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Impact of increasing diesel prices: will electric vehicles become an economic solution for freight transport?

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Summary

Electrification of freight transport is a promising solution to reach carbon free city logistics. Several electric light commercial vehicles are available on the market. However, their adoption remains very low. As a result, we investigate in this paper the competitive position of these vehicles compared to their conventional versions.

The results confirm that transport operators have in the Brussels Capital Region no economic incentives to switch from diesel to electric vehicles. Small utility vehicles are easier to electrify as they weigh less than larger utility vehicles and can run therefore with smaller and less expensive batteries. However, the traditional light commercial vehicles show a higher total cost of ownership than their conventional versions. The heavier the electric vehicle becomes, the more difficult it can compete with conventional vehicles. A sensitivity analysis explored therefore how the total costs of ownership of electric vehicles can be optimised based on its usage. It identified also the opportunity of a better fiscal system to support the competitiveness of electric vans.

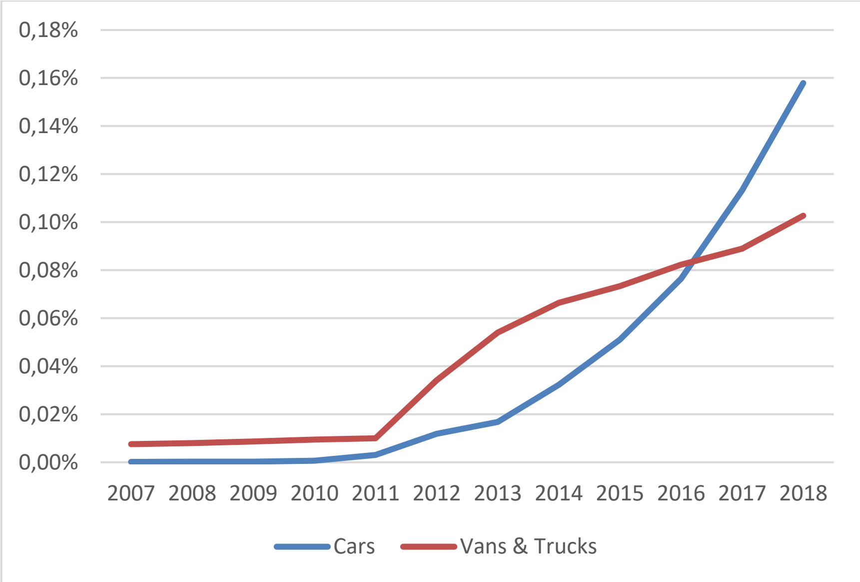
Keywords: Total Cost of Ownership, Light Commercial Vehicles, City Logistics

1 Introduction

Climate change is coming at the top of the political agenda. The recent report of the IPCC GIEC reminded the importance of acting now if we want to limit impacts of global warming to 1.5 degrees Celsius above pre industrial levels [1]. Transportation has a key role to play as it is responsible for about one fourth of GHG emissions [2]. Electrification of transport in that context can be a part of the solution. As a result, EU member states have used different policies to stimulate the adoption of electric vehicles and we can observe a progressive adoption across Europe [3].

The electrification of vans and trucks is however progressing at a slower pace. In Belgium, we do not see a similar evolution in the freight segment than in the passenger segment as shown in Figure 1. Yet, it is one of the most polluting segments of the transport sector. While freight is responsible of about 10 to 15% of the vehicle kilometres in cities, vans and trucks generates up to 25% of CO2 emissions and 50% of NOx emissions [4]. This result can be explained by the large share of diesel in the light commercial vehicle segment. In Belgium, 92.4% of vans run with diesel [5]. Given the opportunities in terms of environmental performance of electric vehicles [6], shifting from diesel to electric vans can support the ambitious objectives set by the European Commission. We need indeed to reduce by -60% the GHG emissions generated by the transport sector by 2050 compared to the levels of 1990 [7]. And major urban centres should run with CO2 free city logistics by 2030 [7].

Figure 1: Evolution of electric vehicles' share in the vehicle fleet in Belgium



Source: Statbel, 2018 [5]

Costs are often considered by companies to be a major barrier to electric vehicle adoption [8]. However, the important purchase price of electric vehicles can be partially compensated by their low running costs and maintenance costs compared to conventional vehicles. Because the costs structure of electric vehicles is different from conventional vehicles, the total cost of ownership has often been used to compare these different technologies [9,10,11]. However, we have not seen a total costs of ownership analysis in the van segment since 2015. In the meantime, the technology and the market have progressed fast. Price of batteries have dropped. Diesel prices have increased. Regulations are changing. As a result, this paper presents an up to date overview of the competitive position of electric vehicles in the light commercial vehicle segment of the Brussels-Capital Region. To extrapolate the results beyond Brussels, a sensitivity analysis will show how the results can change with a different policy context.

