Low Carbon Vehicle Public Procurement Programme (LCVPPP)

Lessons learnt for the practice of Innovation Orientated Procurement (IOP) in a fleet context

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Cenex

Centre of excellence for low carbon and fuel cell technologies

Low Carbon Vehicle Public Procurement Programme
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Management Summary (Overview)

- The following report summarises the policy and practice of Innovation Orientated Procurement (IOP) as applied in an exemplar project – the Low Carbon Vehicle Public Procurement Programme (LCVPPP). The LCVPPP was developed by the Department for Transport in response to the recommendations of the 2007 Low Carbon Transport Innovation Strategy (LCTIS).
- The LCVPPP was launched in 2008 following extensive stakeholder consultation. The programme's first phase ran between 2008 and 2012, with Cenex as programme manager. The DfT aimed to use the LCVPPP as a means of encouraging innovation with public sector fleet procurement targeting increased uptake of low carbon vehicles.
- The central feature of the LCVPPP was a vehicle procurement exercise targeting the deployment of low carbon vans across public sector fleets. The programme was designed to use procurement to help pull forward innovative technology. A Competitive Dialogue procurement procedure was used to explore technology solutions with motor manufacturers with the procurement exercise creating a framework agreement from which a range of public bodies would be able to buy a number of low carbon vans.
- The programme design included risk mitigation for the participating public sector fleets deploying the innovative low carbon vans. This reflected consultation feedback regarding risk aversion among fleet managers being a key barrier to low carbon vehicle uptake. Risk mitigation measures included;
    - Financial support – via full recovery of incremental investment costs.
    - Technical support – during the procurement process adopted for supplier selection and project management oversight.
    - Operational support – DfT managed the procurement on behalf of public sector stakeholders and applied contractual terms protecting fleet operations from the possible adverse impacts of deploying new technology (ensuring replacement vehicles in the event of in-field operational issues).
- The implementation of the programme involved a series of steps commencing with procurement process steps and proceeding to the supply of vehicles for deployment across a range of public sector fleets. The first deployment phase included independent monitoring and evaluation to create an independent assessment of real world performance of the vans to aid public (and private sector) fleet decision making. Suppliers successfully delivering against the aims of the programme during the first deployment phase would be rewarded with a second phase of funded procurement.
- Five key programme outputs were;
    1) A successful procurement exercise culminating in a framework including four approved low carbon van suppliers; three supplying battery electric panel vans and one supplying a hybrid van.
    2) The placement of 200 vans into operation across 21 fleets via vehicle orders from the framework in Phase 1.
    3) A field trial phase involving the performance monitoring of all 200 vans for a minimum of one year's worth of real-world operation.
    4) The selection of one supplier to proceed to Phase 2 of funded procurement.
    5) The placement of the full allocation of 500 vans across 7an expanded group of 77 stakeholder fleets in Phase 2.

Low Carbon Vehicle Public Procurement Programme
Management Summary (Lessons Learnt)

- Five features of programme design were successful;
  1) The DfT sought to be innovative in what was being procured (van performance specification) and how the procurement was managed (via the use of the Competitive Dialogue procurement procedure) achieving vehicle performance aims and running a successful procurement.
  2) The LCVPPP was implemented in a stepwise, controlled fashion, and outputs were delivered in all key areas meeting targets for deliverables, albeit not within the initial timescales envisaged.
  3) The LCVPPP helped stimulate supply chain innovation via a two-stage process. Initial orders provided an immediate reward for suppliers with the potential for larger phase two (follow on) orders. This helped qualify four suppliers.
  4) The programme successfully fostered the formation of a stakeholder fleet group who supported the programme through its full duration and were keen to participate in other low carbon vehicle demonstration projects.
  5) The choice to combine the programme management and technical support roles positioned the programme manager (Cenex) to provide the DfT with independent evaluation of the performance of the low carbon vehicles deployed during Phase 1 trials, thereby helping DfT decide which of the suppliers (only one in this case - Ashwoods) met the success criteria (vehicle performance and cost reduction) for Phase 2 grant funded procurement.
- Five aspects of implementation proved problematic
  1) The programme wasn't able to catalyse innovative product offerings from mainstream vehicle manufacturers.
  2) The gap between the recruitment of the first and second wave of public sector fleets was too long. The first entrants had a long wait until the programme got up-to-speed, whilst the second wave didn't have the time to realign vehicle replacement cycles to LCVPPP timescales resulting in delays in vehicle orders being placed. Ideally a larger procurement group would have formed earlier during the programme's set-up phase.
  3) The risk mitigation placed an emphasis on contractual terms which slowed implementation. Contracts progressed better when based on principles not practice (e.g. not dependent on vehicle details and numbers, etc.). For programmes such as these generous time allocation is needed for contractual matters.
  4) The innovative nature of the vans combined with the immaturity of the SME's supply chains resulted in delays in delivery and gave DfT and Cenex limited options for supply chain management (e.g. ensuring on-time delivery). IOP project design needs to make allowances for the lower Technology Readiness Level (TRL) and Manufacturing Readiness Level (MRL) of technology being deployed when compared with the procurement of mature technologies.
  5) The diversity of needs among the procurement group led to a lot of vehicle customisation with associated complexity which worked against economies-of-scale for the suppliers and added considerably to the complexity of grant administration for Cenex and the DfT.

Low Carbon Vehicle Public Procurement Programme
Management Summary (Evaluation and Recommendations)

➢The LCVPPP resulted in a completed IOP case study of interest both in terms of its supply chain stimulus when compared with conventional procurement procedures and its stimulus for Innovation when compared with R&D support and grants.

➢Presently, the relative novelty of IOP makes it a harder project type to implement than potential alternatives. Its main advantage is that it seeks to leverage a sustainable customer demand to stimulate suppliers to invest to elevate technology from lower to higher Technology Readiness Level (TRL) and Manufacturing Readiness Level (MRL). IOP can complement R&D funding leveraged by vehicle manufacturers for supply chain capability development. Alternative policies that leverage customer-demand include demonstration-based R&D projects (TRL6-8) and grants to aid market uptake for validated TRL 9 technologies.

➢Based on the experience of the LCVPPP the following recommendations would be made for those considering implementing this form of project;

- Invest in the pre-dialogue planning and preparation phase. Conduct supplier workshops to help ascertain supply chain capabilities and intent ahead of the formal commencement of a procurement process (e.g. before a PQQ is issued) and build in success criteria at the outset as a spur to technology providers. The LCVPPP offered future higher volumes based on independently validated vehicle performance with the higher volumes linked to price reduction targets.
- Focus on forming a large procurement group at the outset. Work with that group to help define requirements (needs including socialising those needs with potential technology providers during the market sounding phase) and to build a commitment for collective action and the associated process steps including sign-off on contractual arrangements.
- Where possible, the procurement group needs should be normalised into as few requirements as possible to avoid the complexity of customisation for individual stakeholders.
- Use the stakeholder group for both IOP and green public procurement initiatives. For example, conducting both more and less adventurous vehicle procurement exercises through the same group would help enable the stakeholder fleets to remain engaged in low carbon vehicle uptake for an extended period of time, opting in or out of new procurement exercises depending on the applicability of a particular vehicle or fuel type to their operations.
- Accept that grant funding will be needed to facilitate projects where the innovation may not offer a compelling short term operational benefit versus incumbent technologies.

➢Stakeholder liaison and assistance is crucial for project success: consideration should be given to there being funding available for buyer consortia to bid in for help financing IOP projects with innovation intermediaries assigned to assist the consortia to manage projects from inception through to procurement, deployment, evaluation and dissemination.

Low Carbon Vehicle Public Procurement Programme Introduction

- Funded by the Department for Transport (DfT) and latterly, the Office for Low Emission Vehicles (OLEV), the Low Carbon Vehicle Public Procurement Programme (LCVPPP) placed 200 hybrid and electric panel vans from four different vehicle suppliers, with 21 public sector fleets between 2009 and 2011.
- The objectives of the LCVPPP were to:
  - Create demand for low carbon vehicles.
  - Foster a culture change in public sector fleets (in support of the procurement of low carbon vehicles)
  - Manage the risk of trialling new vehicles for the fleets involved.
  - Promote innovation and unit cost reduction.
  - Test and validate low carbon vehicles in real-world driving conditions
- Cenex provided programme management and technical analysis for LCVPPP.
- The technical analysis phase of the LCVPPP is summarised in the publication *Low Carbon Vehicle Public Procurement Programme Summary Technical Report*
- This report describes the policy and practice underpinning the LCVPPP, with a focus on the vehicle procurement phase of the programme:
  - The first section of the report describes the policy background to the programme.
  - The second section describes the design of the programme and reviews the tactical choices made regarding the choice of vehicle types and the choice of procurement technique.
  - The third section describes the phases of implementation of the programme as they progressed in practice and the outputs achieved. Detailed information on the pre-procurement phase is provided in Appendix 1 and details on the implementation phase in Appendix 2.
  - The final section includes a review of lessons learnt , followed by conclusions and recommendations.

Key point

- Funded by the DfT and OLEV the Low Carbon Vehicle Public Procurement Programme (LCVPPP) helped placed 200 hybrid and electric panel vans from four different vehicle suppliers with 21 public sector fleets. This report deals with policy and practice associated with the van procurement phase of the programme.

Low Carbon Vehicle Public Procurement Programme
Policy Background

- The LCVPPP was formulated as a policy intervention by the UK Government's Department for Transport (DfT) in 2007 in its Low Carbon Transport Innovation Strategy (LCTIS) which highlighted a broadening of the Government's focus in its environmental policy interventions in the transport sector to include CO_2 emission reduction as well as air quality improvement that began in 2002 with the Powering Future Vehicles strategy (DfT, 2002):

  - *We are providing new funding of an initial £20m to develop a programme aimed at reducing the barriers faced by companies in moving from prototype demonstrations of lower carbon technologies to full commercialisation. This programme will provide financial support for public procurement of fleet demonstrations of lower carbon vehicles (and where appropriate supporting infrastructure). The programme will seek to build on the model of contractual forward commitments in which commitments to purchase vehicles are linked to the achievement of predetermined cost and performance criteria.*

  (DfT, 2007)

- The interest in the role of public procurement within the LCTIS drew on the recommendations of the Environmental Innovation and Growth (EAIG) Team in terms of the identification of public procurement as a means of catalysing innovation within an industrial supply chain.

- The LCTIS was also a follow on to earlier policy measures focused on assisting the deployment of environmentally friendly vehicles through grants to end users, such as the PowerShift and CleanUp campaigns.

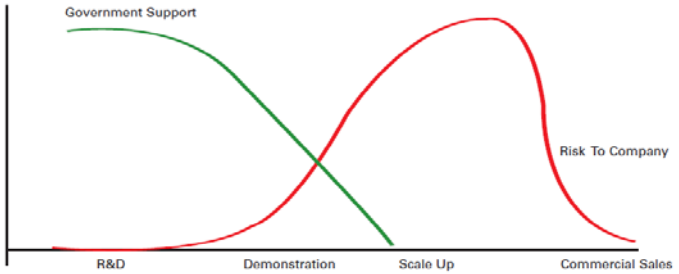
Key point

- LCVPPP was formulated as a policy intervention by the UK Government's Department for Transport (DfT) in 2007 as a follow on from its Low Carbon Transport Innovation Strategy (LCTIS).

Low Carbon Vehicle Public Procurement Programme
Policy Background: EIAG and Innovation Oriented Procurement

- Established by the Department of Trade and Industry (DTI) and Department for the Environment, Food and Rural Affairs (Defra) in 2003, the Environmental Innovations Advisory Group (EIAG) was tasked with identifying practical measures to tackle barriers to innovation in the environmental industries sector and to mobilise key stakeholders to bring about change, building on the earlier work of the Environmental Innovations and Growth Team (IGT). In 2006, the EIAG published a summary of its first three years work, Environmental Innovation: Bridging the Gap Between Environmental Necessity and Economic Opportunity (EIAG, 2006).

- The EIAG noted that (in 2006) support was too focused at the R&D end of the spectrum. The EIAG's view was that the time of maximum commercial risk to the company was at pre-commercial scale up, where large expenditures are incurred by the product is not market-proven, but where State Aid rules restrict direct Government funding support. The phase of pre-commercial demonstration and scale up is often characterised as the 'Valley of Death' in innovation studies, whereas the EIAG used the term 'Mountain of Risk':



- The EIAG's response to problems of government funding of pre-commercial innovation was to propose the forward commitment model whereby:
  - *a public sector body offers to buy in the future a product or service that delivers specified performance levels including environmental benefits at a defined volume and at a cost it can afford. Once the product is in the market place normal market forces will determine competition and price* (EIAG, 2006).
- Forward Commitments are seen as a key component of the process of Innovation Oriented Procurement (IOP), defined here as:
  - any public procurement activities that aim at stimulating the creation, improvement, adaption and diffusion of innovative solutions (technological or organisational)(Manchester Institute of Innovation Research, 2012).
- This can be compared to Green Public Procurement (GPP) defined by the EC as:
  - a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured (EC, 2012).

Key point

- The EIAG noted that the time of maximum commercial risk to the company was at pre-commercial scale up, where large expenditures are incurred by the product which is not market-proven. Innovation Oriented Procurement (IOP) aims at stimulating the creation, improvement, adaption and diffusion of innovative solutions; green public procurement (GPP) seek to procure goods, services and works with a reduced environmental impact throughout their life cycle.

Low Carbon Vehicle Public Procurement Programme
Programme Design: DfT Scoping Study Work

- Having committed to scoping a Low Carbon Vehicle Public Procurement Programme (LCVPPP), DfT recruited a number of public sector partners committed to deploying low carbon vehicles into fleets through a joint procurement initiative. These included;
  - the Environment Agency, the Government Car and Despatch Agency (GCDA), the Metropolitan Police, the Royal Mail, Transport for London (TfL) and the UK Borders Agency (UKBA) which was then part of Her Majesties Revenue and Customs (HMRC)

- The DfT ran a consultation exercise between July and September 2007 to gather stakeholder input as to how the LCVPPP should operate and which vehicle types it should focus on. The scope of the consultation covered issues of technological ambition, vehicle types, the scale of procurement(s) and the method of delivery (classic procurement or competition). Input to the consultation from fleets highlighted the risk averse nature of fleet operators and the need to take steps to overcome what they saw as barriers to innovation when it came to low emission\low carbon vehicles, including high initial capital costs, risk of vehicle downtime, limited warranty support, lack of information from suppliers and the requirement for specialist technical support not available in-house.

