



Un caso studio internazionale

North Warwickshire and Hinckley College
United Kingdom

Bologna 24 e 25 ottobre 2016



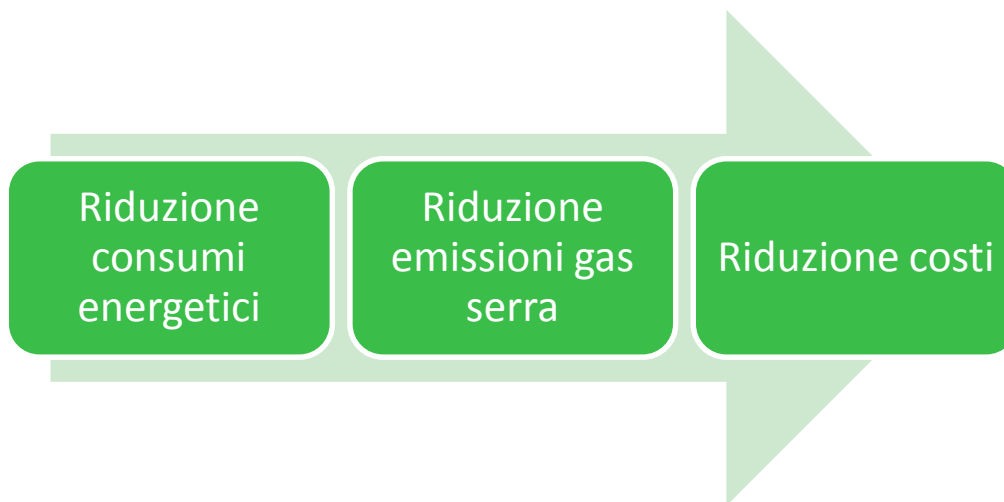
Piano di gestione delle emissioni di carbonio





I motivi

- Conformità con gli obiettivi esistenti (SDP e SP);
- Ridurre i consumi e costi di energia;
- Diventare un modello di sostenibilità nel settore educativo;
- Promuovere il College ed attrarre più studenti;
- Promuovere l'educazione ambientale attraverso servizi e strutture;
- Requisiti legali (DEC, CRC, etc)





Le necessità

Nel 2009/10 il College ha speso **£579,946** ed emesso **2,908 tonnellate di CO₂** :

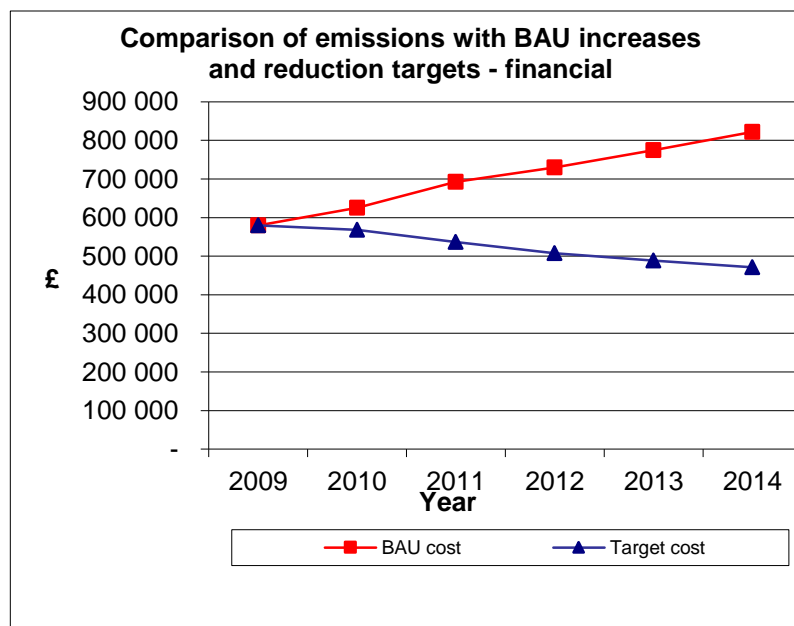
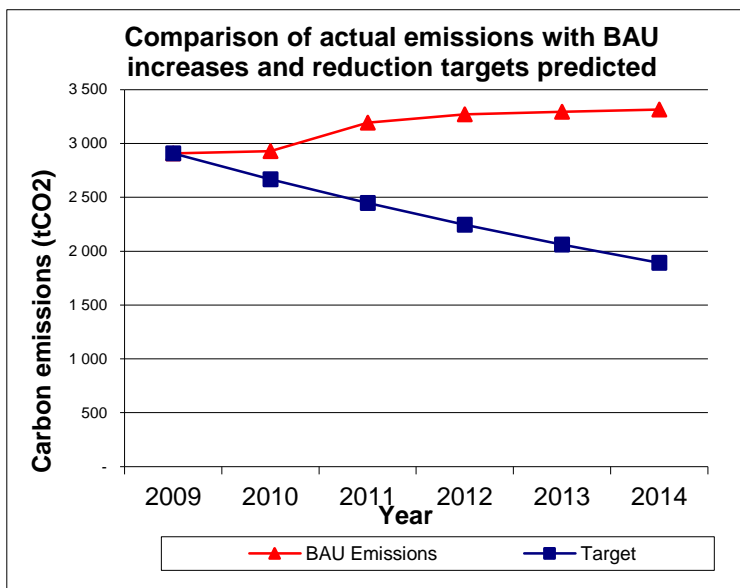
- 85% dai consumi di energia
- 10% da rifiuti ed acqua
- 5% trasporti

