

Computing sustainability

June 19, 2008

From *The Economist* print edition

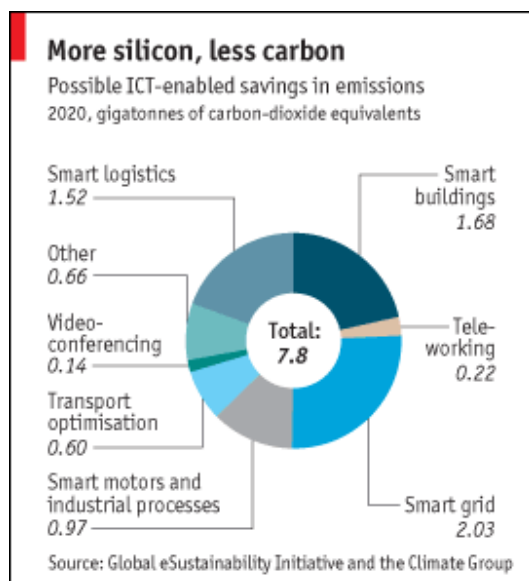
How computers can help to cut carbon emissions

How much computing can mankind afford? That is a question the computer and telecoms industries hate to hear. They do not see themselves in the same dirty league as airlines or carmakers, sources of huge amounts of carbon dioxide, but instead as part of the solution. In a **pre-emptive strike**, a group of technology firms calling itself the Global eSustainability Initiative (GeSI) has joined the Climate Group, a non-profit environmental club, to examine how information and communications technologies (ICT) affect climate change. Their research has confirmed that ICT could in fact do much to reduce greenhouse-gas emissions—but not in the way you might think.

When it comes to emissions, **ICT is on a par with aviation**. In 2007, according to the report, the world's electronic gear (including PCs, their peripherals, telecoms networks and devices, and the warehouses of corporate machines known as data centres) produced 830m tonnes of CO₂—about 2% of total emissions from human activity. Even with technology that uses energy more sparingly, this is expected to grow to 1.4 billion tonnes by 2020. Although PCs, mobile phones and networks will **account for** most (56%) of this, emissions from data centres will grow the fastest.

Yet these numbers look much less frightening if, in the words of the study, ICT's "enabling effect" is taken into account. The study calculates that ICT could help to reduce emissions in other industries by 7.8 billion tonnes by 2020, or five times ICT's own footprint. Perhaps the best-known of these enabling effects is to replace face-to-face meetings, which require **carbon-belching air travel**, with low-emission alternatives such as videoconferencing. John Chambers, the boss of Cisco, a big maker of network equipment, says his company has reduced its carbon footprint by 11% by using its own "telepresence" gear. It also means higher productivity and reduced **"wear and tear"** on executives, he adds.

But reducing transport emissions using technologies such as videoconferencing and **teleworking** turn out to be some of the smaller enabling effects—saving a potential 140m and 220m tonnes of CO₂ a year in 2020 respectively (see chart). Using computers to improve logistics (for example, by planning the routes of delivery vehicles more efficiently) could save 1.5 billion tonnes; using data networking inside a "smart" electrical grid to manage demand and reduce unnecessary energy consumption could save 2 billion tonnes; and computer-enabled "smart buildings", in which lighting and ventilation systems turn themselves off if nobody is around, could save 1.7 billion tonnes.



None of this will be easy. The industry can supply the hardware and software, but the bigger problem is the "wetware"—people, economics and politics. The right skills are often scarce. **Incentives** are lacking for businesses to invest in carbon-reducing technology. There need to be new technical standards. For transport, power grids and buildings to become more efficient, there must be rules on how, for instance, refrigerators should talk to electricity meters, and thermostats to heating systems. But the internet shows that when common standards are agreed on in an industry, great things can happen. The technology industry's contribution to tackling climate change may come from its standards bodies as much as its clever **gizmos**.

A. COMPREHENSION CHECK

Discuss the points and answer the questions arising from the article.

- 1 How do information and communications technologies affect climate change?
- 2 Can ICT's own carbon footprint be reduced? Name some ICT's enabling effects. Interpret the chart. What does it show?
- 3 Define the computer-enabled environment. What are your own predictions for the computer-enabled future?
- 4 Do you agree that teleworking is becoming a reality? Are there any other options?
- 5 What does the author of the article mean by the "wetware"?
- 6 Explain the meaning of the highlighted items in the text.

