

Title of the measure:	FIN27 Investments in heating plants
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General description

Since 1996, the Ministry of Agriculture and Forestry has granted investment aid for building heating plants in farms when the switch is made from fossil fuels to biofuels, e.g. wood chips or energy crops.

The investment aid is either an interest rate subsidized loan (maximum amount 50–80%, depending on the object) or a grant (maximum amount 15–40% of eligible costs).

Aid is applied for to the Rural Affairs Divisions of the ELY Centres, and it is paid according to the progress of the work in no more than five installments, against receipts for the costs incurred.

Impact evaluation (methods and results)

Methods

The following method has been used in Finland's fourth National Energy Efficiency Action Plan (NEEAP-4) submitted in April 2017.

The Ministry stores data from aid applications into the HYRRÄ database (until 2015 RAHTU). The application shows the size of the project (heating plant output being replaced), estimated costs, information about the applicant, and the date on which the application was submitted. The decision on whether to grant aid and any information relating to the decision are entered in the same database.

As heating plant projects the following are considered: new piggery, poultry-rearing establishment and greenhouse projects and the new or extended heating plants connected to them, as well as other heating plants used to replace existing ones.

The calculation method is based on the number of heating plant projects implemented, the mean power, and the estimated annual usage time and efficiency.

The impact assessment has assumed the following:

- in addition to replacing heating plant power produced by oil, heating plants that use biofuels as set out in the application also replace older log and wood-chip boilers- they are assumed to account for 15% of the projects. The saving is calculated on the basis of replacing oil with biofuels in old boilers;
- the utilisation time of a biofuel boiler's annual peak output is approximately 4 500–5 000 hours; the biofuel boiler is rarely designed in accordance with the calculated peak output, and in temperatures well below zero an oil-fired boiler will probably also be used on farms in addition to a biofuel boiler (and the oil-fired boiler also serves as a back-up system at the same time);
- it is assumed that approximately 85% of the projects to update heating plants, for which applications are submitted, will be implemented;
- some applicants do not obtain fuel from their own farms and the heating plant runs on delivered fuel (pellets, purchased wood chips, etc.); it is assumed that 80% use their own fuels until 2013 and thereafter 70% area assumed to use their own fuels;
- the impact assessment assumes that 30% of the projects applied for will have been implemented by the end of that year and the remainder not 'till the following year;
- the lifetime of biofuel boilers is 25 years, so the savings apply from 1996 onwards.



The following information has been extracted from the aid applications:

- in 1996–1999, approximately 330 applications were submitted each year, and the total power to be replaced, as stated in the applications, was approximately 5.5 MW per annum;
- in 2001–2005, 200–300 applications were submitted each year; the total aggregate output from heating plants that was being replaced was approximately 28 MW per annum;
- in 2006–2012, no statistics were compiled on output from heating plants, but the mean output was estimated, on the basis of typical power needs, by the Ministry based on the type of investment object and the scope of the investment. This was done by using data on investment projects made in 1996–2005. The total power of plants receiving subsidy was thus estimated at 27 MW in 2006, 166 MW in 2007, 62 MW in 2008, 85 MW in 2009, 31 MW in 2010, 66 MW in 2011 and 74 MW in 2012.
- The total power of plants receiving subsidy was 84.4 MW in 2013, 53.4 MW in 2014, 25.8 MW in 2015 and 38.6 MW in 2016.

The assessment concerns investments in heating plants on farms in cases where an old boiler that uses fossil fuels (oil) is replaced by a boiler that uses the farm's own renewable energy (e.g. wood chips or energy crops).

The annual energy saving/fuel substitution in compliance with ESD is based on the saving in delivered energy (oil). In accordance with the preceding section, the mean boiler age is 25 years for the purposes of the calculation, i.e. all investments apply for the whole period studied.

The annual energy saving/fuel substitution (ES) is calculated using the model:

$ES [GWh/a] = \text{installed boiler output per annum [MW]} * \text{peak power usage time [h]} * a$, where $a = 0.58$ = correction factor, which takes into account that:

- some of the boilers that are to be restored used the farm's own renewable energy previously;
- some aid applicants do not use their own renewable energy but rather, for example, bought pellets; and
- some projects that have received aid have not been implemented for some reason.

The total impact on energy savings given in the table below is obtained for the years shown in the table by adding together the impact on energy savings (ES) that applied at the time, calculated using the grounds set out above for the years in question.

Results

NEEAP-4: The total amount of fuel substitution from oil to biomass is estimated at 1 201 GWh/a in 2010, 1 950 GWh/a in 2016 and 2 198 GWh/a in 2020.

This is more a fuel conversion than energy efficiency measure although the savings account towards the ESD target. Therefore, measure impact level is difficult to determine. Because of the very high impact on greenhouse emissions, "high" ranking is given.

Measure Impact Level		
<input type="checkbox"/> low	<input type="checkbox"/> medium	<input checked="" type="checkbox"/> high

Interaction of measures

Historical data

References

