Basis of Reporting

2016

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Lost Time Injuries and Lost time injury frequency rate (LTIFR)

1. KPI Description

Lost time injury frequency rate (LTIFR) is an industry standard measure for tracking personal safety performance for serious injuries.

A lost time injury is defined as an incident arising out of Centrica's operations which leads to an injury, where the employee or contractor is not available to work for one day or more, excluding the day that the injury occurred.

2. Scope

	Included in scope	Excluded from scope
Geography	• Global	• N/A
Organisational	• All Centrica businesses	• N/A
Operational	• All directly controlled activities are included. This includes all activities undertaken by third parties where: ○ work activities are undertaken under a Centrica business brand ○ work performance is under the direct control of a Centrica businesses line management ○ Centrica owns or has the controlling interest in the premises/asset where the third party is working	• LTIs resulting from non-work related activities. • LTIs resulting from unavoidable injuries are not captured in this indicator. • Franchisee injuries are not recorded as work related except where work is undertaken under contract to Centrica by a Franchisee.

3. Calculation methodology

3.1 Unit of measure

Lost Time Injury: Number

LTIFR: Per 200,000 work hours

3.2 Calculation

No. of Lost Time Injuries (Agency)
No. of Lost Time Injuries (Contractor)
No. of Lost Time Injuries (Employee)

= **Number of Lost Time Injuries (Agency/Contractor/Employee)**

MyHSES constituent indicator filter criteria:

- Work Related=Yes,
- Workflow state=Any except 'Draft' or 'Deleted',
- Injury → Lost Time sub types that have Relationship to Centrica = 'Agency', 'Contractor', OR 'Employee'

Indicator counts the number of Lost Time sub types that meet these conditions.

$$\textbf{LTIFR} = \text{MAT}\left[\frac{\text{Number of lost time injuries x 200,000}}{\text{Hours worked}}\right]$$

3.3 Changes from previous years

The methodology for reporting lost time frequency rate has changed in two ways:

- Reporting period has changed from Year to Date (YTD) to Monthly Annual Total (MAT) – a rolling average over the previous 12 months.
- Lost Time Injury Frequency Rate calculated using 200,000 hours used as the basis of reporting (previously 100,000) to allow for easier industry sector benchmarking.

4 Data quality, collection and reporting frequency

4.1 Data Quality

All data is extracted from *myHSES*, validated and approved by the Business director.

Where actual worked hours are available these are used to calculate TRIFR, if actual work hours are not maintained, for example salaried personnel, the following calculation is used to estimate work hours across the group:

> *monthly average FTE (equivalent full time employees) x 8 hours x number of working days in the month (excluding weekends and national holidays*)
>
> *Note: for off-shore workers a 12 hour working day should be used for the days off-shore.*

It may generally be assumed that actual work hours are available for industrial personnel; hours for office based personnel are generally estimated (including agency workers). Contractor hours are provided by the contractor as agreed in the contract.

Any other work hour estimations must be submitted to Group HSES for approval before 1 December of the preceding recording year by the business HSE Director.

4.2 Data Collection and Reporting Frequency

As per HSES-STD-03

Recordable Injuries and Total Recordable Injury Frequency Rate (TRIFR)

1. KPI Description

Total recordable injury frequency rate (TRIFR) is an industry standard measure for tracking personal safety performance for serious injuries.

Recordable injuries include all work related injuries apart from first aid. This includes fatalities, lost time, restricted duty and medical treatment (Note: all needle stick and sharps injuries are recordable).

To avoid double counting of injury events, only the most severe outcome for an injury is reported in our statistics, for example if a lost time injury eventually results in a fatality, the injury severity is updated in the original event and consequently the lost days information ceases to be recorded. Likewise restricted/modified duty severity events that later result in lost time (and vice versa) will only be reported as lost time, however myHSES will maintain both lost time and restricted/modified duty lost days separately.

2. Scope

	Included in scope	Excluded from scope
Geography	• Global	• N/A
Organisational	• All Centrica businesses	• N/A
Operational	• All directly controlled activities are included. This includes all activities undertaken by third parties where: ○ work activities are undertaken under a Centrica business brand ○ work performance is under the direct control of a Centrica businesses line management ○ Centrica owns or has the controlling interest in the premises/asset where the third party is working	• Recordable injuries resulting from non-work related activities. • Recordable injuries resulting from unavoidable injuries are not captured in this indicator. • Franchisee injuries are not recorded as work related except where work is undertaken under contract to Centrica by a Franchisee.

Only first aid injuries described as below are excluded:

a) Using a non-prescription medication at nonprescription strength (for medications available in both prescription and non-prescription form, a recommendation by a physician or other licensed health care professional to use a non-prescription medication at prescription strength is considered medical treatment for recordkeeping purposes);

b) Administering tetanus immunizations (other immunizations, such as Hepatitis B vaccine or rabies vaccine, are considered medical treatment)
c) Cleaning, flushing or soaking wounds on the surface of the skin
d) Using wound coverings such as bandages, Band-Aids™, gauze pads, etc.; or using butterfly bandages or Steri-Strips™ (other wound closing devices such as sutures, staples, etc., are considered medical treatment)
e) Using hot or cold therapy
f) Using any non-rigid means of support, such as elastic bandages, wraps, non-rigid back belts, etc. (devices with rigid stays or other systems designed to immobilize parts of the body are considered medical treatment for recordkeeping purposes)
g) Using temporary immobilization devices while transporting an accident victim (*e.g.*, splints, slings, neck collars, back boards, etc.)
h) Drilling of a fingernail or toenail to relieve pressure, or draining fluid from a blister
i) Using eye patches
j) Removing foreign bodies from the eye using only irrigation or a cotton swab
k) Removing splinters or foreign material from areas other than the eye by irrigation, tweezers, cotton swabs or other simple means
l) Using finger guards
m) Using massages (physical therapy or chiropractic treatment are considered medical treatment for recordkeeping purposes)
n) Drinking fluids for relief of heat stress.

3. Calculation methodology

3.1 Unit of measure

Recordable Injuries: Number

TRIFR: Per 200,000 work hours

Constituent Indicators

Indicator	Definition
Fatalities	Any work related fatalities associated with our activities
LTI	A work related injury that results in 1 or more days away from work, excluding the day that the injury occurred.
Modified or Restricted Duty	The removal of one or more normal work duties by the company or a professional health practitioner as the direct result of an injury or illness for one or more days, excluding the day that the injury occurred.
Medical Treatment	The management and care of a patient to combat injury, disease or disorder by a professional health practitioner. Medical treatment does not include: a) Visits to a physician or other licensed health care professional solely for observation or counselling b) The conduct of diagnostic standards, such as x-rays and blood tests, including the administration of prescription medications used solely for diagnostic purposes (e.g.: eye drops to dilate pupils)

3.1 Calculation

No. Recordable Injuries (Agency) No. Recordable Injuries (Contractor) No. Recordable Injuries (Employee)	= **Number of Recordable Injuries (Agency/Contractor/Employee)**

MyHSES constituent indicator filter criteria:

- Work Related=Yes,
- Workflow state=Any except 'Draft' or 'Deleted',
- Injury → Sub types 'Fatalities', 'Lost Time', 'Modified/Restricted Duty' OR 'Medical Treatment'
- Relationship to Centrica = 'Agency', 'Contractor', OR 'Employee'

Indicator counts the number of Injury sub types that meet these conditions.

$$\textbf{TRIFR} = \frac{\text{MAT [Number of recordable injuries]} \times 200{,}000}{\text{MAT [Hours worked]}}$$

3.2 Changes from previous years

The methodology for reporting lost time frequency rate has changed in two ways:

- Reporting period has changed from Year to Date (YTD) to Monthly Annual Total (MAT) – a rolling average over the previous 12 months.
- Lost Time Injury Frequency Rate calculated using 200,000 hours used as the basis of reporting (previously 100,000) to allow for easier industry sector benchmarking.

4. Data quality, collection and reporting frequency

4.1 Data Quality

All data is extracted from *myHSES*, validated and approved by the Business director.

Where actual worked hours are available these are used to calculate TRIFR, if actual work hours are not maintained, for example salaried personnel, the following calculation is used to estimate work hours across the group:

> *monthly average FTE (equivalent full time employees) x 8 hours x number of working days in the month (excluding weekends and national holidays*)
>
> *Note: for off-shore workers a 12 hour working day should be used for the days off-shore.*

It may generally be assumed that actual work hours are available for industrial personnel; hours for office based personnel are generally estimated (including agency workers). Contractor hours are provided by the contractor as agreed in the contract.

Any other work hour estimations must be submitted to Group HSES for approval before 1 December of the preceding recording year by the business HSE Director.

4.2 Data Collection and Reporting Frequency

As per HSES-STD-03

Customer Injuries and Customer Injury Frequency Rate

1. KPI Description

This KPI captures all actual customer injuries as defined in the Centrica Standard HSES-03 section 8.6.4

2. Scope

	Included in Scope	Excluded from Scope
Geography	• Global	• N/A
Organisational	• Energy Supply and Services UK (ESS UK) • Energy Supply and Services Ireland (ESS I) • Energy Supply and Services North America (ESS NA) • Distributed Energy & Power (DE&P)	• Upstream businesses
Operational	• The domestic home owner/tenant and their direct family, or friends. • The commercial client and their employee or those conducting work for the client • Customer injuries occurring while an engineer is not present if an injury is the result of defective workmanship or supplies or parts being left in inappropriate places by Centrica engaged couriers.	• Does not include third parties such as postman or other trades or visitors or shoppers at the clients site • Indicator does not capture non-work related or unavoidable injuries.

3. Calculation methodology

3.1 Unit of measure

Customer Injuries: Number

Customer Injury Frequency Rate: Per 1,000,000 jobs

3.2 Calculation

Sum of all work related customer injuries (excluding severity level 1 and 2) (YTD)

Customer Injury Frequency Rate [MAT] = Number of customer injuries in last 12 months x 1,000,000

Number of customer jobs completed in last 12 months

MAT = Moving Annual Total

myHSES constituent indicator filter criteria:

- Work Related=Yes,
- Workflow state=Any except 'Draft' or 'Deleted',
- All Actual Severity events with a severity greater than zero.
- Avoidable
- Injury → all sub types recorded that have Relationship to Centrica = Customer

Indicator counts the number of injury sub types that meet these conditions.

3.3 Changes from previous years

Reporting period has changed from Year to Date (YTD) to Monthly Annual Total (MAT) – a rolling average over the previous 12 months.

4. Data quality, collection and reporting frequency

4.1 Data Quality

All data is extracted from *myHSES*, validated and approved by the Business director.

4.2 Data Collection and Reporting Frequency

As per HSES-STD-03

Tier 1 Process Safety Events

1. KPI description

Process safety is defined by the International Association of Oil & Gas Producers (IOGP) as: "*a disciplined framework for managing the integrity of operating systems and processes that handle hazardous substances. It relies on good design principles, engineering, operating and maintenance practices.*"

At Centrica the effectiveness of our process safety improvement programmes are tracked through both lagging and leading indicators. These lagging and leading indicators are based on American Petroleum Institute (API) Recommended Practice (RP) 754, Process Safety Performance Indicators for the Refining and Petrochemical Industries.

This Recommended Practice (RP) identifies leading and lagging process safety indicators that are useful for driving performance improvement. The indicators are divided into three tiers that represent a leading and lagging continuum. Tier 1 is the most lagging and Tier 3 is the most leading. Tiers 1 and 2 are suitable for public reporting and Tiers 3 is intended for internal use at individual sites.