- The DfT also commissioned an evaluation exercise to narrow down the range of potential vehicles to align with the fleet compositions of the stakeholders which drew up a draft performance specification for a low carbon large panel van (Ricardo, 2007).

- Taking onboard the consultation feedback , the DfT secured an internal sign-off for the business case for the LCVPPP and announced its intention to proceed with a programme in November 2007. This announcement also initiated the process for recruiting a programme manager. The DfT specified that the programme manager had to be independent of the technology provider community so not conflict of interest could arise during the subsequent procurements.

Key point

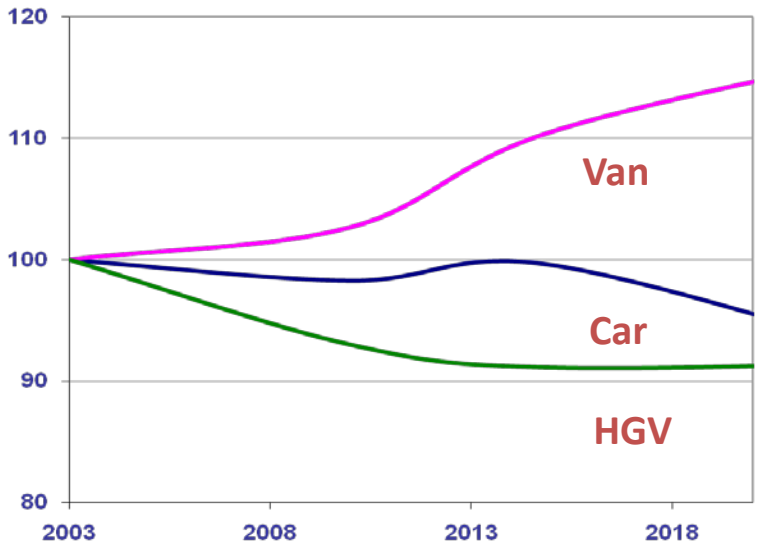
The DfT consulted extensively as it sought to build an internal business case for the LCVPPP. Stakeholder demand (from public sector fleets) and supplier interest (from vehicle manufacturers) were seen as necessary for success. The programme design was therefore strongly shaped by stakeholder feedback including the need to mitigate risk for the first fleet adopters.

Low Carbon Vehicle Public Procurement Programme
Programme Design: Choice of Vehicle Type(s)

- Drawing on the work of the EIAG, the DfT had identified vans as its preferred first target for procurement based on;
  - Volume of the market: Initial DfT market data had found that >300,000 vans were being used by the public sector, with 90,000 vans bought each year.
  - Growing CO_2 emissions seen from the van sector, attributed to market trends including increased home delivery.
  - No existing low carbon van in the market place.
  - Vans fell outside the scope of other policy measures (EU CO_2 regulation) .

- The initial scoping review considered both car derived and large panel vans. In terms of total fleet numbers, car derived vans exceeded larger panel vans. However, this was largely down to the size and composition of the Royal Mail fleet. The review recommended that the DfT should commence with a large panel van procurement as this vehicle type was more evenly distributed across the stakeholder fleets.

- The DfT consulted on both vehicle types and technology options. It decided against considering hydrogen fuel cell vehicles as a candidate for procurement due to the high costs anticipated for fuel cell vehicles. The DfT retained its interest in initiating a Plug-in Hybrid Car trial and selected a minibus as an additional option given the large numbers of minibuses operated by public sector fleets.



Forecast CO2 emissions by vehicle type

Van emissions projected to rise based on;

- 41% rise in van traffic.
- Van journeys are generally longer than other vehicle types.
- No established policy measure in place designed to cut van CO_2 emissions at the time.

Key point

The DfT identified the van market as being an ideal candidate for the LCVPPP, based on potential impact given that carbon emissions were forecast to rise markedly in this sector, with no low carbon vans available for the public sector to procure at that time and there were no other policy initiatives in place considered likely to help cut van CO_2 emissions.

Low Carbon Vehicle Public Procurement Programme
Programme Design: Aims and Objectives

- The key programme aim at the outset was to accelerate the introduction of lower carbon vehicle technologies into the UK market. This was to be achieved through:
  - Successful high profile demonstration of lower carbon options.
  - Independent test and validation of lower carbon vehicles in real-world use.
  - Promotion of innovation and unit cost reduction.
  - Fostering culture change in public sector procurement.
  - Demonstrating environmental sustainability and the ability to impact the market through procurement.

- The programme objectives were to:
  - Initiate and complete four procurement lots across different technology and market sectors.
  - Through these procurements put between 150 and 200 vehicles into fleet operation with test and validation work undertaken to determine the performance of the vehicles in real-world operation (with supporting laboratory test verification) benchmarked against comparator vehicles.
  - Establish (build) demand for successful vehicles for wider adoption across public sector bodies (public sector leadership encouraging private sector followership).

Key point

The programme aimed to stimulate demand for low carbon vehicles within a cohort of public sector stakeholders through a proactive approach to facilitating innovation-orientated procurement. It was hoped that the successful procurement and demonstration of low carbon vans would support both supply chain and market development for low carbon vans, as well as providing an example project contributing toward the fostering of an ongoing culture change in public sector procurement toward both innovation and low carbon.

Low Carbon Vehicle Public Procurement Programme
Programme Design: Key Features and Supplier offer

- The LCVPPP was designed with a two Phase approach with associated underpinning assumptions, as follows;

Phase 1 (budget £20m)

Small numbers of demonstrator vehicles

Intensive monitoring of real-world performance of trial vehicles

Build confidence with operators and technology providers

Phase 2 (budget £30m)

Wider public sector fleet rollout

Support deployment with less intensive monitoring

Higher production volumes and economies of scale reduce costs for public *and* private sector fleets

- Phase 2 of the procurement project was designed to extend the reach of the programme to a wider audience of public sector fleets. Suppliers proving their capability during the Phase 1 activity would be awarded a Phase 2 contract. Purchase from these contracts would be opened out to all public sector organisations with no cap on the number of vehicles ordered. It was hoped that the supplier learning (confidence in product and cost reduction with supply chain development and volume sales) along with fleet operator learning (endorsement of product in operation by public sector fleets) would help support uptake within both public and private sector fleets.
- For the vehicle suppliers to the programme, Phase 1 offered a potential route to sales not necessarily available without the programme. However, the primary incentive was to be awarded a Phase 2 contract that would extend the same contractual terms to any public sector body and thus increase the number of vehicle orders to be expected.

Key point

A two phase approach was adopted whereby fleets could acquire confidence through demonstrators and then deploy in greater volumes in Phase 2. The two phase approach offered suppliers the incentive of participate in Phase 1 with the potential to access to the wider public sector markets in Phase 2, with sales incentivised in both phases by the DfT.

Low Carbon Vehicle Public Procurement Programme
Programme Design: Offer to Stakeholder Fleets

- The LCVPPP initial design anticipated four phased procurement lots during Phase 1, as follows;
  - Lot 1: Low Carbon Van.
  - Lot 2: All Electric Van.
  - Lot 3: Low Carbon Minibus.
  - Lot 4: Plug in Hybrid Car.

- For Phase 1, the stakeholders (partners) involvement in the programme would be de-risked, to the extent that there should be no barriers to their adopting low carbon vehicles. Stakeholders would;
  - Pay the same price that they would normally pay for a diesel vehicle when purchasing a low carbon vehicle using the LCVPPP Framework. For LCVPPP participants the DfT would fund the difference between this low carbon vehicle and a diesel conventional comparator vehicle (referred to as CCV).
  - Be offered replacement vehicles where any vehicle supplied suffered from downtime.
  - Be funded for associated electric vehicles, associated infrastructure needs (charge points).

- The Royal Mail and GCDA were both subject to state aid restrictions (as both were providing a service that the private sector could also supply) and, as a consequence, could only receive 35% of the cost difference.

Key point

The DfT sought to remove barriers to the involvement of stakeholder fleets by measures including using grant funding to make the initial price (cost) of low carbon vehicles the same as conventional vehicles and including terms requiring the supplier to offer replacement vehicles where vehicle reliability proved to be an issue.

Low Carbon Vehicle Public Procurement Programme
Programme Design: Responsibilities and Governance

DfT (OLEV)

- initial programme design and implementation support, including recruitment of a programme manager
- funding
- strategic oversight of the programme, including final choice on key decisions (e.g. vehicles types for procurement lots, stakeholder (fleet partner) involvement, Phase 2 vehicle supplier selection)
- PR and publicity for the programme

Programme Manager (Cenex)

- communicate with potential vehicle manufacturers
- providing technical information required during the procurement process
- lead on stakeholder engagement, including preparation of a Stakeholder agreement, negotiation and signup of Stakeholder (partner) fleets
- management of the vehicle ordering
- management of vehicle delivery mechanisms (ensuring delivery of the vehicles to time)
- oversight of vehicle test and validation work
- oversight of the delivery and commissioning of vehicles at the Stakeholder organisations
- grant administration

DfT Procurement

- development and issue of OJEU notices
- processing of all ITTs and bid responses
- choice of procurement approach
- processing of ITT returns

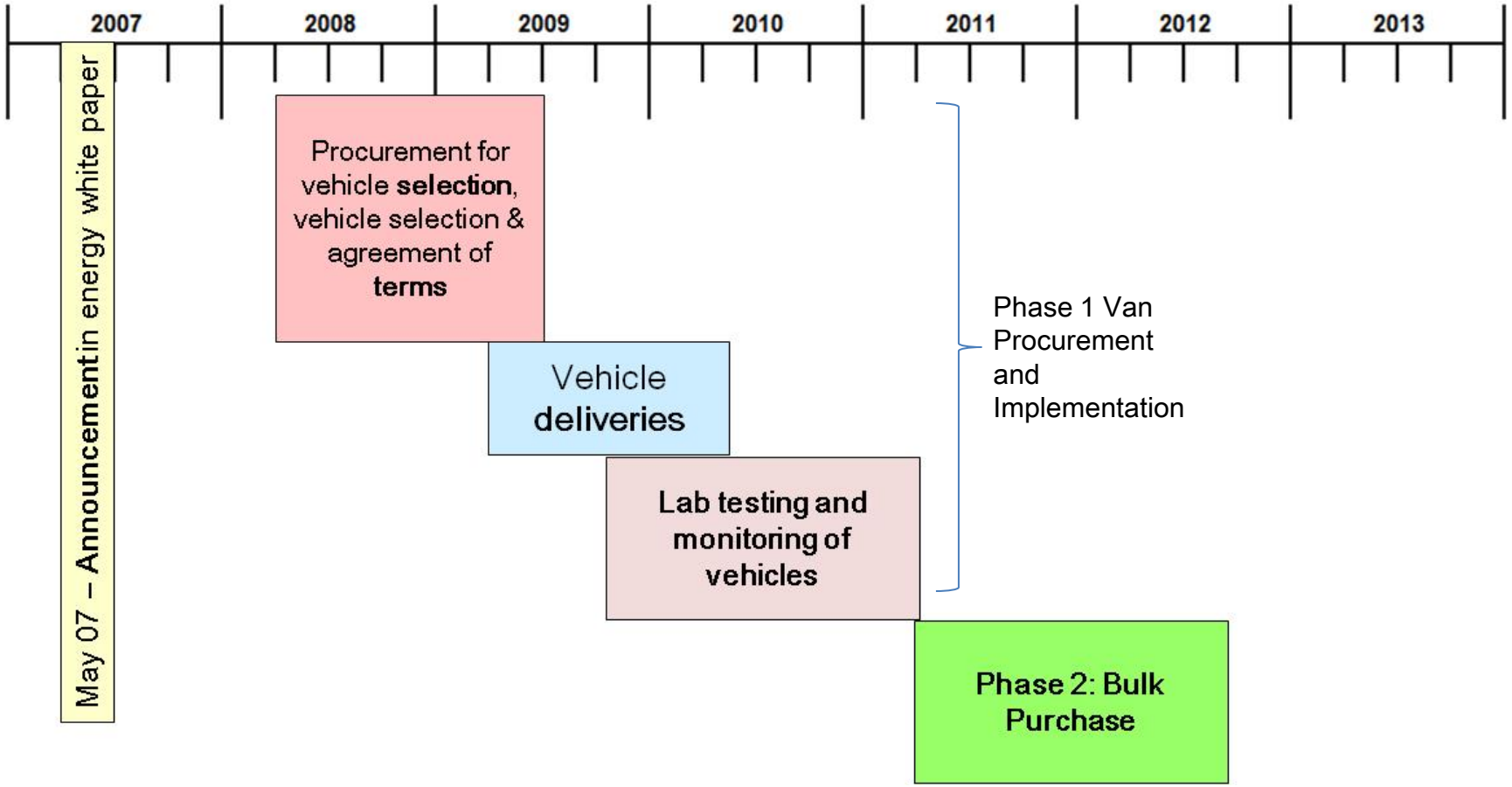
Programme Board

- oversee programme activity; assure quality of outcomes and benefits; provide strategic direction; and offer constructive leadership. Comprised members of DfT /OLEV, DfT Procurement, Cenex, Stakeholder fleet representatives (initially GCDA, later joined by Gateshead Council) and a representative of the Technology Strategy Board (TSB, now Innovate UK) Low Carbon Vehicle Innovation Platform

Key point

The programme design had a clear delineation of roles between the DfT (OLEV), DfT Procurement and the selected Programme Manager. A close working relationship (partnership approach) between the Programme Manager and DfT was anticipated as being key to successful delivery.

