

CARNO
COMMUNITY CENTRE

Wood Fuelled Community Centre

Key Points:

Key Points: 45kW PK45 Binder Pellet Boiler
Estimated annual heat output 50,000kWh
Community Centre Heating and Hot Water

Carno Community Centre, Carno Recreation Association

Carno Community Centre, run by Carno Recreation Association, was established for the benefit of the inhabitants of Carno village and surrounding district, providing facilities in the interests of social welfare for recreation and leisure time occupation. The community centre is well used by a range of groups including a children's nursery, the local football team, the WI, mothers and toddlers and badminton and bowls clubs. In this rural area it provides a vital facility for the local community.

The Community Centre is a detached building of brick construction, built around 1988/89 with some later extensions. It is single storey and is approximately 29m by 18m by 8m high (at its tallest point). It consists of a large hall and various ancillary rooms, including shower facilities which are used by the local football team and opponents when matches are played at home.



Rationale for the Installation

The Management Committee of Carno Community Centre had been investigating options available for the replacement of the Centre's ageing oil-fired boiler. The objective has been to identify low-input and user-friendly means of providing heating and hot water for the Community Centre whilst minimising its environmental impact. 'Future-proofing' was also a consideration, with the anticipation that fossil fuel prices would continue to rise.

After examining the potential of various fuels including oil, gas and wood fuels, the Management Committee decided that a pellet boiler would provide the best solution to meet the criteria that the Committee has been working to. Pellets were chosen over wood chip or logs because it was felt that the fuel supply would require less management by the client and a high level of automation and efficiency could be achieved. Gas was considered but eventually rejected as an option, partly because the Centre currently has no mains gas connection (though it is available in the village) and partly because of the superior environmental performance of wood fuels. Solar water heating was also considered but rejected because the majority of hot water use at the Centre is over the winter months, during the football season, where large amounts of hot water are required intermittently.

The Technology

Due to shortage of space within the community centre, a containerised system was chosen that could be placed on land adjacent to the Centre, on the site of the existing oil tank.

The boiler is a fully automatic Binder PK45 with a maximum capacity rating of 45kW, suitable for wood-pellet fuels. The boiler has an Auger-driven fuel extraction and conveying system, electric ignition, exhaust gas fan and automatic ash-collection and heat-exchanger cleaning systems. The installation will include a 1000 litre Accumulator tank to improve the efficiency of the system and to allow a peak power of 50kW to be supplied for up to 2.5 hours a day if necessary.

The containerised system also includes a pellet storage facility with a volume of 12m³.

Based on 50,000kWh, the boiler system will save c. 12 tonnes of CO₂ per year assuming heating oil is the alternative fuel.

Costs and Funding Sources

The installation of the wood pellet boiler is part of a larger project to remedy problems with the community centre's heat distribution system and water storage. The containerised wood pellet boiler and fuel store cost £51,950 plus VAT, while the electrical works required to install the boiler cost £4,891 plus VAT. Other costs have brought the total budget for the project to £60,916.80 including VAT.

Grant funding for the project, including the wood pellet boiler and improvements to the heating system, has been received from the Energy for Sustainable Communities project, Windfall (mid Wales Community Energy Trust), Low Carbon Building Programme, E.ON and Carno Community Trust (funded by npower renewables operated Carno Wind Farm).

For Further Information

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CANOLFAN GYMUNEDOL
CARNO

Canolfan Gymunedol yn rhedeg ar Danwydd Pren

Pwyntiau Allweddol:

Bwyler Pelennau Binder 45kW PK45

Allgynnyrch gwres blynyddol amcangyfrifedig o 50,000kWh

System Gwres a Thwymo Dŵr i'r Ganolfan Gymunedol

Canolfan Gymunedol Carno, Cymdeithas Hamdden Carno

Sefydlwyd Canolfan Gymunedol Carno, sy'n cael ei rhedeg gan Gymdeithas Hamdden Carno, er lles trigolion pentref Carno a'r cyffiniau. Mae'n darparu cyfleusterau i ddibenion lles cymdeithasol i hyrwyddo gweithgareddau hamdden ac adloniant. Mae'r Ganolfan Gymunedol yn cael ei defnyddio'n rheolaidd gan rychwant o grwpiau gan gynnwys meithrinfa i blant, y fîm pêl-droed lleol, Sefydliad y Merched, mamau a babanod a chlybiau badminton a bowlïo. Yn yr ardal wledig hon mae'n darparu cyfleusterau hanfodol ar gyfer y gymuned leol.