2. Scope

	Included in scope	Excluded from scope
Geography	• UK • Ireland • Netherlands • Norway • Canada	• North America

Organisational	• Centrica's upstream businesses: Exploration & Production, Centrica Storage, Bord Gais (Whitegate power station) and Distributed Energy and Power.
	• All directly controlled activities are included. This includes all activities undertaken by third parties where:
	  ○ work activities are undertaken under a Centrica business brand
	  ○ work performance is under the direct control of a Centrica businesses line management
	  ○ Centrica owns or has the controlling interest in the premises/asset where the third party is working
		• Energy Marketing and Trading, Connected Homes, Direct Energy and British Gas

Drawing from the American Petroleum Institute's[1] (API) recommended practice a Tier 1 process safety event will include any:

[1] ANSI/API RECOMMENDED PRACTICE 754. FIRST EDITION, APRIL 2010

"unplanned or uncontrolled release of any material, including non-toxic and non-flammable materials (e.g. steam, hot condensate, nitrogen, compressed CO2 or compressed air), from a process that results in one or more of the consequences listed below:

- *an employee, contractor or subcontractor "days away from work" injury and/or fatality;*
- *a hospital admission and/or fatality of a third-party;*
- *an officially declared community evacuation or community shelter-in-place;*
- *a fire or explosion resulting in greater than or equal to $25,000 of direct cost to the Company;*
- *a pressure relief device (PRD) discharge to atmosphere whether directly or via a downstream destructive device that results in one or more of the following four consequences:*
    - *liquid carryover;*
    - *discharge to a potentially unsafe location;*
    - *an on-site shelter-in-place;*
    - *public protective measures (e.g. road closure);*
- *a PRD discharge quantity greater than the threshold quantities(see appendix 1) in any one-hour period;*
- *a release of material greater than the threshold quantities (see appendix 1)in any one-hour period"*

3. Calculation methodology

3.1 Unit of measure

Number

4. Data quality, collection and reporting frequency

4.1 Data quality

A Group Process Safety Event (PSE) review and assurance process exists in order to minimise the inaccuracies in the process safety event data that is recorded and reported in MyHSES, as far as is practicable. This is done to a level that allows stakeholders to assess Process Safety performance with reasonable confidence. In addition to this the review process will ensure that the Group Process Safety function holds an auditable record of all year to date PSE's.

4.2 Data Collection

The Process Safety Event Reporting Support Tool is used to assist those reporting an event to determine whether it is a process safety event, and if it is which tier it should be reported as under API RP 754.

The recording system for all source data is myHSES, our new global HSES data management system launched in September 2015. From 1st January 2016 myHSES has been used to systemise business level data validation and provide all HSES metrics and performance reports used within business units and at group level.

The basis of reporting is now aligned with industry best practice in order to ensure consistency and the ability to benchmark. To achieve this, the approach is now based on the American Petroleum Institute's (API) recommended practice (Process Safety Performance Indicators for the Refining and Petrochemical Industries, RP 754).

4.3 Reporting Frequency

During 2016 data has been reported monthly to Group HSES.

Tier 2 Process Safety Events

1. KPI description

Process safety is defined by the International Association of Oil & Gas Producers (IOGP) as: "*a disciplined framework for managing the integrity of operating systems and processes that handle hazardous substances. It relies on good design principles, engineering, operating and maintenance practices.*"

At Centrica the effectiveness of our process safety improvement programmes are tracked through both lagging and leading indicators. These lagging and leading indicators are based on American Petroleum Institute (API) Recommended Practice (RP) 754, Process Safety Performance Indicators for the Refining and Petrochemical Industries.

This Recommended Practice (RP) identifies leading and lagging process safety indicators that are useful for driving performance improvement. The indicators are divided into three tiers that represent a leading and lagging continuum. Tier 1 is the most lagging and Tier 3 is the most leading. Tiers 1 and 2 are suitable for public reporting and Tiers 3 is intended for internal use at individual sites.

2. Scope

	Included in scope	Excluded from scope
Geography	• UK • Ireland • Netherlands • Norway • Canada	• North America

Organisational	• Centrica's upstream businesses: Exploration & Production, Centrica Storage, Bord Gais (Whitegate Power Station) and Distributed Energy and Power.
	• All directly controlled activities are included. This includes all activities undertaken by third parties where:
	  ○ work activities are undertaken under a Centrica business brand
	  ○ work performance is under the direct control of a Centrica businesses line management
	  ○ Centrica owns or has the controlling interest in the premises/asset where the third party is working
		• Energy Marketing and Trading, Connected Homes, Direct Energy and British Gas

A Tier 2 Process Safety Event is a LOPC with lesser consequence. It is defined as:

An unplanned or uncontrolled release of any material, including non-toxic and non-flammable materials (e.g. steam, hot condensate, nitrogen, compressed CO_2 or compressed air), from a process that results in one or more of the consequences listed below and is not reported in Tier 1:

- An employee, contractor or subcontractor recordable injury;
- A fire or explosion resulting in greater than or equal to $2,500 (USD) of direct cost to the company;

- a pressure relief device (PRD) discharge to atmosphere whether directly or via a downstream destructive device that results in one or more of the following four consequences:
    1. Liquid carryover;
    2. Discharge to a potentially unsafe location (e.g. resulting in exposure to flammable or toxic mixtures or contact with an ignition source);
    3. An on-site shelter-in-place;
    4. Public protective measures (e.g. road closure);
- A PRD discharge quantity greater than the threshold quantity (see appendix 1) in any one-hour period; or
- A release of material greater than the threshold quantities (see appendix 1) in any one-hour period.

3. Calculation methodology

3.1 Unit of measure

Number

4. Data quality, collection and reporting frequency

4.1 Data quality

A Group Process Safety Event (PSE) review and assurance process exists in order to minimise the inaccuracies in the process safety event data that is recorded and reported in MyHSES, as far as is practicable. This is done to a level that allows stakeholders to assess Process Safety performance with reasonable confidence. In addition to this the review process will ensure that the Group Process Safety function holds an auditable record of all year to date PSE's.

4.2 Data Collection

The Process Safety Event Reporting Support Tool is used to assist those reporting an event to determine whether it is a process safety event, and if it is which tier it should be reported as under API RP 754.

The recording system for all source data is myHSES, our new global HSES data management system launched in September 2015. From 1st January 2016 myHSES has been used to systemise business level data validation and provide all HSES metrics and performance reports used within business units and at group level.

The basis of reporting is now aligned with industry best practice in order to ensure consistency and the ability to benchmark. To achieve this, the approach is now based on the American Petroleum Institute's (API) recommended practice (Process Safety Performance Indicators for the Refining and Petrochemical Industries, RP 754).

4.3 Reporting Frequency

During 2016 data has been reported monthly to Group HSES.

Tier 1 and Tier 2 Process Safety Event Frequency Rate

1. KPI Description

This indicator captures the frequency of Tier 1 and Tier 2 process safety events, which are events resulting in the unplanned or uncontrolled release of any material, including non-toxic and non-flammable materials (e.g. steam, hot condensate, nitrogen, compressed CO_2 or compressed air), from a process that results in one or more of the consequences listed in the scope.

2. Scope

	Included in scope	Excluded from scope
Geography	• UK • Ireland • Netherlands • Norway • Canada	• North America
Organisational	• Centrica's upstream businesses: Exploration & Production, Centrica Storage, Bord Gais (Whitegate Power station) and Distributed Energy and Power. • All directly controlled activities are included. This includes all activities undertaken by third parties where: o work activities are undertaken under a Centrica brand o work performance is under the direct control of a Centrica line management o Centrica owns or has the controlling interest in the premises/asset where the third party is working	• Energy Marketing and Trading, Connected Homes, Direct Energy and British Gas
Tier 1	• An employee, contractor or subcontractor fatality and/or lost time injury; • A hospital admission and/or fatality of a third-party; • An officially declared community evacuation or community shelter-in-place; • A fire or explosion resulting in greater than or equal to $25,000 (USD) of direct cost to the Company; • A pressure relief device (PRD) discharge to atmosphere whether directly or via a downstream destructive device that results in one or more of the following four consequences: - Liquid carryover; - Discharge to a potentially unsafe location (e.g. resulting in exposure to flammable or toxic mixtures or contact with an	

	ignition source); - An on-site shelter-in-place; - Public protective measures (e.g. road closure); • A PRD discharge quantity greater than the threshold quantities shown in appendix 1 in any one-hour period; • A release of flammable gas or liquid that exceeds the threshold quantities described in appendix 1 in any one-hour period.
Tier 2	• An employee, contractor or subcontractor recordable injury; • A fire or explosion resulting in greater than or equal to $2,500 (USD) of direct cost to the company; • a pressure relief device (PRD) discharge to atmosphere whether directly or via a downstream destructive device that results in one or more of the following four consequences: - Liquid carryover; - Discharge to a potentially unsafe location (e.g. resulting in exposure to flammable or toxic mixtures or contact with an ignition source); - An on-site shelter-in-place; - Public protective measures (e.g. road closure); • A PRD discharge quantity greater than the threshold quantity shown in appendix 2 in any one-hour period • A release of material greater than the threshold quantities described in appendix 2 in any one-hour period.

3. Calculation Methodology

3.1 Unit of measure

Number per operational hours

3.2 Calculation

$$\text{Tier 1 \& 2 PSI Frequency Rate} = \frac{\text{MAT[No.of Tier 1 \& Tier 2 Process Safety Events]} \times 200{,}000}{\text{MAT[Process Safety Total Hours Worked]}}$$

4.3 Changes from previous years

Reporting period has changed from Year to Date (YTD) to Monthly Annual Total (MAT) – a rolling average over the previous 12 months.

4. Data quality, collection and reporting frequency

4.1 Data quality

A Group Process Safety Event (PSE) review and assurance process exists in order to minimise the inaccuracies in the process safety event data that is recorded and reported in MyHSES, as far as is practicable. This is done to a level that allows stakeholders to assess Process Safety performance with reasonable confidence. In addition to this, the review process will ensure that the Group Process Safety function holds an auditable record of all year to date PSE's.

4.2 Data Collection

All relevant data is collected and reported as required to be in line with HSES-STD-03. The Process Safety Event Reporting Support Tool is used to assist those reporting an event to determine whether it is a process safety event, and if it is which tier it should be reported as under API RP 754. Process Safety hours worked are manually submitted to Group from tagged process safety assets.

4.3 Reporting Frequency

Data is reported monthly to Group HSES by each business unit.

Fatalities

1. KPI Description

This indicator measures any work related fatalities associated with our activities.

2. Scope

	Included in scope	Excluded from scope
Geography	• Global	• N/A
Organisational	• All Centrica businesses	• N/A
Operational	• All directly controlled activities are included. This includes all activities undertaken by third parties where: ○ work activities are undertaken under a Centrica business brand ○ work performance is under the direct control of a Centrica businesses line management ○ Centrica owns or has the controlling interest in the premises/asset where the third party is working	• Fatalities of members of the public resulting from our activities are also reported, but these are not included in the total fatalities figure. • Franchisees?

3. Calculation methodology

3.1 Unit of measure

Number of people

MyHSES constituent indicator filter criteria:

- Work Related=Yes,
- Workflow state=Any except 'Draft' or 'Deleted',
- Injury Event Type = ‘Fatality’
- Relationship to Centrica in Injury section = ‘Agency’, ‘Contractor’ OR ‘Employee’

Indicator counts the number of injury sub types that meet these conditions.

4. Data quality, collection and reporting frequency

4.1 Data Quality

As per HSES-STD-03

4.2 Data Collection

Data is collected from each business upon occurrence.

4.3 Reporting Frequency

Our reporting standard requires any fatality to be reported to the Chief Executive immediately (as soon as possible following the incident).
The KPI is reported monthly.

UK (British Gas) net promoter score (NPS)

1. KPI Description

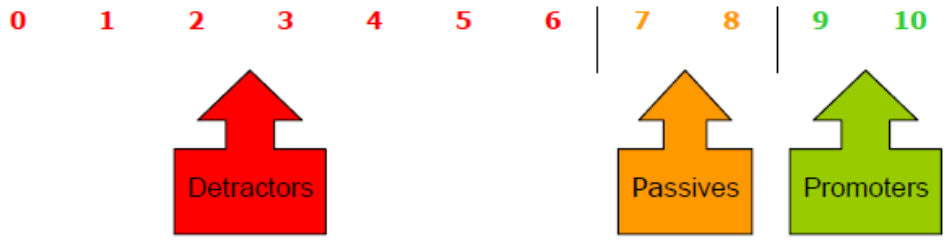
NPS is a measure of customer advocacy and has been shown to be linked to company growth. It uses a scale of 0 to 10, to measure how much a customer would recommend a company. British Gas has three distinct measures of NPS, one is based on a combination of **Contact/Brand NPS (British Gas NPS)**, starting in 2015 we added a **Journey NPS based score (British Gas JNPS)** and starting in 2016 we added a new **Brand NPS score (one score for UK Home & Ireland, and one score for UK Business)**.

2. Calculation methodology

2.1 Unit of measure

NPS is calculated by categorising customers into three groups based on how they answer the question: *How likely is it you would recommend British Gas?*

On a scale of 0-10 with 0 being Definitely Not Recommend and 10 being Definitely Recommend, how likely is it that you would recommend British Gas?