B. DATA ANALYSIS AND COMMENT

Graphs and diagrams – Presenting information visually

The functions of graphics

Graphics are used to demonstrate logical and numerical relationships, to clarify, emphasize, summarize, and organize information. They are important in technical communication because visual elements are more effective than a verbal description. Graphics can catch the reader's attention and interest; they can save space. Presented as a paragraph, the information is uneconomical and hard to remember. Presented in a graphical form, however, the information is more concise and more memorable. People studying a text with graphics learn about one-third more and remember some 43 percent more when a document includes graphics.

- Name different types of diagrams and graphs according to their function.
- What would be the best type of diagram to present the different stages in a research project you did?
- What is another name for a legend in a diagram?

Interpreting charts, graphs and diagrams

Task 1

The verbs below can be used to describe changes commonly represented on line graphs.

Which verbs mean:

go up suddenly/a lot, reach the highest level, stay the same, go up and down, go down sharply.

plummet
rocket
level out

soar
plunge
peak

drop
fluctuate
slump

Changes can also be described in more detail by modifying a verb with an adverb or using an adjective + noun construction. You can find more phrases and expressions in the Useful language section on page 7.

Example:

- Sales *increased/rose dramatically/sharply* from 2006 to 2008.
- There was a *dramatic increase/rise* in sales from 2006 to 2008.

Verbs: increase, rise, decrease, decline, fall, drop.

Adverbs: slightly, moderately, steadily, gradually, rapidly, dramatically, sharply.

Task 2

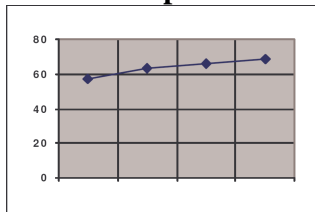
Make the rather informal words in bold sound more precise and academic. Replace them with words having a similar meaning.

- a This flowchart shows the different **bits** of our project over the next five years.
- b Draw a line connecting the points that are **next** to each other.
- c The two lines on the graph **cross each other** at point A.
- d He kept a record by **marking** the midday temperature on a graph for a month.
- e The different **bits** of the pie chart show the numbers of people in each age group.
- f People's salaries usually reach their **highest point** when they are in their late 40s.
- g The government's popularity in the opinion polls is beginning to **fall**.

Task 3 – Describing trends on line graphs

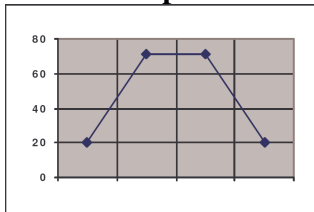
Study the graphs below and fill in the gaps with suitable words and expressions.

Graph A



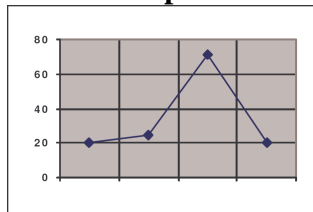
There has been a _____ in production over the year.

Graph B



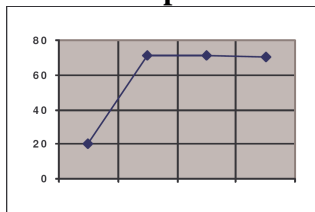
Production started climbing steadily but flattened ____ at a level of around 70. Since then, it _____.

Graph C



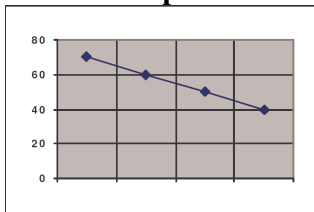
Production _____ more and more _____ over the first three quarters but then _____. Since then, it has quickly dropped.

Graph D



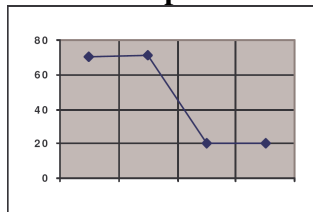
Production grew rapidly in the first quarter, but _____ a plateau ____ about 70. Since then it _____ more or less stable.

Graph E



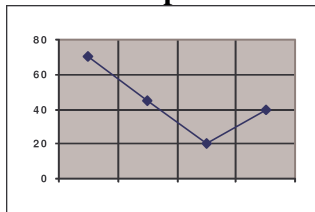
Production has dropped slowly but _____ over the year.