Low Carbon Vehicle Public Procurement Programme
Programme Design: Phase 1 and Phase 2 Timing Plan



Key point

The Timing Plan for the first three years of LCVPPP was split roughly one year for van procurement, one year for vehicle deliveries and one year for evaluation activities ahead of Phase 2 being triggered.

Low Carbon Vehicle Public Procurement Programme
Programme Design: Use of Competitive Dialogue

- DfT Procurement opted for Competitive Dialogue (CD) as the chosen technical method for the Lot 1 and Lot 2 procurements, rather than a more commonly applied restricted procedure procurement. The rationale was that CD allowed for a better exploration (via two way dialogue with suppliers) as to which technologies the low carbon vehicle suppliers could offer at what cost to the programme and to use this dialogue to help clarify appropriate vehicle specifications and terms and conditions prior to final release of the Invitation to Tender (ITT). The DfT's underpinning rationale was that the procurement should help bring forward innovative technology offerings from the suppliers.
- Multi stage process
  - Planning and initial preparation (Pre-OJEU notice).
  - OJEU contract notice.
  - Pre-Qualification Questionnaire (PQQ) issued to help down select suppliers for the dialogue phase.
  - Invitation to Participate in Dialogue (ItPD).
  - Suppliers submit proposals in response to this ItPD.
  - Competitive Dialogue (CD) between DfT and supplier representatives to identify and define solutions.
  - DfT Procurement issues the final ITT.
  - The ITT returns evaluated and contracts awarded to a selected number of potential vehicle suppliers.
- The use of CD was quite novel at this time and advice was sought on its implementation;
  - Government Procurement Service (Office of Government Commerce) advised on the importance of adopting an entirely consistent process throughout the CD and with publication of non-commercial answers.
  - Transport for London (TfL) – based on their experience with a competitive dialogue for the procurement of hydrogen vehicles – advised that CD proved time consuming in cases where the availability of experts from international organisations was factored into dialogue process. They recommended the manager of the process should define a time window to complete and not let the process be extended by the availability of suppliers.

Key point

Competitive Dialogue (CD) was selected as the means by which the vehicles would be procured. The rationale for this was that it would help explore the innovations the suppliers were capable of offering. The DfT and Cenex sought advice and drew on the experience of organisations who had used CD in a similar way.

Low Carbon Vehicle Public Procurement Programme
Programme Implementation: Pre-Procurement Process

- The DfT secured a three year budget of £20m for Phase 1 activities and a £30m budget for Phase 2.
- DfT secured a further £30m earmarked for an additional three years of activity to extend the programme length to six years. This offered the scope for additional procurement lots over and above the initial four.
- Programme implementation commenced in April 2008 when the DfT contracted Cenex (assisted by Beta Technology) to be the Programme Manager for LCVPPP.
- Cenex and the DfT initiated the process outlined below to select vehicle suppliers for the LCVPPP framework.
- The full pre-procurement process is outlined below and is described in *Appendix 1 - Pre Procurement Process*.

Key point

The final approval of the business case allowed for Phase 1 and Phase 2 activities in the first three years of the programme, with the scope for an additional three year extension. The programme implementation commenced in April 2008 when the programme manager (Cenex) was brought on board.

Low Carbon Vehicle Public Procurement Programme
Programme Implementation: Lot 3 Minibus Procurement

Minibus Procurement - background research and market sounding

- Taking into account the intense workload associated with the combined Lot 1\Lot 2 procurement and the benefits of the associated learning, the Programme Board approved a delay in the start of Lot 3 from August 2008 to Spring 2009.
- The Programme Board were also mindful of encouraging the development and deployment of a minibus with a wide market appeal suitable for a Phase 2 procurement with a market size sufficient to offer meaningful CO_2 reduction.
- Stakeholder and supplier input identified two vehicle design types as follows;
  - Low floor, low carbon midibus.
  - Van derived minibus.
- The technical and performance specification of the two vehicle types , as purchased by stakeholders, were found to be very different. Some suppliers also had specific requirements than didn't match the needs of others (e.g. one potential purchaser required a minibus with a reinforced roof).
- Despite the larger size of the stakeholder group the interest in minibuses procurement was found to be weak, with the ownership periods found to be longer than for panel vans, leading to a slower replacement rate.
- Market soundings, conducted at the Bus and Coach Show in Spring 2009, identified that the market (supply and demand) for the low floor, low carbon midibus was small and vehicles highly bespoke. The market for van derived minibuses was found to be dominated by van converters and therefore the base vehicle for any low carbon minibus would likely be drawn from the same pool of suppliers to Lots 1 and 2.

Implementation

- Taking into account the learning from the background research and market sounding the Programme Board decided not to proceed with Lot 3. In retrospect this decision was fully vindicated as the complications subsequently seen for purchase of options for the vans would have been equivalent or greater for the minibus application.

Key point

A pragmatic decision was taken whereby the outputs of the Lot 1\Lot 2 procurements were recognised as providing the foundations for low carbon minibuses and that a dedicated procurement would have limited value-add in terms of market and therefore CO_2 reduction potential because so few vehicles would be converted.

Low Carbon Vehicle Public Procurement Programme
Programme Implementation: Lot 4 Plug In Hybrid Car

- **Lot 4 – Plug In Hybrid Car Procurement**
  - The original intention of the LCVPPP was to procure a number of Plug in Hybrid cars, primarily for the GCDA but with the option for other Stakeholders to purchase or lease vehicles from this Framework.

  - In a subsequent unrelated development ,the Technology Strategy Board (TSB, now Innovate UK) announced (in June 2008) an Ultra Low Carbon Vehicle Demonstration (ULCVD) competition, which had the aim of putting 100 ultra low carbon vehicles on the road, with fleets and private motorists, as a large scale demonstrator programme.

  - The cross over between the aims of this competition and the desired outcome of Lot 4 encouraged DfT (OLEV) to seek soundings as to whether vehicle suppliers were interested to consider submitting plug-in hybrid cars to the ULCVD competition. When this was found to be the case the DfT (OLEV) decided to cancel the Lot 4 procurement and asked Cenex to assist the TSB and OLEV in supporting the evaluation of ULCVD submissions and subsequent project management of projects the DfT was interested to support.

  - The quality of submissions to the ULCVD was judged to be very high and DfT (OLEV) decided to allocate some of its R&D budget (which was also funding LCVPPP) to fund two ULCVD submissions and a third related project, as follows;
    - A Toyota and EDF-led consortium undertaking Plug-in Prius trials in London.
    - An Allied Vehicles-led consortium involving Glasgow City Council and Axeon undertaking electric car and van demonstration.
    - A Mitsubishi project leasing 25 iMiEVs to LCVPPP stakeholder fleets – a project that proved very popular with the Stakeholder group.

Key point

DfT (OLEV) took a pragmatic decision to seek to achieve its aims in funding the putative Lot 4 plug in car procurement via the ULCVD competition as opposed to the LCVPPP. In doing so the DfT (OLEV) ultimately helped channel additional battery EVs into LCVPPP stakeholder fleets.

Low Carbon Vehicle Public Procurement Programme
Programme Implementation: Lots1 and 2 Vehicles Selected onto the LCVPPP Framework

Vehicle characteristics	
Allied Peugeot eBoxer • 54 kWh LiFePO4 battery • 60 kW electric motor • 3500kg GVW	
Modec box van • 84 kWh NaNiCl battery • 76 kW electric motor • 5500kg GVW	
Smith Edison Transit • 50 kWh LiFePO4 battery • 64 kW electric motor • 3500kg GVW	
Ashwoods Hybrid Transit • 1.4 kWh LiFePO4 battery • 17kW parallel axle mounted electric motor • Gear shift indicator, speed limited • 3500kg GVW	

Key point

The outcome of the Lot 1 and Lot 2 van procurement saw four suppliers approved to the Framework, all of which were UK-based SMEs. Three were offering battery electric vans (Allied, Modec and Smith Electric Vehicles) and one (Ashwoods) was offering a mild hybrid conversion. Only the Modec was a dedicated (ground up) vehicle development; the others were conversions of popular (Ford and Peugeot) vans already established in the marketplace.

Low Carbon Vehicle Public Procurement Programme
Programme Implementation: Stakeholder Recruitment

- Once the vehicle specification had been agreed and published Cenex consulted as to the likely demand from the original stakeholder group. A low potential placement of <100 vehicles encouraged the programme board to sanction an extension of the stakeholder group to ensure the target of 200 Phase 1 vans would be met.
- Efforts to secure additional National Government partners stalled as a number of Departments were found to be signatories to a Ministry of Defence procurement framework for vehicle purchase which still had a number of years to run and had no scope to accommodate innovative low carbon vehicles.
- Cenex invited all UK Local Authorities (*ca.* 425) to submit Expressions of Interest (EOIs) to join the stakeholder group. Over 50 EOIs were received within the timescales specified. These included a spread of local authorities from across the UK, including Wales and Scotland, but no EOI submissions were received from Northern Ireland.
- A number of local authorities missed the deadline for responses. Feedback indicated that this was in large part due to the time taken for the invitation to reach the desk of an officer interested to respond, but also due to delays that officer faced in terms of getting internal sign-off on a developed proposal.
- The responses received were evaluated using a multi-criteria analysis with criteria including the level of environmental ambition, track record of environmentally friendly vehicle activities and vehicle renewal numbers. An additional 15 public sector organisations were recruited (see overleaf).

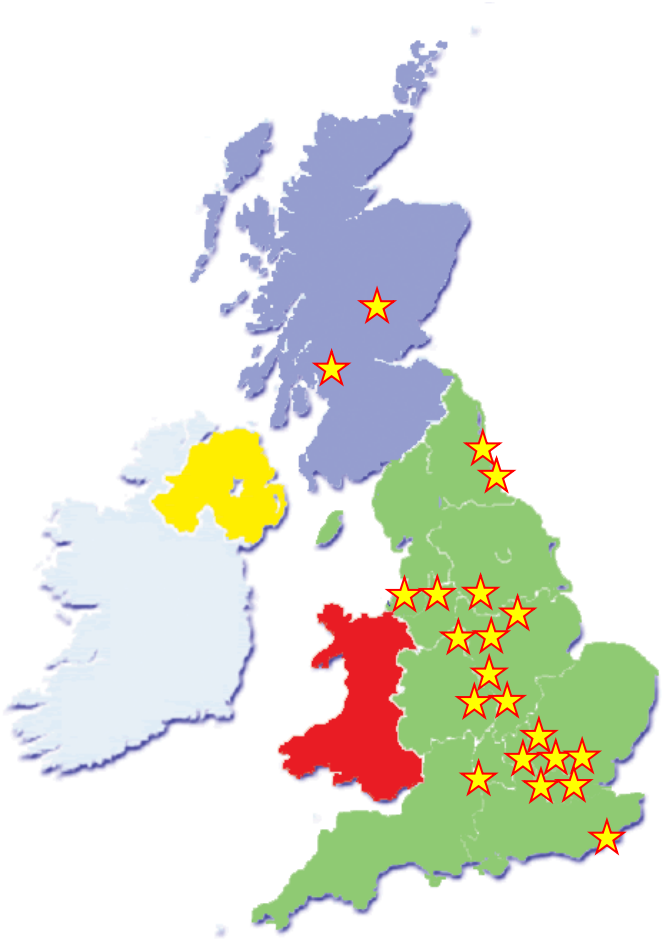
Key point

Additional public sector stakeholders were recruited. High quality Expressions of Interest were received, but interest was limited (< 15% of UK Local Authorities). The submission process provided evidence of the relatively slow progress of information travel and decision making within local authorities that was subsequently to be a feature of the programme implementation phase.

Low Carbon Vehicle Public Procurement Programme
Programme Implementation: Stakeholder Fleets

Vehicle fleets

- Coventry City Council
- Coventry University
- Derbyshire County Council
- Environment Agency
- Gateshead City Council
- Glasgow City Council
- Government Car and Dispatch Agency
- Leeds City Council
- Liverpool City Council
- London Boroughs of Camden, Hackney and Islington
- City of London
- Metropolitan Police Service
- Newcastle City Council
- Perth and Kinross Council
- Royal Mail
- Transport for London
- UK Border Agency
- City of Wakefield Council
- University of Warwick



Prior low carbon vehicle experience

- Environment Agency
  - 10 LCV retrofits
  - 1 EV panel van
- Royal Mail
  - 2+ EV vans
- Leeds City Council
  - 5 LCV retrofits
- London Boroughs of Camden Hackney and Islington
  - 2 EV vans
- City of London
  - 2 EV vans
- University of Warwick
  - 3 small EV vans

Prior LCV experience was limited to retrofits from Connaught and electric vans including Modec and Smiths.

Key point

The final Stakeholder group formed now comprised of the six original partners and the 15 newly recruited public sector organisations. Only a limited number of these Stakeholders already had experience operating all electric and low carbon vehicles.

Low Carbon Vehicle Public Procurement Programme
Programme Implementation: Post-Procurement Process

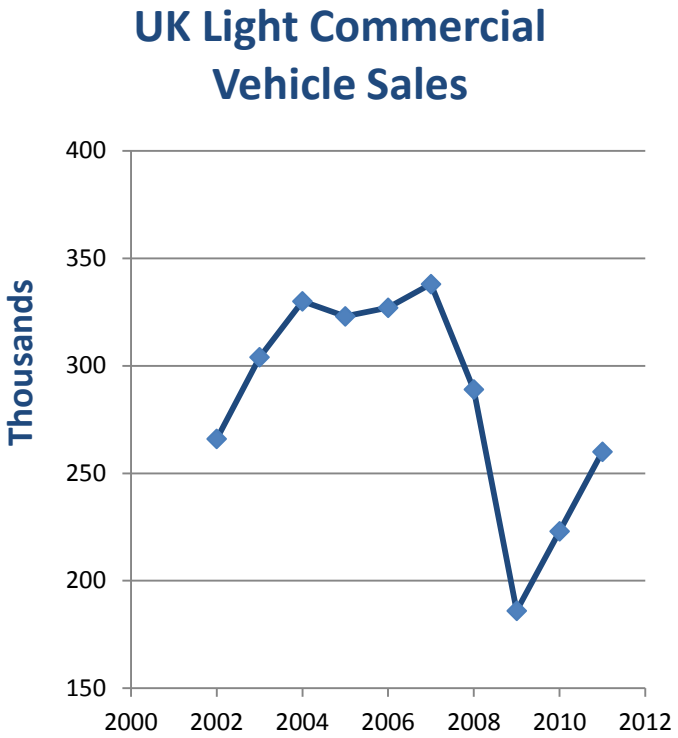
- Once the Framework Agreement and a Stakeholder Group were in place there were five remaining work packages, as illustrated below.
- The full post-procurement process is outlined below and is described in *Appendix 2 Post-Procurement Process*.