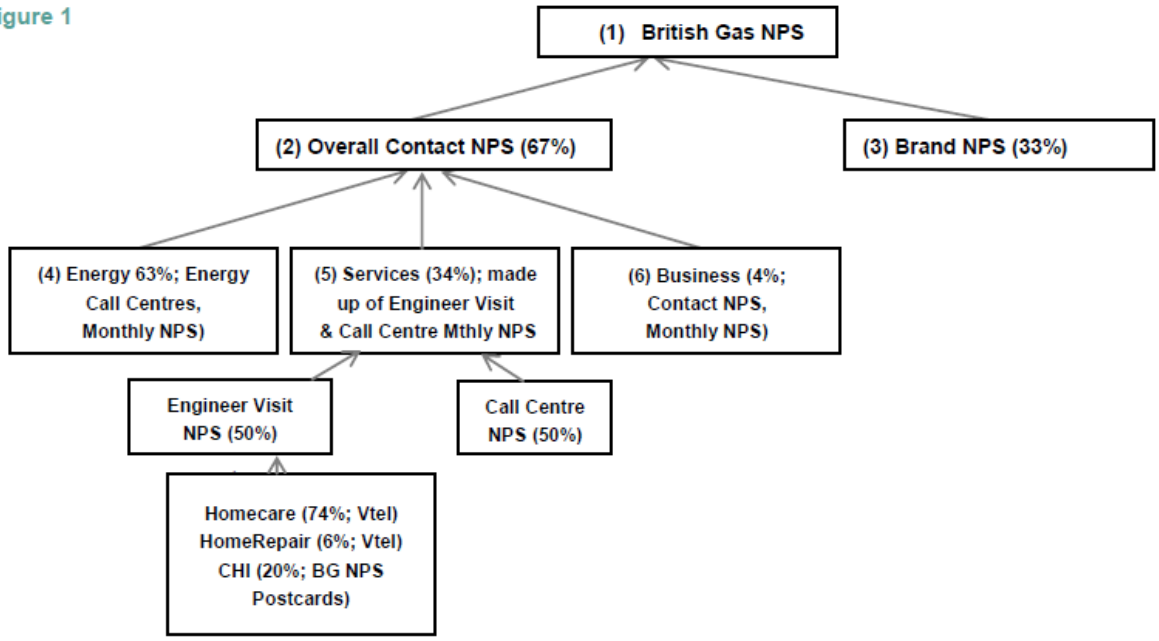
NPS = % Promoters - % Detractors

British Gas NPS

3. Scope

British Gas NPS measure is a composite metric combining NPS scores for UK Home Energy, UK Home Services and UK Business divisions. There are multiple NPS metrics from multiple separate survey sources that go into making up this composite score (outlined below – Figure 1), using the weightings shown.

Figure 1



The **Contact NPS** measures customer advocacy soon after an interaction (call centre or engineer visit). **Brand NPS** measures customer advocacy among all Residential customers, including customers with no recent interaction with the business.

Table A - Outlines type of measurement used

Metric	Measurement Type	Composition/Inputs
(1) British Gas NPS	Blend of Contact and Brand NPS	British Gas Contact NPS (67%) + British Gas Brand NPS (33%)
(2) UK Home Contact NPS	Blend of UK Home Energy, UK Home Services, UK Business NPS	UK Home Energy NPS (63%) + UK Home Services NPS (34%) + UK Business NPS (4%), each of these scores are in themselves derived from scores based on multiple surveys.
(3) British Gas Brand NPS	Brand	NPS calculated from one survey which is representative of residential customers. End of year score is based on monthly weighted 12 week score up to December 2016. This is to ensure robustness and eliminate any spikes in monthly survey data.
(4) UK Home Energy NPS	Contact	BGRE Customer Services NPS End of year score is based on the survey data for the 12 months from January to December 2016. No weightings are applied.
(5) UK Home Services NPS	Contact	Composite of 50% Engineer visits, and 50% Call Centre. HomeCare 74% (Of which, Central Heating is 84%, Electrical services 7% and P&D 9%); Central Heating Installation 20%, and Home Repair 6% (Of

	which Central Heating is 33% and P&D 67%) HomeCare, CHI and Home Repair weighting based on allocated cost in 2016 operating Plan. Components within HomeCare and HomeRepair weighted based on jobs in 2016 operating plan For Call Centre: Includes all calls in to British Gas Services call centres; no weighting within this category End of year score is based on an average of the 12 monthly weighted scores (from January to December 2016)
(6) UK Business Contact NPS	NPS score is based on result of eDR surveys sent to a randomised selection of customers who have had a query closed in SAP or a quote generated via Inbox Management. As of 1st October 2015 various areas were moved from Services to BGEE (Affordable Warmth, NEST etc.) following reorganisation of the UK B function, from this period of time no weighting were applied to the UK B score

4. Calculation methodology

For all business areas within the contact measurement types, the NPS is calculated monthly by calculating the percentage of promoters for that month, the percentage of detractors for the month and subtracting detractors from promoters.

Brand NPS

The Brand NPS survey provides a monthly NPS score for the British Gas residential customer base. The study is designed to ensure that the results are representative of residential customers and as such are weighted based on customer life stage (Young Sharers/Couples/Singles, Families, Empty Nesters/Active Retired, and Elderly), product holding (Energy or Services).

The monthly total completed surveys among British Gas residential customers are ~1,200 (3 month average based on ~3,600). Year end is 12 week period to December 2016.

British Gas Residential NPS

The overall British Gas Residential (BGRE) NPS score is derived from a contact survey covering customer service calls. No weighting is applied and the 2016 NPS is calculated from the arithmetical sums of the promoter responses and detractor responses for the year. The number completed surveys YTD is 523K).

British Gas Services NPS

The British Gas Services (BGS) NPS score is created by first calculating NPS for each of the business areas (HomeCare, Home Repair and Central Heating Installations). Then, an overall weighted average is calculated with weights reflecting 2016 allocated cost in Operating Plan. There are 600.2k completed surveys in the 12 months to 31 Oct 2106 .The year-end score is YTD at December 2016.

British Gas Business Transactional NPS

NPS is based on e-Digital surveys. Survey invites are sent following the closure of a query in SAP and a quote generated via Inbox Management. The end of year score is based data for December only. The overall UKB NPS score is non-weighted

British Gas Contact NPS

The British Gas Contact NPS is calculated by combining British Gas Residential, British Gas Services and British Gas Business NPS scores using the weighting outlined in Figure 1.

5. Data quality, collection and reporting frequency

British Gas Residential Energy NPS

The BGRE Customer Service NPS survey uses an automated Interactive Voice Response methodology. Respondents are called back within an hour of their conversation with a contact centre agent. Some respondents are screened out by the system, for example if they have recently filled in a survey, otherwise all are dialled. The contact centre agent does not select the calls that will get the survey. This methodology was introduced at the beginning of 2013.

British Gas Residential reporting is available on a weekly basis; the monthly scores are calculated from the summation of the weekly data**.**

British Gas Services NPS

CHI customers are surveyed by post, administered internally by British Gas. Each week each business area pulls together a list of all customers who have had an engineer visit in the prior week. All of these customers are sent a paper survey. Completed surveys sent back by customers are analysed by British Gas and NPS scores created.

HomeCare and Home Repair customers are surveyed by an outbound automated phone survey. Each day a dialler file is created for all customers who have had an Engineer visit in the previous day. The file is uploaded to internally hosted secure site, and customers are called automatically and invited to participate in the survey.

The BG Management Information (MI) analysts process the raw survey data and calculate the monthly NPS figure. All MI reports are published on the MI portal. British Gas Services reporting is published weekly and monthly.

British Gas Business NPS

Data is gathered in real time on eDR systems. These systems can be accessed at anytime to gain up to date scores. As there is now no weighting on BGB scores Monthly scores can be obtained immediately after month end.

British Gas Residential (BGR) Brand NPS

Interviews are conducted online via an external research agency. Interview quotas are set on product holding, fuel mix, and customer life-stage. Corrective weights are added to the final data to ensure the data represents the customer base.

Fieldwork takes place on a daily basis. Approx 1,200 interviews with British Gas residential customers are completed monthly. The external agency recruits customers from a third party online panel(s), while surveying them and collating the resulting data using their CAWI (Computer-Assisted Web Interviewing) tool, Askia Vista.

Customers surveyed in the last month for any British Gas survey are excluded from the sample, as are customers who have completed the Brand NPS survey itself within the last six months.

The Brand NPS figure is published to the business monthly. In addition, interviews are also conducted among customers of 15 competitor brands across the Energy and Home Services Market. Approx 1,300 competitor interviews are completed via the brand survey every month in order to give the business an understanding of their relative position in the market. However these interviews are separate from the British Gas customer interviews and have no impact on the British Gas Brand NPS score.

British Gas Journey NPS

6. Scope

British Gas JNPS combines scores across Residential Energy, Residential Services and Business divisions. The metrics are derived from surveys designed to measure the customer experience at the end of key customer journeys. In December 2015, we were using the weightings shown in Figure 2. Between December 2015 and December 2016 our weighting scheme changed, because of the addition of some new journeys to our UK Home survey. So, at the end of 2016, we were using the weightings shown in Figure 3. To account for this, in our external reporting we have back-dated and re-stated the previously reported December 2015 JNPS score, to enable a like for like comparison with 2016 performance.

Figure 2

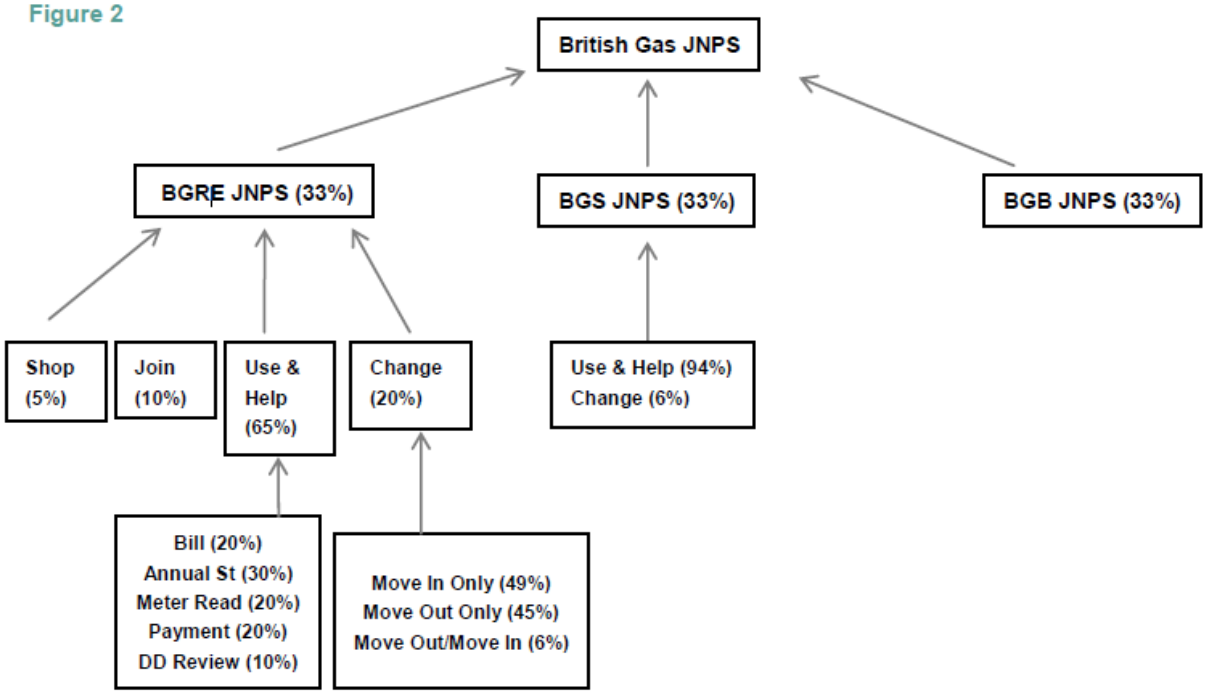
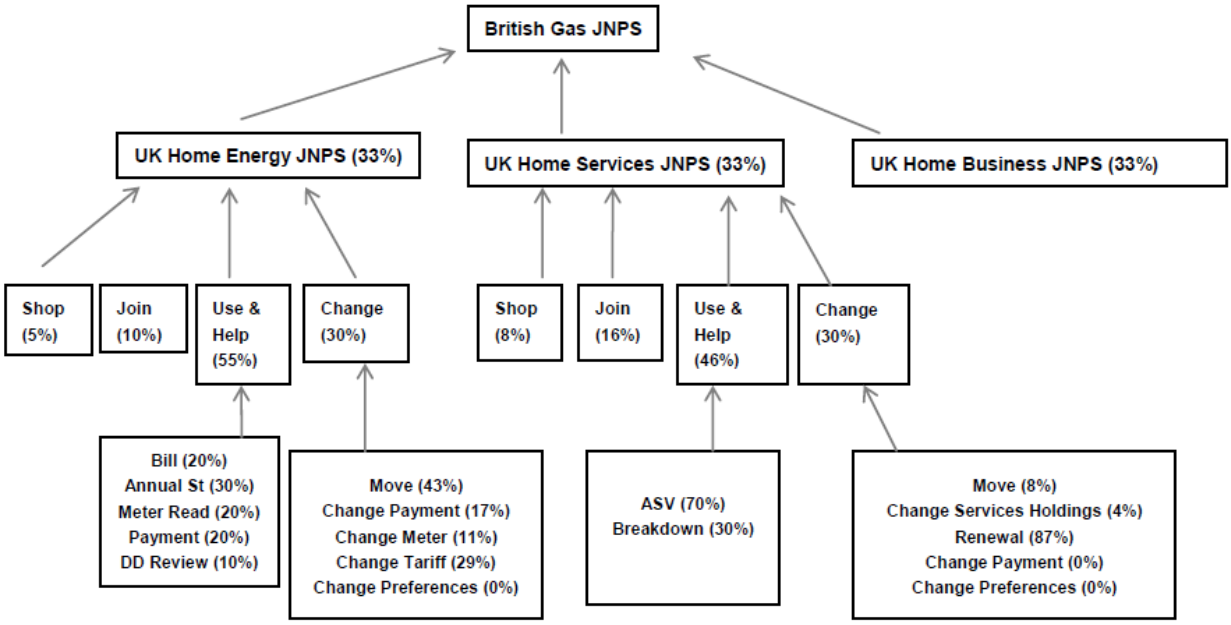