Graph F



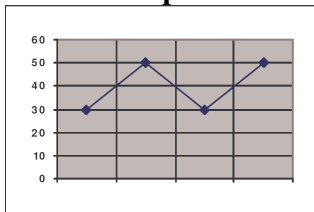
Production started the year in a stable position, but then _____ in the third quarter. It has now _____ at a level ____ 20.

Graph G



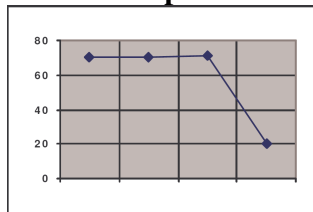
Production fell _____ over the first three quarters, reaching a low of 20. Since then it has staged a partial _____.

Graph H



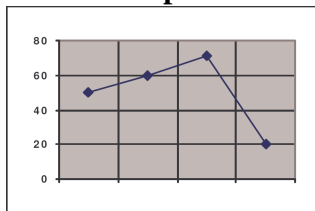
Production _____ all year.

Graph I



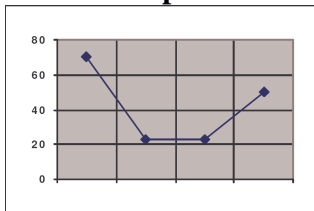
Production started off steady, but _____ in the last quarter.

Graph J



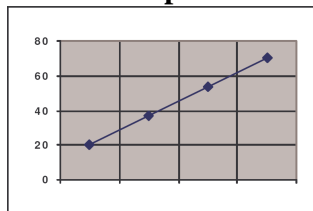
Production showed a marginal _____ in the first three quarters, but then suffered a sharp _____.

Graph K



After a _____ drop in the first two quarters, production bottomed out at 20. Since then it _____.

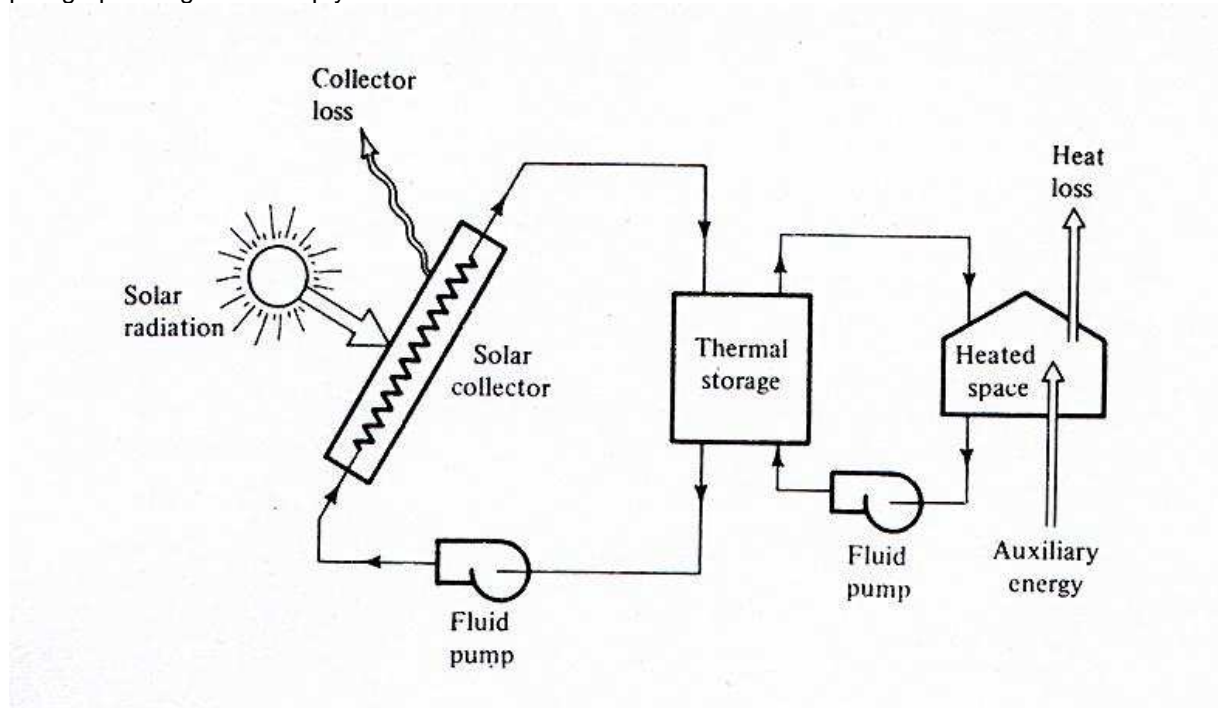
Graph L



Production has experienced a strong, steady _____ over the whole year.

