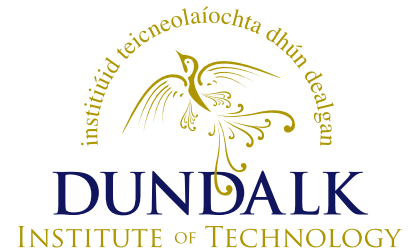


Energy Report for the year ending 31st of December 2012

Prepared by Estates Office DkIT



This report is a short summary of the energy consumption/production of the DkIT campus. It is meant to provide an overview for management purposes.

Infrastructure:

The current electrical installation consists of a two electricity connection to the National Grid, one for the RDC and one for the Main Campus. The choice of energy provider has moved from DkIT to the National Procurement Service (NPS) who now appoints the suppliers.

The electrical metering and billing is managed by Airtricity who are our current electricity provider. The electrical energy consumption is reduced by the production of electricity on site by means of a 850kW Vestas wind turbine. The wind turbine supplements the imported energy and on occasions produces more than needed which results in electricity being exported to the national grid, for which we receive payment (energia purchases excess energy).

The provision of gas is managed two companies, energia and FLOgas, each responsible for several meter points. There are seven meter points on site that connect to the Bord Gais Network. Most of the gas supplied is used for space heating purposes and small amounts for use in various laboratories and kitchens.

Summary:

- The total Energy consumption of the whole campus was *9,920 MWh*.
- Made up of: 5,772 MWh of gas 4,148 MWh of electricity.
- The total cost for Energy was 607 kEuro, 319 kEuro for Electricity and 288 kEuro for gas.
- Of the total electrical consumption of the campus 71% (2,776 MWh) were imported and 29% (1,141 MWh) produced in House.
- The Wind Turbine Produced 1,440 MWh of which 1,141 MWh was consumed in house and 299 MWh exported.
- The average price per kWh was 10.31 cent for electricity and 4.99 cent for gas.
- The total output of CO₂ was 2,637 tonnes.

Benchmark Figures:

The Student Population for 2011/12 was 4,697 full time equivalent students

The useful area on which this calculation is based is 53,238 square metres.

With these figures we can get the following benchmark figures that can be compared on a year to year basis.

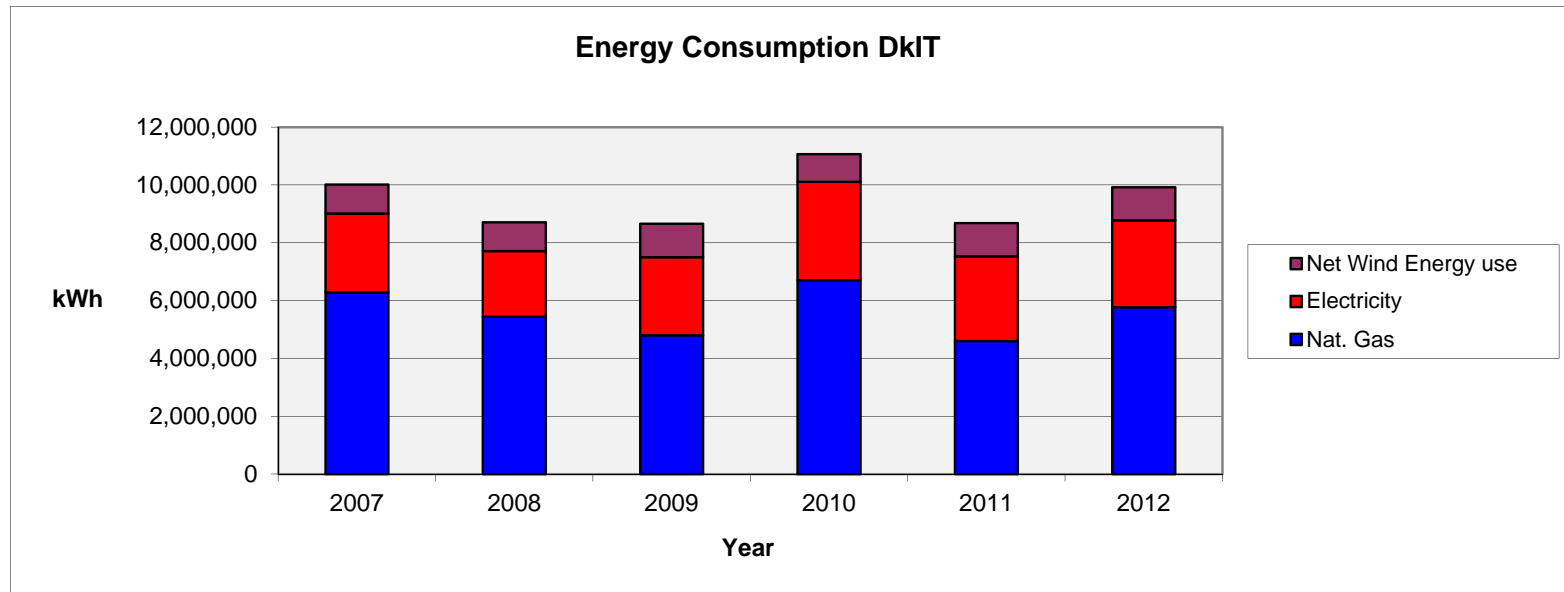
| | |
|---|----------|
| Energy Consumption per student (based on FTe students): | 2112 kWh |
|---|----------|

