

# Energy Management

A Guide for Small Business

Completed Workbook



# Step 1 - Preparation

## Company details

Fill in your details below to personalise your workbook, which will serve as your company's energy management file. You may not have all the details now, so just fill in what you can at the beginning.

Name	<i>Mary Murphy</i>		
Position	<i>Manager</i>		
Company	<i>ABC Office Works</i>		
Branch (if applicable)	<i>Not applicable</i>		
Business activity	<i>Office and Stationery Supplies</i>		
Contact number	<i>01 123 4567</i>		
Contact address	<i>8 Nowans Street Dublin 2</i>		
Email (optional)	<i>mary.murphy@officeworks.ie</i>		
Start date	<i>01-01-2020</i>	Finish date	<i>31-12-2020</i>

## Number of employees

Full-time	<i>40</i>	Part-time	<i>2</i>	Floor space area	<i>234m<sup>2</sup></i>
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## Current energy supplier(s)

Energy type	Supplier	Account manager	Contact number
Electricity	<i>Electricity Supply Company</i>	<i>Anne Smith</i>	<i>01 123 4567</i>
Heating	<i>Gas Supply Company</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 (€/yr)  
*€50,474.10 (electricity), € 10,632.63(heating), €1,766.12 (diesel)*

Annual energy usage (kWh/yr)  
*98,945kWh (electricity), 84,902kWh (heating), 27,336kWh (diesel)*

## Energy management diagnostic questionnaire

### ACTION 1 What is your current energy management situation?

Fill out this energy management diagnostic questionnaire to help you assess this. This form should be filled in again in 12 months' time and the answers compared.

(If a good energy management system is in place, most of your answers will be the third and fourth boxes.)

Has a coordinator been appointed to manage the energy action plan?

No  Informal appointment  Formal appointment but low priority  Formal appointment

Additional comments *No one person has been appointed to manage energy matters within the office however many staff are aware of energy issues.*

Do you have an energy statement?

No  Informal statement  Incomplete statement  Complete formal statement

Additional comments *There is no formal energy statement. An environmental policy is in place however, which could be a basis for an energy statement.*

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

No  Informally (no quantification)  Informally (some quantification)  Yes (quantified assessment)

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)  Informal unwritten plan  Informal written plan  Formal plan

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 employees?

Not at all  Informally and infrequently  Informally but regularly  Formally and regularly

Additional comments *On occasion energy awareness activities are carried out, usually at the request of employees.*

Is there an energy measurement and monitoring system in place?

No (none)  Informal  Incomplete system  Formal system

Additional comments *Readings are taken infrequently on the electricity meter throughout the year. Gas meter readings are not recorded.*

Conclusions from diagnostic: *We have staff that 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.*

## The business case for energy management

### ACTION 2 What is your business case for energy management?

Fill out your own business case table below and estimate what resources and effort you can afford to spend tackling energy management.

How to fill in this table:

1. Record your annual operating costs for the previous year.
2. Record your total energy costs (from previous year's bills).
3. Calculate your total energy costs as a percentage of your annual operating costs.
4. Record your annual profits for the previous year.
5. Calculate your energy costs as a percentage of your profits.
6. Calculate 10% of your energy costs and express this as a percentage of your profits to see how much can be saved.

### Financial indicators

1. Annual operating costs	€1,537,571.00
2. Total energy cost	€51,631.82
3. Energy as % of annual operating costs	3.36%
4. Annual profits	€141,457.00
5. Energy as % of profits	36.5%
6. % increase in profits by a 10% decrease in energy costs	3.65%

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

### ACTION 3 List the issues that are driving your energy management programme.

1. *Cost of energy — electricity and gas.*
2. *Requests from staff for better attitude towards environment.*
3. *Pressure from larger companies which we supply to improve environmental performance.*
- 4.