Task 4 – Guided writing

Look at the diagram below which shows a basic solar heating system. Then look at the notes below the diagram. Use these notes to write a paragraph describing how the system works. Try to use passive forms of verbs where appropriate. Do not forget to supply articles. The first and last sentences of the paragraph are given to help you.



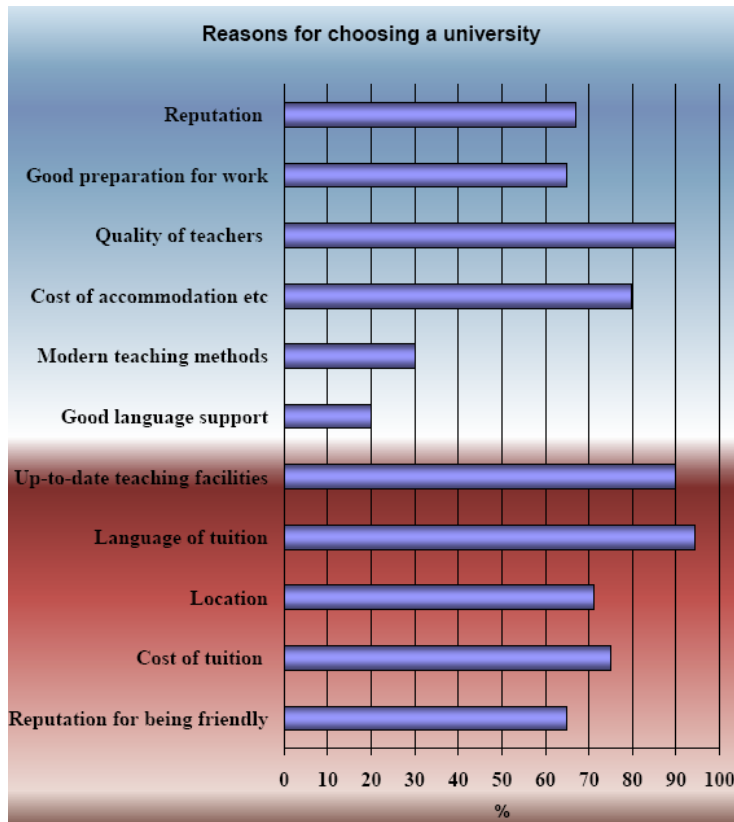
A simple solar heating system is shown in the diagram above.

- First, solar radiation → solar collector.
- Some energy → to sky.
- Liquid in collector heated → sun's energy.
- Next, heated liquid → thermal store.
- Thermal storage ! if energy needed when no solar radiation.
- Often, storage tank = heating element → increase temperature.
- Hot liquid → to area where needed.
- In most buildings, heat lost → roof → auxiliary heating.
- Cool liquid → to tank and then to solar collector → pumps.

Engineers need to be able to calculate the potential for a solar heating system and to be aware of the possibility of using solar energy in installations.

Task 5 – Reasons for choosing a university

Study the chart below and add the phrases A-O in the appropriate spaces in the sentences 1-15, which follow.



List of phrases

- | | |
|--|--|
| A only 30 percent selected | I is |
| B reason behind students choosing | J with approximately |
| C as opposed to 75 percent | K compared with modern teaching methods |
| D can be divided | L at 95%, 90% and 90% respectively |
| E was carried out | M reasons why |
| F was five percent more than | N which influences students |
| G more students quoted | O bottom |
| H is given as | |

- The chart shows 11 _____ first year students from overseas chose a particular university.
- Good language support comes _____ at 20 percent.
- Language of tuition is top of the survey _____ 95%.
- At 95 percent of the sample, Language of tuition is the main _____ a university.
- The survey of 1,000 first year overseas students _____ at universities in the UK.
- Good language support at 20% is the factor _____ least when making a choice about which university to attend.
- Language of tuition _____ a reason by nearly five times as many students as Good language support, at 95% and 20% respectively.
- The top three reasons are Language of tuition, Quality of teachers, Up-to-date teaching facilities, _____.
- According to the graph, the main reason _____ the language of tuition.
- The various factors _____ into two groups, namely those related to teaching and non-teaching related.
- While around 95 percent of the students gave the language of tuition as the main reason for choosing a university, _____ modern teaching methods.
- The cost of accommodation at 80 percent _____ the cost of tuition at around 75 percent.
- Eighty percent of the sample mentioned the cost of accommodation as a reason for choosing a university _____ for the cost of tuition.

