

Secondary Schools Energy Awareness Programme

Wexford Energy Management Agency Ltd, Ireland

Summary

Wexford Energy Management Agency Ltd. (WEMAL), as part of its role in energy education, designed and conducted a Secondary Schools Energy Awareness Programme to increase student awareness of energy issues and environmental effects. The programme covers both Junior Certificate (13 to 15 years of age) and Leaving Certificate (16 to 18 years of age) levels, and was initially trialled in two secondary schools to assess its performance. The culmination of the programme was a display and presentation of student work at a Secondary Schools Energy Exhibition. Student involvement was of paramount importance and all students showed a keen interest and understanding of energy issues at the end of the programme. Further implementation of the programme will take place following this successful trial.

End-user area	Target Audience	Technical
<input type="checkbox"/> New buildings	<input type="checkbox"/> Citizens	<input checked="" type="checkbox"/> Energy efficiency
<input type="checkbox"/> Refurbishment of buildings	<input type="checkbox"/> Households	<input type="checkbox"/> Heating
<input type="checkbox"/> Transport and mobility	<input type="checkbox"/> Property owners	<input type="checkbox"/> Cooling
<input type="checkbox"/> Financial instruments	<input checked="" type="checkbox"/> Schools and universities	<input type="checkbox"/> Appliances
<input type="checkbox"/> Industry	<input type="checkbox"/> Decision makers	<input type="checkbox"/> Lighting
<input type="checkbox"/> Legal initiatives (municipal regulations, directives, etc)	<input type="checkbox"/> Local and regional authorities	<input type="checkbox"/> CHP
<input type="checkbox"/> Planning issues	<input type="checkbox"/> Transport companies	<input type="checkbox"/> District Heating
<input type="checkbox"/> Sustainable communities	<input type="checkbox"/> Utilities	<input type="checkbox"/> Solar energy
<input type="checkbox"/> User behaviour	<input type="checkbox"/> ESCOs	<input type="checkbox"/> Biomass
<input checked="" type="checkbox"/> Education	<input type="checkbox"/> Architects and engineers	<input checked="" type="checkbox"/> Wind
<input type="checkbox"/> Other	<input type="checkbox"/> Financial institutions	<input type="checkbox"/> Geothermal
	<input type="checkbox"/> Other	<input type="checkbox"/> Hydro power
		<input type="checkbox"/> Other

Context

Wexford Energy Management Agency Ltd. (WEMAL) was established under the European Union SAVE II Programme with the support of Wexford County Council and the Wexford Organisation for Rural Development (WORD). Part of WEMAL's remit and objectives are secondary school energy awareness and education throughout County Wexford in the southeast of Ireland. The importance of young people's awareness and involvement in energy issues is of vital importance for the future of energy management and environmental protection. With this in mind, WEMAL set out to design and implement its own Secondary Schools Energy Awareness Programme.

Objectives

The overall aim of the project is to introduce energy topics to secondary school pupils and generate thought, discussion and action in the area of energy conservation and renewable energy use. The primary focus of the programme at Junior Level (13 to 15 years of age) is energy awareness and efficiency and renewable energy awareness and application. The primary focus of the programme at Senior Level (16 to 18 years of age) is energy awareness, monitoring and usage, energy efficiency and conservation, and renewable energy awareness and application. The dissemination of information and awareness to other students, teachers, parents and the general public is the ensuing secondary objective of the project.

Process

A Secondary School Energy Awareness Programme was designed by WEMAL to integrate easily into the school curriculum. At Junior Level the programme was introduced into the Civics, Social and Political Education (CSPE) course. CSPE groups are required to perform Action Projects relative to the subject. Thus, WEMAL designed an Energy Action Project that introduces the topics of energy security, environmental effects of energy use, energy conservation and renewable energies. An in-class presentation provides background information while a field trip to Carnsore Point Windfarm (Hibernian Wind Power Ltd.) provides first hand experience of renewable energy in practice. Students are required to research and report on their action project in the form of an exhibition display and final report.

At Senior Level the programme was introduced into transition year where extra curricular projects are more easily incorporated. A School Energy Audit was designed for use by the students in assessing their school's energy use. An in-class presentation introduces the concepts of energy monitoring, energy security, energy efficiency and potential renewable energy applications. Students are required to measure and calculate annual school electricity and heat energy use along with annual student transport energy use. Results are compiled into a report and exhibition display. The public exhibition serves to highlight the schools' work and relate the energy issues to the general population.

Financial resources and partners

The costs of the project were essentially staff hours and travel expenses. These costs were met through WEMAL finances via EU SAVE II, Wexford County Council and WORD funding. The project was solely undertaken by WEMAL.