## Your heating bills

Previous year: 2019

Billing period	Quantity billed (units) kWh	Total cost (€)
28/02/19 – 28/04/19	60,881	2,739.66
28/04/19 – 28/06/19	58,488	2,632.27
28/06/19 – 28/08/19	31,440	1,414.81
28/08/19 – 28/10/19	17,366	781.48
28/10/19 – 28/12/19	34,816	1,566.74
28/12/19 – 28/02/20	60,205	2,709.25
<b>Total</b>	<b>263,196kWh</b>	<b>€11,844.21</b>

## Natural Gas

Current year: 2020

Billing period	Quantity billed (units) kWh	Total cost (€)
28/02/20 – 28/04/20	54,763	2,464.34
28/04/20 – 28/06/20	52,317	2,354.30
28/06/20 – 28/08/20	28,224	1,270.07
28/08/20 – 28/10/20	41,874	669.35
28/10/20 – 28/12/20	31,661	1,424.74
28/12/20 – 28/02/21	54,441	2,449.83
<b>Total</b>	<b>236,280kWh</b>	<b>€10,632.63</b>

## Your other bills (e.g. diesel, LPG, solid fuel)

Previous year: 2019

Billing period	Quantity billed (units)	(Optional) kWh*	Total cost (€)
23/03/19	1,250L	12,750	823.75
25/09/19	1,430L	14,586	942.37
<b>Total</b>	<b>2,680L</b>	<b>27,336kWh</b>	<b>€1,766.12</b>

## Diesel

Current year: 2020

Billing period	Quantity billed (units)	(Optional) kWh*	Total cost (€)
04/04/20	1,230L	12,546	810.57
24/11/20	1,305L	13,311	860.00
<b>Total</b>	<b>2,535L</b>	<b>25,857kWh</b>	<b>€1,670.57</b>

## ACTION 7

## Take meter readings for electricity and gas once a month and record below.

First, find out where your meter is located. It may be located in another building. You might need to contact your building maintenance company.

## Meter readings — electricity

Date	Reading	Units used since previous reading	Multiplier*	kWh used
11/01/20	62,541	383	60	22,980
11/02/20	62,928	387	60	23,220
13/03/20	63,318	390	60	23,400
12/04/20	63,700	382	60	22,920
11/05/20	64,071	371	60	22,260
12/06/20	64,436	365	60	21,900
14/07/20	64,789	353	60	21,180
11/08/20	65,139	350	60	21,000
11/09/20	65,498	359	60	21,540
12/10/20	65,866	368	60	22,080
07/11/20	66,239	373	60	22,380
10/12/20	66,618	379	60	22,740
<b>Total</b>		<b>4,460</b>	<b>60</b>	<b>267,600kWh</b>

## Meter readings — gas

Date	Reading	Units used since previous reading	Multiplier*	kWh used
11/01/20	19,623	346	60	20,760
11/02/20	19,954	331	60	19,860
13/03/20	20,301	347	60	20,820
12/04/20	20,645	344	60	20,640
11/05/20	20,987	342	60	20,520
12/06/20	21,323	336	60	20,160
14/07/20	21,657	334	60	20,040
11/08/20	21,990	333	60	19,980
11/09/20	22,321	331	60	19,860
12/10/20	22,654	333	60	19,980
07/11/20	22,990	336	60	20,160
10/12/20	23,330	340	60	20,400
<b>Total</b>		<b>4,053</b>	<b>60</b>	<b>243,180kWh</b>

\*Sometimes meters are unable to record the actual amount of energy that you use. In this case, a certain percentage of usage is passed through your meter and the actual usage is calculated by multiplying by a factor, i.e. a multiplier. Check your bill to see if a multiplier applies to your account. If no multiplier applies, the units used = kWh used.

## Energy management diagnostic questionnaire

**ACTION 8**

**Fill out the table below, identifying energy-using equipment, influential factors and people and if there is a potential energy saving.**

Use the example in the completed sample workbook to help you. The best way to fill in this chart is to do a walk around your facility and identify your energy users and influences.

Location	Appliance	Quantity	Hours of usage (hrs / day)	Influential factors
Office	Computer	42	9	Office working hours
	Printers	5	9	Office working hours
	Fans	20	2	Hot weather and stuffy atmosphere
	Air-conditioner unit	3	9	Office working hours & weather conditions
	Fluorescent lights	336	9	All lights controlled by one bank of switches
Toilets	Hand-dryers	4	0.5	As required
	Fluorescent lights	32	9	No natural light available for this room
Server Room	Air-conditioner unit	1	12	High heat levels in server rooms
	Fluorescent lights	40	12	No natural light available in this room
	Server room	2	24	Are 2 servers required, move 1 server to cloud
Kitchen/Canteen	Fridge	1	12	No natural light available for this room
	Microwave	1	24	Staff requirement, Health and safety
	Dishwasher	1	0.5	N/A
	Kettle	1	2	Tea and lunch breaks
	Fluorescent lights	48	1	Tea and lunch breaks
Storage Area	Fluorescent lights	32	4	Tea and lunch breaks
Space and hot water heating	Gas-fired boiler	1	4	All lights controlled by one bank of switches

In the table below will give you an overall idea of the biggest on-site users. Not every piece of equipment needs to be entered. At this stage you could also identify certain people you might nominate to look after certain sectors, technologies or factors that can influence your energy demand and whether there is a potential to make any energy savings with each piece of equipment listed.