2 Methodology

2.1 The Total Cost of Ownership (TCO)

Owning and operating a vehicle is associated with costs that occur at different moments in time. To be able to compare these costs across time, the total cost of ownership methodology uses the financial formula of the present discounted value. This way, every cost can be included in one cost indicator to describe the full cost of one alternative. The total cost of ownership is defined as *"a purchasing tool and philosophy which is aimed at understanding the true cost of buying a particular good or service from a particular supplier"* [12]. It gives the total discounted cost of owning, operating and maintaining an asset over a limited period of time. It is used to compare competing investments and evaluate the most profitable alternative.

To calculate the present value of future one-time costs, the following formula is used [13]:

$$PV = A_t \times \frac{1}{(1+I)^t} \qquad (1)$$

Where:
PV = Present value
At = Amount of one-time cost at a time t
I = Real discount rate
T = Time (expressed in number of years)

In general, the total cost of ownership is calculated in three steps:

1. Analysis of every stream of periodic costs;
2. Calculation of the present value of the one-time and the recurring costs;
3. Division of the present value by the number of kilometres during the vehicle lifetime in order to compute a cost per kilometre.

2.2 Assumptions of the model

Given its definition, the TCO equation can be divided into three variables: (1) the costs of ownership, (2) the period of time over which these costs occurred and (3) the discount rate applied to future costs to actualize them.

2.2.1 Period of ownership

Light commercial vehicles have an average age of 10.9 years in Europe [14]. Age changes across EU member states going from 7.4 in Germany to 17.1 in Greece. In Belgium, average age of light commercial vehicles was 8.2 years in 2016. We assume therefore in our model that light commercial vehicles are used for 8 years before they are sold. But we will test the impact of that assumption in the sensitivity analysis.

2.2.2 Discount rate

The discount rate can be defined as *"the rate of interest reflecting the investor's time value of money"* [8]. It can be either a real discount rate (excluding inflation) or a nominal discount rate (including inflation). However, the real discount rate eliminates complex accounting for inflation within the present value equation. As a result, this study uses the real discount rate. It is based on the long-term interest rate of state bonds to eliminate the risk factor of the financial markets. For this TCO calculation, we use the long-term interest rates for Belgian bounds at 10 years as reference for the real discount rate. The average rate between February 2018 and January 2019 is 0.80% [15]. We extract from the interest rate the 1.6% of expected inflation in Belgium [16] to find a negative real discounted rate of -0.80%. This negative rate reflects the limited growth and the higher inflation we expect in Belgium. Investing is therefore stimulated in such an economic climate.

2.2.3 Cost of ownership

The analysis of the cost of ownership considers every cost associated to the use of the vehicle. Only investments in charging infrastructure are not included since they will be diluted according to the size of the fleet. The following costs flows are considered: road taxes, governmental support and fiscal incentives, battery, maintenance, car inspection, insurance, fuel (and electricity) and purchase costs. All costs are excluding VAT. The following assumptions of the model are applied to these costs:

1. FEBIAC shows that in 2015 there were almost 680,000 light commercial vehicles in Belgium driving 10.97 milliard vehicle kilometres [17]. We know also that light commercial vehicles have an average age of 8.2 years in Belgium according [14]. We assume therefore that light commercial vehicles drive 16,000 km per year and have an ownership of 8 years. Still we will test the impact of that assumption in the sensitivity analysis.
2. The insurance costs were calculated for a company with a frequent use of the vehicle, based in Brussels (postcode 1000) with no accidents in the last 5 years. The insurance is limited to the civil

liability[1]. No cost difference as such is applied between electric and conventional vehicles but differences in the power of the motors may generate a variation in the insurance premiums between the different drive trains.

3. Maintenance costs include costs for small and large maintenance. They are different between conventional and electric vehicles. Maintenance costs of electric vehicles are more limited than conventional since they do not have an internal combustion engine: they have less moving components; they face less temperature stress and do not need oil and filter replacements [18]. Palmer et al. (2018) reported different maintenance costs for electric, petrol and diesel vehicles in different countries of the world [9]. They usually remain stable across countries. We used therefore the costs of the closer country considered, the UK. Based on their estimation, we assume a maintenance costs per year of 240€, 357€ and 970€ for respectively electric, petrol and diesel vehicles[2].
4. As the vehicle is assumed to be sold on the second hand market, its residual value is retrieved. The analysis considers an annual depreciation rate of 18.57%[3] on the value of the diesel, petrol and hybrid vehicles and an annual depreciation rate of 24.43%[4] on the value of electric vehicles.
5. In order to have a clear idea of the cost structure, the costs of the new battery included in the initial purchase costs are deduced from the purchase costs and affected to the battery costs. It represents indeed a significant share of the total costs. Still batteries are evolving fast. Costs have dropped by 73% from 2010 until 2016 and they will keep falling in the next years [19]. According to Berckmans et al. (2017), standard lithium batteries should cost in 2020 around 175€/kWh [20]. We use therefore this value in our model to estimate the costs of batteries if we do not receive information from the manufacturer directly.
6. Lifetime of batteries are also progressing. Manufacturers used to propose warranties on batteries of 5 years and it has now been extended to 8 years for some of them. Lithium batteries used in normal conditions with a very high intense use (reaching 100% of depth of discharge) can hold more than 2500 cycles before they need to be replaced [21]. Assuming that electric vehicles need to be charged once a day during 260 days a year, the model considers that lithium-ion batteries should be replaced when the vehicle ages around 10 years in order to be conservative. No residual value is then considered for the old battery although 80% of its energy capacity is still available. We could not find reliable values to estimate the prices of second-hand batteries.
7. The support for electric commercial vehicles in the Brussels-Capital Region has been replaced by another support scheme in line with the low emission zone enforcement. A subsidy is available to firms that have old vehicles and should replace them in order to access to the low emission zone. As a result, that scheme does not support any more specifically electric vehicles. Hence, we do not consider a subsidy in our model.
8. The Belgian fiscal system allows a deductibility from corporate income taxes of 100% for light commercial vehicles on every cost related to the vehicle. There are no different deductibility rate between electric and conventional vehicles although it is the case for passenger vehicles. As a result, we assume no difference in our baseline scenario but we will test the impact of reduced deductibility rates for conventional vehicles on the competitiveness of electric vehicles. In that context, the model uses a tax rate of 24.25% on profits which is commonly used for small companies with a profit between 1 and 25,000 euros [22].
9. Fuel and electricity costs are assumed not to increase more than the inflation. Because we use the real discount rate, the TCO model does not simulate change in fuel prices. The prices excl. VAT is €1.2/l[5] for petrol, €1.3/l[6] for diesel and €0.19/kWh[7] for electricity.