Figure 3



*N.B. 'UK H Services JNPS – Change' weightings do total 100% (it appears to be 99% here due to rounding. To 1 d.p. Move = 8.4%, Holdings = 4.2%, Renewal = 87.4%).

6.1 Types of measurement

The British Gas JNPS is made up of NPS scores obtained from customers after they have reached the end of key customer journeys. This allows us to measure the impact of the entire experience.

Table B – Outlines types of measurement used

Metric	Measurement Type	Composition/Inputs
(1) British Gas JNPS	Weighted average of 3 scores	UK Home Energy JNPS (33%), UK Home Services JNPS (33%), UK Business JNPS (33%)
(2) UK Home Energy NPS	Weighted average of scores across 4 journeys	Shop (5%), Join (10%), Use and Help (55%), Change (30%). Weights based on volume of customers going through each journey. Use & Help and Change (HMV) based on weighted average of sub-journeys. Weights based on volume of customers going through each sub-journey.
(3) UK Home Services JNPS	Weighted average of scores across 4 journeys	Use and Help (46%), Change (30%), Join (16%), Shop (8%) Weights based on volume of customers going through each journey.
(4) UK Business JNPS	-	There is no current weighting in place

7. Calculation methodology

For all UK Home JNPS scores, the metric is reported monthly and it is a rolling 3 month score. It is the percentage of promoters for the most recent 3 months, the percentage of detractors for the most recent

three months and subtracting detractors from promoters. UK Home Journey NPS metrics capture the customer experience at the end of key journeys. The target score is based on performance in December.

For all UK Business JNPS scores, the metric is reported monthly and it is the calendar month score as agreed between Mark Hodges and Gab Barbaro. The metric is captured as a query is closed in SAP or a quote generated in Inbox Management. The target score is based on performance in December.

8. Data quality, collection and reporting frequency

British Gas UK Home Energy and Services JNPS Surveys

For all of the residential energy surveys, data collection is carried out by agency partner eDR; customers are invited via email to participate in an online survey. Data collection is continuous throughout the month; results are available immediately via an online portal called HUB to which key internal users have access.

Customers are triggered to receive an invite based on having reached the end of the particular journey. Rules are in place to ensure customers do not receive duplicate invites if they are in more than one journey, and also to ensure that 90 days must have elapsed before being invited to participate in a JNPS survey again. The volumes of surveys vary widely per month depending on the journey.

UK Business JNPS Surveys

Data collection is carried out by agency partner eDR; customers are invited via email to participate in an online survey. Customers are triggered for the survey based on a query closed in SAP and a quote generated via Inbox Management.

North America (Direct Energy) net promoter score (NPS)

North America Home NPS and Direct Energy Touch Point NPS

1. Description

Net Promoter Score (NPS) is a widely employed measure of customer advocacy. Across many industries, NPS performance has been shown to be linked to company growth as it serves to measure customer goodwill in terms of social advocacy and purchase behaviours. NPS is measured on a scale of 0 to 10 where responses indicate likelihood that the customer would recommend use or purchase from a company.

North America Home (DE NAH) measures NPS performance across the Residential Energy and Services business units for brand tracking and operational uses as described in this document. NAH adopted new standards for reporting brand NPS in 2016 in conjunction with the formation of the NAH organization as well as to align with overall Centrica group common operating model practices.

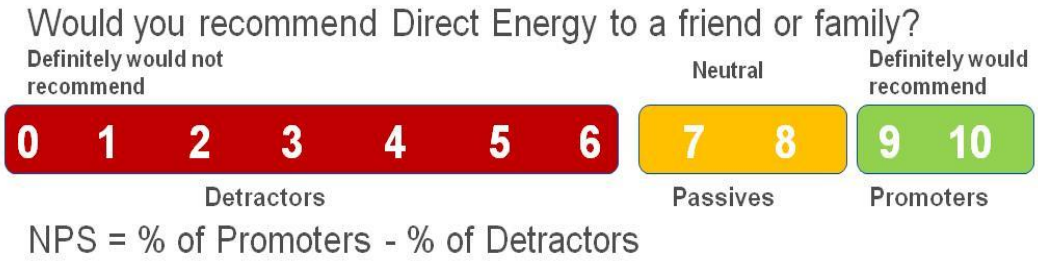
2. Calculation Methodology

2.1 Unit of Measure

NPS is calculated by categorizing customer responses into three groups based on how they answer the question: *How likely are you to recommend {Brand Name} to friends or colleagues?*

Customers rate their likelihood to recommend on a scale of 0 to 10, with zero being 'definitely would not recommend' and 10 being 'definitely would recommend'. As depicted in the image below, customers are grouped three ways based on how they rate their likelihood to recommend:

- 0 to 6 categorized as "detractors"
- 7 or 8 categorized as "passive"
- 9 or 10 categorized as "promoters"



2.2 Types of Measurement

North America Home (NAH) Net Promoter Score measures are managed under two distinct programs each with a unique design focus and business purpose.

- Brand NPS (formerly Relationship NPS)
- Touch Point NPS (formerly Moment of Truth NPS for Services or Contact NPS for Energy)

Brand NPS

Brand NPS measures advocacy for a representative sample of current customers at a non-specific point in the customer lifecycle. Brand NPS depicts general customer sentiment and is primarily utilized for top line brand tracking and overall business performance trending.

As of 2016, Brand NPS is measured for both Energy and Home Services lines of business. Energy and Home Services measures are also combined on a customer holdings basis to generate an overall NA Home Brand NPS score.

Brand NPS has been measured for DER Residential Energy dating back to 2004. The Brand NPS measure was newly introduced for both Home Services and NA Home in 2016 in conjunction with the creation of the NA Home organization and to align with Centrica group standards for NPS performance measurement.

NA Home Services began measuring brand performance in April 2016. NA Home Overall Brand NPS was first reporting in July 2016.

Touch Point

Touch Point NPS measures customer advocacy in the context of a specific point of company interaction with the customer. This metric, also characterized as a moment of truth score, is primarily applicable for operational uses including performance management, transactional customer satisfaction and associated issue identification and resolution.

Touch Point NPS is measured for both Energy and Home Services lines of business.

Touch Point NPS management was broadly re-implemented for the US Residential Energy line of business in 2016.

3. Scope

The NA Home NPS metric measures customers across each operating unit and region. Table A outlines the scope of the metric and indicates the type of measurement used.

Table A – Brand NPS Scope Metrics and Type of Measurement Used

Line of Business	Measurement	Method	Region(s)	Brands/Markets
DER - Residential Energy (Contributes 75% weighting to NAH Brand NPS)	**Brand NPS** (formerly Relationship)	CATI Voice Interview	• Texas • US North • Canada	• Texas (Direct Energy, First Choice Power, Bounce Energy, CPL Retail Energy, WTU Retail Energy excluding Prepaid services.) • Canada (Direct Energy brand, Alberta competitive only) • USN (Direct Energy brand in CT, DC, DE, IL, IN, MA, MD, MI, NJ, NY, OH, PA). Gateway brand in DC, MD, NY, NJ, PA, VA. NYSEG Solutions brand in NY was migrated into DE brand between June – August 2016.
DES –	**Brand NPS**	Online	All	• Airtron

Residential Home Services (Contributes 25% weighting to NAH Brand NPS)	(formerly Relationship)	Survey via email		• Direct Energy Alberta • Clockwork brands • (One Hour Heating and Air, Benjamin Franklin Plumbing, and Mister Sparky Electric) • Direct Energy Protection Plans (DEPP) Serviced by Clockwork Brands • Direct Energy Solar • Home Warranty of America (HWA)
DER – Residential Energy	**Touch Point NPS** (formerly MOT)	Online Survey via email	US Inbound Customer Care	• Texas (Direct Energy, First Choice Power, Bounce Energy, CPL Retail Energy, WTU Retail Energy, First Choice Power Power-to-Go, Direct Energy Power-to-Go, CPL Prepaid) • USN (Direct Energy brand in CT, DC, DE, IL, IN, MA, MD, MI, NJ, NY, OH, PA. Gateway brand in DC, MD, NY, NJ, PA, VA. NYSEG Solutions)
DES – Residential Home Services	**Touch Point NPS** (formerly MOT)	Online Survey via email Print Mailer	All	• Direct Energy Services Alberta • Airtron • Clockwork brands (One Hour Heating and Air, Benjamin Franklin Plumbing, and Mister Sparky Electric) • Home Warranty of America (HWA) • Direct Energy Protection Plans (DEPP) Serviced by Clockwork Brands • Direct Energy Solar 2016 Baseline Reporting: • American Water Heater Rentals (AWHR) Direct Energy Protection Plans (DEPP) Serviced by Third Party Contractors

4. Calculation Methodology

4.1 Brand NPS

A Brand NPS score is calculated by each line of business. 1) Calculations for DER Brand NPS are first conducted on a regional basis to show a NPS regional score, and then combined with other regions using weightings based on customer count to produce a line of business NPS score. 2) DES Brand NPS scores are calculated at the Organization level and are then combined on a customer weighted basis to generate an overall DES score. 3) NA Home Brand NPS combines the monthly score for Energy and Services on a customer holdings basis to generate an overall NAH Brand NPS score.

4.2 Touch Point NPS

DES Touch Point NPS scores are calculated for each of six primary lines of business. These scores are then combined on an established customer holdings basis to generate a weighted NPS measure for the overarching DES organization.

DER Touch Point NPS scores are calculated for each region, Texas and US North, and overall on a pure response basis.

4.3 Reported Measures

Various NPS metrics are reported monthly for each programme (see Table B). Each NPS score is calculated by adding all the promoters, divided by the total sample for the period, and adding all the detractors, divided by the total sample for the same period. A score is produced by subtracting the resulting percentage of detractors from the percentage of promoters and multiplying by 100.

Monthly NPS is calculated as percentage of promoters less the percentage of detractors in the monthly period**.**

Six Month Weighted Average NPS is calculated as a weighted average of the monthly NPS scores earned over the six month period based on monthly sample size.

Rolling-12 Month NPS is calculated as percentage of promoters less the percentage of detractors in the rolling 12-month period.

Year to Date NPS is calculated as percentage of promoters less the percentage of detractors in the year to date period.

The full NA Home NPS score is calculated by multiplying each business units NPS score for the monthly period against a previously determined weighting based on customer holdings and adding the totals together. The formula below shows the calculation:

NA Home Brand NPS = (Residential Energy NPS x 74.89%) + (Residential Services Brand NPS x 25.11%)

NA Home Brand Sample size equals the sum of the completed NPS responses applicable to Residential Energy and Residential Services Brand NPS programs in the period.

