Key skills communication
Level 3 – Wind energy

Tuesday 16 November 2004

Source Booklet

- This booklet contains source material for the level 3 communication test, November 2004
- The test questions will be based on this material
- You must hand in this source booklet at the end of the test, along with your question paper and answer booklet

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The level 3 communication test will assess your ability to:

- select and read material that contains the required information
- identify accurately, and compare, the lines of reasoning and main points from the text and images
- synthesise the key information in a form that is relevant to the purpose
- select and use a form and style of writing that is appropriate to the purpose and subject matter
- organise relevant information clearly and coherently, using specialist vocabulary when appropriate
- ensure text is legible and spelling, grammar and punctuation are accurate so that meaning is clear

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Wind Energy

The European wind energy resource

The wind energy resource in Europe is sufficient in theory, to provide all of Europe's electricity. Technical limitations mean this will not happen, but detailed studies suggest that most electricity supply companies could accommodate between 10-20% of their total production from wind without any technical modification to the existing system.

A broad idea of where Europe's wind energy potential lies can be seen from the "Wind Atlas" (see above right). Lighter colours represent low wind speed regions and darker areas high speed regions. On hills and mountains one may also find good, windy locations even in areas with generally low wind speeds.

In addition to land based wind energy, there is enormous potential for offshore windfarms. These have the advantage of generally high wind speeds, although construction and access is clearly more difficult.

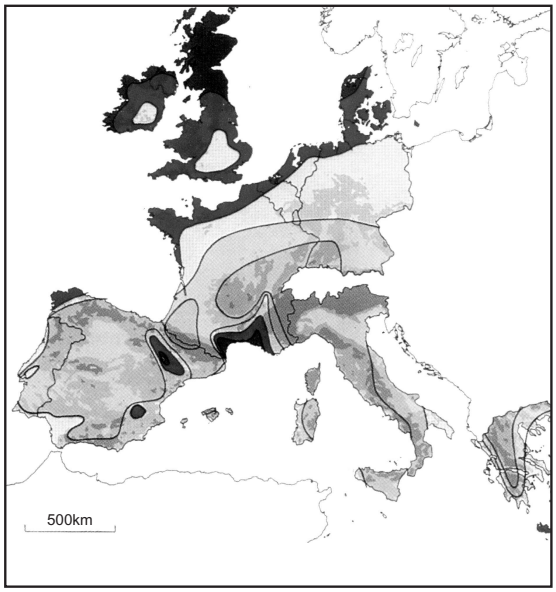
Local attitudes

The building of wind turbines across Europe has been well received by the public.
Published local opinion studies continue to show that over 80 per cent of people polled around wind farms support wind energy.

Wind energy – making environmental sense

Wind energy is clean energy.
It causes no harmful pollution during operation. It produces:

- NO carbon dioxide (a gas that contributes to global warming)
- NO sulphur dioxide or nitrogen oxides (gases that contribute to acid rain), *and*
- NO hazardous or radioactive wastes.



Wind Atlas

All over the world governments are trying to reduce pollution. Wind energy will play a valuable role in creating a cleaner and sustainable future. All forms of energy production have an environmental impact, but with wind energy the impacts are low, local, and manageable. Most people living near wind turbines find them attractive, and wind farms have become tourist attractions. Modern wind turbines are quiet in operation and blend well into the rural environment when care is taken over their siting.

A typical wind farm of 20 turbines might extend over an area of one square kilometre. However, unlike other power stations, the wind farm will only use 1% of this land area. On agricultural land, normal farming activities continue right up to the base of the turbines.

When turbines reach the end of their working lives they can easily be removed and the sites returned to their original use. The scrap value of the turbines will generally pay for the dismantling.

Through sensitive planning and appropriate public consultation wind energy projects can form a new and welcome part of the countryside.

Image 1 *Wind energy produces no pollution*

Wind energy – making economic sense

Producing electricity from the wind is a new industry. 15 years ago there was no commercial wind power in Europe. In some countries wind energy is already competitive with fossil and nuclear power even without accounting for the environmental benefits of wind power. The cost of electricity from conventional power stations does not usually take full account of its environmental impact (acid rain, oil slick clean up, the effects of climate change, etc).

Wind energy production continues to improve in ways which reduce cost and improve efficiency. Electricity from the wind costs about 5 to 8 Euro cents per kwh and is predicted to fall about 4 Euro cents per kwh. Wind energy projects are simple and cheap to maintain. Land rental fees paid to farmers provide valuable additional income in rural communities. The construction work is mostly undertaken by local companies providing local employment, and long-term jobs are created for maintenance work.

Wind energy is a fast-growing world-wide industry. There are approximately 60 manufacturers world-wide and most of these are European.

More than 10 major European banks and more than 20 European utilities have invested in wind energy as have individuals and companies. In Denmark 100,000 individuals have made their own investments in wind.