Key point

The completion of the procurement and stakeholder recruitment tasks marked the beginning of a new phase of the programme aimed at getting vehicles into fleets and monitoring their performance.

Low Carbon Vehicle Public Procurement Programme
Programme Outputs: Headline Outputs

- Programme target of 150-200 vans procured in Phase 1 exceeded (209 orders, 200 delivered) covering four vehicle suppliers.
- Competitive Dialogue completed inside the nine month target.
- Stakeholder group of 21 public sector fleet operators was established with those stakeholders all ordering vans.
- Orders were secured against the backdrop of a sharp decline in the market for vans between 2008-2010.
- Performance monitoring of 200 vehicles over at least a year of operation (see *Low Carbon Vehicle Public Procurement Programme Final Technical Report*).
- The full allocation of 500 vans was sold through Phase 2 of the programme by the end of 2013.



- A growth in van sales had set the context for the LCVPPP, but new vehicle sales slumped in 2009 as a result of the prevailing economic conditions of the period.

Key point

The key headline outputs for the programme were achieved: a procurement consortium was established; a CD-based procurement completed within the target timescales; the 200 vehicle Phase 1 delivery target was met; and Phase 2 delivered a further 500 vehicles. The overall programme took longer to implement than originally planned, primarily due to delays in ordering times and delivery times.

Low Carbon Vehicle Public Procurement Programme
Programme Outputs: LCVPPP Phase 1 Deliveries

Vehicle characteristics	Fleet characteristics	
Allied Peugeot eBoxer • 54 kWh LiFePO4 battery • 60 kW electric motor • 3500kg GVW	• 17 vehicles across 6 fleets	
Modec box van • 84 kWh NaNiCl battery • 76 kW electric motor • 5500kg GVW	• 4 vehicles across 3 fleets	
Smith Edison Transit • 50 kWh LiFePO4 battery • 64 kW electric motor • 3500kg GVW	• 43 vehicles across 10 fleets	
Ashwoods Hybrid Transit • 1.4 kWh LiFePO4 battery • 17kW parallel axle mounted electric motor • Gear shift indicator, speed limited • 3500kg GVW	• 136 vehicles across 14 fleets	

Key point

Stakeholder demand gave a clear indication of which products and suppliers were favoured when vehicle price was removed from the evaluation equation. The Ashwoods product had no range constraints, whereas range constraints depressed EV demand. For the EVs, the Smiths and Allied Vehicles products were favoured over the Modec.

Low Carbon Vehicle Public Procurement Programme
Programme Outputs: Phase 2

- Only Ashwoods met the performance and cost reduction requirements needed to trigger Phase 2 involvement;
  - The Ashwoods mild hybrid retrofit systems met the CO_2 reduction target in the field and proved durable and reliable after some initial issues were resolved.
  - The price of the technology was cut by over two-thirds per unit for Phase 2. With the cost reduction the fuel savings from the hybrid technology are sufficient to payback the investment cost within typical van ownership periods.
- Ashwoods reports that it targeted projects aimed at product development and investment in manufacturing to support it in securing LCVPPP Phase 1 and Phase 2 outputs;
  - Between 2009 and 2012, Ashwoods had two successful submissions to TSB (now Innovate UK) Low Carbon Vehicle Innovation Platform competitions. These projects helped the company develop improved electric motor and battery pack technologies targeting performance improvements and cost reduction. These technologies are being used in Ashwoods hybrid technology and being successfully marketed to other companies active in the LCV sector.
  - In 2009, Ashwoods used the LCVPPP Phase 1 contract to successfully apply for funds through the Government backed Enterprise Finance Guarantee (EFG) Loan scheme in order to prepare for vehicle deliveries in 2010.
- DfT (OLEV) allocated a budget of £1.7 million for up to 500 Ashwoods hybrid van conversions via a ca. £3,500 purchase grant (effectively covering the on-cost at higher volumes)
  - The initial uptake of the Phase 2 vehicles was relatively slow. OLEV and DfT Procurement explored a range of measures to enable increased uptake. One issue was that the framework supplier had initially nominated just two lease companies to place orders with. However it became clear that many fleets wished to select a lease company themselves (often through a mini-competition). The supplier expanded on the number of lease companies - to allow that selection. In addition a short time extension to the framework was approved – from 31st March to 10 June 2013 – based on expected demand at the start of the new financial year.
  - Orders were accumulated from a wide range of public sector fleets and the full allocation of 500 vans were funded by the end of Phase 2 in 2013.
- Ashwoods states that without the LCVPPP it would not have been able to demonstrate its hybrid vehicle technology, nor earn revenue required to grow the business and invest in Innovate UK projects. Without Innovate UK funding Ashwoods would not have been able to invest sufficient funds to develop its technology offerings.

Key point

Only Ashwoods met the performance and cost reduction requirements necessary to proceed from Phase 1 to Phase 2. Aided by the Phase 1 supply contract, Ashwoods leveraged Innovate UK and EFG funding to make concurrent investments in product development and in manufacturing in order to successfully meet the Phase 2 price reduction requirement. All 500 Phase 2 vehicles were allocated to fleets by the end of 2013.

Low Carbon Vehicle Public Procurement Programme
Programme Outputs: Phase 2 (other suppliers)

- Neither electric van supplier remaining in the Programme at the end of Phase 1 were awarded Phase 2 supply contracts as neither were able to offer cost reductions to the level sought by the DfT (OLEV).
  - The battery packs were the most expensive additional component within the vehicles and the batteries remained a 'bought in' as opposed to 'in house' manufactured item with market prices not having fallen sufficiently over the life of the LCVPPP.

- Subsequent to the LCVPPP, DfT (OLEV) announced the Plug-in Van Grant (PiVG) offering up to £8,000 (no more than 20% of the value of the van) for plug-in vans
  - Smith Electric Vehicles qualified a product to be PiVG eligible.
  - Allied Vehicles has not qualified any vans as PiVG eligible, and at the time of writing is no longer manufacturing electric vehicles.

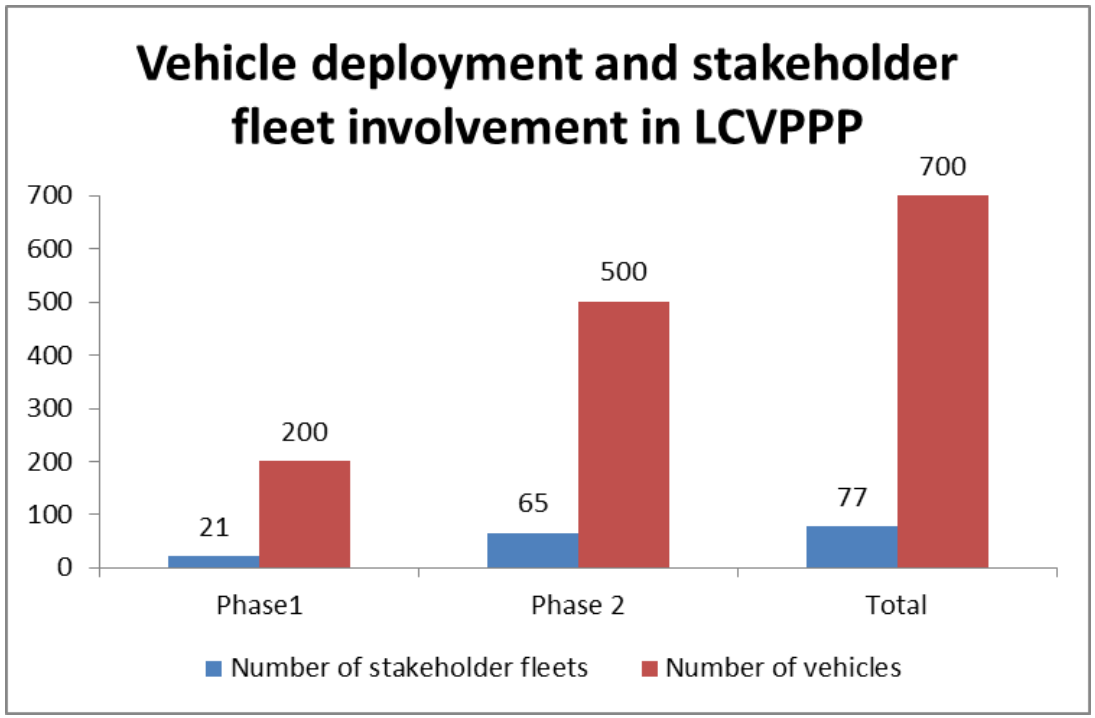
- Through the orders they placed, the public sector stakeholders gave a clear signal that the Modec EV wasn't the right product for their early market sector. In retrospect, this opinion has been accepted by ex-Modec employees;
  - Factors sited as problematic included the vehicle size (5.5tonne GVW), which pushed the van into a weight category requiring drivers to have a C1 qualification on their driving licence – something a sizeable minority of drivers didn't have.
  - Fleet operators also preferred the retrofitted versions of OEM product, as offered by Ashwoods, Smith Electric Vehicles and Allied Vehicles, as this allowed them access to standard and therefore quickly accessible and competitively priced spare parts – particularly relevant for more frequently damaged items (e.g. wing mirrors, hub caps, bumpers, steps, etc). In contrast the bespoke nature of the Modec product meant that all spare parts would have to come from Modec as sole supplier, with resulting cost implications for pricing and the risk of delays leading to unscheduled downtime.

- There was no evidence that the Modec receivers were successful in utilising Modec's participation in the LCVPPP to find a buyer for the company. A service and maintenance operation was established by ex-employees; however, the service charges they offered were considered expensive by stakeholders operating Modec's and as a consequence the general feeling was that the vehicles would be run until they needed maintenance and then be parked up or sold.

Key point

None of the All Electric van suppliers were invited to participate in Phase 2 of the LCVPPP. The reason was that they couldn't offer appreciable cost reductions compared with Phase 1 pricing, primarily due to relatively high battery prices. Allied Vehicles and Smith Electric Vehicles continue to operate (although at the time of writing Allied is no longer converting electric vehicles), but Modec went into receivership.

Low Carbon Vehicle Public Procurement Programme
Programme Outputs: Vehicle and Stakeholder Numbers

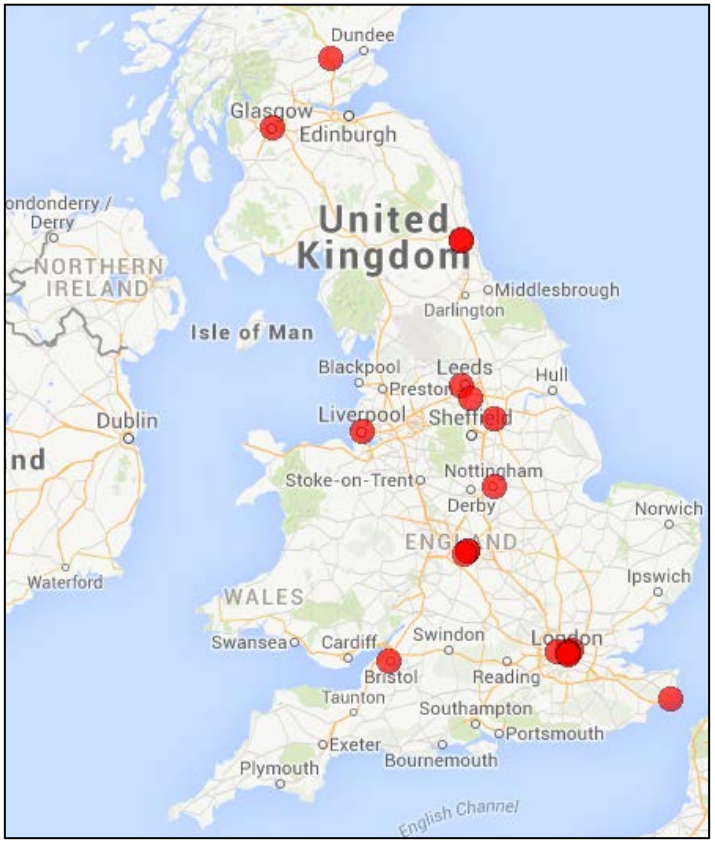


- Phase 2 of LCVPPP marked a significant increase in low carbon vehicle deployment and the number of Stakeholder fleets involved in the programme grew almost fourfold.
- Nine fleets were involved in both Phases of the Programme.