Table B – NPS Reported by Programme

NPS metrics reported by programme	Monthly NPS	Six-Month Weighted Average NPS	Rolling-12 Month NPS	Year to Date NPS
Residential Energy Brand NPS	●	●	●	●
Residential Home Services Brand NPS	●	●	●	●
NA Home Brand NPS	●	●		
Residential Energy Touch Point	●			●
Residential Home Services Touch Point	●		●	●

5. Data collection and reporting frequency

5.1 Data Collection – Residential Energy Brand NPS

For 2016, the Energy Brand NPS metric was collected via CATI Voice Interview surveys conducted by a third party research agency, Telesight. Measurement campaigns are conducted monthly via an established questionnaire.

DE provides the agency with a full sample of qualifying DE customer records. The agency then randomly selects records to survey until a target quota of surveys has been completed. Data management aligns to industry best practices with the research agency performing all necessary data hygiene and list management rules, for example ensuring no duplications exist. The agency collates interview responses and provides summary scoring and raw data to the respective Direct Energy team who verifies the calculations for final NPS scores. NPS scores exclude "don't know" responses and are cleansed of any errors should they exist.

Survey participants are screened for eligibility on the basis of being a current customer and not an employee of the company. As a best practice, the NPS question is the first question presented in the survey interview. Participants are selected as a random sample of current customers comprising a representative overall brand population by region and commodity, where applicable. Surveys are conducted for all brands and markets serviced by residential energy operating unit excluding prepaid lines of business.

Participants are selected as a random sample of customers where service has been on-flow for greater than three months. A customer may be invited to participate in the Brand study only once in six months where a score has not been submitted in the prior 12 months.

5.2 Data Collection – Residential Home Services Brand NPS

Residential Home Services Brand NPS is collected via online surveys presented by email invitations. All DES Brand surveys are conducted by a third party research agency, VirtuaTel. Measurement campaigns are conducted monthly via a limited NPS questionnaire.

DE provides the agency with a full sample of qualifying DES customer records. The agency then issues NPS survey invitations for all eligible customers included in the sample file. Data management aligns to industry best practices with the research agency performing all necessary data hygiene and list management rules, for example ensuring no duplications exist. Survey response data is available via the agency hosted reporting portal. The responsible Direct Energy team retrieves response data from the agency portal and completes all necessary calculations to generate final NPS scores. NPS scores exclude any records where NPS score does not exist or brand data is not defined.

Participants are selected as a random sample of customers having eligible service visits or product relationships in the preceding 12-month period. A customer may be invited to participate in a Brand study only once in six months where a score has not been submitted in the prior 12 months.

5.3 Data Collection – Touch Point Home Services NPS

Direct Energy Home Services Alberta

Alberta Canada data is collected through the daily execution of email NPS surveys the day following the MOT customer interaction. All eligible customers (not on Do Not Contact list) with an email address are surveyed. The email vendor, Relation 1, delivers daily response files to Direct Energy. The survey execution files and the response files are loaded daily to database tables.

Clockwork and Airtron Services

Clockwork and Airtron customers are managed similarly to Alberta with the exception that only mail surveys are conducted for Airtron with 25% sampling of Service and 100% sampling of install. For Clockwork, majority of surveys are conducted for all service and install jobs when the customer's email is available; mail surveys are executed only for the install customers who do not have an email address. For Clockwork, email surveys are processed by a marketing research agency, Relation 1. For both Clockwork and Airtron, printed surveys are generated and processed by a print vendor, RR Donnelly. The survey execution files and the response files are loaded daily to database tables.

Home Warranty of America (HWA)

For HWA an email survey is sent to every homeowner who had a claim in which a vendor (contractor) was assigned. The data is collected, and results of those surveys are stored in database tables. Every Monday an automated job queries the above referenced tables, and sends an encrypted NPS file to the Customer Insights and Analytics team.

Direct Energy Solar

Each Direct Energy Solar customer is invited to participate in a Touch Point satisfaction survey at the point their new solar installation is connected to the energy grid, thus marking a completed installation. Surveys invitations are presented via email generated directly from DE Solar Salesforce CRM and Marketo email solution. Survey results are stored in company tables and queried by DE Solar personnel. NPS scores are calculated and conveyed to responsible Direct Energy team members for inclusion in company NPS reporting.

Direct Energy Protection Plan (DEPP)

Direct Energy Protection Plan (DEPP) customer surveys are conducted based on whether services were performed by Clockwork branded technicians or third party contracts. In each case surveys are delivered via email and are conducted online.

In the case of Clockwork services, surveys reflect the Clockwork Brand (OH, MS, BF) who serviced their appointment. Surveys invitations are generated by a marketing research agency, Relation 1, who provides a response file daily to Direct Energy that is loaded to NPS database tables.

DEPP customers not serviced by a Clockwork brand contractor are invited to participate in a DEPP branded survey. These email survey invitations are generated internally by DE via batch processes managed in the Buffalo Grove operations site. The survey execution files and the response files are loaded daily to database tables.

Table C – DES Touch Point NPS Survey Methods by LOB and Survey Management Group

Line of Business	Method	Brands/Markets
DE Home Services Alberta	Email	Relation1
Airtron	Print Mail	RR Donnelly
Clockwork	Email/Print Mail	Relation 1/RR Donnelly
DE Protection Plan (DEPP) • Serviced by CW • Service by 3rd Party	Email	• Relation1 • DE Internal
DE Solar	Email	DE Internal
Home Warranty of America (HWA)	Email	DE Internal

5.4 Data Collection – Residential Energy Touch Point NPS

US Residential Energy customers may receive invitation to complete a Touch Point survey following contact with the customer care centre. Records are selected based on a qualifying agent disposition placed on the account during the service interaction and where a valid email address exists on the account and the customer has not opted-out of email communication.

Survey sample files are generated daily by DE via automated batch processing and are submitted to the survey vendor, VirtuaTel for invitation processing. Data management aligns to industry best practices with the research agency performing all necessary data hygiene and list management rules, for example ensuring no duplications exist.

A single email invitation may be sent to a customer daily based on a qualifying interaction. Surveys invitations are controlled by customer email address to ensure a single customer does not receive multiple surveys associated to unique accounts or multiple contacts.

The Touch Point survey consists of various satisfaction and diagnostic questions applicable to the customer service experience including the NPS question in standardized format. Completed survey responses are captured in real time and response data is posted to an online reporting portal offered by the solution provider, Virtuatel.

Performance reporting is generated within the hosted reporting portal utilizing standard NPS calculation methodology.

5.5 Survey vendor support organisations

Table D – DES Touch Point NPS Survey Methods by Line of Business (LOB) and Survey Management Group

Vendor	LOB Supported	Function
Telesight	NAH Energy Brand (DER)	CATI Voice Interview
VirtuaTel	NAH Home Services Brand (DES) NAH Energy Touch Point (DER)	Email
Relation1	NAH Home Services Touch Point (DES)	Email
RR Donnelly	NAH Home Services Touch Point (DES)	Print Mail

5.5 Reporting Timelines

Brand NPS reporting standards were aligned across the Centrica group in 2016 following a Q1 working group summit and common operating group board approvals.

As of July 2016 NA Home NPS is reported on a six-month weighted average basis. NAH Monthly NPS is based upon underlying monthly Residential Energy and Residential Services performance measures.

NAH NPS was first reported in July 2016 for the period January to June 2016. Initial reporting of the NAH measure was based on six months of Energy NPS performance history (Jan – Jun) and the available three months of Services NPS performance (Apr - Jun) given the DES measure was not in place prior to April.

The metric is reported monthly to management, corporate affairs and back to each business. The NA Home NPS figure is new in 2016 and is not currently managed against an established target.

North America (Direct Energy) net promoter score (NPS)

North America Business NPS

1. Description

NPS is a measure of customer advocacy and has been shown to be linked to company growth. It uses a scale of 0 to 10, to measure how much a customer would recommend a company.

North America Business (DE NAB) measures NPS performance across its Commercial & Industrial (C&I) and Small Business (SB) customers in all markets within the United States.

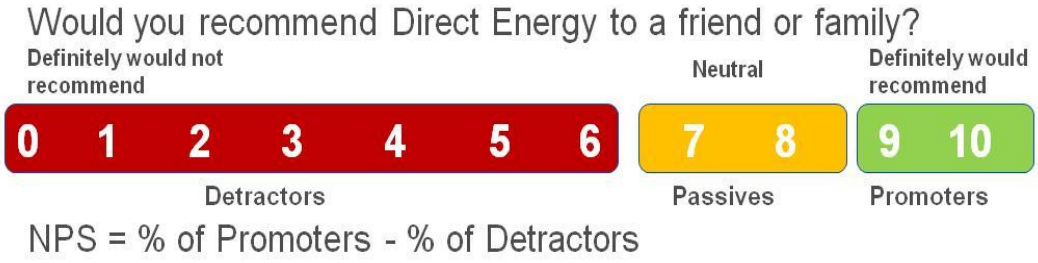
2. Calculation Methodology

2.1 Unit of Measure

NPS is calculated by categorizing our customers into three groups based on how they answer the question: How likely are you to recommend {Brand Name} to friends or colleagues?

Customers rate their likelihood to recommend on a scale of 0 to 10, with zero being 'definitely would not recommend' and 10 being 'definitely would recommend'. As depicted in the image below, customers are grouped three ways based on how they rate their likelihood to recommend:

- 0 to 6 are detractors
- 7 or 8 are passive
- 9 or 10 are promoters



2.2 Types of Measurement

North America Business measures Net Promoter Scores under the Brand NPS (formerly Relationship NPS) program. While other measures exist or are being developed, such as Touch Point NPS (formerly Moment of Truth) and Journey NPS, these are currently not reported as official metrics.

3. Scope

The table below outlines the scope of the metric and indicates the type of measurement used.

Table A – Scope of metrics and type of measurement used

Line of Business	Measurement	Regions/Segments
NAB - Business	Brand	• U.S.A. only (Canada dropped due to operating conditions similar to residential) • Large & medium, and small commercial customer base

4. Calculation Methodology

NAB customers are based on the brand survey in the U.S.A. only. The score is then weighted at 65% for small companies and 35% for mid-sized and large companies. Each NPS score is calculated by adding all the promoters, divided by the total sample for the period, and adding all the detractors, divided by the total sample for the same period. A score is produced by subtracting the resulting percentage of detractors from the percentage of promoters and multiplying by 100.

Monthly NPS is calculated as percentage of promoters less the percentage of detractors in the monthly period.

Six Month Weighted Average NPS is calculated as a weighted average of the monthly NPS scores earned over the six month period based on monthly sample size.

The full NA Business NPS score is calculated by multiplying each customer segment NPS score for the monthly period against a previously determined weighting based on customer holdings and adding the totals together. The formula below shows the calculation:

NA Business Brand NPS = (SB Brand NPS x 65%) + (C&I Brand NPS x 35%)

5. Data collection and reporting frequency

5.1 Data collection

Data is collected through telephone interviews conducted by research agencies. NAB provides the agencies with a full sample of qualifying NAB customer records, the agency then randomly selects records to survey. Data management aligns to industry best practices with the research agency performing all necessary data hygiene and list management rules, for example ensuring no duplications exist. The agency collates interview responses and provides data to the Direct Energy team who calculates the final NPS score (excluding don't know responses) with data being cleaned of errors and de-duplicated.

5.2 Reporting frequency

The NA DE NPS is reported on monthly and on a rolling 6 month basis for each year. The metric is reported to management, corporate affairs and back to each business. The 2016 figure is based on results from 1/1/2016 to 31/12/2016.

Employee engagement

1. Description

Employee Engagement is defined as 'an emotional state driven by individuals' perception of different components within an organisation, which in turn has a measurable impact on business performance'. It is generally measured annually, by an external provider (Centrica currently uses ETS plc) via a survey delivered either online or via paper copy to all employees. In some instances, it is also appropriate to include some contractors and third party employees.

2. Scope

In 2016, all direct Centrica employees are invited to complete the Centrica Employee Engagement survey

The administration of the survey is agreed annually and is generally administered annually unless otherwise agreed by the Centrica Executive Committee (CEC). The survey generally runs for three weeks.

The overall Centrica engagement index excludes contractors, third party and agency staff.

3. Calculation methodology

The employee engagement score takes the mean of six questions which represent the 'feel' and 'Do' elements of the ETS model. The final engagement score is calculated by taking the average of the means of each of the six engagement questions.

Employees are asked to respond to six specific questions:

Feel:

- I feel passionate about the job I'm doing
- I am proud to work for my company
- I feel a strong sense of commitment for my company

Do:

- I am motivated by my business area to do the best job I can
- I tell others outside this company the great things about working here
- I intend to be working for my company in one year's time

The questions are answered using a 6 point scale:

1. Strongly Disagree
2. Disagree
3. Slightly Disagree
4. Slightly Agree
5. Agree
6. Strongly Agree

4. Timeframe

In 2016, the survey ran at slightly different times and to slightly different durations to accommodate the needs of each business.

