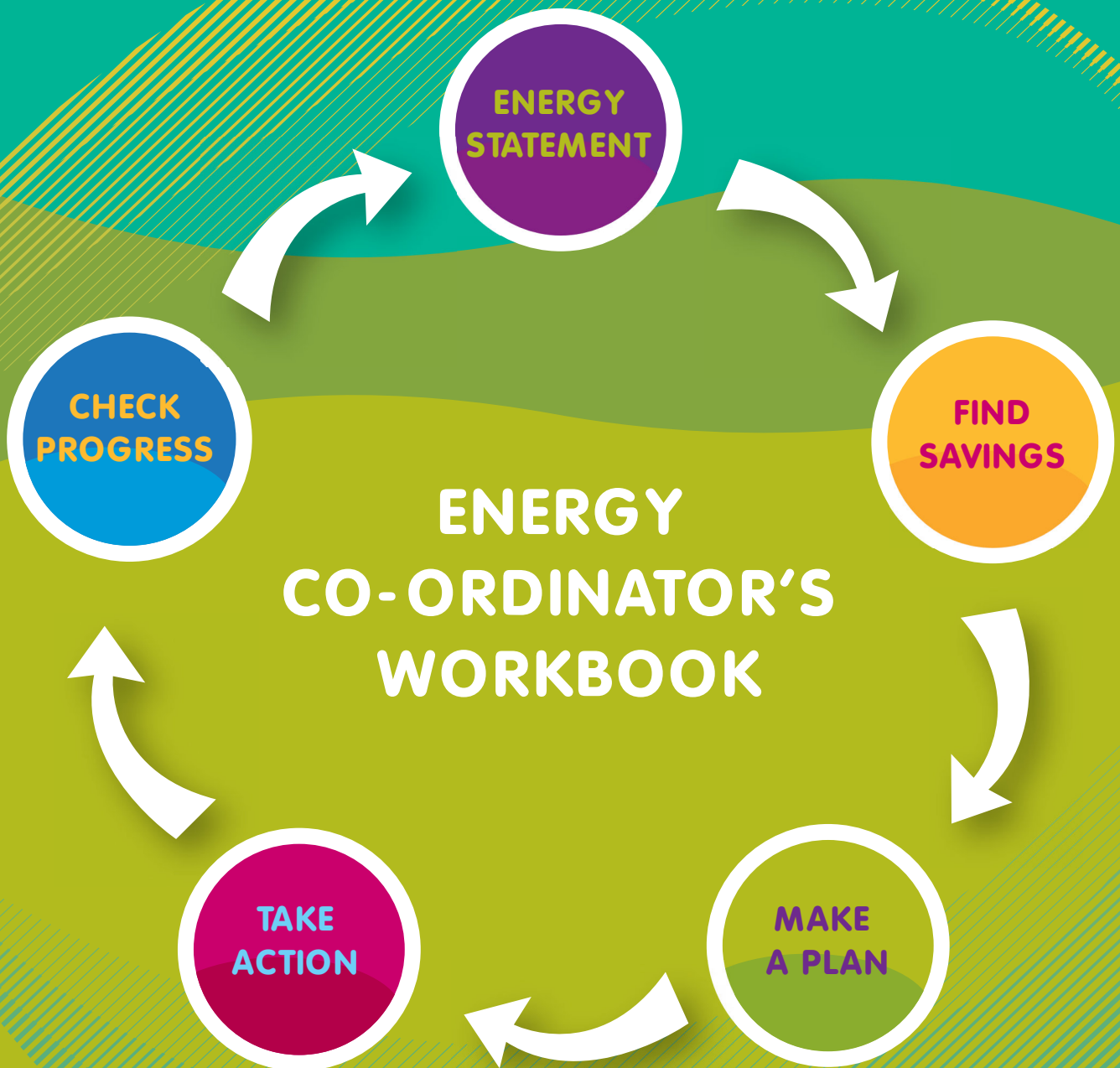




# energy **in** education

energy management guide for schools



This workbook is part of the Energy in Education pack designed to help school boards of management, principals, teachers, administrators, caretaking staff, pupils and parents to improve energy use practices and to reduce school operating costs while helping to protect the environment for future generations. It is designed for use in conjunction with the energy management guide, which outlines a five step process to assist you with effective energy management in your school. The Energy in Education website at [www.energyneducation.ie](http://www.energyneducation.ie) provides a wide range of additional support material and detailed advice on specific topics such as lighting, heating, IT equipment, water conservation and renewables in schools; and school energy saving case studies. A pupil energy logbook has also been developed and the icon below denotes opportunities for pupil involvement in energy management.



