

16 April 2003

Low Carbon Vehicle Partnership
Working Group – R & D
Working Sub-group - Centre of Excellence and Development for Low Carbon and
Fuel Cell Technologies

RECOMMENDATIONS THIRD DRAFT

Background

In 2001 the DTI formed the Automotive Innovation and Growth Team (AIGT) under the chairmanship of Sir Ian Gibson. In May 2002 the AIGT produced a report that recommended among other things the formation of two new Centres of Excellence. One of these Centres is to be in Low Carbon and Fuel Cell Technologies, and the DTI has tasked the LowCVP to recommend the formulation of this Centre. The LowCVP has delegated this task to this Sub-group, whose sole task it is.

Focus

A National Centre for Low Carbon and Fuel Cell Technologies for Vehicles.

Objectives

Quote from AIGT recommendations: “The Centre would be responsible for development of technology up to proof of concept and commercial potential which could include the build of demonstrator vehicles”.

The Centre would:

- Generate competition to produce low carbon transportation technology products
- Stimulate demand for these products
- Help UK manufacturers put British technology on the road
- Drive research for tomorrow
- Stimulate and complement private sector activities
- Work with industry to fill the gaps in the innovation chain
- Pro-actively promote innovation and collaboration towards the centre’s objectives
- Communicate with the public
- Link with Europe and the World
- Encourage participation in European and World programmes in this area
- Demonstrate UK excellence in this area
- Provide a single portal for this area
- Help to de-fragment the UK effort in this area
- Interface with other activities in this area

Structure

The attached figure shows an illustration of the proposed structure. At the core of the Centre is a Directorate, consisting of a Director responsible for the Centre and several

other staff. The diagram shows a “hub and spoke” structure, where the Directorate is at the hub of the Centre, with spokes leading to three different types of organisation. Shown attached to upper hub in the diagram are spokes leading to “Sponsor” organisations, ie those providing the driving force to initiate the Centre, expecting to see deliverables from it, and providing the necessary funding. The middle hub is attached to spokes leading to the “Technology Provider” organisations, i.e.

- vehicle manufacturers who may help ensure the technology developed is producible
- component manufacturers who will develop and supply the components needed
- universities who will conduct research and help put together consortia
- consultants who will help with projects
- energy suppliers who will help with infrastructure and fuel/vehicle interaction

Any of these organisations may participate in consortia aimed at specific objectives. The lower hub shows potential project areas for the Centre, leading to the deliverables, qv. Note that the diagram is illustrative only, more spokes will be added as appropriate. The Directorate should be in a location where there is both an administrative function and an active project group.

The Centre should be associated with two boards; the LowCVP board to ensure the Centre stays on track, and the LowCVP R&D working group, who would set the agenda for the Centre. The Director would report to the latter.

Modus Operandi

The Centre would set a strategy to achieve the objectives (qv). It would pro-actively initiate projects and put together consortia to make the strategy a reality. The Center should use it's money as a catalyst to pull together the funders and the teams to do the work. The Centre would not replace the Foresight Vehicle programme nor the existing DTI fuel cell programme. Rather, it will work with these programmes to ensure that there is neither duplication nor gaps. The Centre of Excellence must also work with the new Energy Research Centre and Fuel Cells UK, and the car, bus and other groupings within the LowCVP.

The Centre should have the capability to manage up to 6 major, diverse, programmes to deliver proof of concept.

Deliverables

Road Maps: It was felt that the Centre should amalgamate the existing relevant roadmaps and be the holder of the Roadmap for future Low Carbon Vehicle Technology and keep it updated, and communicate it to all those working in the field in the UK.

Demonstrator projects, especially Demonstrator vehicles: The Centre should cause them to happen. The demonstrators must be collaborative and should leapfrog current demonstrators. This should mean that the Centre would broker co-operative projects. The Centre should push this agenda and not wait for it to happen. Demonstrators are a means to an end, not an end in themselves. Demonstrators serve many good

purposes, for example they increase the visibility of the technology with the public and help generate customer demand, which is the prime driver of the auto makers. This will encourage uptake of low carbon vehicles. In addition an enormous amount of useful information is gained from designing, building and operating demonstrators. This useful information can then be taken forward into the products for the market place. Demonstrators should be provided to cities – several cities have shown interest in operating demonstrator vehicles, not just buses but also Police and Health vehicles as well.

Taking technology to production: While the Centre will not be in the business of producing vehicles, it should be involved in the whole spectrum of work thus:

- targeted basic research (a portfolio with short term, medium term and long term times to commercialisation)
- technology generation (a “rolling programme” of incoming technologies)
- demonstrator vehicles (ranging from small scale (one or two) futuristic ones through commercial (several) to manufacturers ones in significant numbers (1000))
- subsidised products in the market place (like the EST Powershift Program)
- leading to unsubsidised products in the market place.

Sources of Energy/Infrastructure: Since it makes no sense to run vehicles on low carbon fuel if much carbon is produced in making and distributing it, the Centre should look at the sources of energy and infrastructure as well. Also it should consider the total carbon produced during manufacture and disposal as well as use. In summary, “well to wheels” and “cradle to grave”.