Centrica Storage, and Exploration & Production ran the survey for longer than other brands in order to accommodate the shift pattern of their employees. To accommodate these needs, it was necessary in 2016 to run the survey for these two businesses using an in-house survey tool.

Business	Survey opened	Survey closed
Centrica Storage	10 October	18 November
Other Centrica businesses	10 October	30 October

5. Languages and geography

The survey was administered in English

The primary countries of distribution are:

- The United Kingdom
- Norway
- The Netherlands
- Trinidad and Tobago
- America
- Canada
- The Republic of Ireland

6. Data quality, collection and reporting frequency

Data quality

Employee data for all Centrica employees, including the organisational hierarchy is initially extracted from the Centrica Workday database. This data is then checked, verified and updated manually by teams placed within each business to ensure accuracy.

The survey is administered online. In 2016, it was necessary to use another provider to deliver the extended survey administration period for Centrica Storage and Exploration & Production as ETS were fully committed with other clients. Centrica Storage and Exploration & Production employees completed the survey using the Qualtrics survey system. This was administered by the Consumer Insights team within Bord Gais Energy and was delivered following the same principles with regard to anonymity and confidentiality

ETS and Qualtrics invite employees to take part, via an e-mail invitation.

Data collection

To maintain anonymity responses are captured directly by Qualtrics and ETS. Qualtrics data is shared with ETS in order to combine with the rest of the Centrica data. ETS subsequently provide all of the analysis and produce all of the survey reports.

Reporting frequency

Reports are developed annually for the Centrica Executive Committee and leadership teams. Detailed reports, down to business unit level, are cascaded. Manager reports were excluded in 2016 because developing an intact hierarchy to reliably create line manager reports was impossible due to the volume change generated by the 2016 restructure. This was agreed by the Centrica HR Operating Committee.

Total carbon emissions

1. Description

The reporting of Centrica's total carbon emissions in our Annual Report and Accounts is a legal requirement under The Companies Act 2006 (Strategic Report and Directors' Reports) Regulations 2013. Reporting the metric also enables us to understand our greenhouse gas (GHG) footprint, a pre-requisite for the successful management of such emissions.

2. Scope

	Included in Scope	Excluded from Scope
Geography	• Global	• N/A
Organisational	• All wholly or partially owned reporting entities across Centrica[2]	• Reporting entities where Centrica has no equity • Independent franchisees of Centrica owned franchises
Operational	• Scope 1 emissions from the combustion of fuels in the premises, vehicles, equipment and machinery owned/ controlled[3] by the reporting entity[4] • Combustion of hydrocarbons in flaring • Release of unburnt hydrocarbons • Scope 2 emissions associated with the electricity, heat and steam we import for use in our premises, vehicles, equipment and machinery	• Emissions released during the combustion of biologically sequestered carbon – biomass and biofuels

[2] Where Centrica has only part equity in a reporting entity (e.g. joint ventures), the GHG is pro-rated to reflect Centrica's share. Whilst Centrica follows the equity share approach described by the GHG Protocol; we also draw from the IPIECA guidelines, to assist in the application of the GHG Protocol to our complex organisational structures. Accordingly Centrica applies the company's equity share to the organisation that controls the assets and not the assets themselves.

[3] Owned can mean owned or exclusively leased by the reporting entity (refer below).

[4] The equity approach is applied to the reporting entity and does not necessarily reflect the actual ownership of the assets used by that reporting entity. For example, we lease many of the offices and vehicles that we use, but we report them as scope 1 and apportion the emissions based on the equity we have in the reporting entity that uses them.

2.1 Greenhouse Gas Emission Sources

Table 1 below, details which emissions are in scope:

Table A: Scope 1 & 2 Emissions

In scope	Out of scope
Offices and Depots	
Scope 1 Emissions from offices that we wholly or partially own or lease • Gas use • Diesel use • Refrigerant loss	**Scope 1** Emissions from offices that we sub-lease to others Biofuels used onsite to generate heat and power for on and offsite use (sequestered carbon is reported as a separate indicator)
Scope 2 Emissions from offices that we wholly or partially own or lease • Imported power (whether from Centrica or other supplier)	**Scope 2** Emissions from offices that we sub-lease to others
Fleet	
Scope 1 Emissions from: • Commercial fleet vehicles owned or leased by Centrica • Company cars (business travel only) • Rental cars where the fuel is claimed back as expensed mileage	**Scope 1** Emissions from: • Contractor's vehicles • Personal mileage in company cars, including commuting • Rental car fuel use unless claimed back as expensed mileage • Grey Fleet (personally owned cars used for company business) • Emissions from biofuels in forecourt fuel
Power Generation Reporting Entities	
Scope 1 Emissions from power generating entities where we have equity: • Carbon dioxide (CO_2) from fuel combustion & fugitive emissions • Fugitive GHG (incl. methane (CH_4) from gas turbines, Sulphur Hexafluoride (SF6) leakage, fugitive natural gas emissions, refrigerant leakage (HFCS and PFCS); emissions of Nitrous Oxide (N_2O) and Nitrogen trifluoride (NF_3)	**Scope 1** N/A
Scope 2	**Scope 2**

Imported power for plant consumption (whether from Centrica or other supplier)	N/A

Hydrocarbon Production & Storage Reporting Entities	
Scope 1	**Scope 1**
GHG emissions from reporting entities where we have equity: • Carbon dioxide (CO_2) from fuel combustion including flaring • Venting and fugitive GHG (incl. methane (CH_4) from gas turbines, Carbon dioxide (CO_2) from hydrocarbon processing, Sulphur Hexafluoride (SF_6) leakage, fugitive natural gas emissions, refrigerant leakage (HFCS and PFCS); emissions of Nitrous Oxide (N_2O) and NF3	N/A
Scope 2	**Scope 2**
Imported power for plant (whether from Centrica or other supplier)	N/A

3. Calculation methodology

3.1 Unit of measure

Tonnes of carbon dioxide equivalent (tCO_2e)

3.2 Calculation

Table B: Constituent indicators

Gas Flared[5]	Upstream Scope 1 Total Emissions	= Total Carbon Emissions (tCO_2e)
Oil Flared[4]		
Fuel Oil Use[4]		
Plant Gas Use[4]		
Plant Diesel Use[4]		
Formation Emissions		
AGR Reactor		
Methane from Gas Turbines		
Fugitive Emissions		
Nitrogen Removal Units (as CH_4)		
Product Gas Compressors (as CH_4)		
SF6		
N_2O Nitrous Oxide		
PFCs		
HFCs		
Freon (R22)		
Vented Gas		
HFC blends		
Building Gas Use	Downstream Scope 1 Total Emissions	
Building Gas Oil Use		
Company Car (Fuel Card) - Petrol		
Company Car (Fuel Card) – Diesel		
Commercial Fleet - Diesel		
Commercial Fleet – Petrol		
Company Car Expensed Dist. Diesel		
Company Car Expensed Dist. Petrol		
Service Manager (SEAT) Distance Diesel		
Refrigerants (blended and HFCs)		
Building Electricity use	Scope 2 Total Emissions	
Plant Electricity		

4. Data quality, collection and reporting frequency

4.1 Data quality

As per HSES-STD-03

4.2 Data collection

Based on materiality and in accordance with HSES-STD-03.

4.3 Reporting frequency

As per HSES-STD-03

[5] Where EU ETS data is available, this value will replace the individual emission indicators for: Gas Flared, Oil Flared, Fuel Oil Use, Plant Gas Use, Plant Diesel Use.

4.4 Assumptions

Site specific emission factors are used where available and when there is site specific variation (e.g. unprocessed natural gas) to convert activity data into GHGs. Where there is negligible site specific variation, standard emission factors, from published sources are applied, including:

- The Greenhouse Gas Protocol – Revised Edition from the WRI and WBCSD
- Guidelines to DEFRA/DECC's GHG Conversion Factors for Company Reporting by DEFRA
- United States Energy Information Administration (EIA)
- eGrid
- Environment Canada 'National Inventory Report 1990-2006'

Where activity data is submitted in energy units (e.g. kWh of gas consumption), the emission factor is based on the assumption that the energy units are the gross calorific value, unless specified otherwise. This is based on natural gas suppliers typically quoting gas consumption in gross energy units and natural gas being the main fuel source used.

In the UK, where we purchase grid power from ourselves, we could justifiably use Centrica's own (lower) power carbon intensity to calculate GHG emissions for this imported power. Moreover, as we already report the emissions associated with power generation within the Scope 1 emissions of our exporting assets, it could be argued that we are double-counting the same emissions in the Scope 2 emissions of our importing assets. A solution would be to report our Scope 2 emissions as zero in these cases or remove the relevant emissions from our Scope 1 totals. However, we have retained the approach of reporting our Scope 2 emissions as if they are imported from another generating organisation using the countries' standard grid emission factors. This ensures transparent accounting of our total Scope 1 and 2 emissions and enables trends in our imported electricity consumption to be understood.

Carbon intensity of centralised power generation

1. Description

The carbon intensity (CI) of Centrica's centralised power generation is the amount of carbon dioxide emitted per unit of power produced. It is used by the company to demonstrate Centrica's environmental performance and carbon reduction initiatives.

2. Target

Previously, we had a 2012 UK-only power generation carbon intensity target. On the successful achievement of this, the existing 2020 UK target was reviewed and the Centrica Executive Committee approved the expansion of the target to include Centrica's global power generation. The 2020 target uses a more robust and comparable approach, with CI based on equity share only, excluding site-specific power purchase agreements that had been previously included. This new approach reflects our investment decisions and accommodates assets in part ownership.

Initially the global 2020 target was set at 260gCO_2/kWh, however, following a review, the Centrica Executive Committee agreed to adopt the more challenging target of 200gCO_2/kWh. While the target is higher than the current company CI position, it is considered to be appropriate as future UK market conditions are expected to improve, resulting in a recovery in gas power generation and a subsequent increase in the CI.

3. Scope

	Included in scope	Excluded from scope
Geography	• Global	N/A
Organisational	• All centralised power generating businesses, including: Energy Supply & Services Ireland (ESS (Ire)); Distributed Energy and Power (DE&P); Nuclear	• Business units without centralised power generation
Operational - power generation	• Power generation from wholly or partially owned centralised power generation assets, including our power stations, wind farms and nuclear interests. • Where the asset is not wholly owned, the generation and emissions are pro-rated to reflect the equity share	• Power generation from other assets from which Centrica purchases power, whether site specific contracts or through the open market • Power generation from decentralised assets • Power generated but not available for sale (power consumed by Centrica assets)
Operational - Emissions	• Emissions covered by the EU ETS, or the equivalent in non-European countries	• Emissions that are outside of the EU ETS criteria • Greenhouse gases other than carbon dioxide

4. Calculation methodology

4.1 Unit of measure

Grams of carbon dioxide per kilowatt hour (gCO_2/kWh)

4.2 Target value

200gCO_2/kWh by 2020

4.3 Calculation

Constituent indicators:

Sum of power available for sale from all in-scope generation sites	Electricity available for sale (kWh) / CO_2 emissions (g)	= **Carbon Intensity (gCO_2/kWh)**
Sum of EU ETS emissions (or equivalent) from all in-scope generation sites		

Note: Power available for sale is that provided to the distribution network and is net of any transmission losses on the generation side. Losses associated with supplier distribution are not accounted for.

5. Data quality, collection and reporting frequency

5.1 Data quality

The EU ETS emissions data used to calculate the carbon intensity is subject to annual verification. The annual verified values are more accurate than the quarterly submissions, as such, where verification timing allows, the quarterly submissions are reconciled with the verified values at the end of the year.

5.2 Data collection and reporting frequency

Carbon intensity figures are compiled quarterly based on the preceding three months data, for internal tracking of cumulative carbon intensity reported as Mean Annual Total (MAT). The carbon intensity figure for the previous calendar year is reported externally on an annual basis.

5.3 Quarterly emission calculation

The quarterly unverified emissions are based on gas chromatography samples of actual gas consumed for the generation assets.

5.4 Annual verified Emissions calculation

The annual verified emissions are based using the finalised internal view of emissions for the calendar year and are then verified by an accredited third party for compliance with the EU ETS.

5.5 Assumptions

No Assumptions.

Total customer carbon savings from measures installed by British Gas

1. Description

The greenhouse gas (GHG) emissions associated with our customer's use of Centrica's energy products are the most significant component of Centrica's value chain emissions. Helping our customers reduce their energy use helps them save money and reduce the associated environmental impacts.