Involve pupils in the energy management process



Opportunities to integrate with the Green-Schools energy theme

## School details

Fill in your details below to personalise your workbook, which will serve as your school's Energy Management record and allow you to track progress. You may not have all the details now, so just fill in what you can at the beginning.

Name *Mr. John Delaney*

Position *Teacher*

School *ABC school*

Contact number *01 123 4567*

Roll number *12345Z*

Contact address

*8 Nomans Street,  
Dublin 2*

Email (optional) *j.delaney@abc.school.ie*

Start date *01-11-2009*  
(of period for which you  
are using this workbook)

Finish date *01-11-2010*

### Number of staff

*32*

### Number of pupils

*450*

### Current energy supplier(s)

Energy type	Supplier	Account manager (if known)	Contact number
Electricity	<i>ESB Customer Supply</i>	<i>Anne Smith</i>	<i>01 123 4355</i>
Heating	<i>Bord Gáis</i>	<i>Michael Quinn</i>	<i>01 765 4321</i>
Other (please specify)	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>

Annual energy costs (academic year)(€/yr) *€11,194 (electricity), €25,842 (heating)*

Area of school (m<sup>2</sup>) *2089.5m<sup>2</sup>*

What is the rating (A-G) on your school's Display Energy Certificate (DEC)?  
See guide or visit [www.energyineducation.ie](http://www.energyineducation.ie) for more information. *To be confirmed*

Annual energy usage (kWh/yr) *75,222 kWh (electricity), 430,710 kWh (heating)*  
This is a measure of energy use over a year (kWh or kilowatt hour is a unit of energy).

## Questionnaire - Where are we now?

Answer these questions to help you assess your current situation in relation to energy management. Make a photocopy of this form, as ideally it should be completed in 12 month's time and the answers compared.

(If an effective energy management system is in place, most of your answers will be in the boxes on the right.)

Has a Coordinator been appointed to manage the Energy Management Programme?

- No  Informal appointment  Formal appointment

Additional comments: *No one person has been appointed to manage energy matters within the school however a good number of the staff are aware of energy issues.*

Is there an Energy Statement?

- No  Yes, a formal, written, statement

Additional comments: *There is no formal energy statement.*

Have you identified significant energy users and factors that influence energy consumption?

- No  Yes, but energy use has not been quantified  Yes, and some quantification of energy use has taken place  Yes, a full assessment has been undertaken

Additional comments: *We have informally identified a number of areas and factors that we think relate to high energy use figures.*

Is there an Energy Action Plan in place?

- No (none)  Unwritten plan  Written plan  Written plan which has been implemented

Additional comments: *There is no Action Plan in place, however many staff are energy conscious and minimise use where possible.*

Are energy efficient practices and energy awareness promoted amongst staff?

- Not at all  Sometimes  Formally and regularly

Additional comments: *We have labeled some of the light switches in classrooms, to be used on cloudy days only*

Is there an energy measurement and monitoring system in place?

- No  Some informal monitoring  Formal system

Additional comments: *Readings are taken infrequently on the electricity meter every month. Gas meter readings are not recorded.*

Conclusions: *Teachers and maintenance staff are quite aware and motivated to take action on energy. However, there is currently little or no organisation or management of energy and very little quantification of energy use.*

## Making the case for energy management at your school

How much could we save? The table below will help you to estimate the money the school could save through energy management measures. This will help you to demonstrate the benefits of investing resources and effort in implementing energy management.

How to fill in this table

1. Record your total annual energy costs (from previous year's bills).
2. Calculate the value of 5% energy savings that can be made through 'good housekeeping'.
3. Calculate the value of 10% energy savings that can be made through modest building improvements.
4. Calculate the value of 25% energy savings that can be made through medium-cost capital investments.
5. Calculate how many computers (or other equipment) the school could buy with the maximum savings made over three years.