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[1] Data collected from the insurance company Axa.

[2] We consider here the exchange rate of the 15/01/2015 from GBP to EUR at 1.3075

[3] This is an average of the annual depreciation rates of the company LeasePlan between the Kangoo 1.5dci, Caddy 1.6tdi, Trafic 272. 0dci L1H1, Transporter 2.0tdi swb, Master 35 2.3 dci L3H3, Crafter 35 2.0tdi lwb.

[4] This is based on the Kangoo ZE annual depreciation rate of the company LeasePlan (battery is leased and not considered in the depreciation rate).

[5] Source : www.petrolfed.be (price of "Petrol 95 oct 10ppm", Consulted on 1st of May, 2013)

[6] Source : www.petrolfed.be (price of "Diesel 10ppm", Consulted on 1st of May, 2013)

[7] Source: www.brusim.be (price for a professional customer based in 1000 Brussels, with a single rate meter and a total consumption of 10,000kWh a year, Consulted on October 9, 2011)

2.3 Scope of the market research

The supply of commercial electric vehicles is less developed than for passenger car. Nevertheless, a total of 8 electric vehicles were selected based on the availability of the commercial information. If different versions were available, we always selected the basic model with a range above 120km. Also, the selection paid attention to keep the diversity of the market supply by showing a range of vehicles from different vehicle categories (L7 quadricycles and N1 light commercial vehicles) and with different gross vehicle weight (from 850kg to 3,500kg). To be able to compare as accurately as possible the electric commercial vehicles with conventional vehicles, the most similar version of the selected electric vehicles were chosen. As a result, 5 diesel vehicles and 1 petrol vehicles were included in the analysis. The costs considered by the TCO model of the different models were retrieved by contacting directly the manufacturers, the distributors, the car dealers and the regulatory bodies. Table 1 summarises the main inputs we considered in the TCO model.