| | Buildings | Transport | Waste and Water | Total |
|---|-----------|-----------|-----------------|---------|
| Baseline CO ₂ emissions (tonnes) | 2,479 | 131 | 297 | 2,908 |
| Baseline Cost (£) | 385,512 | 139,164 | 55,270 | 579,946 |



Previsioni

Senza un piano di riduzione, le emissioni e i costi di gestione aumenterebbero: **Business-As-Usual (BAU) scenario**





Il programma

- 1. Mobilitizzazione:** identificare il “Cosa? Chi? Come?” ;
- 2. Scenario di base e previsioni:** raccogliere ed analizzare I dati relativi alle attività responsabili delle emissioni di gas serra;
- 3. Quantificazione:** identificare progetti ed iniziative finalizzate alla gestione e riduzione delle emissioni di carbonio all’interno della organizzazione;
- 4. Approvazione del piano:** da parte della direzione;
- 5. Implementazione del piano:** partendo da iniziative con risultati a breve termine.





Cosa? Obiettivo di riduzione

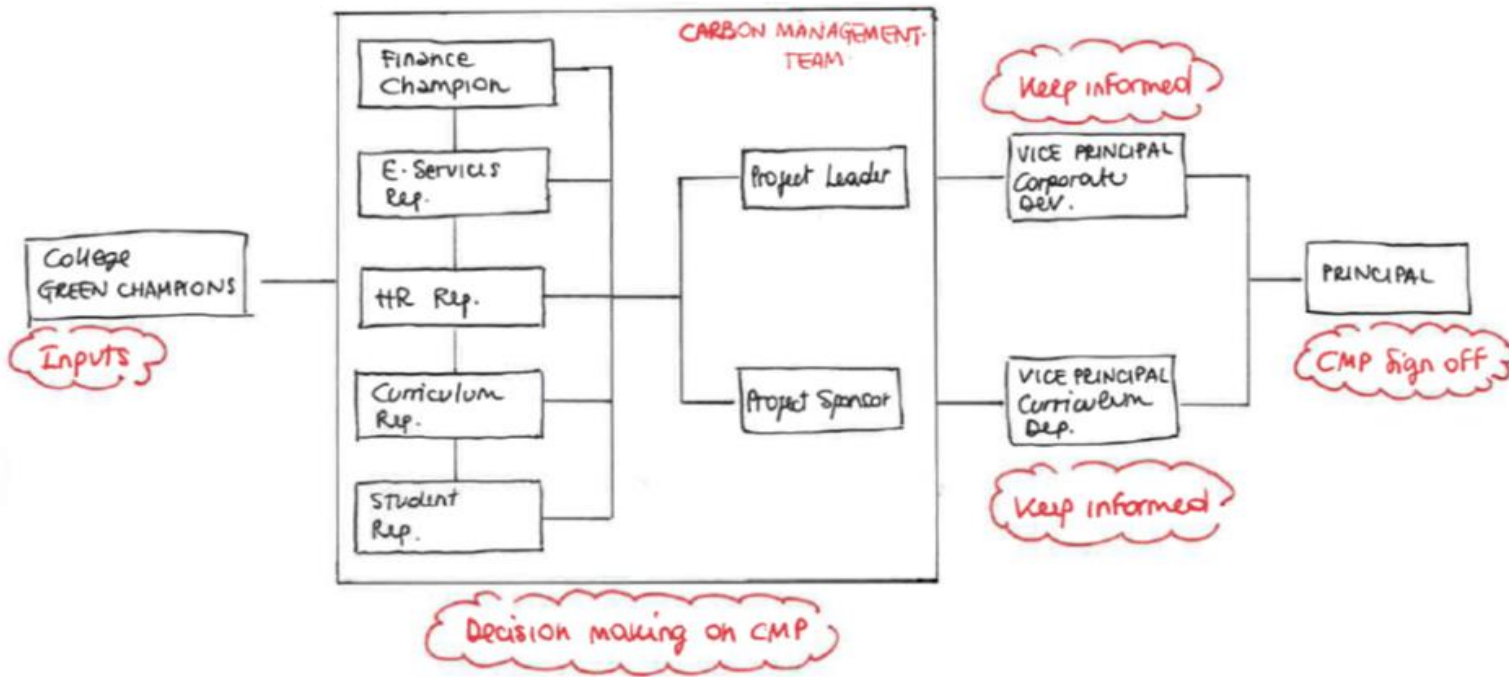
North Warwickshire and Hinckley College intende ridurre le emissioni di carbonio dirette ed indirette prodotte da tutte le attività di competenza (scope 1, 2 e 3) del **35%, entro l'anno scolastico 2014/15 in confronto allo scenario di base 2009/10.**