| | |
|--------------------------------------|---------|
| Energy Consumption per square metre: | 174 kWh |
|--------------------------------------|---------|

A more detailed comparison year on year is attached in the following Pages.

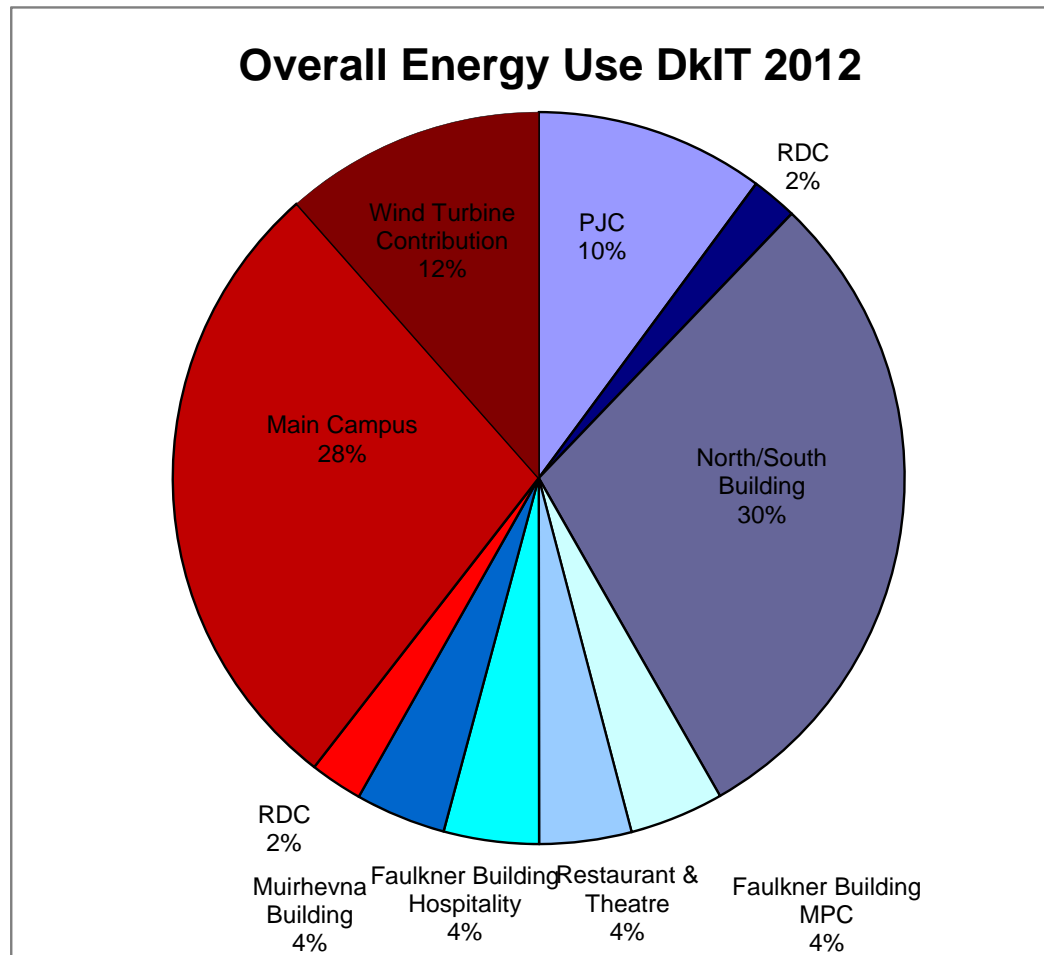
Energy Consumption DkIT

| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | |
|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----|
| Nat. Gas | 6,284,660 | 5,442,081 | 4,803,297 | 6,706,913 | 4,604,204 | 5,772,063 | kWh |
| Electricity | 2,731,937 | 2,270,675 | 2,702,368 | 3,403,401 | 2,927,124 | 3,007,121 | kWh |
| Net Wind Energy use | 1,000,000 | 1,000,000 | 1,156,116 | 957,568 | 1,148,923 | 1,141,460 | kWh |
| Wind Energy production | estimated | estimated | 1,497,671 | 1,117,718 | 1,510,316 | 1,440,406 | kWh |
| Wind Energy Export | | | 341,555 | 160,150 | 361,393 | 298,946 | kWh |



| Building | kWh |
|-------------------------------|------------------|
| PJC | 1,004,858 |
| RDC | 200,442 |
| North/South Building | 2,936,614 |
| Faulkner Building MPC | 413,130 |
| Restaurant and Theatre | 403,473 |
| Faulkner Building Hospitality | 417,158 |
| Muirhevna Building | 396,388 |
| RDC | 230,998 |
| Main Campus | 2,776,123 |
| Wind Turbine Contribution | 1,141,460 |
| TOTAL | 9,920,644 |