### Financial indicators

1. Total annual energy cost	€37,036
2. 5% Energy savings	€1,852
3. 10% Energy savings	€3,704
4. 25 % Energy savings	€9,259
5. Number of new PCs, assuming 10% savings for three years	25

How do these savings compare to the amounts raised through fundraising by the school last year? *It would take the fund raising committee a lot of effort to raise €3,704*

**Conclusions** *Energy is costing my school a significant amount of money and the savings to be made by decreasing my energy costs by just 10% makes it worthwhile to put in place an energy management programme.*

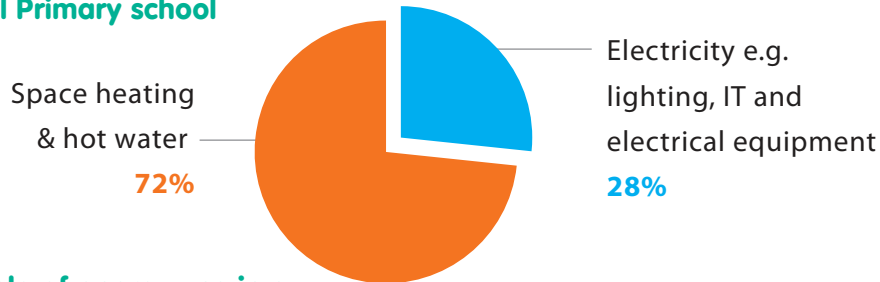
### Why should our school save energy? What will drive our campaign?

1. *Cost of energy – electricity and gas.*
2. *Requests from pupils and staff to demonstrate our commitment to protecting our environment.*
3. *Public sector targets for energy consumption reductions/ Requirement for a Display Energy Certificate*
4. *Attain a Green Flag for Energy under the Green-Schools programme*

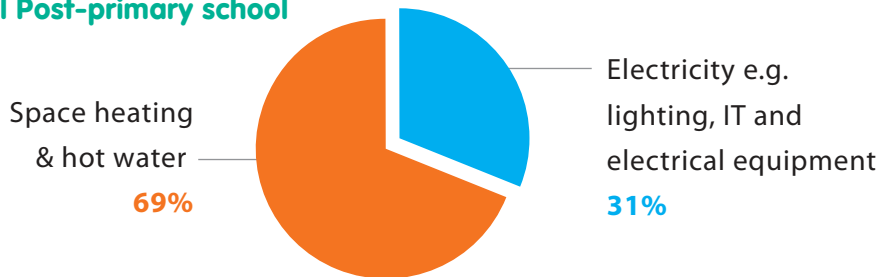
## Where does the energy go in an average school?

Energy use will vary a lot from school to school but the following pie charts illustrate that in general the main energy users are heating, lighting and hot water.

### Example of energy use in a typical Primary school



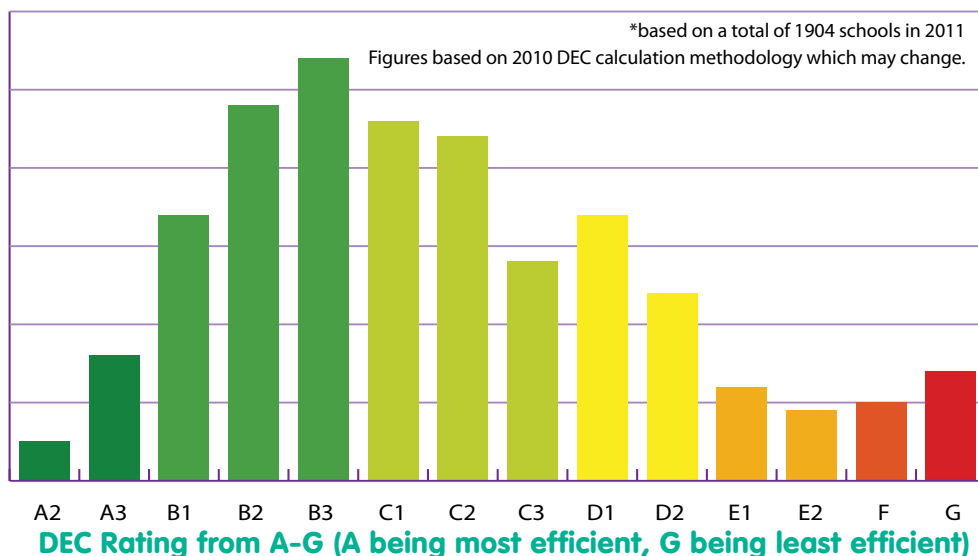
### Example of energy use in a typical Post-primary school



## How much energy are schools using?

There are no hard and fast rules and many factors such as the age of the building and the energy management practices will influence energy consumption. If you have a Display Energy Certificate (DEC) you will have information on the energy rating of your school. If not, you can apply on line at [www.energyineducation.ie/Display\\_Energy\\_Certificate](http://www.energyineducation.ie/Display_Energy_Certificate) once you know your energy use for a recent 12 month period and the area of your school (why not use the information you record on your energy bills in this workbook and tips on measuring the area of a school, available on the website?)