Influential people	Is there a potential energy-saving opportunity here? If yes, add to register of opportunities	(Optional) Energy rating (kW) You will find this on nameplate on appliance	(Optional) Energy value (kWh) for 1 day Energy rating x quantity x hours of usage
Office staff, Energy Champion	Yes	0.25	75.6
Office staff	Yes	0.41	18.45
Office staff, maintenance staff	Maybe	0.020	0.80
Maintenance staff	Yes	1.00	27.00
Staff, cleaners, security	Yes	0.016	48.38
Office staff	No	1.80	3.60
Staff, cleaners	Yes	0.006	1.73
Maintenance staff, IT staff	Yes	1.00	12.00
Staff, cleaners, security, IT staff	Maybe	0.006	2.88
IT staff	Yes	1.8	43.2
Office staff, cleaners	No	0.10	2.40
Office staff, cleaners	No	0.80	0.40
Office staff	Yes	1.500	3.00
Office staff, canteen staff	Yes	2.75	2.75
Staff, cleaners, security	Yes	0.016	3.072
Staff, cleaners, security	Yes	0.006	0.768
Maintenance, office staff	Yes	40.00	440.00

**Conclusions**

The main users are lighting, IT equipment and air-conditioning units. Staff do have influence over the majority of these aspects and therefore good energy awareness is essential. Security, cleaning and maintenance staff are also very important.

## Energy management diagnostic questionnaire

**ACTION 9****Start to fill out your register of opportunities.**

Some common opportunities are outlined in the completed sample workbook.

Aspect (e.g lighting) or area (e.g. zone 1, office or canteen)	Opportunity
Office	- Ensure heat is not wasted through open windows and ensure staff are aware of local heating controls
	- Ensure proper timing of heating in line with working hours and current weather
	- Ensure proper timing of on/off switches for AC unit — avoid leaving AC on in an unoccupied building
	- Ensure proper timing of on/off switches for ventilation — avoid leaving ventilation on in an unoccupied building
	- Ensure people know where the light switches are
	- Clean dirty light diffusers or shades
	- Investigate upgrading to LEDs
	- Ensure computers are switched to 'Power Saving Mode'
	- Ensure computers, photocopiers and printers are all switched off at night
	- Investigate insulation for entire building
Kitchen/Canteen	- Ensure proper timing of heating in line with working hours and current weather
	- Ensure proper timing of on or off switches for AC unit — avoid leaving AC on in an unoccupied building
	- Reduce temperature in hot tap
	- Install insulation on hot water storage vessels and pipework
	- Avoid running dishwashers on part-load
	- Avoid boiling full kettles for one cup tea or coffee
	- Ensure people know where the light switches are
- Clean dirty light diffusers or shades	
Storage Area	- Ensure lights are switched off when unoccupied
Server Room	- Ensure proper timing of on or off switches for AC unit — avoid leaving AC on when not required
	- Ensure lights are switched off when unoccupied
Toilets	- Reduce temperature in hot tap
	- Ensure lights are switched off when unoccupied

This table allows you to list opportunities in various areas. This document can be added to at any stage during the process. Any ideas or suggestions should be captured here.

Comment	Cost
Windows often open while heat is also on	No cost
Heating is often on outside of working hours	Low cost
AC often left on even when office is unoccupied	Low cost
Staff awareness required	Low cost
Staff awareness required	No cost
Add to responsibility of maintenance	Low cost
Not possible until next year	Investment opportunity
Staff awareness required	No cost
Staff awareness required	No cost
Not possible until next year	Investment opportunity
Heating is often on outside of working hours	Low cost
Area unoccupied for majority of time but AC left on constantly	Low cost
This is currently excessive—report to maintenance	Low cost
May not be possible until next year	Investment opportunity
Talk to cleaner regarding this—one load per day will suffice	No cost
Need more staff awareness for this to happen	No cost
Staff awareness required	No cost
Add to responsibility of maintenance	Low cost
Area unoccupied for majority of time but lights left on constantly	No cost
Area unoccupied for majority of time but AC left on constantly	Low cost
Staff awareness required	No cost
This is currently excessive — report to maintenance	Low cost
Area unoccupied for majority of time but lights left on constantly	No cost

# Step 4 - Plan

## Energy action plan

**ACTION 10**

**Complete your energy action plan below.**

Get a manager to sign this to show commitment.