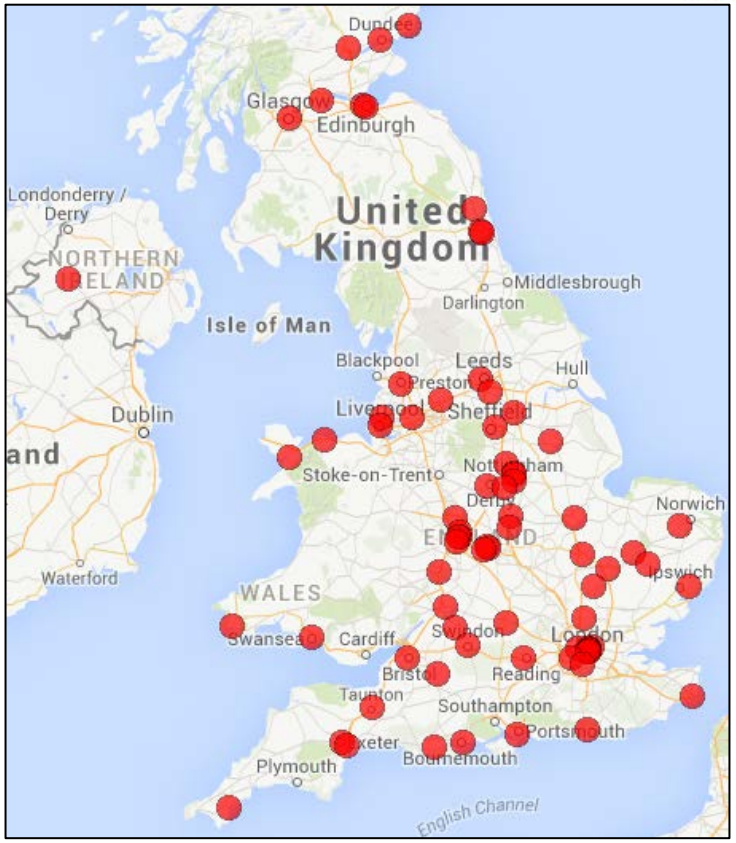
Key point

Phase 2 of LCVPPP brought a significant increase in low carbon vehicle deployment from 200 to 700 and the number of Stakeholder fleets involved in the programme grew almost fourfold to reach 77. Nine fleets were involved in both Phases of the Programme.

Low Carbon Vehicle Public Procurement Programme
Programme Outputs: Programme Outreach



Phase 1: 200 vehicles deployed with 21 Stakeholder fleets



Phases 1 and 2: 700 vehicles deployed with 77 Stakeholder fleets

Maps produced using GPSVisualizer

Key point

Phase 2 of LCVPPP significantly increased the geographical outreach of the programme, including bringing in public sector fleets from Northern Ireland and Wales for the first time.

Low Carbon Vehicle Public Procurement Programme
Programme Outputs: Measuring Success

Success criteria proposed (ref. July 07 consultation)	Achieved
The successful demonstration of a range of vehicles which have significantly lower CO_2 emissions (for a given vehicle size, performance specification or type) than those currently widely available on the market	200 vans demonstrated
The creation of opportunities to validate and test new technologies in real world conditions in respect of their environmental and emissions performance	Validation and test work on vans in real world operation
Evidence of innovation benefits in terms of learning, cost and risk reduction and the securing of economies of scale in relation to new technologies	• Evidence of learning, cost reduction and economies of scale for Ashwoods • Learning for Allied and Smiths in terms of improvements in manufacturing processes and vehicle performance verification in real-world operation • Learning for fleet operators
Significant subsequent orders for additional vehicles from both public sector and private sector organisations	Subsequent progression to Phase 2 with 500 fulfilled orders for Ashwoods

Key point

The programme delivered against the majority of the success criteria proposed at its outset.

Low Carbon Vehicle Public Procurement Programme
Lessons Learnt: IOP Influence on Vehicle SMEs

- LCVPPP demonstrated that Innovation Orientated Procurement (IOP) can effectively influence SMEs to bring forward new technology. Entrepreneurial in outlook, these niche players proved readier to accept challenges and were less risk averse than the major OEMs.

- The involvement of niche vehicle suppliers highlighted that time and effort was required to advance the new technologies up the Technology Readiness Level and Manufacturing Readiness Level scale and this caused delays for programme delivery.

- The niche suppliers involved in the programme, along with the motor industry as a whole, faced economic challenges during the LCVPPP time period. The prevailing economic conditions of the period combined with the weak demand for low carbon vehicles served to adversely impact suppliers to the programme;
  - One supplier failed to get through the PQQ (on financial grounds as opposed to a track record of supply) and subsequently went into receivership.
  - Modec (and LDV) were selected as suppliers but went into receivership during the LCVPPP time period.
  - Tanfield Group, the owner of Smith Electric Vehicles, faced financial difficulties and restructuring during the LCVPPP time period.

- One EV supplier in the LCVPPP criticised the Programme for causing customers to delay placing orders (awaiting possible inclusion in Phase 1 or subsequent Phase 2 participation). Thus, they argued that LCVPPP was skewing the market and indicated a strong preference for the immediacy of grants (applicable to both public and private sector purchasers). There was a desire to get Phase 2 demand at Phase 1 pricing and also a misconception, in some quarters, that all of the available funding could be translated into vehicle orders (not evidenced by demand seen from fleet operators within the programme). The argument about skewing the market does not seem to have been vindicated as follow up vehicle orders from stakeholder organisations were not obvious, and orders from private sector fleet operators were also limited during the same time period.

Key point

SME organisations responded effectively to the IOP and brought forward innovative low carbon and all electric vehicles for Phase 1. The downside of SME involvement was the adverse impact of the immaturity of their technology, operations and supply chain management, which led to delivery delays for two of the four suppliers.

Low Carbon Vehicle Public Procurement Programme
Lessons Learnt: IOP influence on Vehicle OEMs

- The LCVPPP use of Innovation Orientated Procurement (IOP) was found to be less effective in encouraging OEMs to bring new technology to market than it was for SMEs. Only one major OEM responded to the full ITT, but only with a vehicle offering a relatively low level of innovation. In the event they were not able to accept the terms of the Framework Agreement.

- The OEM organisations who engaged with the programme reported they need more significant market or regulatory drivers than procurement initiatives to introduce radical (for the organisation) new technologies outside of their long-standing and carefully-planned product development plans. This was evidenced by two OEMs offering already established alternative fuelled vehicles whilst another offered a vehicle at the very early stages of the product development process.

- Reasons cited for OEM reticence to put more technologically adventurous prototypes into fleet operation included an aversion to the reputational risk of trialling products in sight of the customer, concerns about the wider market demand trialling new technology would create among key customers and concerns that the supply chain for low carbon technologies would be too immature to enable competitive (low cost) mass production.

- OEMs reported that small fleet demonstrations are conducted where a new product is being prepared for launch and, on these occasions, there will be interest to deploy vehicles under the umbrella of Government funded activities. This was the case for Innovate UK's ULCVD and Lot 4 of LCVPPP.

- Evidence from Innovate UK projects shows that competitive RD&D projects may be more effective than procurement when it comes to getting small fleet trials with OEMs ahead of commercial launch. The OEMs report that RD&D projects give them a greater control over vehicle operation than would be the case when a vehicle is sold to the customer with its performance independently validated, as with the LCVPPP .

Key point

OEM organisations wouldn't alter their development schedules for the short timescales of Phase 1 of LCVPP. Longer timescales need to be considered for IOP activities if OEMs are to be engaged. For OEMs, R&D funding for demonstrators can achieve the same goals of making an ultra low carbon vehicle visible to potential customers.

Low Carbon Vehicle Public Procurement Programme
Lessons Learnt: IOP Influence on Fleet Operators

- The LCVPPP was found to have a positive impact on fleet operators (stakeholders to the LCVPPP) in terms of encouraging a step change in the introduction of low carbon vehicles, with a jump from *ca.* 25 low carbon vehicles deployed to around 700.

- In the case of LCVPPP, fleet managers within stakeholder organisations were enthusiastic but stakeholders' circumstances and organisational policies changed over the duration of the programme . One potential Stakeholder reported an anticipated high vehicle demand to the initial programme scoping study (c 1,000 vehicles), but eventually took very few in Phase 1.

- Fleet operators were interested in supporting the introduction of innovative vehicles, but were equally keen to set the same performance requirements (notably reliability) for LCVPPP vehicles that they would for the conventional diesel vehicles.

- The commodity nature of the van (as seen by volume pricing discounts available to public sector fleets for conventional diesel vehicles) meant that low carbon and all electric products held a higher premium over conventional diesel comparator vehicles than list prices would indicate, making the challenge for low carbon vehicle suppliers (and the challenge for the van as an exemplar for IOP) particularly hard.

- The risk aversion to new technology led to a limited introduction rate for the LCVPPP vehicles into existing fleets during Phase 1. However, Ashwoods reported fleets being more willing to purchase in Phase 2 as a result of the in-service endorsement (de-risking) of Phase 1.

- IOP arguably offers the greatest potential where there is a key customer driver encouraging a change in approach, whereby new technology overcomes a barrier or enables an opportunity that incumbent technology doesn't. Overall, low carbon vans fell in the category of 'nice to have' rather than essential, with no strategic driver on the fleets to adopt them. As such, the DfT wanted the strategic deliverable of low carbon vans more than the fleet operators.

Key point

Fleet operator Stakeholders were supportive of the LCVPPP, but retained a naturally cautious and risk averse approach. The design of LCVPPP sought to de-risk their involvement, but drivers to adoption were still too weak for Stakeholders to accept possible risk.

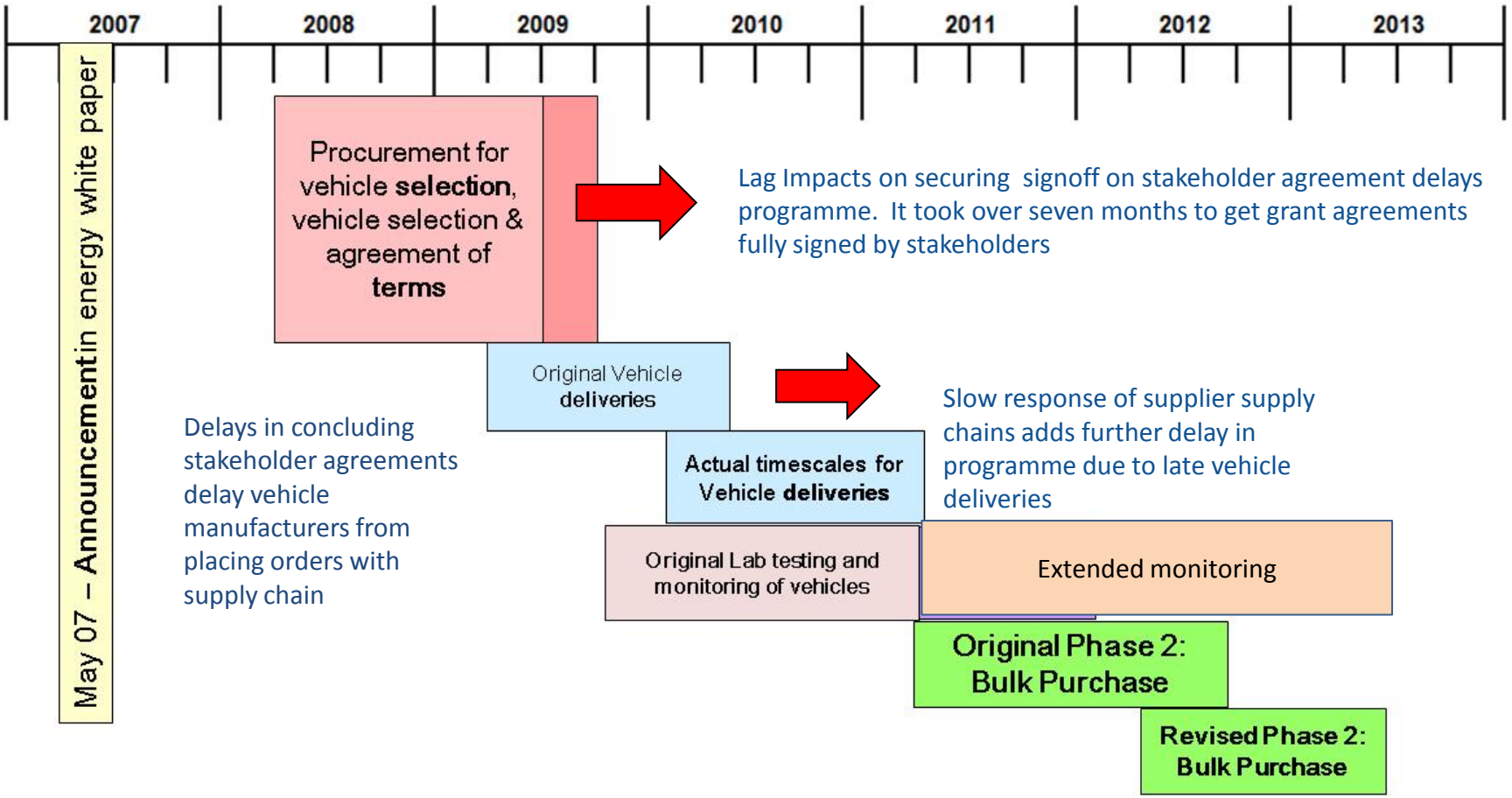
Low Carbon Vehicle Public Procurement Programme
Lessons Learnt: Programme Management

- **Procurement Process**
  - CD proved an effective mechanism for exploring the ambition of suppliers to introduce new technology and to clarify an appropriate specification, but the PQQ let some suppliers through who didn't ultimately have innovative technology to offer.
- **Planning and Task Management**
  - The complexity of individual tasks and work packages, particularly the first-time authorship of guidance to applicants and legal agreements, meant that resource tended to be deployed in line with the leading edge of the programme. In retrospect more resource could have been deployed preparing for the post-procurement programme management tasks.
  - Cenex' technical as well as project management expertise was critical to ensuring progress at key stages in the project. The stakeholder management approach adopted brought synergies and cost savings for DfT (OLEV) when it came to combined technical and project management.
- **Timescales**
  - The initial timescales (one year procurement, one year vehicle deliveries and one year evaluation) were overly optimistic.
  - The initial programme plan grossly underestimated the time required to secure vehicle orders. Delays in securing signoff on the stakeholder agreement were a factor, but decision making processes within the stakeholders when it came to placing orders resulted in a more significant source of delay.
  - The programme design underestimated the time taken by technology providers to deliver vehicles to customers.
- **Stakeholders**
  - The inclusion of local authorities in the LCVPPP changed the dynamics within the programme. Whilst it helped add to the total number of vehicles deployed, it fragmented the time profile of demand. The local authorities needed time to establish internal business cases for purchases and additionally sought to customise their purchases.
  - Ideally the local authorities would have been included at the outset of the programme. Had the initial programme scoping study analysed local authority van fleets it might have recommended a caged tipper (a common request by the local authorities) or chassis cab. The latter might have offered a best compromise as a lowest common denominator base vehicle and the platform for a number of customisations, so there would have been less variation in the base product ordered.