### DEC ratings of Irish Schools\* – how does your school's DEC compare?



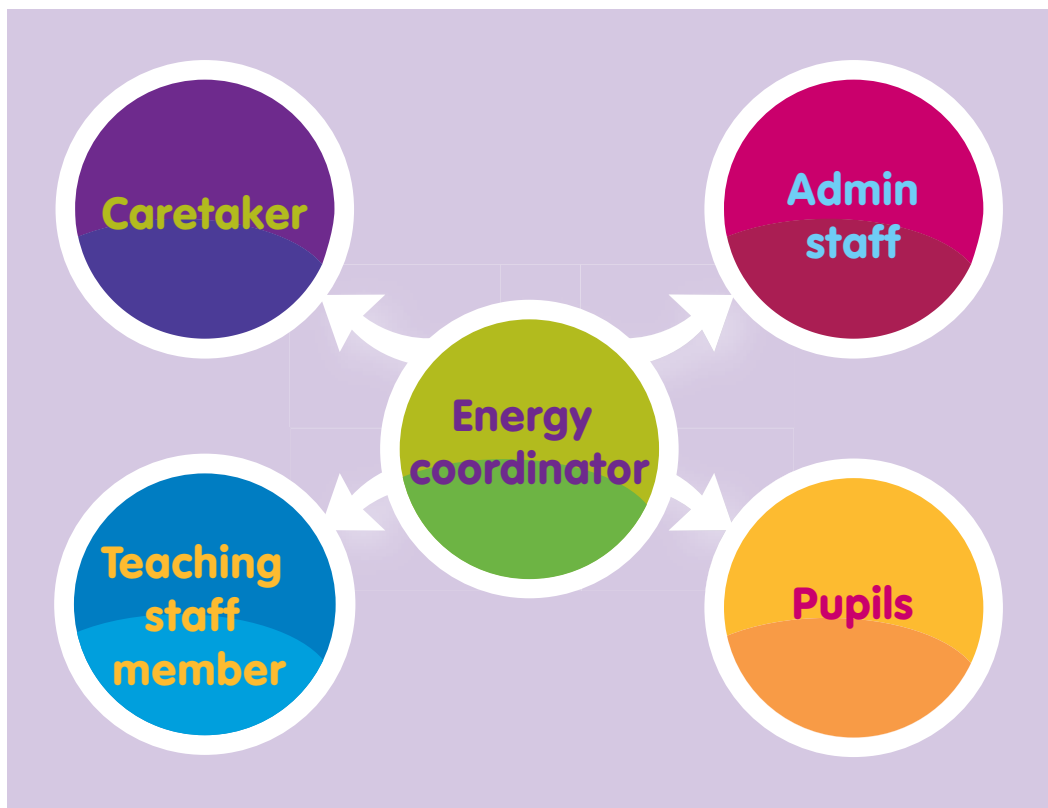
# 1. ENERGY STATEMENT

## Step 1 Energy Statement

Assign an Energy Coordinator for your school.

Name of energy coordinator	Position
Mary Murphy	Deputy Principal

### Energy Team



### Energy team members

Peter Ryan, Caretaker	Emma Byrne, Student
Joan O'Brien, Secretary	Daire Reilly, Student
Maeve Keogh, Teacher	
Pat Keane, Teacher	
John Delaney, Teacher	

## Write an energy statement for your school (see example page 7 of guide).

School energy statement

*ABC School is dedicated to implementing energy efficient practices, recognising that this is essential to provide a leading example to our pupils and the wider community. We are committed to the following:*

- Continual improvement in reducing our energy usage*
- Minimising the impact that our energy has on the environment*
- Communication of our energy statement and energy programme to all staff and pupils*
- Ensuring suppliers and contractors are aware of our energy programme*