- 14 _____ the cost of accommodation and the cost of tuition than Location at 80% and 75% respectively.
- 15 Good language support was stated by only 20 percent of the sample as a reason for choosing a university _____ at 30 percent.

C. HOMEWORK ASSIGNMENT

Webcast

Prepare your own mini-presentation for the web. Use the data from the box below or, alternatively, make up your own data/fact sheet using a similar format. Prepare the necessary slides and add any graphs or product pictures you would like to. Suggested titles on the presenters' slides:

- Aims
- Overview
- 2008 Performance Analysis
- R & D Investment
- 2009 Outlook

Write the transcript of the webcast using the key phrases from the presentation language feedback. Deliver your webcast to a group of investors (students in the class). Be ready to answer any questions from analysts and from the audience.

<p>Company name: Digital Business Solutions Product: Portable electronics Performance 2008 (turnover):</p> <ul style="list-style-type: none">• Q1 €100m• Q2 €150m• Q3 €200m• Q4 €250m <p>R & D Plans: Developing a multi-purpose 'office in your pocket' palm computer 2009 Outlook: Good</p>

Follow up

List some similarities and differences between a live presentation and one on the Internet.

Related websites

<http://www.un.org/webcast/index.asp>

<http://www.presentations.com/>

<http://webcast.berkeley.edu/events/index.html>

Report structure – email English

Acquire a professional email writing style that will give you key skills for the world of work. Write a short report as an email. Some ideas are given below, but adapt and change them as you wish.

- a) An email to your line manager related to your job.
Ideas: a sales report; a market report; a product report.
- b) An email report to your line manager that is a report based on the information below:
- *Introduction and background:*
sales report for last year – strong market (sales up 12%, profits up 6%).
 - *Findings:*
strong competition meant that we could not increase prices, so profits grew less than sales; most of the increase in the first half of the year; sales of new products were very good, but fewer new products next year.
 - *Recommendations:*
need to keep cutting costs because next year probably won't be so good; need to develop new products and look for new markets; marketing department need to analyse why the second half was weaker.

- *Closing comments:*
the next meeting will discuss this report, so ask for comments and say they will be circulated before the meeting.

When you finish, check grammar, spelling, punctuation and style. Is everything clear, well-structured and easy to understand?

D. USEFUL LANGUAGE FOR INTERPRETING GRAPHS

- The graph illustrates / shows the rise in . . .
- The graph illustrates / shows that . . .
- It is estimated that . . .
- Which factor comes top / bottom / second from the bottom?
- Compare the data in the bar graph / chart.
- Give the percentages of several factors. Which factor is the highest / the lowest?
- The trend (in customer numbers) was upward X downward.
- There was / has been a downward trend in customer numbers.
- The trend was flat.
- The present trend is maintained.
- Production started the year in a stable position, but then plunged / plummeted / slumped in the third quarter. It has now flattened out / levelled out / bottomed out at a level of . . .
- Customer numbers fluctuated slightly X wildly.
- There were considerable / wild fluctuations in customer numbers.
- Production has fluctuated all year.
- Customer numbers were erratic.
- Customer numbers rose.
- There was a gradual rise in customer numbers.
- There has been a slight increase in production over the year.
- Production showed a marginal rise in the first three quarters, but then suffered a sharp drop.
- Production has experienced a strong, steady growth over the whole year.
- Production grew rapidly in the first quarter, but reached a plateau of about . . . Since then it has remained more or less stable. / Since then, it has quickly dropped.
- Production started climbing steadily / began to rise rapidly but levelled off / flattened off at a level of around . . . Since then it has fallen steadily.
- Sales rocketed. Prices are soaring / rocketing / skyrocketing.
- Customer numbers (have) soared.
- There was / has been a steep rise in customer numbers.
- Customer numbers hit / reached a peak.
- There was a peak in customer numbers.
- There was a slight dip in customer numbers.
- There was a steady fall / decline in customer numbers.
- Numbers fell steadily.
- Production has dropped slowly but steadily over the year.
- The number of customers fell dramatically.
- Production fell sharply / considerably in / over the last quarter, reaching a low of . . . Since then it has staged a partial recovery.
- There was a rapid / considerable / dramatic / sharp drop in production in the first two quarters.
- Customer numbers dipped / plunged.