Gap Analysis: The Centre should study the whole field of effort in low carbon technology for transportation applications, and identify gaps. It should then work pro-actively to fill these gaps. Also the Centre needs to be aware of technology being developed outside the UK to avoid duplication and ensure gaps are filled

Policy Advice: HM Government wants fast accurate and reliable policy advice. The Centre should provide it in the Low Carbon Vehicle field. This should be done via the LowCVP.

Communication: The Centre must communicate with all the Sponsors, all the technology providers and other parties with a major interest in this field. It should work to prevent separate efforts in separate compartments that do not communicate. The Centre should provide linkage with the non-vehicle low carbon activities. The Centre should be a clearing house for feedback.

Vehicle Test Facilities: The Centre should provide vehicle project, R&D and test facilities, since many technology developers do not have their own. This means using existing facilities.

Set Standards: The Centre should set standards, where they don't already exist, relating to low carbon vehicle systems. This should be done via working groups.

Unsolicited ideas: While the Centre's activities will be driven primarily by the strategy derived from the road maps, the Centre should also have the capability to

handle unsolicited ideas at a rate of up to 20 per annum. Ideas remaining after an initial screening should be given a mentor and help as appropriate to bring them via feasibility studies, project development and possibly to fruition.

Resources

- (a) **Funding:** While the AIGT recommendations mentioned that the total funding level of the two Centres should be £15M over 5 years, the group felt that this was too much money to cover just administration (it would cost about £400k per annum to run the Directorate), and not enough to cover the total work needed in this area. Thus it was felt that since the Centre should be more than just administrative, the £7.5M from the DTI should be leveraged. A demonstrator car project costs in the region of £3M, with a bus project somewhat higher. By way of comparison, the Carbon Trust has a budget of £30M per annum, and covers low carbon technology outside the transportation sector. Since transportation contributes around 30% (projected to increase to 40%) of the total CO₂ emitted in Britain, a total annual budget of around £10M would seem reasonable, or £50M over five years. However, this £50M would not all need to be sourced from the centre. Some of it could come from other sources such as the Foresight Vehicle, the existing DTI fuel Cell programme and others. Suppose then that half the funding has to come from the Centre. That would imply a budget of £25M over five years. One possible formula could be:

initially from	DTI £7.5M over 5 years
	DfT £5M over 5 years
	EPSRC £5M over 5 years
	Carbon Trust - £5M over 5 years
	AWM - £2M over 5 years
	EMDA - £0.5M over 5 years

After the initial two to five years, it was felt that funding could be leveraged from Industry.

- (b) **People:** It was felt that the Directorate should consist of a Director responsible for all the activities of the Centre, and answerable to the Board. The Director should have extensive experience of the automotive industry, including component suppliers, as well as experience of technical programmes, co-operative programmes and political savvy. The Director would have several staff to assist him, probably three in the first instance. In addition there should be people on paid part time secondments from industry at one or two days per week. These need to be top quality people. There should be two or three people with information skills to help meet the communication objectives (qv).
- (c) **Buildings:** It was felt that the Directorate should be housed in a specific single location, which should be highly visible (“a big flag on a big hill”). The group felt that it should offer several location options to the board for a decision, indicating the preferred option. The options then are:

- A University strong in the automotive field
- A contract engineering company
- A development agency
- A business park strong in the automotive field

The Centre should include office space for expansion to at least 10 people, conference rooms, and a showroom for vehicles. Other options are that the Centre could be:

- a full facility with offices, conference rooms, show room, major R&D lab, workshop and fabrication facilities
- a partial facility with offices, conference rooms, show room and some workshop facilities
- offices and conference facilities only

There are several locations believed to be interested in housing the Directorate, listed below:

- Birmingham Longbridge site
- Birmingham University
- Cranfield University
- Imperial College
- Loughborough University
- Sheffield University
- Tees-side

The preferred option would be that the location should be near a University, with office space for expansion to at least 10 people, conference rooms, a showroom and with workshop space where demonstrator vehicles could be worked on. The group felt that the preferred location would be the Birmingham Longbridge site. However, there is no building on the relevant site at present, so it would be necessary to start the Centre elsewhere and move it to Longbridge when the building could be complete in about 18 months. The cost of the building would not be met by funds from the Centre, rather, it would be met by a combination of funds from Birmingham City Council and Advantage West Midlands.

Legal Status

It was felt that the Centre should be a legal entity. One possibility is a “not for profit company limited by guarantee”. Methods of handling IPR need to be defined. One possible model is the Foresight Vehicle model (which is similar to the European Framework 6 model).

Next steps and Schedule

April 29, 2003 - Next meeting of the LowCVP R&D working group. These recommendations will be passed to them then.

First week in June - Next meeting of the Low CVP board. Recommendations revised using input from the R&D working group will be passed to the Board then.

We need to get commitments from:

- sponsor organisations (DTI is already committed)
- vehicle makers
- component suppliers
- energy suppliers
- end users (two letters of support already received from city councils)

The goal is to get the Centre up and running by Autumn 2003. A launch Director could be appointed to make this happen.

Attachments

Outline structure diagram for the Centre

List of people consulted

Business Case