Results

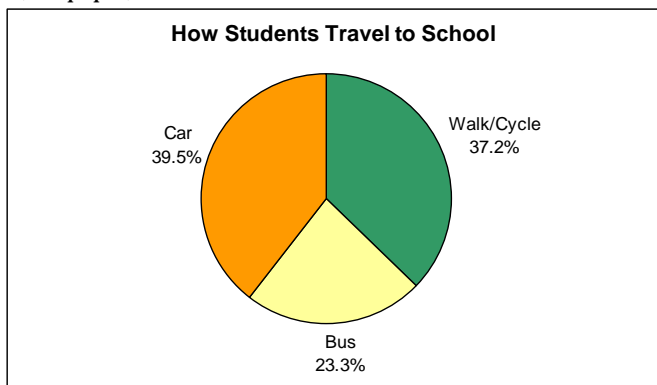
The WEMAL secondary school energy awareness programme was trialed in two secondary schools in County Wexford. The Junior Level Energy Action Project was implemented in Bridgetown Vocational College, Bridgetown, Co. Wexford. Twenty students participated in the Action Project, including a field trip to Carnsore Point Windfarm. The Action Project included three wind energy surveys conducted with 100 students, 100 people living in proximity to Carnsore Point Windfarm and five TDs (members of Irish parliament) and one MEP. The students exhibited their results at the Renewable Energy National Conference 2004, held in Wexford Town in February 2004, where they were awarded the Conference's Best Schools Project Award at Junior Level.

The Senior Level Secondary Schools Energy Audit was implemented in the Christian Brothers Secondary School, Thomas Street, Wexford. Fourteen students participated in the audit in which electricity usage, heat energy use and transport energy use were measured and calculated for their school over an annual period. Transport energy use was assessed via a student survey of 172 pupils throughout all school years (42% of the total school attendance). Recommendations for improving

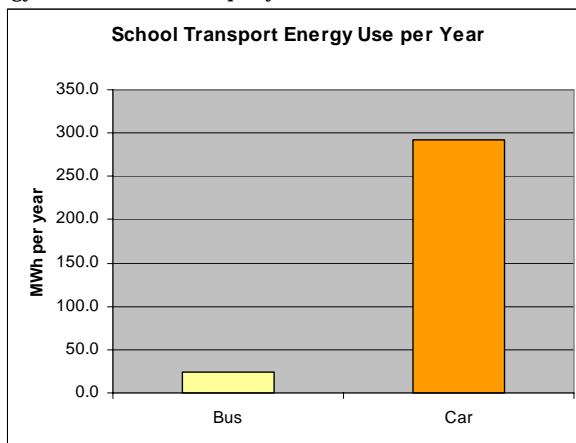
energy efficiency in all areas were put forward by the participants. The students exhibited their results at the Renewable Energy National Conference 2004, held in Wexford Town in February 2004, where they were awarded a Certificate of Achievement in recognition of outstanding work.

Senior Level Secondary Schools Energy Audit – Transport Results.

A survey of 172 students across all years was conducted in CBS Secondary School Wexford to determine by what means and how far students travel to and from school each day. The survey group represents 42% of the total school attendance (410 pupils).



Those that walk or cycle use only their own energy and emit no net greenhouse gases. Those travelling by bus or car use fossil fuels. Annual school transport energy expenditure was calculated for bus and car use. The average distance travelled by each student taking the bus was 22.5 km (round trip). At an energy expenditure of 0.076 kWh/km/student (WEMAL, 2003) this equates to 163.6 kWh per day, or 24.5 MWh per annum. The average distance travelled by each student using a car was 13 km (round trip). At an energy expenditure of 0.928 kWh/km/student (WEMAL, 2003) this equates to 1,949.3 kWh per day, or 292.4 MWh per annum. Total school transport energy use is 316.9 MWh per year.



Carbon dioxide (CO₂) emissions from school transport were then calculated. A CO₂ emission rate of 0.02 kg/km/student (WEMAL, 2003) was used for bus transport. This gives a CO₂ emission of 43 kg per day from school bus transport, or 6.5 tonnes per annum. A CO₂ emission rate of 0.245 kg/km/student (WEMAL, 2003) was used for car transport. This gives a CO₂ emission of 515 kg per day from school bus transport, or 77.2 tonnes per annum. Total school transport CO₂ emissions are 83.7 tonnes per year. This is directly contribution to global warming and climate change.

Conclusions & Recommendations. Current school transport at CBS Wexford is not sustainable with 62.8% of students relying on fossil fuels to travel to school each day. Increasing the number of students walking or cycling is one way to reduce fossil fuel transport use. Those living close to the school should be encouraged to walk and cycle. An increased bus network would increase the transport efficiency of the school. Running school buses on renewable fuels, such as biofuel, would make this form of transport sustainable and reduce pollution. Where cars must be used, students should try to share car journeys if possible and maybe even organise car-pooling in the school.

Lessons learned and repeatability

The WEMAL Secondary Schools Energy Awareness Programme successfully served to introduce energy issues and environmental considerations to secondary school students in County Wexford, Ireland. The students provided positive feedback on the programme and displayed an increased knowledge and enthusiasm for the subject area. Part of the success of the programme lay in designing it to be easily incorporated into the current school curriculum with minimum disturbance to regular teacher/student activities. The showcasing of results at an exhibition provided the students with a defined objective and an exciting extracurricular event. The successful trialling of the programme has already led to two further Junior Level Action Projects with plans to implement both Junior and Senior Level projects in many different schools across the County.

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