2,098 tonnellate
di CO₂



1,890 tonnellate
di CO₂

Chi? Carbon Management Team





Come? Misure e strumenti di calcolo

CM baseline tool 2011 - NWHC_v04 [Condiviso] - Microsoft Excel (Attivazione del prodotto non riuscita)

Expand to enter more emission sources Expand to enter Display Energy Certificate data Expand to review benchmarks

[Back to introduction](#)

Stationary emission sources
(buildings and street lighting) This button will insert a row above the row in which you are currently working in the baseline input table

Baseline year: 2009

| ID | Building, site or group | Category (for graphs) | Emissions Source 1 | | Emissions Source 2 | | Exclude from CRC | Exclude Cost from Analysis | Emissions from outsourced service | Total | | RAP Tool category |
|----|-------------------------------|--------------------------------|--------------------|---------------------------------|--------------------|---------------------------------|------------------|----------------------------|-----------------------------------|-------------------------------|----------|-------------------|
| | | | Energy type | Amount used (kWh) unless stated | Energy type | Amount used (kWh) unless stated | | | | CO ₂ emission (kg) | Cost (£) | |
| 13 | 1 Nuneaton (all HH and nonHH) | Nuneaton (Electricity + Gas) | Electricity (grid) | 1.753.917 | Natural gas | 3.324.774 | Yes | No | No | 1.572.119 | £240.057 | |
| 14 | 2 Hinckley (all HH and NonHH) | Hinckley (Electricity + Gas) | Electricity (grid) | 569.256 | Natural gas | 1.919.497 | Yes | No | No | 665.918 | £103.125 | |
| 15 | 3 Atherstone | Atherstone (Electricity + Gas) | Electricity (grid) | 31.023 | Natural gas | 94.788 | Yes | No | No | 34.472 | £5.325 | |
| 16 | 4 Bermuda (all NonHH) | Bermuda (Electricity + Gas) | Electricity (grid) | 36.358 | Natural gas | 454.893 | Yes | No | No | 104.083 | £16.555 | |
| 17 | 5 Bedworth | Bedworth (Electricity + Gas) | Electricity (grid) | 29.018 | Gas oil | 180.998 | Yes | No | No | 65.656 | £14.629 | |
| 18 | 6 Polesworth | Polesworth (Electricity + Gas) | Electricity (grid) | 24.798 | Natural gas | 127.868 | Yes | No | No | 37.205 | £5.820 | |
| 19 | | | | | | | Yes | No | No | 0 | £0 | |
| 20 | | | | | | | Yes | No | No | 0 | £0 | |
| 21 | | | | | | | Yes | No | No | 0 | £0 | |
| 22 | | | | | | | Yes | No | No | 0 | £0 | |
| 23 | | | | | | | Yes | No | No | 0 | £0 | |
| 24 | | | | | | | Yes | No | No | 0 | £0 | |
| 25 | | | | | | | Yes | No | No | 0 | £0 | |
| 26 | | | | | | | Yes | No | No | 0 | £0 | |
| 27 | | | | | | | Yes | No | No | 0 | £0 | |
| 28 | | | | | | | Yes | No | No | 0 | £0 | |
| 29 | | | | | | | Yes | No | No | 0 | £0 | |
| 30 | | | | | | | Yes | No | No | 0 | £0 | |
| 31 | | | | | | | Yes | No | No | 0 | £0 | |
| 32 | | | | | | | Yes | No | No | 0 | £0 | |
| 33 | | | | | | | Yes | No | No | 0 | £0 | |
| 34 | | | | | | | Yes | No | No | 0 | £0 | |
| 35 | | | | | | | Yes | No | No | 0 | £0 | |
| 36 | | | | | | | Yes | No | No | 0 | £0 | |
| 37 | | | | | | | Yes | No | No | 0 | £0 | |
| 38 | | | | | | | Yes | No | No | 0 | £0 | |
| 39 | | | | | | | Yes | No | No | 0 | £0 | |
| 40 | | | | | | | Yes | No | No | 0 | £0 | |
| 41 | | | | | | | Yes | No | No | 0 | £0 | |
| 42 | | | | | | | Yes | No | No | 0 | £0 | |