The carbon savings for measures installed for our customers downstream are split into two components:

- Annual customer install savings
- Cumulative customer install savings

2. Scope

	Included in scope	Excluded from scope
Geography	• UK	• Republic of Ireland • North America • Continental Europe
Organisational	• Energy Supply and Services UK (ES&S UK) • Distributed Energy & Power (DE&P)	•
Operational	• Products installed by Centrica for residential and business customers • Mandatory installations – Installations that are part of fulfilment of Government mandated energy efficiency schemes • Non-mandatory installations – Installations that are not mandated by Government	• Installations not by Centrica nor its contracted third parties • Installs which have reached the end of their carbon saving lifetime • Installs delivering energy savings deemed immaterial • Upstream installs to reduce the emissions associated with the energy used by our customers • Installs where there is no appropriate or substantiated carbon savings factor for an install

3. Calculation methodology

3.1 Unit of measure

Carbon savings are measured in tonnes of carbon dioxide equivalent (tCO_2e)

3.2 Secondary factors

Carbon[6] savings are estimated using the number of installations made, multiplied by publically available secondary factors, such as carbon or cost savings specific to the install type. Where cost savings are used, data is converted into energy savings by multiplying savings by the greenhouse gas emissions associated

[6] Carbon savings refer to all GHG savings achieved by the in scope installations, measured in carbon dioxide equivalent.

with each pound spent on gas (kg $CO_2e/£$)[7]. Annual totals are then combined to create a cumulative carbon saving up to the present period of reporting.

Where available, such as in the mandated Carbon Emissions Reduction Target (CERT) scheme, agreed carbon saving factors have been used, providing the assumptions correlate strongly with installs of the same product made under other circumstances.

The secondary factors are reviewed annually to accurately reflect the associated emissions savings in each given year.

Secondary factors for carbon savings are GHG savings per unit per year (tCO_2e).

3.3 Annual GHG Savings

$$\frac{\text{Number of new installations in subject year} \times \text{secondary factor}}{2}$$ **= Annual GHG saving in subject year**

N.B the GHG saving is halved to allow for the assumption that install activity is evenly distributed across the year.

3.4 Cumulative GHG savings

Annual GHG savings from latest year in subject period
Savings from (non-new) active installs in latest year of subject period
Previous years' cumulative carbon savings value[8]

= Cumulative GHG savings for subject period

The cumulative savings reported cover a period running from the base year, January 2008, to the last mid or end year point.

4. Data quality, collection and reporting frequency

4.1 Data quality

To ensure calculation accuracy, secondary data and data assumptions used to calculate savings (see Appendix 5) are updated annually in the Customer Carbon Savings Model. The update takes place in advance of the full-year reporting period so that the most up-to-date data is used within the calculation. The lifetime of historical installs are included in the overall data calculation and are removed from the calculations automatically when they expire. Assumptions used to calculate the savings are drawn from reliable public sources such as the Energy Saving Trust.

Secondary factors are compiled and reviewed from reliable public sources either directly or via experts (see Appendix 5 for more information). Mathematical details and justifications for the assumptions made are contained within an excel spreadsheet external to myHSES – previous and current versions of the spreadsheet are stored safely within the platform for an auditable trail.

Using the imported secondary factors the carbon savings calculations are generated automatically in the model. This removes potential error from manual calculations. Calculations do not take into account the interaction of multiple installs when installed together.

[7] $KgCO_2e/£$ calculated using Gas GHG emissions / UK Gas Cost sourced from Ofgem and EST respectively.
[8] The equation runs back to the beginning of the subject period and no installs from outside of this subject period are included.

4.2 Data collection

Our materiality threshold is based on the materiality principle of ISO 14064-3[9]. Our data collection will include a minimum of 95% of all current year installs.

Savings are calculated and installs are reviewed every six months with products either removed or added to the scope.

Savings are presented cumulatively and in 12 month periods starting from January 2008. It is assumed that installs will deliver incremental savings throughout the remaining years of their lifetime, based on the best available data.

4.3 Reporting frequency

As per HSES-STD-03

4.4 Assumptions

See appendix 5.

[9] The ISO 14064 standard is part of the ISO 14000 series of International Standards for environmental management.

Product Indirect Emissions (PIE)

1. Description

Centrica's two core products are electricity and gas sales. These products may be produced or generated by Centrica assets, or purchased from third parties and then re-sold to Centrica's customers. These products make up the majority of Centrica's Scope 3 emissions. Specifically:

- The carbon emissions generated when our customers burn the gas we have sold to them[10]
- The carbon emissions associated with the generation of power we purchase from a third party for resale to our customers[11]

These combined emissions have been termed Centrica's 'Product Indirect Emissions' (PIE). Together, PIE equates to almost 90% of Centrica's calculated Scope 3 emissions[12].

2. Scope

	Included in scope	Excluded from scope
Geography	• Global	• N/A
Organisational	• Wholly or partially owned reporting entities across Centrica[13] that sell gas to end users and/or buy power for resale to end users; including: ○ Energy Supply & Services (Ire) ○ Energy Supply & Services (UK) ○ Energy Supply & Services (NA)	• Reporting entities where Centrica has no equity
Operational	• Emissions from power purchased from a third party and re-sold to customers, both residential and business. This includes Power Purchase Agreements (PPA), Tolling Agreements and power purchased from the wholesale market (aka National Reserve). • Emissions from gas consumed by our customers, both residential and business, irrespective of whether the gas was purchased from a third party or produced from our own assets.	• Emissions from power generated from our own assets (based on equity) sold to our customers. • Emissions associated with extraction, processing and delivery of fuel for power generation. • Transmission and Distribution (T&D) losses of the power generated for resale. • The emissions associated with the production and transport of the gas sold. • Gas or power that is traded but not consumed by Centrica's end-user customers.

3. Calculation methodology

Unit of measure

[10] WRI Corporate Value Chain Scope 3 Accounting and Reporting Standard: Scope 3 Category, 'Use of sold products'.
[11] WRI Corporate Value Chain Scope 3 Accounting and Reporting Standard: Scope 3 Category, 'Fuel-and-energy-related'. Note; the power we purchase for use at our own assets is categorised as Scope 2 emissions. However, there may be double counting when we purchase power for resale and sell it to our assets.
[12] Our calculated Scope 3 emissions include European supplier emissions; Transmission & Distribution losses; and the Product Indirect Emissions
[13] Currently Centrica owns 100% of the reporting businesses involved in PIE.

Tonnes of carbon dioxide equivalent (tCO_2e)

Calculation

Constituent indicators

Wholesale market Power Purchase Agreements Tolling Agreements	Sum of power purchased for resale during subject period **x** Source relevant emission factor	= Product Indirect Emissions (tCO_2e)
Gas Sold – Business Gas Sold – Domestic	Sum of gas sold to our customer during subject period x Natural Gas combustion emission factor[14]	

4. Data quality, collection and reporting frequency

4.1 Data quality

The power purchased for resale values are based on contractual agreements and power trading logs and are subject to rigorous governance and assurance processes. The power is purchased through:

- Power Purchase Agreements (PPAs)
- Tolling Agreements
- The wholesale market

The GHG emissions associated with the Tolling Agreements and PPAs are unique to the individual contracts based on their fuel source. The wholesale market emissions are based on the country specific grid electricity factor.

Gas sales are a core business metric that are subject to rigorous governance and assurance processes. They are reported based on the end user:

- Residential customer gas sales
- Business customer gas sales

4.2 Data collection

As per HSES-STD-03

4.3 Reporting frequency

PIE is reported externally on an annual basis.

The KPI is externally assured triennially (once every three years), with three years of data being assured each time.

4.4 Assumptions

All gas sold is combusted and there are no losses of unburnt gas.

[14] The DEFRA emission factor for natural gas consumption has been used for all gas sales.

Some of the gas and power sold to businesses may include sales to Centrica's own assets. These will already be covered by Centrica Scope 1 and Scope 2 emissions, however, they cannot easily be identified and removed.

Appendices

Appendix 1: Tier 1 process safety - Threshold quantities

Material Hazard Classification	Threshold Quantity (Outdoor)	Threshold Quantity (Indoors)
TIH* Zone A Materials (e.g. bromine, hydrogen cyanide, phosgene)	5kg	2.5kg
TIH* Zone B Materials (e.g. chlorine, hydrogen sulphide)	25kg	12.5kg
TIH* Zone C Materials (e.g. hydrogen chloride, sulphur dioxide)	100kg	50kg
TIH* Zone D Materials (e.g. ammonia, carbon monoxide)	200kg	100kg
Flammable gases or Liquids with Initial Boiling Point <35°C and Flash Point <23°C	500kg	250kg
Liquids with Initial Boiling Point >35°C and Flash Point <23°C	1,000kg	500kg
Liquids with Initial Boiling Point >23°C and <60°C or Liquids with Flash Point >60°C released at a temperature at or above Flash Point or strong acids/bases	2,000kg	1,000kg

Appendix 2: Tier 2 process safety event – Threshold quantities

Material Hazard Classification	Threshold Quantity (Outdoor)	Threshold Quantity (Indoors)
TIH* Zone A Materials (e.g. bromine, hydrogen cyanide, phosgene)	0.5kg	0.25kg
TIH* Zone B Materials (e.g. chlorine, hydrogen sulphide)	2.5kg	1.2kg
TIH* Zone C Materials (e.g. hydrogen chloride, sulphur dioxide)	10kg	5kg
TIH* Zone D Materials (e.g. ammonia, carbon monoxide)	20kg	10kg
Flammable gases or Liquids with Initial Boiling Point <35°C and Flash Point <23°C	50kg	25kg
Liquids with Initial Boiling	100kg	50kg

Point >35°C and Flash Point <60°C or Liquids with Flash Point >60°C released at or above Flash Point or strong acids and bases		
Liquids with Flash Point >60°C released at a temperature below Flash Point or Moderate acids/bases	1,000kg	500kg

Appendix 3: Tier 1 & 2 process safety event frequency rate – Threshold quantities

Material Hazard Classification	Threshold Quantity (Outdoor)	Threshold Quantity (Indoors)
TIH* Zone A Materials (e.g. bromine, hydrogen cyanide, phosgene)	0.5kg	0.25kg
TIH* Zone B Materials (e.g. chlorine, hydrogen sulphide)	2.5kg	1.2kg
TIH* Zone C Materials (e.g. hydrogen chloride, sulphur dioxide)	10kg	5kg
TIH* Zone D Materials (e.g. ammonia, carbon monoxide)	20kg	10kg
Flammable gases or Liquids with Initial Boiling Point <35°C and Flash Point <23°C	50kg	25kg
Liquids with Initial Boiling Point >35 °C and Flash Point <60 °C or Liquids with Flash Point > 60°C released at or above Flash Point; or strong acids and bases	100kg	50kg
Liquids with Flash Point >60°C (140°F) released at a temperature below Flash Point or Moderate acids/bases	1000kg	500kg

Appendix 4: Tier 1 & 2 process safety event frequency rate – Threshold quantities

Material Hazard Classification	Threshold Quantity (Outdoor)	Threshold Quantity (Indoors)
TIH* Zone A Materials (e.g. bromine, hydrogen cyanide, phosgene)	0.5kg	0.25kg
TIH* Zone B Materials (e.g. chlorine, hydrogen sulphide)	2.5kg	1.2kg
TIH* Zone C Materials (e.g.	10kg	5kg

hydrogen chloride, sulphur dioxide)		
TIH* Zone D Materials (e.g. ammonia, carbon monoxide)	20kg	10kg
Flammable Gases or Liquids with Initial Boiling Point of <35°C and Flash Point <23°C	50kg	25kg
Liquids with Initial Boiling Point >35°C and Flash Point <60°C or Liquids with Flash Point ; or Strong acids and bases	100kg	50kg
Liquids with Flash Point >60°C released at a temperature below Flash Point or Moderate acids/bases	1000kg	500kg

Appendix 5: Total customer carbon savings from measures installed by British Gas – Install types and assumptions