Key point

The addition of local authority Stakeholders to LCVPPP significantly changed the dynamic with the programme, adding to overall sales, but fragmenting demand by staggering orders and seeking more specialised use of the vehicles than originally expected for what was assumed to be a standard panel van procurement.

Low Carbon Vehicle Public Procurement Programme
Lessons learnt: Programme Timing



Key point

The Phase 1 Trial Period was set at one year of real world evaluation. Aggregated delays meant that the evaluation phase for the All Electric vans ran late and delayed the commencement of Phase 2 by a year.

Low Carbon Vehicle Public Procurement Programme
Lessons Learnt : Relationship Management

➢ Relationship management proved to be one of the single most important aspect of programme management as issues arose variously between Suppliers, Stakeholders and the DfT throughout the programme.

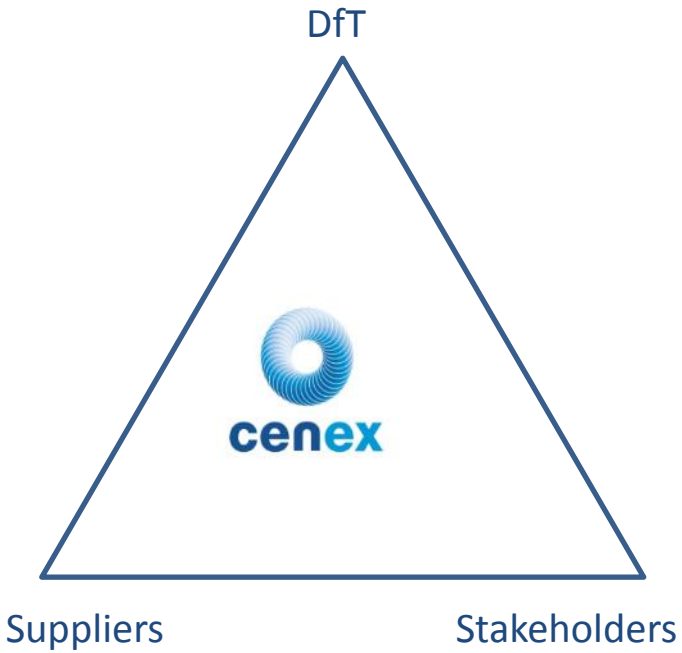
➢The principles underpinning the programme provided the best basis for providing advice to parties in conflict.

➢ Cenex' central positioning between DfT, Suppliers and Stakeholders meant that it was well positioned to act as the neutral arbiter, helping resolve issues quietly in the background before they became too problematic .

➢ Factors contributing to tensions between parties not unsurprisingly included money, time pressures, perceived risk and trust issues.

➢ Understanding the culture of programme participants provided valuable content for relationship management;

- Cenex visited and/or spoke to suppliers daily during the second and third year of the LCVPPP.
- The stakeholder group meetings provided Cenex and the DfT (OLEV) with an essential means by which to keep all parties informed, engaged and enthused or at least on board.
- The group provided stakeholders with the opportunity to share experience with like minded fleet managers within the group. It also proved an effective pressure group acting on vehicle suppliers.



Key point

Relationship management between Suppliers, Stakeholders and the DfT was a key responsibility of the Programme Manager. Understanding organisational culture within the suppliers and stakeholders proved valuable when seeking to manage conflict. The stakeholder forum was a particularly useful forum for information exchange and shared learning.

Low Carbon Vehicle Public Procurement Programme
Conclusions: Stakeholders

- The public sector stakeholders were found to be keen 'in principle' to support public procurement of low carbon and all electric vans. However, initial uptake was low due to perceived risks based on concerns over vehicle performance and disturbance to existing fleet operations. Interest grew steadily as confidence in process and products increased, notably the Mitsubishi iMiEV deployment (a Lot 4 output) was very positively received as an unexpected bonus arising through participation in the stakeholder group.

- Political interest within stakeholders was maintained through the programme in the majority of cases. However the risk of a loss of organisation support (due to policy\management changes) was ever present and realised in the case of one large organisation, which indicated a commitment to purchase large numbers of vehicles when first consulted, but whose situation subsequently changed resulting in it being unable to sustain its support for the LCVPPP at the level originally intended.

- The inclusion of the local authority fleets was necessary to boost Phase 1 demand but their late inclusion meant they weren't prepared to order vans in the timescales anticipated for the original project plan. Delays occurred as they sought to get internal approval to sign the Stakeholder Agreement and sought to identify candidate new van purchases in line with their replacement plans.

- The increasingly specialist use of the local authority vans saw the profile of demand change from the expected procurement of 150-200 standardised panel vans to a more diverse demand.

- Significant differences in usage by stakeholders led to a significant amount of customisation.

Key point

The public sector stakeholders were supportive of the programme aims but the inclusion of the local authorities was key to boosting demand. The late inclusion of the public authorities staggered demand and introduced greater customisation. Both of these factors fragmented the demand seen by the vehicle suppliers.

Low Carbon Vehicle Public Procurement Programme
Conclusions: Suppliers

- Vehicle suppliers who participated benefited from involvement in the programme
  - Ashwoods made commercial and PR gains and was selected for Phase 2.
  - Both Allied Vehicles and Smiths Electric Vehicles gained orders with new customers and improved their internal processes for supply chain management and EV manufacturing.
- Ashwoods leveraged its involvement in the LCVPPP to secure funding for technology development and to upgrade its manufacturing – both of which were key to delivering the price reductions which helped it qualify for Phase 2.
- Cost reductions in Ashwoods hybrid technology enabled it to reach a price point capable of delivering acceptable paybacks based on fuel cost savings offsetting initial investment cost. In contrast the All electric vans remained too expensive for many fleets, largely due to the high cost of the batteries.
- The SME suppliers were responsive to the market opportunity presented by the LCVPPP in terms of bring forward innovative technology. They also sought to back their products in the field respecting customer expectations for OEM levels of service (product reliability, low cost parts, etc).
- The SME suppliers faced barriers to market including being able to offer Stakeholders leasing as well as purchase options. Unproven Residual Values were a notable issue.
- The LCVPPP timescales proved too short to drive Innovation Orientated Procurement responses on the part of the OEMs
  - The demand was seen as too small to distort OEM product plans, particularly given the high product development costs and long lead-times associated with new technology launches.
  - The OEMs were notably sceptical as to the market potential of low carbon vehicles in the van sector given the high on-cost of key components and the commodity nature of conventional diesel comparator vehicles.
  - OEM offerings have emerged in the UK following the implementation of the Plug-in Van Grant.

Key point

SME organisations responded effectively to the LCVPPP and brought forward innovative low carbon and all electric vehicles for Phase 1; the downside of SME involvement was an adverse impact of the immaturity of their technology, operations and supply chain management. The LCVPPP timescales proved too short to drive Innovation Orientated Procurement responses on the part of OEMs.

Low Carbon Vehicle Public Procurement Programme
Conclusions: Project Management

- **Procurement Process, Planning and Task Management**
  - LCVPPP created the tools (e.g., documentation and legal agreements) to be able to replicate a similar project at a future date and the process developed is a model for other innovative procurements.
  - Traps and pitfalls have been captured through lessons learnt and recommendations made for improvements.
  - Public sector fleets appreciate support at both the planning, procurement and vehicle performance evaluation phases.
- **Timescales**
  - Timescales require careful consideration, such as the placement of 'the offering' within pre-existing product development and stakeholder procurement cycles.
  - Contingency time needs to be built into the schedules for IOP projects to take into account delays in concluding key project features, such as the Stakeholder requirements, the Competitive Dialogue Process, contracting, vehicle delivery and vehicle evaluation.
  - Therefore a future project may need to think in terms of several procurement cycles.
- **Stakeholders**
  - The operation of an IOP project arguably requires a change in mindset on the part of the participants as regards managing risk (the presence of risk being a key feature of RD&D projects). For the LCVPPP it proved very difficult for the participants not to revert to a risk-averse mindset;
    - Fleet Stakeholders – unwillingness to accept vehicle performance outside scope of what current vehicles deliver (as specified in current procurement documents) and risk in terms of vehicle performance in the field.
    - Suppliers – unwillingness to order components until orders were finalised.
  - The soft aspects of project management are very important for this type of project;
    - Maintaining an effective Stakeholder Group was critically important for relationship management, as was frequent face-to-face meetings and daily communication with suppliers.
    - Management style is important for this type of project, with long term aims (seeing through a procurement to vehicle delivery and consolidating a buying consortium) potentially overriding short term delivery objectives.
  - Such soft project management needs to be recognised in project planning and appropriate time and resource allocated.

Key point

LCVPPP created processes and programme management artefacts to attempt a similar process in future. Lessons learnt include the need to factor in contingency into programme management timescales, and the need to include considerable 'soft' programme management time for guiding stakeholders through what is still considered an immature process.

Low Carbon Vehicle Public Procurement Programme
Conclusions: Procurement as an Innovation Policy Instrument

- Public procurement can complement the more established policy instruments for innovation support:

	Technology Development Instruments	Technology Diffusion (into the market place) Instruments
Supply-Push Innovation	R&D Funding • Innovate UK LCVIP	Knowledge Transfer • KTNs Technology Demonstration Projects • Low Carbon Truck Demonstration Trial Grants • PiCG, PiVG
Demand-pull Innovation (regulation)	Technology Forcing Regulation • Low Emission Zones • EU 2020 CO_2 regulation	Technology Following Regulation • Euro standards for vehicle emissions control
Demand-Pull Innovation (procurement)	Public Procurement • SBRI • IOP/Forward Commitment Procurement	Public Procurement • Green Public Procurement; Buyer pools

Key point

Public procurement can complement the more established policy instruments for innovation support.

Low Carbon Vehicle Public Procurement Programme

Conclusions: Pros and Cons of IOP for Technology Adoption

- **Pros of IOP as a means of encouraging fleets to adopt new technology;**
  - IOP offers a means of stimulating market pull and can work concurrently with initiatives supporting supply push innovation (e.g. RD&D funding) as envisaged by the Low Carbon Transport Innovation Strategy.
  - Public sector IOP helps provide an additional policy instrument to support innovation from UK companies, whilst demonstrating public sector leadership.
  - The size of the public sector can help ensure a strong demand signal to stimulate supplier innovation.
  - Public sector IOP can cover higher proportions of capital costs than allowed by the State Aid Framework .
  - IOP provides evidence of a market and provides market prices for technology that aid a better understanding of the competitiveness proposition of new technologies (payback potential, cost-benefit of policy intervention, etc.).
  - IOP exercises can aggregate both large numbers of end users and many technology providers within the same programme and can place technologies across a wide number of stakeholders.
  - IOP exercises can be repeated in quick succession .
- **Cons of IOP as a means of encouraging fleets to adopt new technology;**
  - IOP exercises require complex, multi-stage processes (to align demand) and can be slow to deliver initial outputs. Support from stakeholders can wax and wane over the timescales of an IOP project.
  - Experience with IOP remains limited.
  - Government facilitation of IOP relies on structured programmes and grant funding.
  - Difficult to engage private sector purchasers in IOP with any funding provision by Government being capped by state aid rules.
  - IOP has limited pull on major OEMs (unless the products are already committed to in the planning development cycle). OEMs see supply to procurement projects as more of a commitment to their client base than demonstration projects.

Key point

The main pros of IOP are that it offers a repeatable means of leveraging the power of public sector procurement to stimulate suppliers to bring forward new technology. The cons of IOP lie in the complexity associated with the structural steps necessary to align and fund demand and the risk that suppliers choose not to respond.

Low Carbon Vehicle Public Procurement Programme Recommendations: Process

- The LCVPPP approach to IOP has been successfully demonstrated and could be replicated in appropriate circumstances within a transport or other industrial context, with only a small number of process changes recommended, as follows;
- **Supplier engagement**
  - Conduct supplier workshops to help ascertain supply chain capabilities and intent ahead of the formal commencement of a procurement process (e.g. before a PQQ is issued).
  - Build in success criteria at the outset (performance and cost requirements) as a spur to technology providers (offer of higher volumes) with independent third party validation.
- **Stakeholder demand**
  - Establish a large stakeholder group at the outset (larger than for the LCVPPP) to help bulk up demand from the commencement of the programme and maintain a buyer pool operating to a common timeframe.
  - Engage the stakeholder group early in the process to align vehicle replacement cycles in order to establish strong demand aligned to a buying window coinciding with the publication of a completed Procurement Framework Agreement.
  - Complete the processing of the Stakeholder Agreement (written around principles not detail) concurrent with the procurement phase so it is completed for all stakeholders by the time the Framework is published.
  - Use the time bound nature of the procurement window to establish an order size for the suppliers (e.g. don't need all stakeholders within the buyer pool to place orders, just enough responding in a timely manner to generate demand that rewards supplier interest and intent).
  - Use the stakeholder group for both IOP and green public procurement initiatives. For example, progressing EV\PHEV or FCEV procurement through the same group as undertake IOP would mean that stakeholders could remain engaged in low carbon vehicle uptake for an extended period of time, opting in or out of new procurement exercises depending on the applicability of a particular vehicle or fuel type to their operations.
- **Programme Management**
  - If possible, use an initial outline budget for the sponsor to transfer funds to the programme manager and then the programme manager to manage grant outlay on the basis that monies not spent are returned to the sponsor in a subsequent year.
  - For grant administration, move away from the principle of complete cost recovery for the stakeholder to fixed amounts that cover the majority of incremental investment costs without getting locked into minutia of dealing with fully itemised detailed costs. Otherwise offer cost recovery only on a baseline option such as a fixed vehicle chassis\body variant.