Media: 1.017.136 Conteggio: 6 Somma: 6.102.818 100%



Come? I progetti di riduzione

| Project | Cost | | Annual Savings (yr 1) | | Pay back (yrs) | Net Present Cost (£) | % of Target |
|------------------------------------|-------------------|-----------------|-----------------------|------------------|----------------|----------------------|---------------|
| | Capital | Operationa l | Financial (Gross) | tCO ₂ | | | |
| Existing projects | £506,700 | -£13,725 | £173,994 | 871.9 | 2.7 | -£1,765,874 | 85.7% |
| Planned / funded projects | £576,000 | | £54,597 | 320.1 | 10.5 | £329,494 | 31.4% |
| Planned projects requiring funding | £250,600 | -£12,400 | £15,058 | 88.3 | 9.1 | £77,431 | 8.7% |
| Potential future projects | £484,330 | -£7,929 | £53,655 | 269.6 | 7.9 | £36,352 | 26.5% |
| Totals | £1,817,630 | -£34,054 | £297,304 | 1,549.9 | 5.5 | -£1,322,587 | 152.3% |



Come? I progetti di riduzione

I progetti proposti sono finalizzati alla riduzione delle emissioni di gas serra da scopes 1, 2 e 3. In dettaglio:

Scope 1 - emissioni dirette :

- Uso combustibile gas e petrolio
- Uso carburante per veicoli
- Perdite di gas refrigeranti

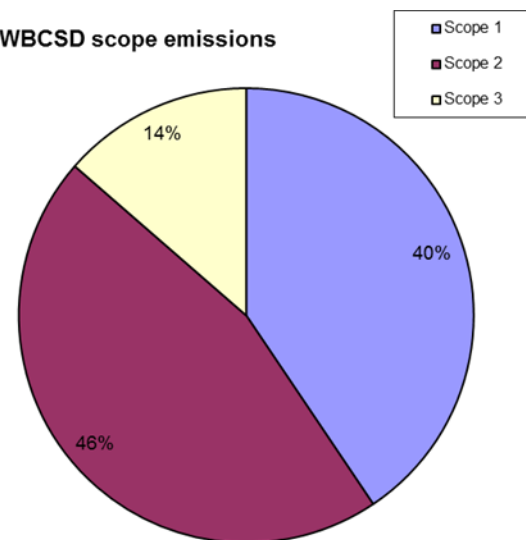
Scope 2 - emissioni indirette

- Consumi di elettricità

Scope 3 - tutte le altre emissioni indirette

- Viaggi per lavoro (mezzi pubblici e veicoli personali)
- Rifiuti
- Consumi di acqua