Table 1: Overview of vehicles analysed in the TCO model

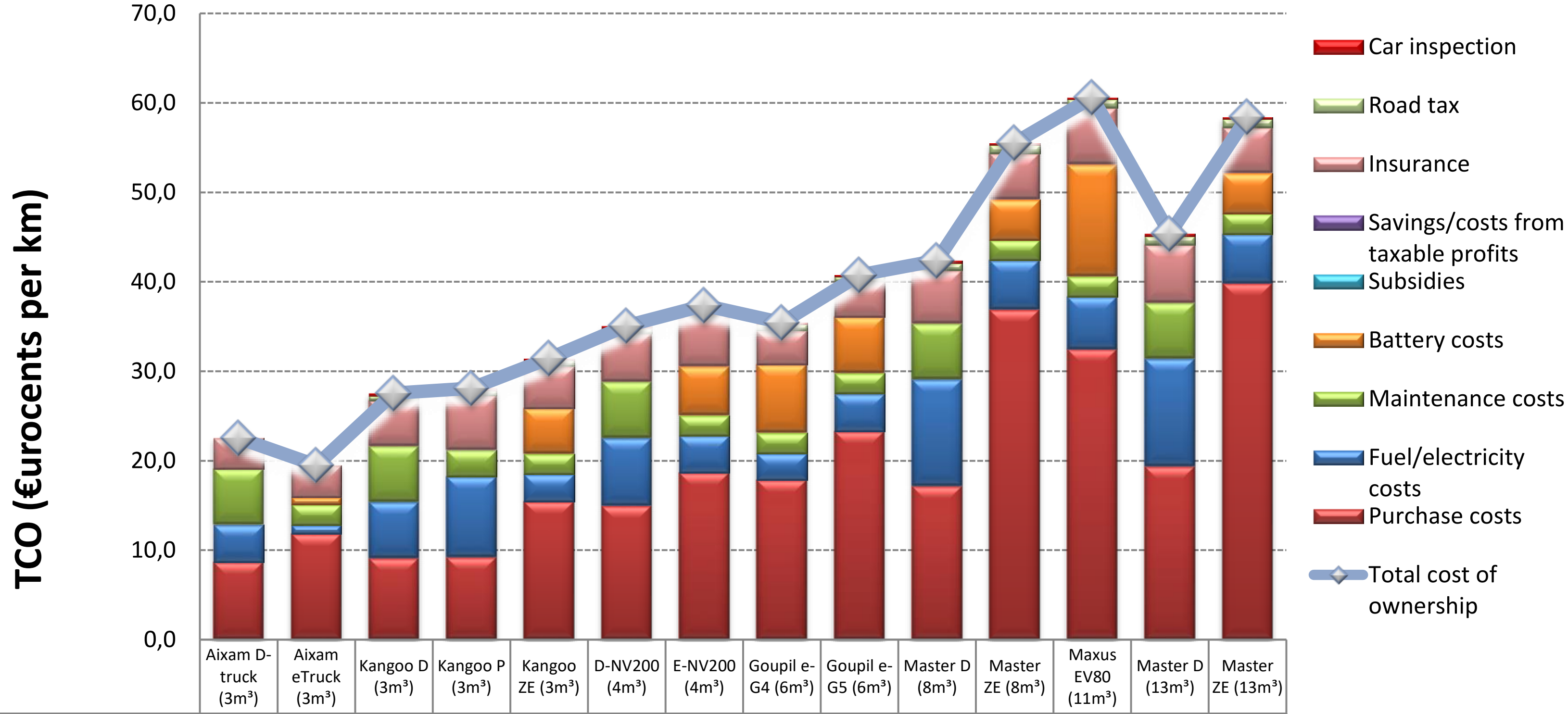
Name	Volume (m^3)	GVW (kg)	Purchase price (€, VAT excl.)	Consumption (l/100km or kWh/100km)	Insurance (€, VAT excl.)	Range NEDC (km)	Speed Max (km/h)	Battery capacity (kWh)	Supposed Battery price (€, VAT excl.)
Aixam D-truck ($3m^3$)	2.87	842	13,799	3.1	534,19	-	45	-	-
Aixam E-truck ($3m^3$)	2.8	857	17,999	5	549,93	130	45	6.14	1,075
Kangoo D ($3m^3$)	3	1,950	14,450	4.7	791,31	-	150	-	-
Kangoo P ($3m^3$)	3	1,920	14,600	7.3	948,74	-	173	-	-
Kangoo ZE ($3m^3$)	3	2,126	28,600	15.2	733,59	270	130	33	6,500
D-NV200 ($4m^3$)	4.2	2,000	23,700	5.7	849,04	-	158	-	-
E-NV200 ($4m^3$)	4.2	2,240	33,720	20.6	922,50	275	123	40	7,000
Goupil e-G4 ($6m^3$)	5.6	2,100	35,320	15	588,23	148	50	14	9,800
Goupil e-G5 ($6m^3$)	6	2,000	41,385	21	616,57	171	70	19.2	8,000
Master D ($8m^3$)	7.75	2,800	27,250	8.9	927,75	-	140	-	-
Master ZE ($8m^3$)	8	3,100	58,600	27.5	801,81	120	100	33	5,775
Maxus EV80 ($11m^3$)	11.5	3,500	62,500	29.2	985,47	192	105	56.4	16,000
Master D ($13m^3$)	12.48	3,500	30,750	9	1006,46	-	148	-	-
Master ZE ($13m^3$)	13	3,100	62,800	27.5	801,81	120	100	33	5,775

3 Results

Figure 2 shows the results of the TCO for the 14 different electric vans. They are sorted from the vehicle with the most limited payload in terms of volume to the largest.

The first 2 vehicles belong to the quadricycles category. It is possible to drive them without a license and they have a top speed of maximum 50km/h. The manufacturer Aixam proposes in that category two small utility vehicles, one diesel and one electric version. The results show that the TCO of the diesel version is less competitive than its electric version: Figure 2 shows that, although the purchase cost of the E-Truck is higher, they are compensated by the savings achieved on maintenance and running costs. The TCO of the electric version is also not too much entailed by the extra costs of the battery. Indeed, they are limited to 4% of the TCO. Because the vehicle has a gross vehicle weight of less than 1,000kg, the vehicle does not need to have a large battery to ensure an acceptable range (130km). As a result, the electric version seems more competitive in that segment.