Adeilad brics ar wahân yw'r Ganolfan Gymunedol, a godwyd tua 1988/89 â nifer o estyniadau diweddarach. Adeilad un llawr ydyw, yn mesur rhyw 29m o hyd, 18m o led, ac 8m o uchder yn y pwynt uchaf. Mae'n cynnwys neuadd fawr a nifer o ystafelloedd ategol, gan gynnwys cawodfa a ddefnyddir gan y fîm pêl-droed lleol a'u gwrthwynebwyr pan fydd gemau'n cael eu chwarae gartref.

Rhesymwaith Gosod y System

Yr oedd Pwyllgor Rheoli Canolfan Gymunedol Carno wedi bod wrthi'n archwilio'r gwahanol opsiynau yng nghyswllt adnewyddu hen fwyler y Ganolfan a oedd yn rhedeg ar olew. Y nod oedd darganfod dull isel ei fewnbwn, hawdd i'w ddefnyddio, o ddarparu gwres a dŵr poeth ar gyfer y Ganolfan Gymunedol tra'n cadw'r effaith ar yr amgylchedd mor isel â phosibl. Yr oedd 'diogelu rhag y dyfodol' yn ffactor i'w ystyried hefyd, o dybio y byddai prisiau tanwyddau ffosiledig yn dal i godi.

Ar ôl astudio posibiliadau gwahanol fathau o danwydd megis olew, nwy a thanwyddau pren, fe benderfynodd y Pwyllgor Rheoli mai bwyler pelenni oedd y dewis gorau o ran bodloni'r criteria y mae'r Pwyllgor wedi ceisio cadw atynt. Dewiswyd pelennau yn hytrach na sglodion pren neu foncyffion gan y teimlid y byddai'r tanwydd hwn yn gofyn llai o reolaeth ar ran y cleient, ac y gellid cyrraedd lefel uchel o awtomeiddio ac effeithioldeb. Ystyriwyd opsiwn nwy ond fe'i gwrthodwyd yn y diwedd, yn rhannol oherwydd nad yw'r Ganolfan wedi'i chysylltu â'r rhwydwaith cyflenwi nwy ar hyn o bryd (er ei fod ar gael yn y pentref) ac yn rhannol oherwydd gwell perfformiad amgylcheddol tanwydd pren. Cafodd systemau twymo dŵr ag ynni'r haul eu hystyried hefyd, a'u gwrthod gan mai yn ystod misoedd y gaeaf, sef y tymor pêl-droed, y defnyddir y rhan fwyaf o'r dŵr poeth yn y Ganolfan, ac am feintiau mawr o ddŵr poeth yn ysbeidiol y daw'r angen bryd hynny.

Y Dechnoleg

Oherwydd diffyg lle y tu fewn i'r Ganolfan Gymunedol, dewiswyd system hunangynhwysol y gellid ei gosod ar dir wrth ochr y Ganolfan, ar safle'r hen danc olew.

Binder PK45 hollol awtomatig yw'r bwyler, â chapasiti aruchaf o 45kW, sy'n addas ar gyfer tanwydd pelennau pren. Mae gan y bwyler system daradr i dynnu a chludo'r tanwydd, taniad trydanol, gwyntyll wagio nwy, a systemau awtomatig i gasglu'r lludw a glanhau'r cyfnewidydd gwres. Bydd tanc cronni 1000 litr yn cael ei gynnwys i wella effeithioldeb y system gan ei gwneud yn bosibl i gyflenwi lefel ynni aruchaf o 50kW am hyd at 2.5 awr y dydd os bydd angen.

Mae gan y system gynhwysydd hefyd sy'n storio 12m³ o belennau.

Ar sail lefel gynhyrchu o 50,000kWh, fe fydd system y bwyler yn arbed tua 12 tunnell o CO₂ y flwyddyn, mewn cymhariaeth ag olew cynhesu.

Costau a Ffynonellau Cyllid

Mae gosod y bwyler pelennau pren yn rhan o brosiect ehangach i ddatrys problemau gyda systemau dosbarthu gwres a storio dŵr y ganolfan gymunedol. Fe gostiodd y bwyler pelennau pren a'r storfa danwydd £51,950 heb gynnwys TAW, tra bod y gwaith trydanol a fu'n angenrheidiol i osod y bwyler wedi costio £4,891 heb gynnwys TAW. Mae costau eraill wedi codi cyfanswm cost y prosiect i £60,916.80 gan gynnwys TAW.

Mae grant i gyllido'r prosiect, gan gynnwys y bwyler pelennau pren a gwelliannau yn y system gynhesu, wedi cael ei dderbyn oddi wrth brosiect Ynni dros Gymunedau Cynaliadwy, Windfall (Ymddiriedolaeth Ynni Cymunedol Canolbarth Cymru), y Rhaglen Adeiladu Carbon Isel, cwmni ynni E.ON ac Ymddiriedolaeth Gymunedol Carno (a ariennir gan Fferm Wylt Carno, a weithredir gan gwmni npower renewables).

I gael rhagor o fanylion:

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