Install Type	Installed under mandatory initiatives	Installed under voluntary initiatives	Assumptions and Source	Energy Saving Source: Energy Saving Trust
In scope				
Appliances 7-15 years	Yes	No	• The number of appliances installed are calculated per appliance type. • All appliances were installed under the CERT scheme and have carbon saving factors approved by Ofgem.	• Energy efficient appliances such as standby savers and washing machines beyond A-rated reduce the amount of energy used by household appliances both during periods of activity and at rest.
Air Source Heat Pump (ASHP) 15 years	Yes	Yes	• An average value for an average property with this install type is used. There is no data on which fuel systems are replaced so a 50/50 split between electric and gas systems has been used. • **Source**: Energy Savings Trust	• Air Source Heat Pumps absorb heat from the outside air which can be used to heat radiators, underfloor heating systems, or warm air convectors and hot water in the home.
Biomass Boiler 20 years	Yes	Yes	• Biomass boilers are assumed to replace an older Gas or Electricity (non-condensing) heating system in a typical four-bedroom detached house with basic insulation. The house type is assumed based on the majority of install types being in 4 bedroom detached houses. • The majority replaced are Gas therefore the mid-range gas value	• Biomass boilers burn wood pellets, chips or logs to provide warmth in a single room or to a power central heating and hot water boilers. • The carbon dioxide emitted when wood is burned is the same amount that was absorbed over the months and years that the plant was growing.

			was used; this value is also the most conservative. • **Source**: Energy Savings Trust	
Residential Gas Boiler Changes 12 years	Yes	Yes	• SEDBUK (Seasonal Efficiency of Domestic Boilers in the UK) ratings give ranges of domestic boiler efficiency in standard domestic conditions in the UK. The efficiency of the boiler being replaced is categorised into one of two categories determined using 2009 and 2010 editions of the SEDBUK ratings. The difference between the two categories and a new A-rated boiler is calculated to give a number of boilers saving carbon. These are then multiplied by a carbon or cost emission factor. • Given the lack of recent public data regarding boiler population distribution, a conservative assumption has been made. It has been assumed that all boiler replacements are replacing D rated boilers (£85.0 Annual Savings / household / year). • **Source**: SEDBUK, EST and DEFRA	• A-rated condensing boilers are much more efficient than older boilers and therefore reduce the energy required to provide the same amount of heating.
Commercial Gas Boiler Changes 12 years	No`	Yes	• A 50:50 split of 40kW ((1474.4/2)+(3807/2)= 2640kg CO2/yr)) and 100kW boilers where 40kW boilers SEDBUK D-rated are being replaced by 40kW A and B rated boilers and 100kW boilers SEDBUK D-rated are being replaced by 100kW A and B rated boilers.	• As above

			Efficiency is used to estimate carbon savings. These savings are generated using the energy.gov commercial boiler calculator (see above for an explanation of SEDBUK categories in 'Residential Gas Boiler Changes'). • **Source**: SEDBUK, internal data and EPA.	
Cavity Wall Insulation 42 years	Yes	Yes	• Ofgem agreed value.	• Cavity walls are made up of two walls with a gap in between, known as a cavity. Cavity wall insulation fills that gap, reducing the amount of heat lost to the outside, therefore lowering energy usage.
Compact Fluorescent Light (domestic) 14 years	Yes	No	• Ofgem agreed value.	• CFL technology used gas inside a glass tube which is charged with electricity until it glows and gives off light. CFLs use about 75-80% less electricity than an equivalent traditional bulb and can last up to 10 times longer.
Draught Proofing 10 years	Yes	Yes	• Mid-range financial savings offered by the British Gas Energy Efficiency Lab are used to calculate the reduction in gas use. This is in turn used to calculate the reduction in carbon emissions using DEFRA figures. • **Source**: BG Energy Efficiency Lab (Energy Savings Trust data) and DEFRA emission factors.	• Draughts warmer air to escape and colder air to enter a home. This requires additional energy to sustain internal temperatures. Blocking unwanted gaps save warm air which means less energy is required to heat the home.
External Wall Insulation 36 years	Yes	Yes	• EST provides a carbon saving per property type. • British Gas customer property distribution used. A weighted	• External wall insulation involves fixing a layer of insulation material to the wall, then covering it with a special type of render or cladding. Insulation

			average of carbon savings is calculated from this. • **Source**: Energy Savings Trust and internal data	reduces the amount of warm air lost from a house therefore reducing the energy requirement to heat the interior.
Flat Roof Insulation 20 years	Yes	Yes	• Installs under the Energy Company Obligation (EC0) use the most conservative assumption of all install programmes and use a 2 bed flat. This has been used for all installs which gives the lowest value of all options from EST provided values. • **Source**: Energy Savings Trust	• In an un-insulated home, a quarter of heat is lost through the roof (EST). Roof insulation reduces heat loss and therefore reduces energy usage.
Fuel Switching 20 years	Yes	No	• Ofgem agreed values.	• Gas is a less carbon intensive fuel, therefore switching to gas from fossil fuel based sources reduces the volume of greenhouse gases emitted per unit of energy consumed.
Gas Boiler Replacement (Full System) 12 years	No	Yes	• Calculations assume that a Condensing boiler replaces a SEDBUK F-rated boiler in a gas-heated, three-bedroom semi-detached home (see 'Residential Gas Boiler Changes' section for a description of SEDBUK categories) • **Source**: Energy Savings Trust	• Condensing boilers are much more efficient than older boilers and therefore reduce the energy required to provide the same amount of heating.
Solar Installations (Full System) 25 years	No	Yes	• Carbon savings for different geographic areas are provided by the EST. A weighted average has been employed using the distribution of activity we have in different areas has been provided internally. • **Source**: Energy Savings Trust	• Solar photovoltaics (PV) convert sunlight into electricity which can be used to run household appliances and lighting therefore reducing energy required from other sources. • Residential
Glazing	Yes	Yes	• An average of A, B and C glazing	• Energy efficient glazing reduces heat

20 years			savings per housing type weighted by British Gas customer housing distribution. • **Source**: Energy Savings Trust and internal data.	loss through windows, therefore reducing the energy required to heat a home.
Ground Source Heat Pump (GSHP) 20 years	Yes	Yes	• Agreed Ofgem values.	• Ground Source Heat Pumps use pipes buried in the garden to extract heat from the ground. This heat can then be used to heat radiators, heating systems and hot water.
Loft Insulation (Per DIY m2) 42 years	Yes	Yes	• Agreed Ofgem values (calculated per m^2 – in line with the data entry).	• In an un-insulated home, a quarter of heat is lost through the roof (EST). Roof insulation reduces heat loss and therefore reduces energy usage.
Loft Insulation (Per Professional Installation) 42 years	Yes	Yes	• Agreed Ofgem values.	• As above
Micro CHP 15 years	Yes	No	• Average 4% carbon savings is used for the scale of installations we provide. • **Source**: Carbon Trust.	• Micro combined heat and power technology generates heat and electricity simultaneously from the same energy source. By generating electricity on-site, both energy requirement and carbon intensity are reduced.
Smart Meters 25 years	Yes	Yes	• Calculations use stratified control groups to normalise other factors. Energy Smart and other customers that are currently excluded from smart are also excluded from the control group. This methodology has been adopted by DECC / ONS. • **Source**: Factors measured with internal meters	• Smart meters allow visible tracking of energy usage, allowing behaviour adaptation resulting in long term carbon and financial savings.
Shower Regulators 12 years	Yes	No	• Agreed Ofgem values.	• About 21% of a typical gas heated household's heating bill is from

				heating water (EST) therefore reducing water used in showers reduces energy usage.
Solar Boiler/Thermal 25 years	Yes	Yes	• An average system is considered. Assumes that the system replacing a gas boiler is the most conservative available from the EST values provided. • **Source**: Energy Savings Trust	• Solar thermal systems use heat from the sun to warm domestic hot water reducing energy usage.
Solar PV (Per MWp) 25 years	No	Yes	• A specific British Gas weighted geographical customer distribution is used from an internal source. Carbon savings for commercial projects are calculated per MWp savings. The values are sourced from internal sources. The total MWp is then provided and entered as activity data. This assumption assumes that the British Gas customer base has limited migration within the U.K.	• Solar photovoltaics (PV) convert sunlight into electricity which can be used to run household appliances and lighting therefore reducing energy required from other sources. • Commercial
Solid Wall Insulation 36 years	Yes	Yes	• The ECO 2 Bed flat assumption is used. EST values are provided for each property type. For CERT activity, there is an agreed Ofgem figure however this is larger than the EST one so the conservative value used. • **Source**: Energy Savings Trust.	• Solid wall insulation reduces the ability of warm air to escape therefore reducing the energy required for heating.
Voltage Regulators 36 years	No	Yes	• 5.2% and 6.3% energy saving per year for electrically heated and non-electrically heated homes respectively. • **Source:** Savings factors sourced	• Voltage regulators reduce the voltage level from that of the incoming supply which reduces energy consumption.

	from the Energy Saving Trial Report for the vPhase VX1 Domestic Voltage Optimisation Device, calculated using Ofgem Insights paper on households with electric and other non-gas heating' and DEFRA annual average GHG household emissions from electricity.	
Out of scope		
Commercial CFL lighting 10 years	• Reason for exclusion: There is a lack of evidence/case studies to substantiate the claims made. Going forward, any case studies which can support a carbon saving factor for commercial CFL lighting will be used to bring the savings into the model.	• CFL technology used gas inside a glass tube which is charged with electricity until it glows and gives off light. CFLs use about 75-80% less electricity than an equivalent traditional bulb and can last up to 10 times longer.
Commercial smart meter installs 25 years	• Reason for exclusion: Despite extensive research on the residential use of smart meters fuelled by government incentives, there is no statistically significant data available to provide a carbon savings factor for the commercial use of smart meters.	• Smart meters allow visible tracking of energy usage, allowing behaviour adaptation resulting in long term carbon and financial savings.
District Heating 1. house installations 2. house upgrades 3. biomass upgrades 4. Heat meter installs	• Reason for exclusion: District heating is the supply of heat or hot water from one source to a district or a group of buildings. Consequently it is not possible to identify how much is saved as the scale of the projects. Ranging from small schools to large-scale	• District heating (also known as heat networks or teleheating) is a system for distributing heat generated in a centralized location for residential and commercial heating requirements such as space heating and water heating. The heat is often obtained from

	industrial parks. The amount of carbon saved is impossible to accurately determine as there are too many other factors. The fuel mix of the heat and power generated also significantly affects the carbon saved. Again the residential focus over commercial installs means there are no studies to support entry into the model.	a cogeneration plant burning fossil fuels but increasingly also biomass, although heat-only boiler stations, geothermal heating, heat pumps and central solar heating are also used, as well as nuclear power.
Under floor insulation	• Reason for exclusion: Although there is a Carbon saving factor published on the EST site, we were made aware of the install too late to set it up in the system for 2017 assurance with Deloitte. We will introduce it as a product line going forward in 2017 for 2018.	• Insulating a floor involves adding an insulating material beneath the floorboards, thereby reducing heat escaping through the floor into the ground. Approximately 15% of heat is lost through a house via this route. Insulation also acts to prevent draughts coming up through the floorboards. In addition the household should also consider insulating the gaps between the skirting boards and the floor, which also helps in reducing draughts. Floor insulation is most commonly done when putting a new floor in place, but most floors can be retrofitted with insulating material, and this will make a large saving to your overall heating bill.
Hot Water Cylinder Insulation	• Reason for exclusion: Although there is a carbon saving factor published on the EST site, we were made aware of the install too late	• This is a simple heating jacket, or insulation type. By slipping pipe insulation around your exposed hot water pipes you'll keep your hot

	to set it up in the system for 2017 assurance with Deloitte. We will introduce it as a product line going forward in 2017 for 2018.	water hotter for longer. Fitting insulation to pipes is easy if the pipes are accessible; if your pipes are hard to reach, you may need to engage a professional.
Heating Controls	• Reason for exclusion: Heating controls don't actually save carbon- they merely indicate the temperature of a room. Consequently it is impossible to accurately quantify the impact they have on residential or commercial Carbon emissions.	• These controls will let you set your heating and hot water to come on and off when you need it, decide how warm you want each room to be and heat the areas of your home that you use the most.
Electric Storage Heaters	• Reason for exclusion: Electric Storage Heaters are not actually carbon saving installs. They are offered as they are a cheaper option but do not actually reduce the carbon Emissions of homes.	• A storage heater is an electrical form of heating, designed to take advantage of cheap, night time electricity in order to heat the home cost-effectively. Storage heaters are also often found in homes that are not connected to the gas grid.
Combined Heat & Power	• Reason for exclusion: There are no residential studies that show that Combined Heat and Power is effective at a power station level. Not applicable to British Gas Customers.	• Cogeneration or combined heat and power (CHP) is the use of a heat engine or power station to generate electricity and useful heat at the same time. Trigeneration or combined cooling, heat and power (CCHP) refers to the simultaneous generation of electricity and useful heating and cooling from the combustion of a fuel or a solar heat collector.