Transitioning towards zero emission public transport in the Province of North-Brabant
Province of North-Brabant (the Netherlands)

Background
Situated in the south of the Netherlands, the province of North-Brabant is divided into 66 municipalities with the city of ‘s-Hertogenbosch as its capital, and Eindhoven the largest city. Accessibility and mobility for the region are one of the major policy objectives of the provincial government. As of 2025, the provincial government wants 100% clean bus transport at a socially acceptable price. To learn and innovate, the provincial government has started several pilot actions (running from 2015-2018) with various sustainable energy technologies. The pilot phases (more information, in Dutch, available here) follow four years of Brabant being a ‘living lab’ for smart and green public transport where the provincial government worked closely with the business community to develop the pilots.

The pilots were also used to develop a model for total cost of ownership (TCO). This model is now managed by the CROW - an independent non-profit knowledge partner for (decentralised) governments, contractors and consultancy agencies. The pilots have included trials of electric hydrogen (fuel cell) buses totalling costs of €8 million (on top of the regular costs for diesel fuelled buses) for all three projects. Funding was provided by national, regional and local governments, as well as the private sector (7%).

In terms of the public bus network, responsibility is divided between North-Brabant, which is in charge of contracting and public tendering (setting goals, defining terms of reference and all requirements in the tender documents including selecting the operator), and a private-sector operator (the public transport operator or PTO), which is responsible for operating the service and buying and maintaining rolling stock.

Procurement objectives
When the opportunity arose for the Province to re-tender its bus concessions, it decided to focus on three goals. The first two - improvements to the network of public buses, and increasing customer satisfaction - were the main criteria used to award the contract. The third goal - to transition to a zero emission network (definition provided in next section) - was highlighted as desired, and came into play only where it was possible within financial, operational and technical means. As is common in the Netherlands, the whole of a municipal bus network is packaged and competitively tendered in one concession contract (more information available here).

The province of North-Brabant is divided into three concessions: West, East and Southeast-Brabant. The first two were tendered in 2013/2014 and the last was tendered in 2015/2016 (to operate until 2026).

The tender Southeast-Brabant, to service the wider Eindhoven/Brainport region, was worth almost €50 million per year (including €21 million worth of subsidies), and requires the provision of over 200 buses. Throughout the length of the contract, it is the joint responsibility of the Province and the PTO to continue developing the network and the fleet. New vehicles are transferred to the next concession period strengthening the business case for investment in new
technology. As the market for zero emission vehicles has been gradually evolving, the Province has increased the share of points given to the zero emissions award criteria from 4%, in 2013/2014, to 11.5% in the latest tender (in 2015/2016).

The winning tender managed to fulfil all three goals, and by December 2016 the PTO had already introduced 43 zero emission articulated buses1, as well as the accompanying charging infrastructure. The gradual transition to an entire zero emission bus fleet (approximately 200 buses) is set to happen by 2024.

By staging the transition against a planned series of milestones, the ability to introduce new forms of technology as it develops is retained, while still ensuring a speedy transformation of the network without imposing any extra costs regarding the tenders.

Criteria used in the Southeast-Brabant tender (Eindhoven area)

Concessions in the Netherlands are mostly based on regional policies that are recorded in a Programme of Demands. The latter is a result of more global policies set by the Senate in a Vision on Public Transport (in Dutch).

Subject matter of the contract:
Servicing public transport using a 100% zero emission fleet by 2024.

Performance-based specifications:
Zero emission buses were defined according the EU-Regulation Nr. 630/2012, being a ‘pure electric vehicle’ or a ‘Hydrogen fuel cell vehicle’. A ‘hybrid electric vehicle’ as defined in EU-Regulation Nr. 630/2012, does not qualify as zero emission.