*Michael King*  
*Principal*

**1. ENERGY STATEMENT**

### TIPS

- ➔ Don't hide away your energy statement, communicate it to staff at meetings and display it prominently in the school.
- ➔ Inform parents of the new energy policy through newsletters or a note and consider involving interested parents in the energy management process.
- ➔ You can download a template for your energy statement to complete and display at [www.energyineducation.ie/Energy\\_Management\\_Getting\\_Started](http://www.energyineducation.ie/Energy_Management_Getting_Started)



## 2. FIND SAVINGS

### Step 2 Finding Savings

Document energy bills and take meter readings to determine your energy usage and costs. Try to record all your energy bills in kWh for consistency. Conversion factors for different fuels are often on your bill and are available online at [www.energyineducation.ie/Measure\\_Energy\\_Use](http://www.energyineducation.ie/Measure_Energy_Use), where you can also download a bill tracking tool.

#### Your electricity bills

If you have multiple buildings with different billing periods you can make copies of these tables. If your bills are estimated contact your supplier with a meter reading to find out real consumption figures.

Previous academic year: 2008-2009

Billing Period	Quantity Billed (Units) kWh	Total Cost (€)
12/09/08-12/11/08	16,099	2,495.35
12/11/08-12/01/09	17,499	2,712.35
12/01/09-12/03/09	14,600	2,263.00
12/03/09-12/05/09	13,389	2,075.30
12/05/09-12/07/09	6,215	963.33
12/07/09-12/09/09	4,420	685.10
<b>Total</b>	<b>75,222 kWh</b>	<b>€11,194.41</b>

Current academic year: 2009-2010

Billing Period	Quantity Billed (Units) kWh	Total Cost (€)
12/09/09-12/11/09	15,512	2,404.36
12/11/09-12/01/10	16,215	2,513.33
12/01/10-12/03/10		
12/03/10-12/05/10		
12/05/10-12/07/10		
12/07/10-12/09/10		
<b>Total (To Date)</b>	<b>31,727 kWh</b>	<b>€4,917.69</b>

#### Your heating bills

#### Type of Fuel (e.g. natural gas)

Previous academic year: 2008 - 2009

Billing Period	Quantity Billed (Units) kWh	Total Cost (€)
12/09/08-12/11/08	113,924	6,835.44
12/11/08-12/01/09	122,034	7,322.04
12/01/09-12/03/09	117,979	7,078.74
12/03/09-12/05/09	69,726	4,183.56
12/05/09-12/07/09	4,655	279.30
12/07/09-12/09/09	2,392	143.52
<b>Total</b>	<b>430,710 kWh</b>	<b>€25,842</b>

Current academic year: 2009 - 2010

Billing Period	Quantity Billed (Units) kWh	Total Cost (€)
12/09/09-12/11/09	105,564	6,333.84
12/11/09-12/01/10	97,395	5,843.70
12/01/10-12/03/10		
12/03/10-12/05/10		
12/05/10-12/07/10		
12/07/10-12/09/10		
<b>Total (To Date)</b>	<b>202,959 kWh</b>	<b>€12,177.54</b>



## Meter readings - Gas

Date	Reading	Units used since previous reading	kWh used
02/10/09	190623	50,701	50,701
02/11/09	241324	52,620	52,620
01/12/09	293944	51,245	51,245
07/01/10	345189	47,568	47,568
—/02/10			
—/03/10			
—/04/10			
—/05/10			
—/06/10			
—/07/10			
—/08/10			
—/09/10			
Total (to date)			29,520 kWh

## Meter readings - Water

Date	Reading	Litres used since previous reading
02/10/2009	756,893	
02/11/2009	824,430	67,537
01/12/2009	914,587	90,157
07/01/2010	986,887	72,300
—/02/10		
—/03/10		
—/04/10		
—/05/10		
—/06/10		
—/07/10		
—/08/10		
—/09/10		
Total (to date)		

Action

get  
pupils  
involved

Pupils can assist with taking meter readings from electricity/gas meters and recording details from bills (see pupil logbook)

## Energy users and influences

Identify energy-using equipment (lights, computers, heaters, kettle, dishwasher), the people who use it and if there are possible savings (you may need extra copies of this sheet). You can download this table at [www.energymeducation.ie/Energy\\_Management\\_Getting\\_Started](http://www.energymeducation.ie/Energy_Management_Getting_Started)