Figure 2: Results of the total cost of ownership analysis



	Aixam D-truck (3m³)	Aixam eTruck (3m³)	Kangoo D (3m³)	Kangoo P (3m³)	Kangoo ZE (3m³)	D-NV200 (4m³)	E-NV200 (4m³)	Goupil e-G4 (6m³)	Goupil e-G5 (6m³)	Master D (8m³)	Master ZE (8m³)	Maxus EV80 (11m³)	Master D (13m³)	Master ZE (13m³)
Car inspection	0,0	0,0	0,3	0,3	0,2	0,3	0,2	0,2	0,2	0,3	0,2	0,2	0,3	0,2
Road tax	0,0	0,0	0,5	0,5	0,7	0,5	0,7	0,7	0,5	0,8	1,0	1,0	1,0	1,0
Insurance	3,4	3,5	5,1	6,1	4,7	5,5	5,9	3,8	4,0	6,0	5,2	6,3	6,5	5,2
Savings/costs from taxable profits	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Subsidies	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Battery costs	0,0	0,8	0,0	0,0	5,1	0,0	5,5	7,7	6,3	0,0	4,5	12,5	0,0	4,5
Maintenance costs	6,2	2,3	6,2	3,0	2,3	6,2	2,3	2,3	2,3	6,2	2,3	2,3	6,2	2,3
Fuel/electricity costs	4,1	1,0	6,3	9,0	3,0	7,6	4,1	3,0	4,2	11,9	5,5	5,8	12,0	5,5
Purchase costs	8,7	11,8	9,1	9,2	15,4	14,9	18,7	17,8	23,3	17,2	36,9	32,5	19,4	39,8
Total cost of ownership	22,5	19,5	27,5	28,1	31,4	35,1	37,4	35,4	40,8	42,4	55,5	60,6	45,4	58,4

The next 13 vehicles belong to the N1 category where we can find a large diversity of light commercial vehicles. The gross vehicle weight starts at around 2,000 kg and ends at 3,500kg. As a result, batteries are much larger in that segment and the competitive position of electric vehicles is less straightforward. Indeed, if we compare the TCO of the Renault Kangoo Express in their diesel, petrol and electric versions, the electric version seems less competitive than the other ones. Conversely to the analysis of the quadricyles, the lower running cost and the lower maintenance cost of the electric vehicles cannot compensate their larger purchase and battery costs. Indeed, we can observe that the share of battery costs has increased to over 15% of the TCO of the Kangoo ZE. When comparing these three vehicles, it is also interesting to notice that the diesel version has a lower TCO than the petrol version despite the recent rising prices of the diesel. Running costs of the petrol version remain indeed higher due to the higher consumption of petrol vehicles. Insurance costs are also more expensive given that these vehicles are usually more powerful. As a result, these extra costs do not offset the lower maintenance costs of petrol vehicles and the diesel version shows the most interesting TCO. This advantage for diesel vehicles can explain the large share of that technology in the light commercial vehicle segment. It shows also that transport operators are not incentivised to change of technology despite the recent increase in diesel prices.

The analysis gives the same results when comparing the diesel and the electric Nissan NV200. The TCO of the electric version is higher than the diesel version because the lower maintenance and running costs do not compensate the costs of the batteries. The share of the batteries in the TCO remains around 15%. We can however notice that the Goupil G4 offers an interesting electric alternative to the diesel NV200. The TCO difference is less important for the G4 than for the e-NV200. Moreover, it offers a larger payload both in terms of volume and weight. Still, that vehicle has a top speed more limited as it can reach a maximum of 50km/h. The manufacturer Goupil proposes also the G5 which offers a higher top speed, maximum 70km/h, and a larger volume. However, his TCO is also higher than the electric vehicle G4 and the e-NV200.

The last segment of vehicles includes the Renault Master and the Maxus EV80. They offer much larger payloads, from 8 to 13m³. Figure 2 shows that the TCO difference between electric and diesel vehicles is the largest in that segment. It is interesting however to see that the battery does not contribute the most to that difference. Indeed, batteries of the Master ZE are the same than the batteries of the Kangoo ZE. Range is therefore reduced from 270 to 120km, given that the gross vehicle weight is heavier for the Master. And the share of the batteries in the TCO of the Masters ZE drops around 8%. The batteries and range of the Maxus EV80 are larger and provide to the vehicle a range of almost 200km. But again, Figure 2 shows that costs of the batteries do not explain first the TCO difference with the diesel Masters of Renault. We see that purchase costs contribute the most to that difference. Indeed, purchase costs of the Masters ZE are more than doubled compared to to their diesel versions. The purchase costs of the Maxus EV80 are more limited but remain much higher than the diesel Masters. Since the purchase costs have been analysed apart from the battery costs, the difference can be explained by the faster depreciation of electric vehicles. As the technology is not widely adopted, it can be more difficult to sell the vehicle on the second-hand market. That risk is therefore reflected in the higher depreciation rate. That factor cannot however explain solely the large difference in the purchase costs. The more limited economies of scale achieved on the expected lower sales of the electric versions compared to diesel versions could perhaps be a more important factor explaining that cost difference with the conventional versions.