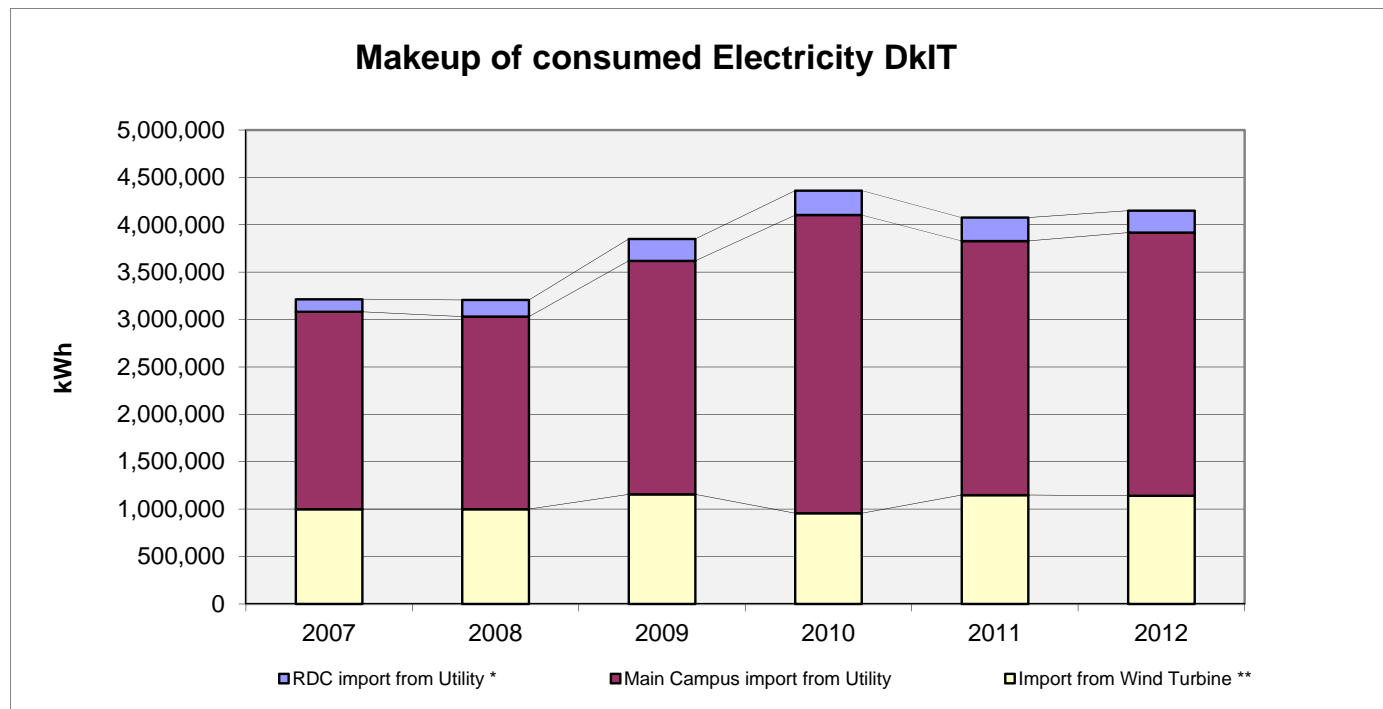
| | | |
|------------|-----------|-----|
| Electrical | 4,148,581 | 42% |
| Thermal | 5,772,063 | 58% |



Makeup of consumed electrical energy DkIT

| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | |
|---------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----|
| RDC import from Utility * | 132,344 | 175,950 | 230,750 | 257,150 | 246,600 | 230,998 | kWh |
| Main Campus import from Utility | 2,082,320 | 2,031,643 | 2,463,867 | 3,146,251 | 2,680,524 | 2,776,123 | kWh |
| Import from Wind Turbine ** | 1,000,000 | 1,000,000 | 1,156,116 | 957,568 | 1,148,923 | 1,141,460 | kWh |
| TOTAL Imports (Consumption) | 3,214,664 | 3,207,593 | 3,850,733 | 4,360,969 | 4,076,047 | 4,148,581 | kWh |

| | | | | | | | |
|---------------------------|----|----|----|----|----|----|---|
| Percentage of Wind Energy | 32 | 33 | 32 | 23 | 30 | 29 | % |
|---------------------------|----|----|----|----|----|----|---|



