



Energy Efficiency in Dairy Sector Pilot 2017

What is the scheme?

A grant to help dairy farmers to reduce their energy costs.

Why Vacuum Pumps?

The vacuum pumps of the milking machine account for 20% of the total farms electricity consumption. There is a technology available called a variable speed drive (VSD) which can be applied to the vacuum pumps which has been proven to dramatically reduce the electricity consumption of these vacuum pumps by over 60%. In addition to the financial benefits realised due to reducing electricity consumption, the VSD technology also reduces the noise generated by these pumps which makes the dairy a much quieted place to work. Finally, the wear and tear and oil consumption of the pumps is reduced since they will be running at a reduced speed during milking.

During milking the milking machines air consumption is a fraction of the vacuum pump capacity resulting in large amounts of air being drawn in through the regulator. Since the vacuum pump motors only operate at full speed in a regular installation. Addition of a variable speed drive (VSD) to the vacuum pumps of these large modern milking machines can result in savings of over 10% on total farm energy costs. The VSD is able to adjust the rate of air removal from the milking system by changing the speed of the vacuum pump motor to equal the rate air is admitted to the system at a given vacuum level. All of the energy used to move air through the conventional vacuum regulator is saved. A sensor is added to the main airline to measure the vacuum in



the milking machine and VSD the controls the speed of the motor to maintain the desired vacuum level.

Why Variable Speed Milk Pumps?

Milk cooling represents the largest consumer of electricity on the dairy farm at over 30% of total electricity consumption. Pre-cooling of milk with water via a plate cooler is one of the most effective methods of reducing the cooling costs of milk. In order to meet the recommended ratios of water:milk in the plate cooler of 2:1 it is necessary to use a variable speed drive milk pump. This is because the standard high speed milk pumps have very high flow rates that are very suitable for circulation cleaning but these flow rates are excessive for effective pre-cooling. For centrifugal pumps to be effective for pre-cooling they need to be matched with a variable speed drive and liquid level indicator in the receiver jar to smooth the flow of milk through the plate cooler. The addition of a VSD milk pump can reduce total farm energy costs by approximately 5% when used in conjunction with a plate cooler.

How?

Complete the installation of one of the technologies described in table 1. Indicative simple payback

figures are shown in table 2 and include the grant rate that is applicable for each technology.

Table 1: Description of technologies that are eligible for grant aid and the maximum grant amount payable, eligible costs include installation and equipment.

New Technology Installations	Level of support (%)	Maximum level of support Excluding VAT	
		Single Phase	Three Phase
Retrofit Variable Speed Drive (VSD) Vacuum Pump	50%	€4,500	€3,000
Retrofit Variable Speed Drive milk pump	50%	€1,000	
Smart Meter – mandatory requirement	Included in above		

In addition Applicants must ensure that all electrical work in the retrofit is performed by a competent electrician and are a member of the Register of Electrical Contractors of Ireland (RECI) or the Electrical Contractors Safety and Standards Association (ECSSA).

Table 2: Payback (in years) for the different technologies eligible under the current scheme across 4 different sized milking machines

Milking Units	10	16	24	30
VSD vacuum pump (single phase)	15	7	6	NA
VSD vacuum pump (three phase)	NA	4	3	4
VSD milk pump ¹	5	4	4	3

Assumptions: These figures are based on the simple payback method which does not account for interest rates on borrowed monies, the value of money over time (inflation) or any potential increase/decrease in electricity price over time. We assumed an average of 8 cows per milking unit. Payback figures will vary according to the utilisation rate of the milking parlour.

¹ A VSD milk pump helps save energy by smoothing the flow of milk through the plate cooler; hence a saving will only occur if the farm is using a plate cooler with well water.

Who?

The scheme is open to dairy farmers who are currently engaged in milk production **and** are registered with the Department of Agriculture as a herd owner **and** Tax compliant and fill in the relevant information

needed for the grant application process. Please see accompanying Energy Efficiency Application Guide for a full list of eligibility criteria

Contact Details

Contact your local Teagasc Advisor or Farm Advisor who can assist with information and completing the application documentation.
Email: info@seai.ie