4 Sensitivity analysis

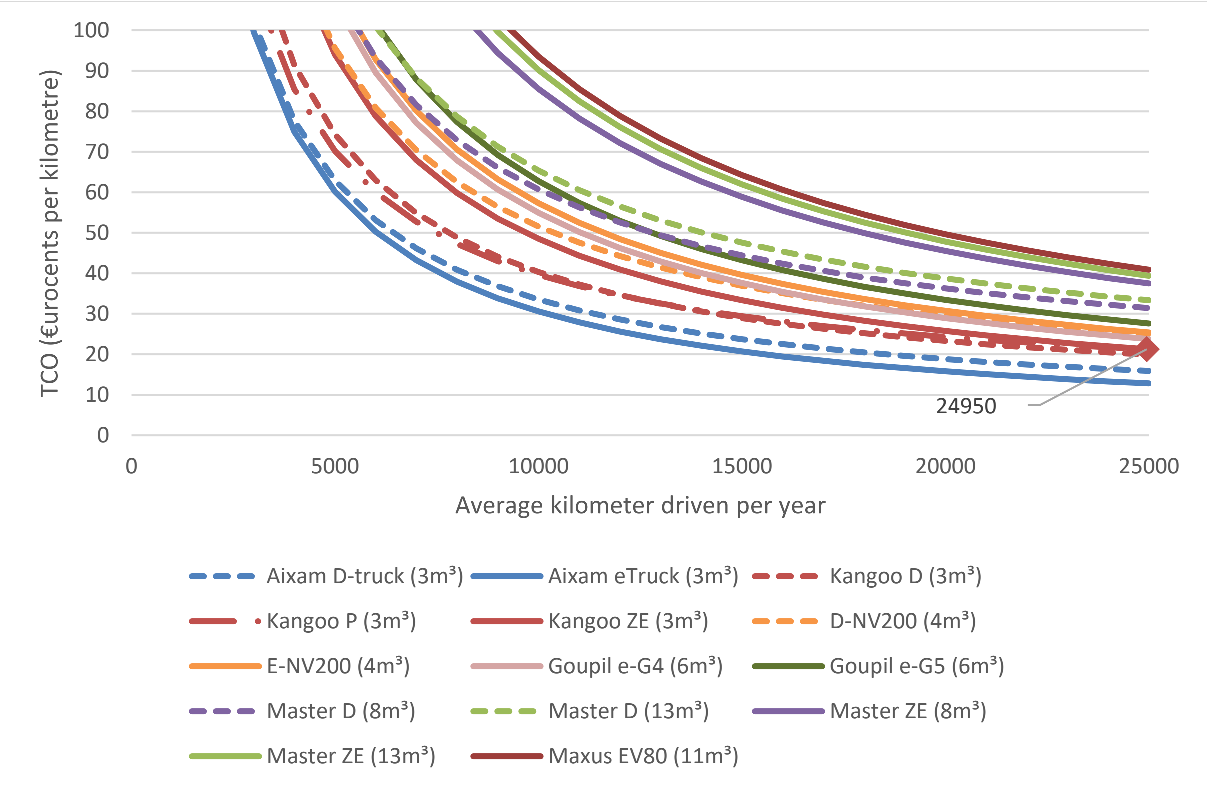
Different assumptions of the TCO model are investigated in this sensitivity analysis. We explore in the following sections the impact of the kilometres driven, the ownership period and different fiscal incentives on the results of the TCO.

1. Kilometre driven

The results shown in Figure 2 have assumed an average distance of 16,000km per year. Figure 3 shows the sensitivity of that criteria on the TCO of the light commercial vehicles we have analysed. The trend is clear and straightforward: the more the vehicle drives, the more the TCO per kilometre decreases. However, the TCO of electric vehicle drops faster than the TCO of conventional vehicles given its lower running costs.

Conversely, we can see the larger competitive gap between electric vehicles and their diesel version when distances are low. We find only the E-Truck that remains competitive compared to the diesel D-Truck at lower distances. The competitiveness of electric Kangoo ZE and e-NV200 remains difficult, even with long distances: Figure 3 shows that the Kangoo ZE and e-NV200 almost reach a breakeven point with their diesel versions at distances of 25,000 km per year. They would reach probably their breakeven point with a higher distance than 25,000 km per year but these vehicles have also range constraints which would make difficult to reach higher average distances. Still, we observe a breakeven point between the electric and petrol version when kilometres reach 249,550Finally, Figure 3 shows that heavier electric vehicles cannot compensate their high purchase and battery costs with their low running costs, even with high distances. Figure 3 confirms the difficult competitive position of these vehicles compared to their diesel counterparts.