Where	Appliance	How many	Hours on per day	Influential factors	Who is responsible	Savings opportunity?	(Optional) Energy rating (kW) <small>you will find this on nameplate on appliance</small>	(Optional) Energy value (kWh) for 1 day <small>Energy rating x quantity x hours of usage</small>
Classrooms and corridors	Fluorescent Lights	336	7.5	Lights controlled by single switch in classrooms	Staff, cleaners, caretaker	Yes	0.018	45.36
	PC	42	7.5	Teaching hours	Staff, students	Yes	0.086	27.09
	Printers	5	7.5	Teaching hours	Staff, students	Yes	1.32	49.5
	Interactive Whiteboards	3	4	Teaching hours	Maintenance, staff	Yes	0.3	3.6
Space & hot water heating	Gas-fired boiler	1	11	Weather, local control by staff of radiators	Maintenance, staff	Yes	32	352
Staff Room	Fridge	1	24	Staff requirement, Y&S	Staff, cleaners	No	0.5	12
	Microwave	1	0.5	N/A	Staff, cleaners	No	1.3	0.65
	Dishwasher	1	2	Tea and lunch breaks	Staff	Yes	1.5	3
	Kettle	1	1	Tea and lunch breaks	Staff, canteen staff	Yes	2	2
	Fluorescent lights	12	4	Tea and lunch breaks	Staff, cleaners, caretaker	Yes	0.018	0.864
Storage Areas	Fluorescent lights	32	7.5	No natural light available for this room	Staff, cleaners, caretaker	Yes	0.018	4.32
Toilets	Hand Dryers	1	0.5	As required (Staff toilet)	Staff	No	2.2	1.1
	Fluorescent lights	10	7.5	No automatic control	Staff, Cleaners	Yes	0.018	1.35



### Action

Pupils can assist with counting and recording energy using equipment (see pupil logbook)



### Action

Environmental review of energy or energy audit (consult your Green-Schools energy handbook)

## List of opportunities

Start to fill out your list of opportunities to save energy and include opportunities in various areas. This should be a 'living' document, which can be added to at any stage during the process. You can download this table at [www.energyneducation.ie/Energy\\_Management\\_Getting\\_Started](http://www.energyneducation.ie/Energy_Management_Getting_Started). Any ideas/suggestions should be captured here.

Ref	Aspect (e.g. lighting) or Area (e.g. zone 1 / classroom/canteen)	Opportunity	Cost	Comment
1	Classrooms and corridors	- Ensure people know where the light switches are	No Cost	All light switches should be labelled
2		- Clean dirty light fittings/shades	No Cost	Add to responsibility of maintenance
3		- Ensure PCs, photocopiers and printers are all switched off at night	No Cost	Student energy patrol to check
4		- Investigate upgrading wall insulation for entire building	Investment	To be done under summer capital works project
5		- Ensure proper timing of heating in line with school day and current weather	No Cost	Heating is often running on Saturdays
6		- Ensure heat is not wasted through open windows and ensure staff are aware of local heating controls	No Cost	Windows are often open if the classroom is stuffy in winter when the heating is on.
7	Staff room	- Fit timers to vending machines to turn off overnight	Low cost	
8		- Install electric point of use water heater for hot drinks	Investment	
9		- Ensure proper timing of heating in line with working hours current weather	No Cost	Add to maintenance checklist to adjust for when the clocks go forward
10	Storage Area	- Ensure lights are switched off when unoccupied	No Cost	
11	Toilets	- Ensure lights are switched off when unoccupied or fit occupancy sensor	Low cost	Staff awareness required
12		- Replace normal wall light switch with passive infra red sensor	Low cost	
13				
14				
15				



## Action

Pupils can assist with counting and recording energy using equipment (see pupil logbook)

## Energy action plan

Using your list of opportunities complete your Energy action plan below. You will have lots of ideas but remember to be realistic about what you can achieve, and check the Energy Management Guide for advice on prioritising measures. It should be signed by the Principal to demonstrate commitment. You can download this table at [www.energyineducation.ie/Energy\\_Management\\_Getting\\_Started](http://www.energyineducation.ie/Energy_Management_Getting_Started)