Award criteria:
The award criteria and the share of points given to them were split as follows:
• Network and schedules (49%)
• Customer interfaces (15%)
• Zero emission (ZE) transition (11.5%):
  • Transition path (qualitative criteria): What is the plan for reaching zero emissions, for example, considering factors such as how the PTO will acquire new technical knowledge, e.g. through employment of new staff.
  • Pilots and innovations: Cooperation with the provincial government in these areas.
  • Pilot buses: Obligation to use the new bus technologies piloted, e.g. fuel cell operated electric buses.
  • Number of zero emission vehicles in use at the start of the contract and the pace of introduction of further ZE vehicles (quantitative criteria).
  • Basic vehicle requirements (e.g. EEV – enhanced environmentally friendly vehicle) at the start and during the concession.
• Operational quality (11%)
• Comfort of rolling stock (8.5%)
• Market position (5%), whereby the PTO was asked to describe and provide results (in terms of increases in passenger numbers and satisfaction) for improving its market position (e.g. quality criteria to pull and retain travellers), process of innovation, and vision for developing the service further and increasing cooperation with further stakeholders.

It is important to note that the ‘technical specifications’ and ‘contract performance clauses’ required by the Province of North-Brabant were the same as those required for diesel powered buses.

The Province uses the broader functional term ‘zero emission’ in their procurement/tender documents rather than ‘electric’, which is a specific type of zero emission bus. Currently, two types of buses that meet the zero emissions definition are available: battery electric buses and hydrogen buses. The latter with an electric drive-line.

1 Usually single deck design buses comprising of two rigid sections linked by a pivotal section (or articulation) and are commonly used as part of a Bus Rapid Transit network.
Results

The contract was awarded to the company already operating the Eindhoven area, which was the only company to respond to the tender for the new concession. The call for zero emission vehicles may have caused some uncertainty among other potential competitors. However, the network tendering procedure in combination with the awarding criteria showed to be the trigger for the market operator to take a big step in the transition towards emissions-free public transport. It is interesting to note that the provision of zero emissions buses was not an obligatory requirement of this contract, and also only counted for a relatively small proportion of the award criteria (11.5%). However, the competitive nature of the market meant that this was enough of an incentive to get the required result.

The result of the tendering process is more public transport with comfortable buses. The company also offered a stepwise transition to full zero emission during the concession. Starting with 43 articulated buses at the start of the concession (December 2016), the fleet will grow to around 100 zero emission buses in 2021 and will be fully zero emission by 2024. There is also room for new technologies in this concept, such as Mobility as a Service (MaaS).

Although the main focus was on improving the existing network and increasing the focus on the customer, within a few years Eindhoven will be the first 100% zero emission network concession in the Netherlands and possibly in the world. It is up to the PTO to decide what type of buses to be used: be it battery electric or hydrogen electric, both qualifying as zero emission vehicles.

Similar results have been achieved with the concessions of South-Limburg and Amstelland-Meerlanden (near Amsterdam).

Environmental Impacts

Road transport is responsible for around one fifth of all greenhouse gas emissions in the EU (2013 figure), and has seen a 16% increase against 1990 levels. It is also a significant source of air and noise pollution. The provision of quality, zero emission public transport is therefore an essential step in the reduction of pollution from road transport, particularly when it also reduces the total amount of journeys made using personal transport.

The new buses in the Eindhoven region emit no pollution or greenhouse gases from the exhaust and are far quieter than traditional buses. They are also equipped with fast-charge batteries, ensuring the provision of a reliable service (more information in English available here). In addition, due to the positive example provided by Eindhoven (as well as in nearby Limburg, which has also introduced zero emission buses) the Netherlands’ Association of Provincial Authorities (IPO) together with the Metropool Regions of Amsterdam and Rotterdam-the Hague and the Dutch Ministry of Infrastructure and Environment has been inspired to sign a commitment to include requirements regarding zero emission vehicles for all bus concessions going forward, as well as stipulating that all energy powering these buses will come from regional renewable electricity by 2025.

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3 Tires and brake pads still cause particulate matter
Lessons learned

- Taking a step-by-step approach in the procurement process to gradually increase ambitions towards establishing a zero emission bus network.
- Appropriately award zero emission technologies when defining the requirements in the call for tenders.
- Demand zero emission buses at the start of the concession (at least 25-50 buses), if the concession is in densely populated urban areas.
- Guided phase transition to 100% zero emissions. Piloting new approaches and technologies first before going for a full scale roll-out is considered the most effective approach. Stakeholder cooperation during pilots is indispensable.
- Allow the public transport operator to start with used buses (EEV).
- Take longer concessions (for example, 15 years) into consideration.
- Takeover rules for buses and infrastructure to the next concession contract.

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For related information, please see European GPP criteria for Transport and the Technical Background Report.