Figure 3: Sensitivity of the distance driven on the TCO results

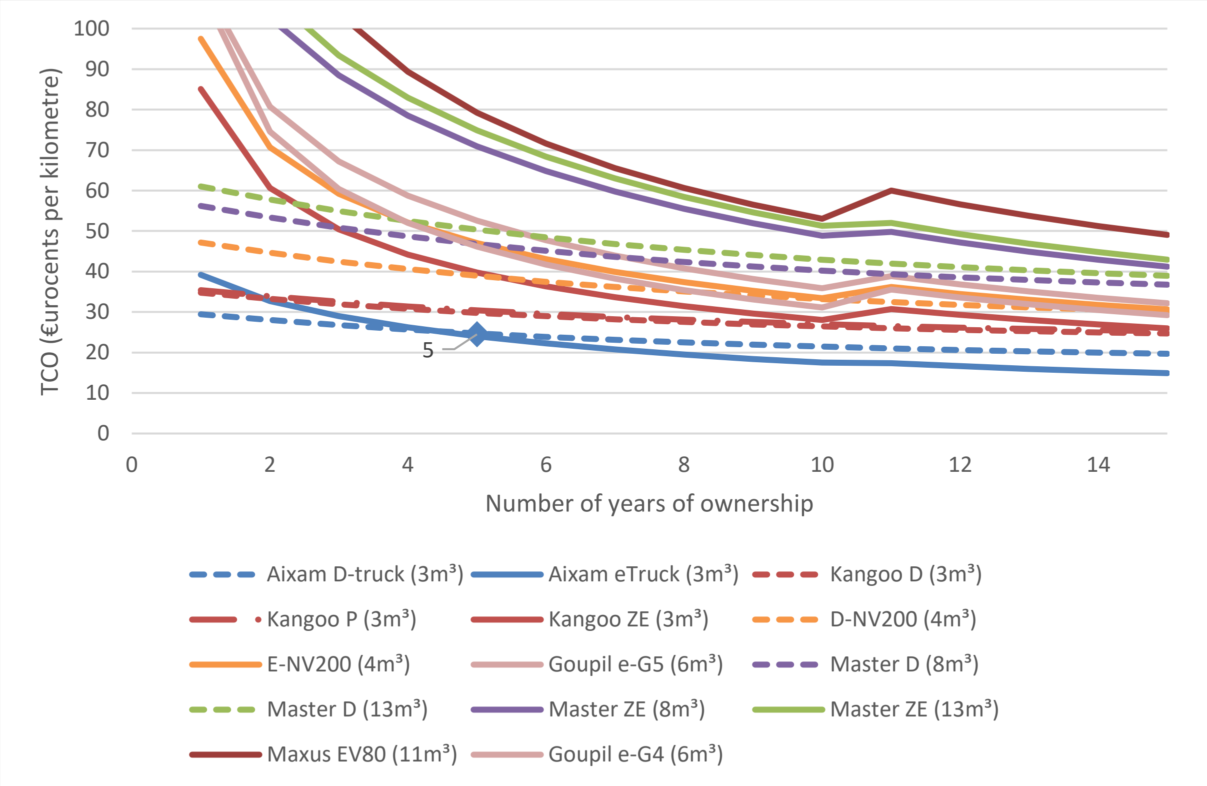


2. Period of ownership

The results of the TCO assumed an ownership of 8 years. However, the competitiveness of electric vans changes according that criteria. Indeed, Figure 4 shows that electric vehicles have a very high TCO compared to diesel vehicles in the first years of ownership. Then, their TCO drops faster than the ones of diesel vehicles, mainly because they can compensate during a longer time the high purchase costs of electric vehicles with low running costs. In that extent, the sensitivity analysis on the period of ownership is similar to the sensitivity analysis on the kilometres driven. It remains difficult for the electric Kangoo ZE and eNV200 to reach a breakeven point with their conventional versions. We notice also the same large competitive gap between the heavier electric and diesel vehicles.

Still Figure 4 shows that the TCO of electric vehicles is more sensitive in the first years of ownership. Indeed, we need to keep the vehicle a minimum of 5 years before that the Aixam E-Truck becomes more competitive than the diesel D-Truck. Figure 4 shows also that the TCO of electric vehicles increases after 10 years. The model considers indeed that batteries need to be replaced after 10 years. This maintenance would particularly affect the electric vehicles in the heavier segment given the costs of the larger batteries. Figure 4 does not show a breakeven point in the first 15 years for these vehicles. But probably that if the ownership lasts until the next replacement of batteries their TCO would be comparable to their conventional versions. Though, the main lesson from the sensitivity of that criteria is that ownership of electric vehicles can be optimised by selling the vehicle when the batteries have to be replaced.

