product list will be published on the scheme website (not yet available). See appendix 1 for details.

Irrigation equipment itself normally comprises a specifically designed system. It is proposed that manufacturers certify to users on their invoice that the system they are selling will meet the 85% emission or distribution uniformity criteria as well as the fact that the equipment is manufactured or installed to the British Standard for irrigation BS7562, these criteria being set for ECA qualification. This will enable users to claim back the enhanced capital allowance.

Users should note that it is the whole system as described on these web pages that qualifies and not component parts such as pipe-work on its own (see under what plant and machinery does not qualify for ECAs). The manufacturer should list that all the items were bought.

What Plant and Machinery costs qualify for ECAs?

Costs that are directly associated with the provision of Plant and Machinery can also qualify for capital allowances. The words 'on the provision of machinery or plant' in CAA are interpreted narrowly so as to exclude remote or indirect expenditure. Some common types of cost are detailed below:

- Transportation and installation costs should be regarded as expenditure on the provision of machinery or plant. These can include, for example, the costs of transport, crainage costs to lift machinery in to place, project management costs, installation, modifications to existing Plant and Machinery, and commissioning.

- Professional fees qualify only if they are directly related to the acquisition and installation of assets that are plant or machinery. Fees incurred on such things as feasibility studies or design work are too remote from the acquisition and installation to qualify.

- Costs of alteration to an existing building incidental to the installation of qualifying Plant and Machinery are eligible for ECA.

What Plant and Machinery costs does NOT qualify for ECAs?

It is investment in Plant and Machinery that will qualify for the ECA. Some assets will fall outside the definition of Plant and Machinery and will not qualify for ECA. These include:

- Assets that are buildings or structures, as defined by Schedule AA1 CAA do not qualify for any capital allowances given on Plant and Machinery. An example is a building which houses a CHP Scheme, where the main purpose of the building is weather protection or security .

- Like-for-like replacement of components of an irrigation system as part of a general repair and maintenance programme will generally be a revenue expense that can be set against profits in full for the period in which sums are expended. As these costs are not capital expenditure they will not qualify for Enhanced Capital Allowances.

Appendix 1

ECA Procedures Flow Chart for Product and Technology Processing

This draft is taken from the current ECA scheme for energy efficient products. In place of Carbon Trust, Defra would handle initial applications and then pass applications to a technical expert (TE). We propose to adopt the same work flow for applications which would result in applications appearing on the Product List within one month of application being submitted and all necessary papers received (unless further information is required). The application process and application tracking would be via the website.

The items this workflow relates to are irrigation control software, control units and sensors.