Target or plan	Cost	Priority
<i>Create and publicise energy statement</i>	<i>No</i>	<i>Medium</i>
<i>Reduce electricity consumption by 10% through following actions:</i>		
<i>Monitor electricity and gas meters and check all bills</i>	<i>No</i>	<i>High</i>
<i>Ensure proper timing of heating systems</i>	<i>No</i>	<i>High</i>
<i>Awareness campaigns to ensure all staff understand how to use local controls and avoid waste</i>	<i>No</i>	<i>High</i>
<i>Service and maintenance routine for AC unit, including timing</i>	<i>Medium</i>	<i>High</i>
<i>Awareness campaign to ensure staff switch off all lights at end of shift</i>	<i>No</i>	<i>High</i>
<i>Awareness campaign to ensure all staff switch off PC monitors at end of shift</i>	<i>No</i>	<i>Medium</i>
<i>Appoint staff member to take responsibility for turning off all printers and photocopiers at night</i>	<i>No</i>	<i>High</i>

Management sign off

Name *Michelle King*

Position *Manager*

Ideally, the plan shown below should be for a period of one year. Plan period: Jan '20 to Dec '20

Person responsible	Target or expected result	Target date	Achieved (yes or no)
<i>Manager and Energy Coordinator</i>	<i>Awareness among employees of overall approach to energy management</i>	<i>01/02/20</i>	<i>Yes</i>
<i>Energy Coordinator</i>	<i>Improved understanding of gas consumption</i>	<i>Every 2 months</i>	<i>Yes</i>
<i>Energy Coordinator</i>	<i>Decrease in energy consumption</i>	<i>Every 2 months</i>	<i>Yes</i>
<i>Energy Coordinator</i>	<i>Decrease in energy consumption</i>	<i>13/09/20</i>	<i>Yes</i>
<i>Maintenance technicians</i>	<i>Decrease in energy due to improved efficiency</i>	<i>Every 6 months</i>	<i>No</i>
<i>Energy Coordinator</i>	<i>90% of lights to be switched off at end of shift</i>	<i>28/01/20</i>	<i>Yes</i>
<i>Energy Coordinator</i>	<i>95% of PCs to be switched off at end of shift</i>	<i>24/04/20</i>	<i>Yes</i>
<i>Responsible staff member</i>	<i>All printers and photocopiers to be switched off overnight</i>	<i>Immediately</i>	<i>Yes</i>

Signature *Michelle King*

Date *12/01/20*



# Step 5 - Act

**ACTION 11**

Establish your operations and maintenance checklist below.

Use the example in the completed sample workbook to help you complete this step.

Area	Task	Check frequency	Person responsible	Training required	✓
Lighting	- Are all switches labelled?	Annually	Energy Coordinator	No	✓
	- Is all lighting LED where possible?	Annually	Maintenance staff	No	✓
	- Are all unnecessary lights switched off at end of day?	Daily	All staff	No	✓
	- Are daylight sensors and presence detectors installed?	Annually	Manager	No	✓
	- Are all dirty diffusers and shades cleaned?	Every 3 months	Maintenance	No	✓
	- Are all roof lights cleaned?	Every 3 months	Maintenance	No	✓
Building envelope	- Are all doors and windows closed at end of shift working day	Daily	All staff	No	✓
	- Has insulation been checked for damage?	Every 6 months	Maintenance	No	
	- Have any broken windows/rooflights been repaired?	As necessary	Maintenance	No	✓
	- Has a check been carried out of damp areas?	Every 3 months	Maintenance	No	✓
Office equipment	- Are all PC monitors switched off at end of working day and weekends?	Daily	All staff	No	✓
	- Are all printers & photocopiers switched off at end of working day and weekends?	Daily	1 member of staff	No	✓
	- Are all PC monitors switched to power saving mode?	Monthly	Manager	No	✓
Ventilation	- Are filters checked for clogging/blocking and cleaned if necessary?	Every 3 months	Maintenance	Yes	
	- Are timers/switches monitored to ensure ventilation is coming on at appropriate times?	Every 3 months	Energy Coordinator	Yes	✓
Space heating and boilers	- Is building heated outside of working hours?	Every 3 months	Energy Coordinator	No	✓
	- Have temperature settings been checked?	Every 3 months	Energy Coordinator	No	✓
	- Are thermostats placed correctly and working effectively?	Every 3 months	Maintenance	Yes	✓
	- Have radiator settings been checked?	Monthly	Energy Coordinator	Yes	✓
	- Are excessive amounts of windows and doors open?	Weekly	Energy Coordinator	No	✓
	- Is there poor or damaged insulation on boiler?	Every 6 months	Boiler Services	Yes	✓
	- Has a boiler maintenance and check been carried out?	Annually	Boiler Services	Yes	✓