Target/Plan	Cost	Priority	Responsible	Expected Result	Target Date
Create and publicise energy statement	No	Medium	Principal & Energy Coordinator	Awareness among staff and pupils of overall approach	01/10/09
Reduce electricity consumption by 10% through the following actions:					
Awareness campaign to ensure all staff and pupils switch off PC monitors at end of the day	No	High	Energy Coordinator	All library PCs switched off at the end of the day	24/10/09
Awareness campaign to ensure teachers/pupils switch off all lights at end of classes	No	High	Teachers	No empty classrooms with lights on	✓11/2009
Appoint students to take responsibility for turning off all printers and photocopiers at night	No	High	Energy team	No equipment running unnecessarily overnight	✓12/2009
Monitor electricity meters and check all bills	No	High	Energy team	Improved understanding of gas use	✓12/2009
Reduce heating consumption by 10% through the following actions:					
Monitor gas meters and check all bills	No	High	Energy team	Improved understanding of gas use	✓12/2009
Ensure heating systems come on at the right times	No	High	Caretaker	Decrease in gas use	✓10/2009
Approved: <i>Michael King</i>					Date: ✓09/10



Green-Schools

Action

Action plan for energy (consult your Green-Schools energy handbook)

## Step 3 Make a Plan

3.  
MAKE  
A PLAN

# 4. TAKE ACTION

## Step 4 Take Action

Implement housekeeping and Energy Action Plan.

### Maintenance checklist

Establish your housekeeping and maintenance checklist below. Think about what should be turned off and when. You may want to leave an individual checklist for particular pieces of equipment or in certain areas of the school. Labels can be useful reminders. You can download this table at

[www.energyneducation.ie/Energy\\_Management\\_Getting\\_Started](http://www.energyneducation.ie/Energy_Management_Getting_Started)

Area	Task	Check Frequency	Person Responsible	Training Required?	Achieved?
Lighting	- Are all switches labeled to show what lights they are turning on?	Annually	Energy Coordinator	No	Y
	- Is all lighting T5 fluorescent tubes where possible?	Annually	Maintenance staff	No	Y
	- Are all unnecessary lights switched off at end of day?	Daily	All staff	No	Y
	- Are daylight sensors and presence detectors installed?	Annually	Energy Coordinator	No	Y
	- Are all dirty diffusers and shades cleaned?	Every 3 months	Maintenance	No	Y
	- Are all rooflights cleaned?	Every 3 months	Maintenance	No	Y
Building Envelope	- Are all doors and windows closed at end of school day?	Daily	All staff	No	Y
	- Has insulation been checked for damage?	Every 6 months	Maintenance	No	
	- Have any broken windows/rooflights been repaired?	As necessary	Maintenance	No	Y
	- Has a check been carried out for damp areas?	Every 3 months	Maintenance	No	Y
	- Are all PC monitors, interactive whiteboards etc., switched off at end of school day and weekends?	Daily	All staff	No	Y
School equipment	- Are all printers & photocopiers switched off at end of school day and weekends?	Daily	1 member of staff	No	Y
	- Are all PC monitors switched to power saving mode?	Monthly	ICT Coordinator	No	Y
	- Is building heated outside of school working hours?	Every 3 months	Energy Coordinator	No	Y
	- Have temperature settings been checked?	Every 3 months	Energy Coordinator	No	Y
	- Are thermostats placed correctly and working effectively?	Every 3 months	Maintenance	Yes	Y
Space Heating & Boilers	- Have radiator settings been checked?	Monthly	Energy Coordinator	Yes	Y
	- Are excessive amounts of windows and doors open?	Weekly	Energy Coordinator	No	Y
	- Is there poor or damaged insulation on boiler?	Every 6 months	Boiler Services	Yes	Y
	- Has a boiler maintenance and check been carried out?	Annually	Boiler Services	Yes	Y
Hot water demand Staff room	- Is the water too hot?	Every 3 months	Energy Coordinator	No	Y
	- Are vending machines on 24/7?	Weekly	Energy Coordinator	No	Y
	- Are dishwashers running on a part load?	Daily	Staff	No	Y
Design & procurement	- Is energy use considered when designing new buildings or procuring new equipment?	When required we consult <a href="http://www.seai.ie/">www.seai.ie/</a> <a href="http://aca.ie/">aca</a> for products	Energy Coordinator	No	

## Step 5 Check Progress

### Energy management annual progress review

Reviewing your progress each year allows you to benchmark success and should inform your plans for the coming year. You can start by completing the questionnaire on page two again to re-assess the school's position overall in relation to energy management. You can then review the situation in more detail using the checklists and tables in this section.