Figure 4: Sensitivity of the period of ownership on the TCO results

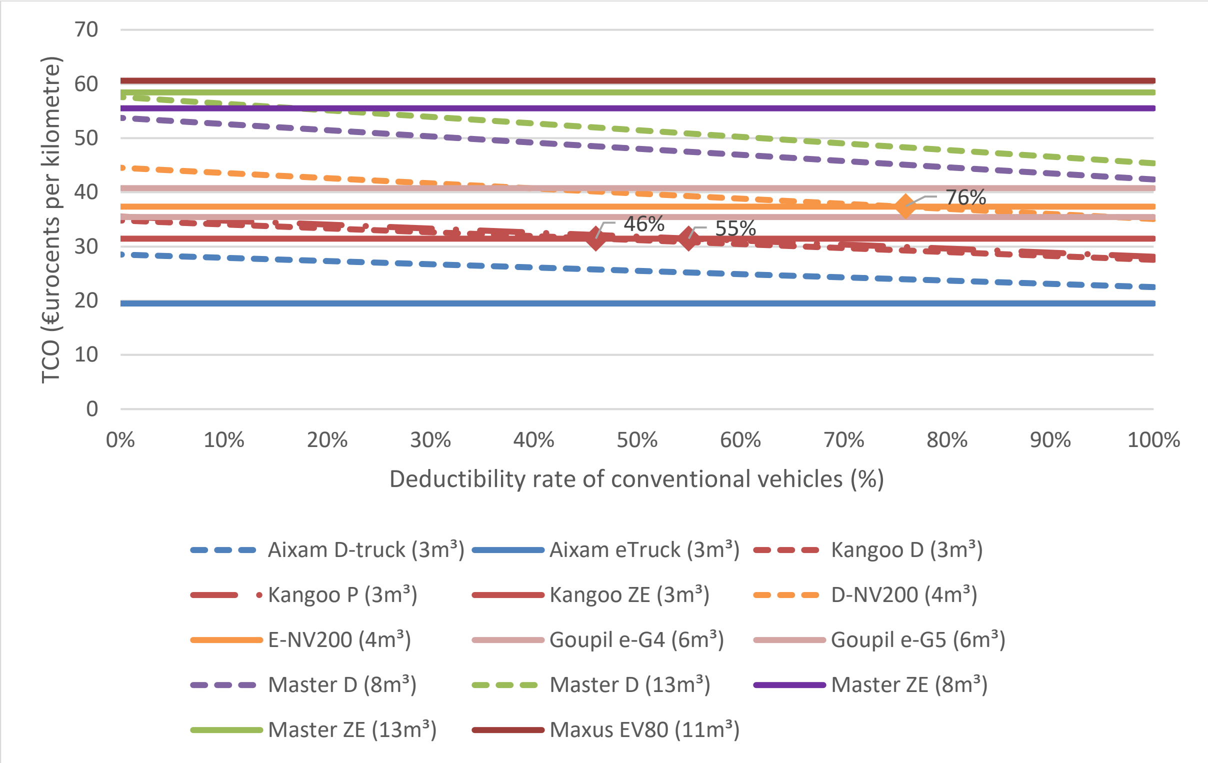


3. Fiscal system

It is also interesting to conduct a sensitivity analysis on criteria that are policy dependant. We can on the one hand evaluate the impact of future policies on the competitiveness of electric vans in Brussels. On the other hand, we can extrapolate the results of the TCO to cities that have a different policy context.

In Figure 5, we evaluated the sensitivity of our results to different fiscal systems where the deductibility of costs related to conventional vans would be reduced while the ones of EV would remain at 100%. The analysis shows that the impact of such a measure can be effective on the competitiveness of electric vans. We observe indeed several breakeven points. The Nissan eNV200 is the first electric van to reach a breakeven point with its conventional counterpart: when the deductibility on conventional vehicles is reduced to 76%, the eNV200 becomes more competitive than its diesel version. The breakeven point of the electric Kangoo comes later, at 55% to compete with its petrol version and at 46% to compete with its diesel version. Finally, if conventional vehicles do not benefit of any fiscal incentives, we can see that the TCO of every electric vans becomes lower than their diesel versions, except in the heavier segment. Still, it should be noted that the analysis is assuming here a company that shows a low taxable income, with a maximum of 25,000€. If companies show a higher taxable income, corporate taxes can increase from 24,25% up to 33,99% which increases the effect described in Figure 5. In that case, the heavier electric vans would also become more competitive than their diesel versions if conventional vehicles do not receive any fiscal incentives.

Figure 5: Sensitivity of the deductibility rate of conventional vehicles from corporate taxes on the TCO results



5 Conclusions

The results of this total cost of ownership analysis have shown that the competitive position of electric vehicles is still difficult today in the segment of light commercial vehicles despite the recent increase of diesel prices. Small electric utility vehicles do compete with their conventional versions as they weigh less and need therefore smaller and less expensive batteries. The heavier the electric vehicle becomes however, the more difficult their competitive position become with their conventional versions.

The paper has explored the sensitivity of a few critical assumptions. The results have shown that the competitiveness of electric van can be improved by optimising the usage of the vehicle. By using intensively the vehicle, the TCO of electric vehicles drops quicker than the TCO of conventional vehicles as it benefits from low running costs. Still, it is difficult to optimise the usage of an electric van based on the distance driven given the limited range of those vehicles. Ownership time seems therefore a more relevant criteria to optimise. First, it has a more important impact on the TCO, especially in the first years. Second, it shows the critical impact of battery replacements on the TCO of electric vans. As a result, we find that the ownership of the vehicle should last until the battery has to be replaced.

The paper extended the sensitivity analysis to the impact of the fiscal system on the competitiveness of electric light commercial vehicles. If fiscal incentives for conventional vehicles are stopped, most of the electric vans are found to be more competitive than their conventional versions, even potentially in the heaviest segment of vans. Policy makers have there a potentially powerful measure to support the electrification of city logistics.

Still the paper identifies the low support for electric vans in the Brussels-Capital Region. Policies have not been introduced in the context of light commercial vehicles. Subsidies have even been cancelled. This highlight the gap between the ambitious climate objectives and the limited supporting policies. Measures should finally be implemented to support the development of electric vans. Especially given the new electric vans coming up on the market in 2019 from Mercedes (Vito), Volkswagen (Crafter) and Peugeot (Partner).

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