Area	Task	Check frequency	Person responsible	Training required	✓
Hot water demand	- Is there excessive temperatures at taps?	Every 3 months	Energy Coordinator	No	✓
Kitchen and canteen areas	- Are vending machines left on 24/7?	Weekly	Energy Coordinator	No	✓
	- Are dishwashers running on part-load?	Daily	Canteen staff	No	✓
	- Are there badly fitting door seals on fridges and freezers?	Every 6 months	Energy Coordinator	Yes	✓
Design and procurement	- Is energy use considered when designing new buildings and when procuring new equipment?	When required	Energy Coordinator	No	✓
Other					

Action 12 and 13 — these are completed by putting environmental awareness and training programmes in place. There are no workbook components to these steps.

# Step 6 - Review

## Performance comparison progress table

**ACTION 14**

Fill in the table below to compare and benchmark your performance.

This should be done on a continuous basis.

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
14/01/20	206kWh / m <sup>2</sup>	157kWh / m <sup>2</sup>		
16/03/20	213kWh / m <sup>2</sup>	168kWh / m <sup>2</sup>		
17/05/20	205kWh / m <sup>2</sup>	162kWh / m <sup>2</sup>		
16/07/20	200kWh / m <sup>2</sup>	154kWh / m <sup>2</sup>		
15/09/20	201kWh / m <sup>2</sup>	152kWh / m <sup>2</sup>		
17/11/20	205kWh / m <sup>2</sup>	155kWh / m <sup>2</sup>		

### Energy management diagnostic questionnaire

**ACTION 15** Complete review checklist below.

1. Have you filled in your company details?

Yes  No

2. Have you 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.*

3. Does your energy coordinator have your full support?

Yes  No

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

Yes  No

5. What projects have you carried out during this cycle of energy management?

*We have noticed a slight decrease in our heating and 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 noted in this sector we could continue with higher cost measures.*

*Some projects have not been carried out due to lack of maintenance staff throughout the year.*

6. How many targets have been identified in your energy action plan?

7

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

5

8. Have you started running an energy awareness campaign?

Yes  No

If yes, please detail

*We have noticed a slight decrease in our heating and Yes, we have used posters, stickers and meetings to increase awareness among staff.*

9. Have you noticed a change in staff attitude to energy?

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.*

10. Do you feel familiar with your company's energy bills?

Yes  No

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

Yes  No

12. How much energy have you saved?

*Electricity: we have reduced electricity usage by 29,399kWh according to our bill, which represents a saving of €3,637.86 or 9.5% on last year's bill. Gas: we have reduced gas usage by 26,916kWh according to our bill, which represents a saving of €1,182 or 10% on last year's bill.*

13. Have you considered entering the SEAI energy awards?

Yes  No

14. Have you investigated the range of grants that are available from SEAI?

Yes  No

*We are currently investigating the grants that are available from SEAI.*

### Future recommendations

**ACTION 16** Fill out future recommendations below.

Outline a list of suggestions as to how to improve on your energy management programme for next year:

*Need to get more staff involved in programme as currently too many tasks are falling on energy coordinator.*

*Awareness material needs to be updated more regularly to maintain momentum.*

*Maintenance staff need more direction and supervision to ensure activities on checklist are carried out.*

*Start to look at some of the investment opportunities.*



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