Key point

IOP process recommendations include adding a supplier workshop to ascertain industry intent ahead of the formal commencement of procurement, working with stakeholders to bulk up and align demand around a common timeframe and to opt for a grant on a baseline vehicle rather than offering complete cost recovery on all variants to aid programme management and cost control.

Low Carbon Vehicle Public Procurement Programme Recommendations: Candidates for future IOP

- There are a number of potential areas for which the IOP approach could be considered
  - The Down to Zero Carbon Procurement compact – which has BIS, Industry and public sector support, is seeking to procure ultra low emission vehicles, with zero emission vehicles as the ultimate goal.
  - The rate of uptake of plug-in vehicles through grants could be enhanced by a public sector procurement initiative using either IOP to take into account the plug-in vehicles expected to reach the market from 2015 onwards, or as green public procurement helping purchase vehicles already qualified for the Plug-in Car or Plug-in Van Grant.
  - The launch of hydrogen fuel cell vehicles (expected in the 2017 to 2020 timeframe according to UKH2Mobility) would provide another opportunity to revisit IOP.

- Innovate UK supports the use of procurement as a means of stimulating innovation through its Small Business Research Initiative (SBRI). The SBRI process starts with a government department or other public body identifying a specific challenge. This is then turned into an open competition for new technologies and ideas that is open to the broad business community. Innovate UK provides finance the company develop its ideas, and the public sector gets more innovative solutions to its needs. The SBRI process, typically providing ca. £100k of funding, is of the wrong size and duration to support Consortia-led IOP projects. Consideration should be given to there being funding available for buyer consortia to bid in for help finance IOP projects with innovation intermediaries assigned to assist the consortia to manage projects from inception through to procurement, deployment, evaluation and dissemination.

Key point

Renewed interest in procurement consortia and the anticipated introduction of advanced ultra low carbon vehicles offers opportunities for revisiting the use of IOP.

Appendices

Low Carbon Vehicle Public Procurement Programme
Appendix 1. Pre-Procurement Process
Programme Implementation

- The DfT secured a 3 year budget of £20m for Phase 1 activities and a £30m budget for Phase 2.
- DfT secured a further £30m earmarked for an additional three years of activity to extend the programme length to six years. This offered the scope for additional procurement lots over and above the initial four.
- DfT contracted Cenex (assisted by Beta Technology) to be the Programme Manager for LCVPPP. Cenex commenced work on the programme in April 2008.
- An OJEU ITT published in June 2008 (Ref: 080627 - Vanproject-OJEUinputv3.doc)
  - The project offered potential vehicle suppliers an opportunity to bid for and win a framework contract for the supply of vehicles meeting the agreed vehicle specification (Ref: 080708 - Bidders Information Pack - Final.doc).
- The full pre-procurement process is outlined below and is described in the subsequent slides.

Key point

The final approval of the business case allowed for Phase 1 and Phase 2 activities in the first three years of the programme, with the scope for an additional three year extension. The programme implementation commenced in April 2008 when the programme manager (Cenex) was brought on board.

Low Carbon Vehicle Public Procurement Programme
Appendix 1. Pre-Procurement Process
Pre-Qualification Questionnaire

- **Pre-Qualification Questionnaire (PQQ)**
  - **Rationale**
    - The aim of the PQQ was to select for candidate suppliers by ensuring only organisations with the financial capability and track record to be an effective supplier to Phase 1 should receive an Invitation to Participate in Dialogue (ItPD).
    - DfT Procurement advised that questions regarding low carbon vehicle capabilities were to be held back for the Competitive Dialogue (CD).
    - DfT Procurement strongly advised that no more than five companies, for each of Lot 1 and Lot 2, should be invited to the dialogue phase as a manageable number.
  - Outcome
    - 24 PQQ responses were received, assessed and ranked;
      - Ten responses for the low carbon van procurement.
      - Six for the All Electric.
      - Eight covering both.
    - The financial criteria measured historic financial performance, whilst the track record was a measure of the ability of the company to deliver vehicles to fleet users. The ranking took into account both measures.
    - At the PQQ stage one company was eliminated of grounds of a weak financial balance sheet (This company subsequently ceased trading during the LCVPPP Phase 1 time period).
    - One company allowed through the PQQ stage to CD went on to submit a success bid to the ITT but went into receivership before contract award.
    - One company allowed through the PQQ went on to be contracted and to successfully deliver vans to Phase 1 only to go into receivership before the end of the LCVPPP.

Key point

A Pre-Qualification process was used to select the best suppliers to participate in the dialogue phase. The filtering stage took into account financial and operational (vehicle supply) capabilities and did not formally consider innovation or low carbon vehicle capabilities.

Low Carbon Vehicle Public Procurement Programme
Appendix 1. Pre-Procurement Process
Competitive Dialogue

- Competitive Dialogue (CD)
  - Five organisations were selected to enter competitive dialogue for the low carbon van lot 1 and five for the all electric van Lot 2.
  - DfT (OLEV) had a strong preference to try to complete the dialogue phase through one meeting with each bidder. Their rationale was that if suppliers were offered additional meetings they would take them but each subsequent meeting would become less productive. The CD meetings were conducted over two weeks in December 2008 .
  - The dialogue was conducted with the same team throughout, comprised of Cenex staff (3), DfT OLEV (1), DfT Procurement (2) and Stakeholder Representatives (2).
  - Each dialogue was minuted and answers to non commercial questions were published on the web (consistent with DfT Procurement guidelines).
- As guidance to bidders entering the dialogue, Cenex and DfT (OLEV) prepared a set of Frequently Asked Questions (FAQ) to describe the programme. This FAQ document included the draft technical specification of the low carbon van and the all electric van.
- DfT Procurement provided guidance to suppliers in terms of aspects of the procurement for discussion including the duration and location of vehicle demonstrations, performance specifications, how orders would be placed, levels of demand, the viability of potential solutions and pricing structures.
- The main areas for discussion during the CD turned out to be the vehicle performance specification (notably how payload would be measured), eligibility of alternative fuels and the length of the trial period.
- At the end of the CD a revised set of FAQs was issued , along with the bidders pack which included the finalised technical specifications.

Key point

The CD phase was seen as a key stage-gate for the LCVPPP. The same team and same process was adopted throughout the dialogue. Suppliers were provided with detailed guidance documentation (in the form of the bidders pack and a set of FAQs) before the CD commenced. Suppliers had common issues to raise during CD.

Low Carbon Vehicle Public Procurement Programme
Appendix 1. Pre-Procurement Process
Vehicle Specifications

	All-Electric Vans	Low Carbon Vans
Payload volume	> 6m^3 (SAE method)	> 6m^3 (SAE method)
Payload	> 800 kg	> 1,100 kg
Gross vehicle mass	< 5500 kg	< 3500 kg
Acceleration	0-50 mph < 40 sec (fully laden)	0-60mph < 25 sec (fully laden)
Maximum speed	> 50 mph at zero grade (fully laden)	> 60 mph at zero grade (fully laden)
Range	> 100 miles (5% tolerance) at zero grade (fully laden)	N/A
Gradeability	achieve a 15% grade (fully laden)	achieve a 25% grade (fully laden)
Charge time	< 10 hours	N/A
CO_2 emissions reduction	N/A	> 10% (NEDC cycle)

Originally 1,200kg

5% tolerance not originally included

Changes in red between draft specification and final specification after CD

Key point

Only two performance specifications changed as a result of CD, confirming supplier acceptance and ability to meet these requirements. The original FAQ indicated that vehicles could be returned to the supplier at the end of a year's operation (a measure designed to encourage suppliers to be more technologically adventurous), but this was replaced as stakeholders and suppliers argued for the retention of the vehicles in operation so the deployment phase was extended to three years.

Low Carbon Vehicle Public Procurement Programme
Appendix 1. Pre-Procurement Process
Competitive Dialogue Outcomes

	Low Carbon	All Electric
Companies	• Company A – Major OEM • Company B – Major OEM • Company C – Major OEM • Company D – UK SME • Company E – Major OEM	• Company A – UK Medium-sized Enterprise • Company B – UK SME • Company C – UK SME • Company D – UK SME • Company E – Major OEM
Supplier Offer and Assessment	• A – aerodynamics and driving aids (borderline in scope) • B – LPG (out of scope) • C – Natural gas + Stop\Start (out of scope) • **D – Retrofit micro-hybrid (In scope)** • E – Hybrid (out of scope)	• **A – Battery EV (In scope)** • **B – Battery EV (In scope)** • **C – Battery EV (In scope)** • **D – Battery EV (In scope)** • E – Battery EV (out of scope)
Summary of CD Outcomes	• Not clear for A or B that CO_2 reduction targets would be met. • Neither A, B nor C offerings were considered sufficiently technically ambitious • Neither B nor E subsequently marketed their product offerings • **A and D proceeded to submit a full ITT response**	• Only company E was ruled out of scope . It offered a car derived van with a delivery date projected well beyond the initial three year operation of the Phase 1 procurement. The procurement would have needed to fund development costs. Company E unveiled the product five years after the CD

Key point

The CD Phase helped four OEM suppliers clarify that their products were not suited to the requirements of the LCVPPP procurement in terms of vehicle performance, level of innovation and timescales for delivery. SMEs offered options with the best fit for the LCVPPP. The planning and preparation in advance of the CD phase paid dividends in terms of timely completion of the process.

Low Carbon Vehicle Public Procurement Programme
Appendix 1. Pre-Procurement Process
Full ITT Response

- **All Electric**
  - Four bidders submitted tender responses to the ITT and all bids were of quality required to be selected as suppliers to the LCVPPP.
  - However, Company A went into administration after selection. The official receiver was notified of the contract award given that it ought to have had a potential value for any organisation wishing to take over the assets or IP of Company A. No buyers were forthcoming and Company A was therefore withdrawn from the list of suppliers approved to the Framework.
- **Low Carbon**
  - Two suppliers submitted a tender response to the ITT, but one supplier (a major OEM) wasn't prepared to accept the terms of the supply agreement (related to vehicle returns) and therefore it was only possible to proceed with one bidder.

- The quality and content of bids submitted did not change appreciably between the ItPD outline proposal and the full ITT proposal.

- Each selected supplier was required to sign the Framework Agreement, which set out the terms for the eligibility for LCVPPP grant funding. On award DfT wrote to the suppliers to reiterate the conditions required to trigger Phase 2.

- The procurement process was completed eight months after the publication of the OJEU. DfT Procurement reported that this CD completed in record time, which was especially positive since this was the first innovation-orientated procurement of its type.

Key point

Only the SME suppliers signed up to the Framework Agreement. The OEM suppliers proved to be more risk averse than the SMEs. None of the OEMs were prepared to offer an innovative product outside of product planning process and were found not to have low carbon or all electric vans being prepared for market at the time of the LCVPPP Phase 1 procurement.

Low Carbon Vehicle Public Procurement Programme
Appendix 2. Post-Procurement Process

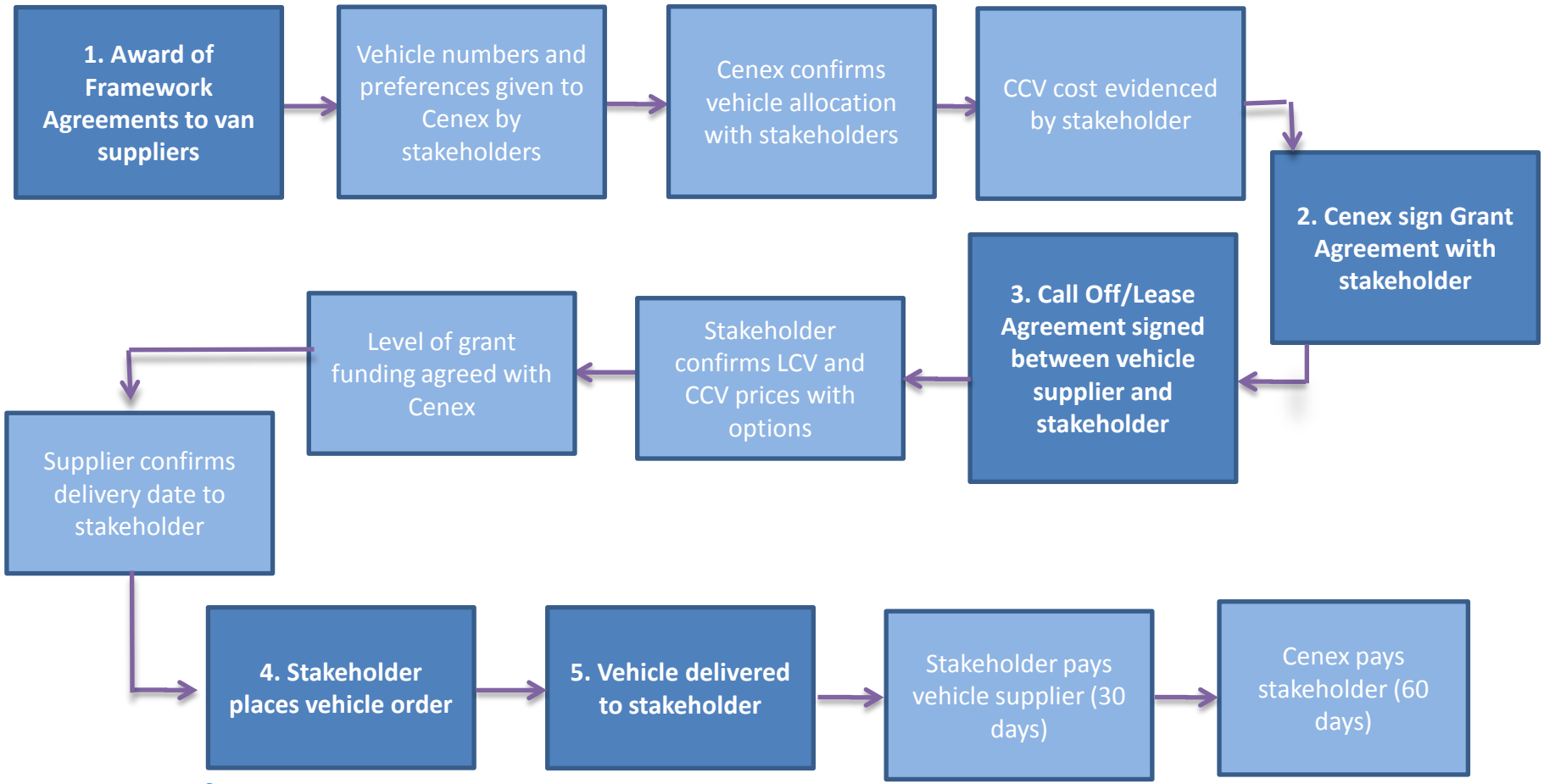
- Once the Framework Agreement and a Stakeholder Group were in place there were five remaining work packages, as illustrated below.
- The full post-procurement process is outlined below and is described in the following slides.