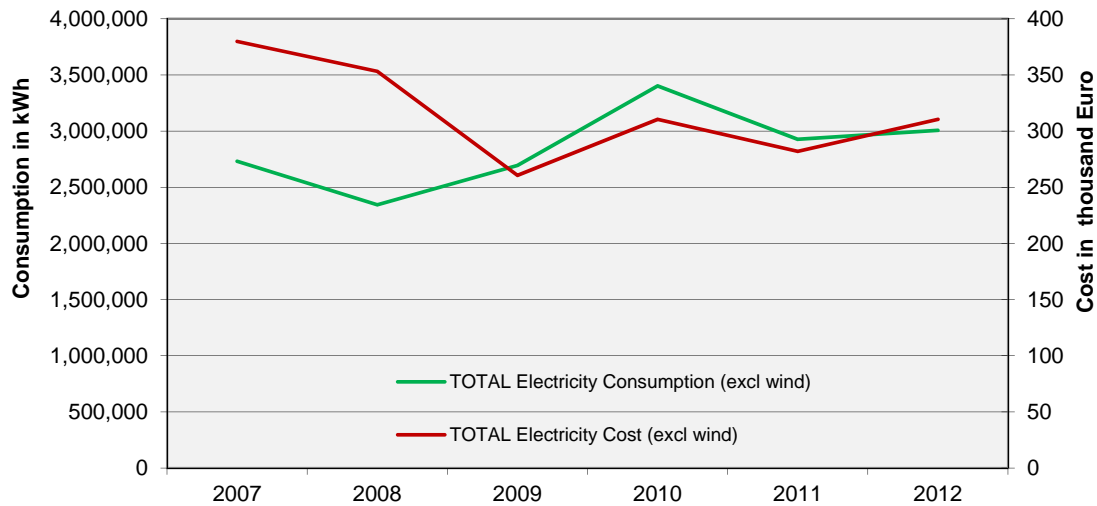
* RDC does not import from wind turbine

** data for 2007 & 2008 estimated

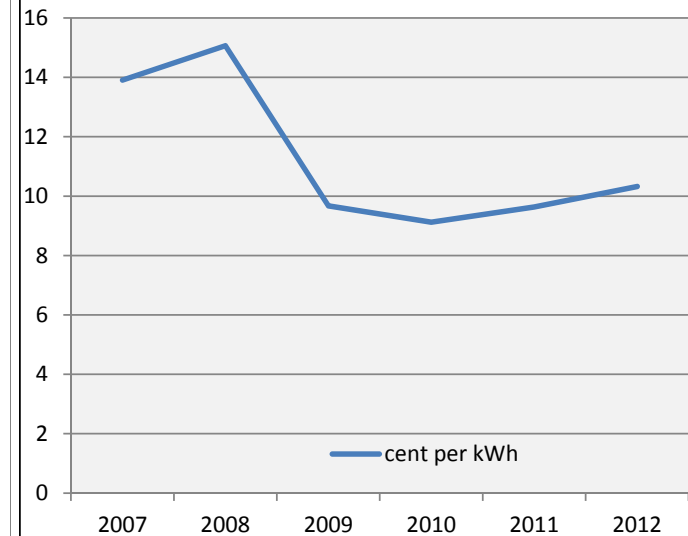
Imported Electricity

| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | |
|---|-----------|-----------|-----------|-----------|-----------|-----------|------|
| TOTAL Electricity Cost (excl wind) | 379,975 | 353,205 | 260,692 | 310,524 | 282,066 | 310,512 | Euro |
| TOTAL Electricity Consumption (excl wind) | 2,731,937 | 2,343,875 | 2,694,617 | 3,403,401 | 2,927,124 | 3,007,121 | kWh |
| Average cost per kWh | 13.909 | 15.069 | 9.675 | 9.124 | 9.636 | 10.326 | kWh |

