

Ellon Parish Church Ground Source Heat Pump

Introduction

Ellon Parish Church of Scotland was established in its current physical form in 1777. The facility is not limited to church activities, but instead is utilised by a wide range of groups for a range of activities in the community. After consultation with various user groups it was agreed that an upgrade to the facilities was needed.

The refurbishment project included the replacement and improvement of the environmentally and financially inefficient systems installed in 1967, to eco friendly heating, lighting, and insulation. The aim was to make the building far more energy efficient for the benefit of the whole community.

Equipment

NIBE Fighter 1140, 17kW Ground Source Heat Pump

An energy audit was conducted to explore the various renewable options, which were:

- Wind - There is little space on site for a turbine and the area around the church is very built up
- Biomass- Good option in many ways, however sufficient space for fuel storage is not available and delivery lorries would have to park on a busy corner of the main road.
- Solar Thermal – Suitable roof space with correct aspect was not available at this site.

Suitable geology and a lack of space dictated that a borehole (rather than trenched) heat pump would be the most appropriate solution. The process for the total refurbishment project involved a professional quantity surveyor and architectural service. Four contractors were asked to tender, of which one declined. Of the three contractors, one was selected on the basis of lowest price. In order to gain maximum benefits from the ground source heat pump, it was key that high grade insulation was added throughout the building.



Cost and Grant Funding

Total project cost	£41,869.00	The remaining funding was obtained through: Own funds
CARES grant	£32,695.20	
CARES grant percentage	80%	

Fuel Bill Savings

Compared to heating the facilities using the replaced electric heating system, the ground source heat pump will save approx £2,000 a year.

Emission Savings

Estimated kWh savings p.a.	15,866
Annual CO ₂ savings (kg)	6,822
Lifetime CO ₂ savings (kg)	68,220

Project Monitoring

A thermostatic monitoring system was installed as an integral part of the whole system. This allows the system to be automatically managed on a daily basis.

All facility user groups have been trained in the operation of the system.

Local Impact

The financial savings made through the installation of the heat pump have allowed the group to develop an outreach programme to all members of the local community.

The facility is now kept at a comfortable temperature throughout the day allowing users to enjoy the space seven days a week.



Lessons Learned

As far as the group were concerned the installation went very well, no real issues with it. The only thing emerging (it seems obvious now!) is that when you heat an old building via low grade underfloor heating, and therefore pretty much have some heat in it all the time, the effect is that things dry out (fabric, wood etc) like they never have before. This has resulted in a few cracks in fabric etc, but nothing major.

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