WBCSD scope emissions





Come? I progetti di riduzione

Progetti esistenti

| Project | Cost | | Annual Savings (yr 1) | | Pay back (yrs) | % of Target |
|--|-----------------|-----------------|-----------------------|------------------|------------------|--------------|
| | Capital | Operational | Financial (Gross) | tCO ₂ | | |
| Nuneaton Campus refurbishment - Phase 1 | £225,000 | | £14,514 | 73.6 | 15.5 | 7.2% |
| Awareness Raising - buildings | £0 | £0 | £24,792 | 123.2 | 0.0 | 12.1% |
| Awareness Raising web/teleconferencing - transport | £7,200 | £1,275 | £6,081 | 10.5 | 1.5 | 1.0% |
| Improve space utilization at Nuneaton Campus | £0 | £0 | £15,470 | 78.6 | 0.0 | 7.7% |
| Nuneaton Campus refurbishment - Phase 2 | £130,500 | £0 | £7,200 | 37.9 | 18.1 | 3.7% |
| New Hinckley campus-heating and hot water | £0 | -£15,000 | £66,066 | 323.4 | 0.0 | 31.8% |
| New Hinckley campus - Electricity | £0 | £0 | £16,304 | 95.6 | 0.0 | 9.4% |
| Improve good housekeeping | £0 | £0 | £9,917 | 49.3 | 0.0 | 4.8% |
| Replace existing desktop computers with low power Dell screens - phase 1 | £144,000 | £0 | £13,649 | 80.0 | does not payback | 7.9% |
| Totals | £506,700 | -£13,725 | £173,994 | 871.9 | 2.7 | 85.7% |



Come? I progetti di riduzione

Progetti che richiedono fondi

| Project | Cost | | Annual Savings (yr 1) | | Pay back (yrs) | % of Target |
|--|-----------------|-----------------|-----------------------|------------------|------------------|-------------|
| | Capital | Operational | Financial (Gross) | tCO ₂ | | |
| Solar PV 50 kWp array at Nuneaton Campus | £126,600 | -£13,400 | £3,785 | 22.2 | 7.5 | 2.2% |
| Evaporative cooling for server room at Nuneaton Campus | £24,000 | £1,000 | £4,104 | 24.1 | 7.7 | 2.4% |
| Server Virtualisation and low energy replacements | £100,000 | | £7,169 | 42.0 | does not payback | 4.1% |
| Totals | £250,600 | -£12,400 | £15,058 | 88.3 | 9.1 | 8.7% |



Come? I progetti di riduzione

Possibili progetti futuri

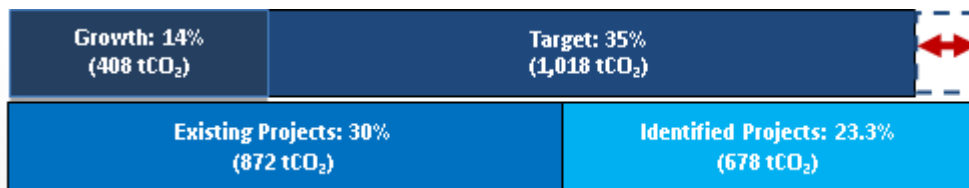
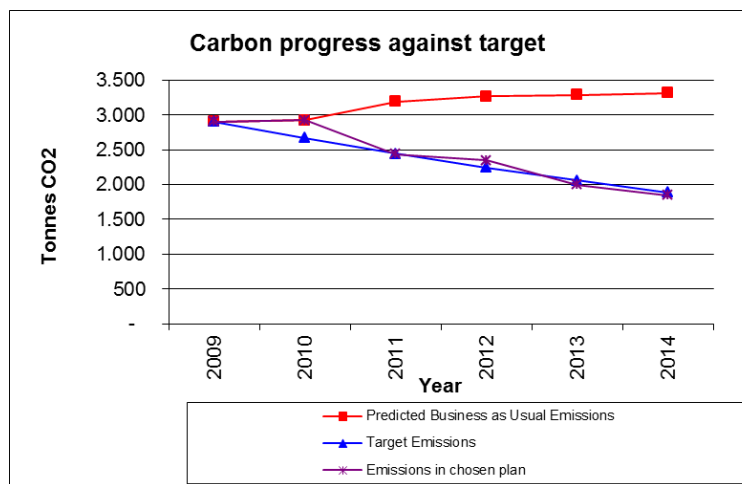
| Project | Cost | | Annual Savings (yr 1) | | Pay back (yrs) | % of Target |
|--|-----------------|----------------|-----------------------|------------------|------------------|--------------|
| | Capital | Operational | Financial (Gross) | tCO ₂ | | |
| BMS at Nuneaton Campus - heating only | £250,000 | £0 | £21,944 | 92.4 | 11.4 | 9.1% |
| Replace oil boiler at Bedworth Campus | £35,000 | -£5,429 | £2,715 | 44.9 | 4.3 | 4.4% |
| Electric/Hybrid vehicles fleet | £36,000 | £1,000 | £6,779 | 2.1 | does not payback | 0.2% |
| Nuneaton Campus refurbishment - Phase3 | £107,330 | £0 | £21,466 | 125.8 | 5.0 | 12.4% |
| Replace halogen projectors with LED projectors | £56,000 | -£3,500 | £752 | 4.4 | does not payback | 0.4% |
| Totals | £484,330 | -£7,929 | £53,655 | 269.6 | 7.9 | 26.5% |