Imported Electricity from Utilities DkIT



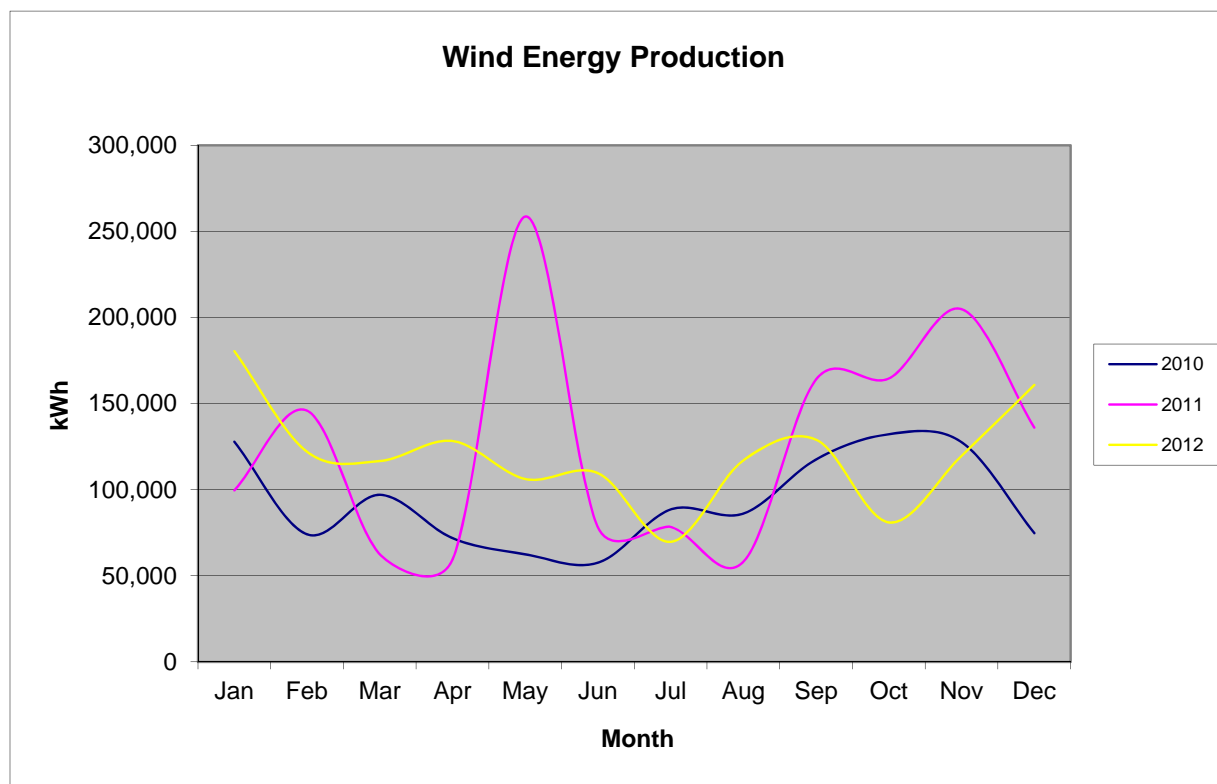
Average Electricity Price per kWh



Wind Turbine

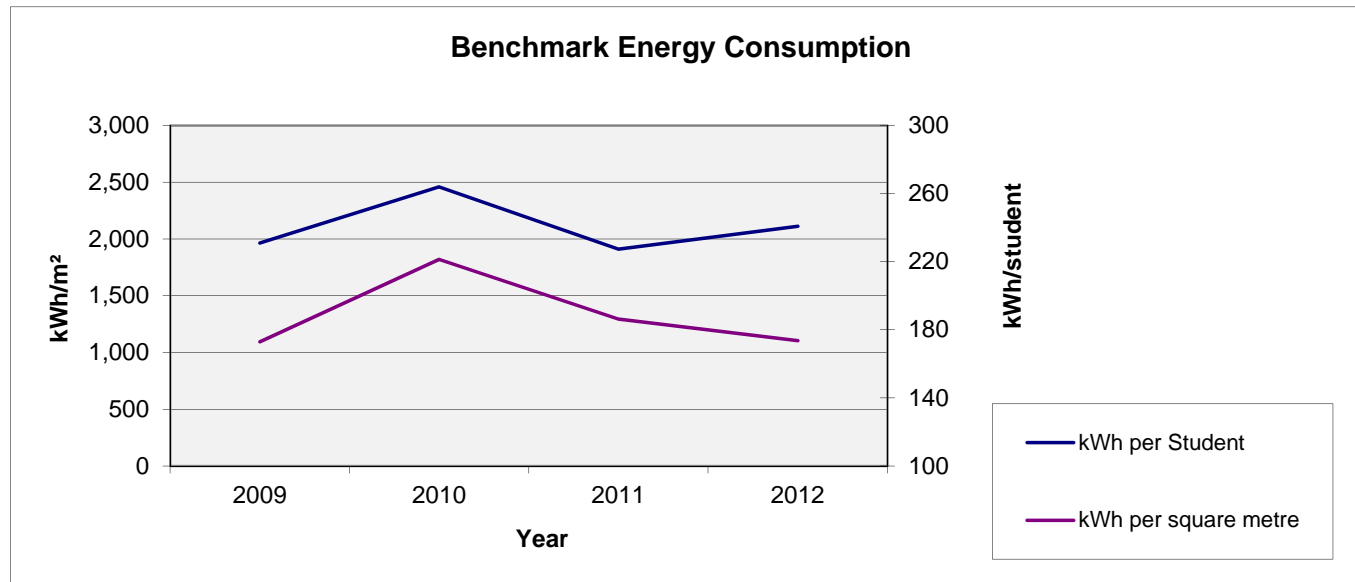
| Year | 2009 | 2010 | 2011 | 2012 | |
|------------------------|-----------|-----------|-----------|-----------|-------|
| Production | 1,497,671 | 1,117,718 | 1,510,316 | 1,440,406 | kWh |
| Export | 341,555 | 160,150 | 361,393 | 298,946 | kWh |
| Consumption by DkIT | 1,156,116 | 957,568 | 1,148,923 | 1,141,460 | kWh |
| Maintenance Cost | 20,798.24 | 14,235.93 | 22,417.01 | 24,069.27 | Euro |
| Export Refund | 5,926.83 | 6,401.17 | 17,723.08 | 14,964.13 | Euro |
| Cost for Wind Energy | 14,871.41 | 7,834.76 | 4,693.93 | 9,105.14 | Euro |
| Cost per unit produced | 0.993 | 0.701 | 0.311 | 0.632 | c/kWh |