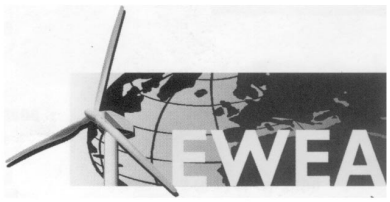
The wind industry is also a major employer. A recent study by the Danish wind Turbine Manufacturers Association concludes that the Danish wind industry alone employs 8,500 Danes and has created a further 4,000 jobs outside Denmark. The Danish wind industry is now a larger employer than the Danish fishing industry. Total employment within the wind industry in Europe as a whole is estimated to exceed 20,000 jobs.

Signposts to the future

We all use electricity. Most of it comes from traditional sources of energy such as coal, gas and nuclear power. There is much debate as to how long the supplies of these will last, but everybody agrees that one day they will run out. Now in Europe we are using a different way to produce electricity – wind energy.

An energy policy for a sustainable future will be based on high levels of energy efficiency and greater use of renewable energy.

It is in the interests of our children and future generations that we continue to develop harnessing the energy in the wind.



European Wind Energy Association

Source: European Wind Energy Association, 2001

Britain

Energy Policy

New nukes or wind farms?

Britain cannot go green without paying a price

How do you cut emissions of green-house gases (GHGs) while ensuring that voters still get cheap electricity? After wrestling with this question for months, the government this week pretty much admitted that it cannot be done.

A long-awaited report published on February 14th by Tony Blair's performance and innovation unit (PIU), part of the Cabinet Office, was supposed to set out the broad outlines of energy policy for the next 50 years. Actually, all the report does is to invite a debate on whether there should be such a policy, or whether things should be left mostly to market forces.

Classical energy policy suggests that countries need a range of power sources – coal, nuclear, gas and so on – with as much as possible coming from domestic supplies. The rationale is to ensure there are alternatives even if one source is disrupted or if international events interrupt imports, but it means government spending heavily on meddling in the marketplace.

Increasingly, liberalised markets are seen as the best guarantor of energy security. The remarkable resilience of Britain's electricity trading system recently, despite the collapse of Enron, the country's biggest energy trader, bolsters this argument. What's more, liberalisation has given Britain the cheapest energy in Europe.

Mr Blair's government has avoided making tough decisions about energy policy. That has been possible because it inherited plenty of nuclear power and offshore gas. Just over 40% of electricity is produced by gas, just under 30% by coal, 25% by nuclear and tiny amounts from oil and renewables.

Two factors will bring about difficult choices. First is Britain's noisy commitment to the Kyoto protocol, a UN treaty to combat global warming. Mr Blair even dared to criticise his bosom buddy, George Bush, for walking out on Kyoto last year. That pact commits Britain to sharp cuts in its emissions of GHGs. Second, nine of Britain's ten nuclear power stations are due to shut down by 2005. Nuclear plants produce no GHGs. Unless those plants are replaced by carbon-free sources (new nukes or renewables), Britain's climate goals cannot be met.

The government wants a big expansion of renewable energy, from supplying 3% of electricity needs now to 20% in 2020. Experts agree it is possible. A recent report for the Scottish government reckoned that there is enough potential wind and wave power around Scottish coasts to supply 75% of Britain's electricity needs.

But how to get there? British Energy, a nuclear generator, and AMEC, a big construction firm, are looking at building a 300-turbine wind farm, the biggest yet in Europe, on the Hebridean island of Lewis. It would generate about 600MW, about half the output of a nuclear power station. But British Energy thinks it may need a subsidy to help pay for the £300m-400m cost of laying a sub-sea cable to get to the main electricity market in England. Supplying this sort of power on the scale envisaged would, the government reckons, raise electricity bills by up to 6%.

Image 2

The PIU also wants to keep the nuclear option open, but public opinion is hostile. Even if that can be overcome, British Energy admits that current electricity prices are too low for new nuclear to be economic; it needs fresh subsidies too.

The PIU report is not keen on that, preferring to wait and see if new technologies bring the cost of nuclear power down. Even if that happens, few banks are willing to finance such a project unless the costs of dealing with nuclear waste and insuring against accidents are sorted out. These costs too, are likely to fall on the taxpayer or the consumer. Renewable or nuclear, greenery will be costly. ■

Source: *The Economist*, 16 February 2002

THE SUNDAY TIMES - JANUARY 20, 2002 **LIVING** 4

Something in the Wind

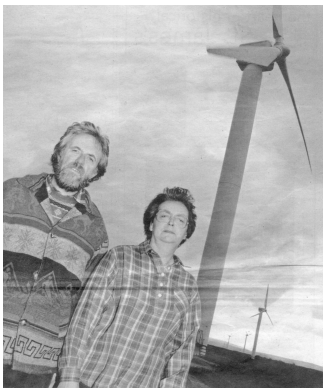
Blight or thing of beauty? Plans to build wind farms across Britain are provoking mixed views, says **Ross Dodd**

To some people they are "grotesque" blights on the countryside; to others, graceful machines that offer a welcome alternative to nuclear power and a way of tackling global warming.