Come? I progetti di riduzione

I progetti proposti, se implementati, possono ridurre le emissioni di 1,550 tonnellate di CO₂

↓ -53.3%





Dopo 5 anni..



33% CO₂ reduction
over 5 years



18% reduction in
electricity use over 5 years



40% reduction in gas
use over 5 year



Principi fondamentali

- **Coinvolgere** in un approccio costruttivo tutte le parti interessate.
- Raccogliere i **dati** delle attività in modo accurato
- Identificare **ruoli e responsabilità**
- Definire gli **obiettivi**
- Definire **azioni** precise e quantificate
- Definire un **calendario** e le **risorse** necessarie (persone e finanza)
- Identificare **indicatori** per seguirne l'implementazione e i risultati
- Dare **priorità** ad azioni che:
 - Hanno attuazione immediata
 - Sono semplici da implementare e visibili
 - Hanno un recupero dell'investimento breve
 - Siano sostenibili
 - Riguardano le più importanti fonti di emissione di gas serra



Key Performance Indicators

| KEY PERFORMANCE INDICATORS | | SOURCE | UNIT | 2007/2008 | 2008/2009 | 2009/2010 |
|----------------------------|--|--------------------------------|----------------|-------------|-------------|--------------------|
| 1 | College Carbon Footprint | Carbon Trust calculator | Tonnes CO2 | 3.820,7 | 3.868,3 | 3.514,4 |
| | | Monthly meter readings | kWh | 2.419.817,1 | 2.469.914,0 | 2.443.307,3 |
| 2 | Electricity usage | Carbon Trust calculator | kg CO2 | 1.299.441,8 | 1.326.343,8 | 1.312.056,0 |
| | | Finance report | £ | n.a. | n.a. | |
| 3 | Gas usage | Monthly meter readings | kWh | 6.089.199,1 | 6.258.272,7 | 5.956.041,6 |
| | | Carbon Trust calculator | kg CO2 | 1.126.501,8 | 1.157.780,4 | 1.101.867,7 |
| 4 | Water usage | Finance report | £ | n.a. | 234.097,0 | 168.474,2 |
| | | Monthly meter readings | m ³ | 29.723,0 | 19.783,0 | 23.014,0 |
| 5 | Water dispensers service | Finance report | £ | n.a. | n.a. | 16.948,5 |
| | | Invoice record | £ | n.a. | n.a. | 35.000 |
| 6 | Paper purchase | E-Services record | £ | 43.625,1 | 40.055,2 | 818,4 |
| | | Veolia reports | tonn | n.a. | 943,8 | 818,4 |
| 7 | Non Hazardous Municipal Waste | Invoice record | £ | n.a. | 53.073,0 | 41.015,8 |
| | | Invoice record | £ | n.a. | n.a. | not jet calculated |
| 8 | Confidential Waste | Waste service provider reports | % | n.a. | 8,5 | 23,1 |
| | | Waste service provider reports | % | n.a. | 6,0 | 18 |
| 9 | Percentage of recycling | Cyclescheme extranet | n. | n.a. | 302.448,0 | 312.089,8 |
| | | Payroll reports | miles | 311.330,0 | 302.448,0 | 312.089,8 |
| 10 | People registered for the cycling scheme | Payroll reports | miles | 311.330,0 | 302.448,0 | 312.089,8 |
| | | Payroll reports | miles | 311.330,0 | 302.448,0 | 312.089,8 |
| 11 | Mileage claimed by staff | Payroll reports | miles | 311.330,0 | 302.448,0 | 312.089,8 |
| | | Payroll reports | miles | 311.330,0 | 302.448,0 | 312.089,8 |
| 12 | Gasoline/Diesel usage from the College fleet | Payroll reports | miles | 311.330,0 | 302.448,0 | 312.089,8 |
| | | Invoice record | £ | 14.188,8 | 14.148,0 | 12.529,3 |



Timeline