Key point

The completion of the procurement and stakeholder recruitment tasks marked the beginning of a new phase of the programme aimed at getting vehicles into fleets and monitoring their performance.

Low Carbon Vehicle Public Procurement Programme
Appendix 2. Post-Procurement Process

Process Steps



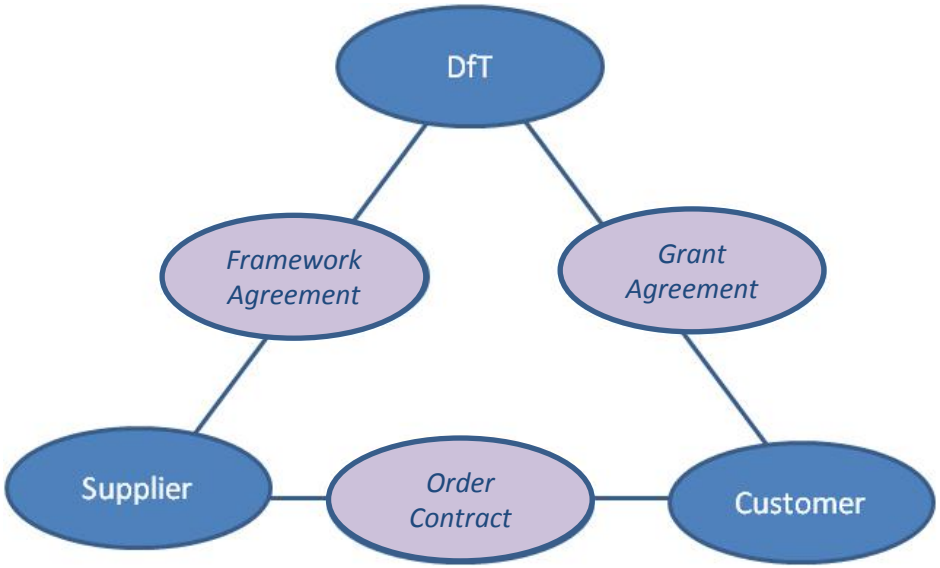
Key point

A formal five-part process was followed between suppliers being qualified to a Framework Agreement through to vehicle delivery (dark blue boxes above). The financial controls for grant administration required intermediate process steps (light blue boxes above) for accurate calculation and payment of grants due to stakeholders. The process was administratively complex.

Low Carbon Vehicle Public Procurement Programme
Appendix 2. Post-Procurement Process
Contracting

➢ To proceed to the placement of vehicles into fleets for monitoring, three contractual steps were required, as follows;

- Framework Agreement between DfT and the vehicle supplier
- Grant (Stakeholder) agreement between DfT and the fleet operator (customer) , negotiated by Cenex
- Order contract between the supplier and the customer



➢ Cenex took on the role of developing and putting in place Grant (Stakeholder) Agreements between DfT and each of the 21 stakeholder organisations who expressed a desire to purchase or lease low carbon vans through the LCVPPP.

➢In addition a contract, developed under the procurement framework by DfT, was signed between the stakeholder and the manufacturer when purchasing or leasing a vehicle. This document included clauses specifying a minimum level of vehicle performance (90% availability) and requirements on the manufacture to repair vehicles within 48 hours or otherwise provide a replacement vehicle.

Key point

Two contractual agreements (a Framework Agreement and a Grant\Stakeholder Agreement) needed to be in place before a customer could place an order with a supplier. This in turn required an Order Contract agreement.

Low Carbon Vehicle Public Procurement Programme
Appendix 2. Post-Procurement Process
Stakeholder Demand

➢ Clarification of stakeholder demand

- With the Framework Agreement in place the stakeholders had four suppliers from whom they could buy or lease vehicles once they had a stakeholder agreement in place.
- The suppliers were encouraged to make contact with the stakeholder fleets to sell the benefits of their products. Feedback from stakeholders indicates that some of the suppliers were more proactive and better at this than others.
- The DfT process had anticipated that stakeholders would order vehicles within a short period of the Framework being put in place. However, the local authorities would not be rushed to place orders. Even allowing for their being no premium for the purchase or lease of the LCVPPP vans (versus CCVs), internal processes for vehicle purchase kicked in. These involved establishing a business case for each vehicle purchase, with vehicle orders to be placed in line with fleet replacement schedules and timescales linked to annual budgeting cycles and whether there was headroom in the current year's budget or a need to defer to the following financial year.

➢ Stakeholder Agreement

- In order to accept the terms of the Stakeholder Agreement, stakeholders reported that they needed time for internal review by their legal team and in some cases the agreement would need to be passed to several staff for approval before it could be signed off. One stakeholder in particular required a significantly revised version of the original grant agreement before they were willing to sign involving considerable time and effort from the Programme Managers.
- The Stakeholder Agreement was initially designed to include stakeholder-specific numerical details as annexes. These annexes covered grant calculations and payment schedules for the vehicles that the stakeholder would order. The inclusion of this detail led to delays as the schedule detail could not be finalised until the stakeholder placed an order, which required the Stakeholder Agreement be in place. The grant calculation schedule was ultimately removed and replaced with a worked example showcasing the principles of the operation of the agreement. This helped get easier sign-off, but detail remained to be resolved in latter stages (see Steps 3 and 4 on the previous page).

Key point

Once supply contracts were awarded a vehicle uptake and allocation phase commenced. The local authorities could not be rushed to place orders and securing signed stakeholder agreements proved problematic. This stage of programme delivery took much longer than allowed for in the initial timing plan.

Low Carbon Vehicle Public Procurement Programme
Appendix 2. Post-Procurement Process
Vehicle Delivery

- The aggregation of demand from stakeholders into a finalised Phase 1 order size (# of vehicles) was delayed by the delays by stakeholders in signing up to the stakeholder agreement and placing their orders.
- Vehicle orders and delivery progressed far quicker for Ashwoods product than for the All Electric vans.
- For the All Electric lot, the SME suppliers were loathe to place orders for high cost items (battery packs, electric motors) until the final aggregated customer orders were confirmed. As a consequence they delayed orders on their supply chain with a consequent delay to vehicle assembly and delivery.
- When suppliers approached their supply chains with finalised numbers they found they faced long delays (up to six months) for the delivery of key components such as batteries.
- The immaturity of the supply chains for key components and the lack of purchasing power on the part of the suppliers contrived to extend delivery times far longer than originally anticipated.
- The late delivery of vehicles increased tensions between DfT, suppliers and the stakeholder fleets.
- The programme board tasked Cenex to ensure that all vehicles should be delivered by 31st March 2011 and placed a budget cut-off whereby any vehicle delivered after the end of March would not qualify for grant funding.
- **Vehicle Deliveries**
- Original orders totalled 209 vehicles but actual deliveries amounted to 200.
- The first vehicles were delivered by Ashwoods in January 2010 and all its Phase 1 vehicles were delivered by March 2011.
- Modec entered administration during 2010. This meant that only four of the seven vehicles ordered could be handed over; stakeholders were offered alternatives from Allied or Smiths. Modec considered a change in battery type between competitive dialogue and the vehicle delivery phase, illustrating that its All Electric van product was still a product under development.
- All EV suppliers had significant variation from the lead times indicated in their tender submissions. Cenex had to apply a close level of supervision of the operations of both suppliers to ensure all vehicles were delivered by mid February 2011.

Key point

Supply chain management factors adversely impacted delivery times. A year end cut off of 31st March 2011 had to be applied, along with supply chain and manufacturing oversight, to ensure deadlines were met.

Low Carbon Vehicle Public Procurement Programme
Appendix 2. Post-Procurement Process
Grant Administration

- The LCVPPP grant to the stakeholder covered the additional capital cost and any other direct costs associated with fitting a van for operation, as well as the cost of data logging equipment and costs associated with infrastructure (e.g. EV charge points).
- Stakeholders were offered the option either to buy vehicles outright, or lease. The offer of a lease required suppliers to partner with a leasing company, with the leasing company needing to take a view on the Residual Value of the new technology.
- Once the stakeholder agreement was signed and before an order could be placed stakeholders had to agree with Cenex the grant amount for each van, taking into account the difference between the low carbon or all electric van and its CCV.
- The diversity of use of the vans across the public sector partners introduced variations in vehicle type (e.g. long and short wheel base) and the specific purposes for which they were being purchased introduced complexity in terms of the extras ordered to equip the vans for operation (e.g. steps, reversing lights, internal racking, etc.).
- Stakeholders complained that the cost of options from suppliers on the framework were higher than those they typically paid for comparator vehicles and also noted that they usually received dealer discounts on conventional vehicle purchase. Both factors increased the premium associated with low carbon and all electric vehicle purchase and therefore the eligible grant.
- Populating and reviewing LCV and CCV comparisons to accurately determine grant calculations took time and many of the Stakeholders became frustrated with this process. Further complications were caused for grant administration in cases where the costs on a supplier invoice were found to be different from the grant calculation.
- This process could have been simplified by leaving additional items out of the grant calculation such as vehicle options, servicing and instrumentation or otherwise including them in the final grant payment.
- These observations emphasise the need to keep documents as simple as possible in practice in order to avoid delays in reaching agreement and sign off.

Key point

The design of the programme to ensure stakeholders paid no more for either low carbon or all electric vans than a diesel equivalent introduced complexity into grant calculations, the resolution of which introduced further delays in vehicle orders being placed. A flat grant for a common baseline vehicle would have simplified programme delivery.

Low Carbon Vehicle Public Procurement Programme
Appendix 2. Post-Procurement Process
Managing Cash Flow

- As the activities associated with vehicle purchase and delivery got underway it was necessary to manage cash flow associated with grant administration.

- The initial cash flow model developed by Cenex took into account the vehicles ordered (and by whom), the specification, price and agreed grant calculation. In anticipation of the vehicle test work, the addition of vehicle telemetry and any laboratory testing was also included. This first model developed was complex as it included many trigger inputs and dates, including;
  - a vehicle Purchase Order; a Grant Calculation; an estimated Delivery Date; an Invoice Payment; a Grant Claim; a Grant Payment. At any one time a statement of grant payments due would be developed (given some assumptions on time to pay invoices) which could be used by Cenex to draw down monies from DfT.

- DfT (OLEV) budgets have a Fiscal Year cut off (no carry over) so accurate budgeting around the Year End became a project management priority.

- The cash flow model was reworked to take into account the information flow from stakeholders to seek to ensure a high degree of accuracy whilst making data access more efficient for reporting purposes.

- It is important that spreadsheet models are subject to peer review at the design phase to ensure they are logically constructed, using simple design principles and are well documented so others can easily use them. External peer review also encourages refinements to models which may save time in the long run, in terms of getting useful data out. In the case of the LCVPPP consideration should have been given to the joint development of the cash flow model to aid shared use.

Key point

As Cenex engaged with multiple stakeholders to progress orders through the sales processing and delivery pipeline the inputs to the cash flow model became increasingly complex with a good deal of uncertainty as to how far activities had progressed (with stakeholders and suppliers) and how fast progress would be made. This made forecasting cash flow problematic.

Low Carbon Vehicle Public Procurement Programme
Appendix 2. Post-Procurement Process
Managing Uncertainty

- The complexity associated with uncertainties in the middle phase of the delivery of LCVPPP can be illustrated by a report to the Programme Board submitted for review at the beginning of April 2010. At this stage in the life of the programme (ten months after the suppliers had been selected and with 12 months of the programme to go) the estimated vehicle supply stood at 196 vehicles;

Grant Agreement signed	Call Off/Lease Agreement signed	Stakeholder places vehicle order	Vehicles delivered
3 stakeholders granted 1 month extension to sign agreement and place orders (est. 7 vehicles)	3 stakeholders not yet confirmed orders (est. 30 vehicles)	Orders confirmed for 159 vehicles from 15 of 21 stakeholders	22 of 159 vehicles delivered

Timescales between call off/lease agreement signed and stakeholder order placement varying between 1 and 25 weeks

Suppliers reporting projected delivery time variations between 12 and 32 weeks

Key point

The programme managers faced a fluid situation in terms of the status of the pipeline between stakeholders' stated vehicle preferences and vehicle demand; their actual orders confirmed and vehicles delivered. Timescales were being set by stakeholders and suppliers with little programme management control possible.

Low Carbon Vehicle Public Procurement Programme
Appendix 3.

Abbreviations

CCV	conventional comparator vehicle
CD	competitive dialogue
DfT	Department for Transport
EC	European Commission
EIAG	Environmental Innovations Advisory Group
EV	electric vehicle
FCEV	fuel cell electric vehicle
IUK	Innovate UK (formerly the Technology Strategy Board)
IOP	innovation-oriented procurement
LCTIS	Low Carbon Transport Innovation Strategy
LCV	low carbon vehicle
LCVPPP	Low Carbon Vehicle Public Procurement Programme
MRL	manufacturing readiness level
OLEV	Office for Low Emission Vehicles
PHEV	plug-in hybrid electric vehicle
PiCG	Plug-in Car Grant
PiVG	Plug-in Van Grant
PQQ	prequalification questionnaire
RD&D	research, demonstration and deployment
SBRI	Small Business Research Initiative
SME	small-medium enterprise
TRL	technology readiness level
TSB	Technology Strategy Board (now Innovate UK)

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