1. Has the school recorded savings in energy cost since using this energy management guide?

Yes

No

If yes, please detail

*We have noticed a slight decrease in our heating and electricity bills in comparison to last year's bills. We think that a contributing factor to this might be our vigilance in ensuring all non-necessary equipment is switched off at night. However, as the year went on we were not as vigilant and this is also reflected in the bills.*

2. Does the energy team have the full support of the school management?

Yes

No

3. Have you communicated your energy statement to all staff members?

Yes

No

Describe how *At staff meeting and through the school website and reminder texts.*

4. What projects have been carried out during this cycle of energy management?

*As above, we initially looked at all no or low cost measures to implement to start off our energy-saving programme. We felt that once results were achieved we could continue with higher cost measures. Some projects have not been carried out due to lack of maintenance staff throughout the year.*

5. Which objectives have been achieved from the energy action plan?

*Seven of our targets have been achieved.*



6. Of these targets, how many have been achieved within their timeframe?

*Five of our targets have been achieved within their timeframe.*

7. Have you started running an energy awareness campaign?

Yes

No

If yes, please detail

*We have used posters, stickers and meetings to increase awareness among staff and pupils.*

*The majority of staff are far more aware of their responsibility towards energy efficiency and aware that all the small changes can make an effective contribution to reducing our over-reliance on energy. Staff are willing to participate in all events and are making progress to achieving all targets as set out in the Action Plan.*

8. Have you noticed a change in attitude to energy waste?

Yes

No

If yes, please detail

*The majority of staff are far more aware of their responsibility towards energy efficiency and aware that all the small changes can make an effective contribution to reducing our over-reliance on energy. Staff are willing to participate in all events and are making progress to achieving all targets as set out in the Action Plan.*

9. Have you made a list of recommendations for the ongoing plan for energy efficiency?

Yes

No

10. Have you investigated the range of grants that are available from Department of Education and Skills/ SEAI?

Yes

No

If yes, please detail

*We are currently investigating if there are grants that are available for increasing our roof insulation over the old wing.*

## Annual performance comparison progress table

Review your school's annual performance and plan for future work by filling in the tables below.

Date (Try to do this to tie in with your energy bills)	Comparison 1 Electricity Use kWh/m <sup>2</sup>	Comparison 2 Gas Use kWh/m <sup>2</sup>	Comparison 3	Comparison 4
Academic Year 2007/2008	38 kWh / m <sup>2</sup>	216 kWh / m <sup>2</sup>		
Academic Year 2008/2009	36 kWh / m <sup>2</sup>	206 kWh / m <sup>2</sup>		
Academic Year 2009/2010				

## Most recent Display Energy Certificate rating

## Previous Display Energy Certificate rating

## Future Recommendations

Based on the energy management annual progress review (step 5) outline a list of suggestions as to how to improve on the energy management programme for next year.

<i>Need to get more pupils involved in programme as currently too many tasks are falling on Energy Coordinator.</i>
<i>Awareness material needs to be updated more regularly to maintain momentum.</i>
<i>Start to look at some of the investment opportunities.</i>

the 1990s, the number of people in the UK who are employed in the public sector has increased from 10.5 million to 12.5 million, and the number of people in the public sector who are employed in health care has increased from 1.5 million to 2.5 million (Department of Health 2000).

There are a number of reasons for the increase in the number of people employed in the public sector. One reason is that the public sector has become a more important part of the economy. Another reason is that the public sector has become a more attractive place to work. A third reason is that the public sector has become a more important part of the welfare state.

The increase in the number of people employed in the public sector has led to a number of changes in the way that the public sector is organized. One change is that the public sector has become more decentralized. Another change is that the public sector has become more market-oriented. A third change is that the public sector has become more customer-oriented.

The changes in the way that the public sector is organized have led to a number of challenges for the public sector. One challenge is that the public sector has become more complex. Another challenge is that the public sector has become more competitive. A third challenge is that the public sector has become more demanding.

The challenges that the public sector faces are a result of the changes in the way that the public sector is organized. The public sector must find ways to meet these challenges if it is to continue to provide the services that it is expected to provide.

One way that the public sector can meet these challenges is by improving the way that it is organized. Another way is by improving the way that it is managed. A third way is by improving the way that it is funded.

The public sector must find ways to meet these challenges if it is to continue to provide the services that it is expected to provide. The public sector must be able to meet the needs of the people that it serves. The public sector must be able to provide the services that are needed in a cost-effective way.

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