| Month | 2010 | 2011 | 2012 | |
|--------------------------|------------------|------------------|------------------|------------|
| Jan | 127,848 | 99,616 | 180,442 | kWh |
| Feb | 74,059 | 145,901 | 121,982 | kWh |
| Mar | 97,017 | 62,436 | 116,658 | kWh |
| Apr | 71,817 | 59,484 | 128,282 | kWh |
| May | 62,509 | 258,650 | 106,182 | kWh |
| Jun | 57,599 | 78,064 | 109,582 | kWh |
| Jul | 88,525 | 78,402 | 69,712 | kWh |
| Aug | 86,147 | 58,165 | 117,037 | kWh |
| Sep | 117,637 | 164,145 | 129,020 | kWh |
| Oct | 132,240 | 164,569 | 80,964 | kWh |
| Nov | 127,580 | 204,846 | 119,735 | kWh |
| Dec | 74,740 | 136,038 | 160,810 | kWh |
| Total | 1,117,718 | 1,510,316 | 1,440,406 | kWh |
| <i>average per month</i> | <i>93,143</i> | <i>125,860</i> | <i>120,034</i> | <i>kWh</i> |



Benchmark Energy Consumption DkIT

| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|-------------------------------|-------|-------|--------------|--------------|--------------|--------------|
| kWh per Student (billed) | 2,505 | 1,917 | 1,702 | 2,246 | 1,658 | 1,658 |
| kWh per Student | | | 1,964 | 2,460 | 1,910 | 2,112 |
| kWh per square metre (billed) | 199 | 170 | 150 | 202 | 150 | 150 |
| kWh per square metre | | | 173 | 221 | 186 | 174 |



CO₂ Output DkIT

| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | |
|--|-------|-------|-------|-------|-------|-------|--------|
| CO ₂ Output (electric) | 1,778 | 1,478 | 1,759 | 2,216 | 1,906 | 1,578 | tonnes |
| CO ₂ Output (thermal) | 1,244 | 1,078 | 951 | 1,328 | 912 | 1,060 | tonnes |
| TOTAL | 3,023 | 2,556 | 2,710 | 3,544 | 2,817 | 2,637 | tonnes |
| Additional CO ₂ Output without the use of Wind Energy | | | 753 | 623 | 748 | 749 | tonnes |