There are now more than 60 wind farms in Britain – the windiest nation in Europe – with 853 turbines producing enough power to run 500,000 homes a year. The numbers are set to rise as the government cranks up its drive to generate 10% of Britain's electricity from green energy sources by 2010.

Last week Powergen announced that it is considering building one of the biggest wind farms in the world in the Thames Estuary, sinking several hundred turbines into a sand bank in a project worth £500m.

It comes in the wake of plans announced in December for a huge onshore wind farm on the Hebridean island of Lewis.



The Theobalds: see no problems with turbines

If the project gets planning permission, 300 turbines will be built, eventually meeting 1% of Britain's electricity needs.

An increasing number of homeowners therefore have to get used to the prospect of living near the whirling blades. Margaret Gough, for one, cannot stand the sight of the towers that straddle the grassy slopes near her mid-Wales home.

When she and her late husband retired to a village outside Aberystwyth 15 years ago, they chose a bungalow which had stunning views – until the Mynydd Gorddu wind farm opened several years later.

"The reason we bought this property was for the scenery," says Gough. "It was such a beautiful skyline: if I stood in the garden and looked around all I could see was tree-covered hillsides. Now when I look out I can see about eight or nine wind turbines."

Archaeologist Dr Stephen Briggs, also from Wales, claims he moved because infrasound, sound with a frequency below an audible level, from a wind farm made his wife ill. Problems started not long after the Llangwyryfon wind farm, 12 miles from Aberystwyth, opened 10 years ago. The Briggs' house was 350m from three of the 20-plus turbines and 650m from six of the machines.

"Our initial intention was to stay put, even though we were disturbed by the changes and damage," says Briggs.

"We had been assured the turbines would make no noise, but we were so close we could hear the wind whistling through them.

"We also discovered that not only did they broadcast audible sound, they produced infrasound. It started to make my wife sick."

Finally, six years ago, the Briggs decided to sell their house and move to a new home five miles away.

Dr Peter Musgrove, head of development at National Wind Power, which used to own Llangwyryfon, says; "The issue of the infrasound has been looked into in considerable detail and no evidence has been found that it is emitted by the turbines."

Not everybody objects to turbines, however. John Theobald and his wife Sue are more than happy to live in the lee of a wind farm. Their bungalow overlooks Delabole in Cornwall, the oldest commercial wind farm in Britain, which attracts thousands of visitors a year. From their windows, they have a clear view of all 10 turbines.

"My wife and I are inveterate supporters of renewable energy anyway, but I love them," says Theobald, who runs a woodturning business and a bed-and-breakfast.

"They change colour depending on the weather: some days they look thunderously grey and broody; other days, when the sun goes down, they turn pink and purple.

"Having said that, I don't think anyone would like to live right underneath the tower."

"We live about four or five fields away and only occasionally hear the noise from the turbines if the wind is in the East."

In fact, the noise is diminishing all the time as technology advances.

"Noise is no longer an issue," asserts Peter Edwards, owner of Delabole farm. "You can stand under the turbine in Swaffham in Norfolk [the world's most efficient turbine and at 67m, thought to be Europe's tallest] and you don't know it's turning."

Blowing hot and cold: Martin Wright, above, from mid-Wales, fears turbine blight

Surveys have found that although up to 96% of people say they approve of wind farms, about a quarter would not like to live close to one. Householders' main objections are that wind turbines are "ugly" and they may bring down the value of their properties.

Michael Williams, manager of estate agent Shearer & Morris in Aberystwyth, says that unless homes are very close to wind turbines property prices are unaffected. "I've sold quite a few properties within a mile of wind farms without any bother," he says. Nevertheless, some homeowners are fighting back. Martin Wright, Chairman of the Cefn Croes Campaign, is trying to halt the construction of the biggest wind farm in Britain. Under the £35m project – already approved by Brian Wilson, the energy minister – 39 turbines, each 100m high, will be cited at Cefn Croes, near Devil's Bridge in Ceredigion, mid-Wales. Wright says he objects to wind farms because he fears that vast swathes of rural Britain will be lost to the machines.

"Mid-Wales is full of them," he laments. "The reason I oppose them isn't because I don't want them in my back yard – there's a wind farm on the mountain above my house and I can't say it disrupts my life – it's to do with the wider issue of the value of our landscape.

"Wind power is a good idea, but the only way it is going to have any impact on our energy needs is to cover the whole country with turbines. So unless we are going to go down that path, why bother?

"We are going to ruin some of the lovely wildernesses that have been protected since the war: you can't build bungalows, but you can put up a 100m high turbine. That doesn't seem right."

Source: *The Sunday Times*, 20 January 2002