



CONSTRUCTEUR
DE VÉHICULES
ÉLECTRIQUES UTILITAIRES
DEPUIS 1996

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Business Case

6 reasons to switch to **ELECTRIC UTILITY VEHICLES** AND HOW TO DO IT THIS YEAR





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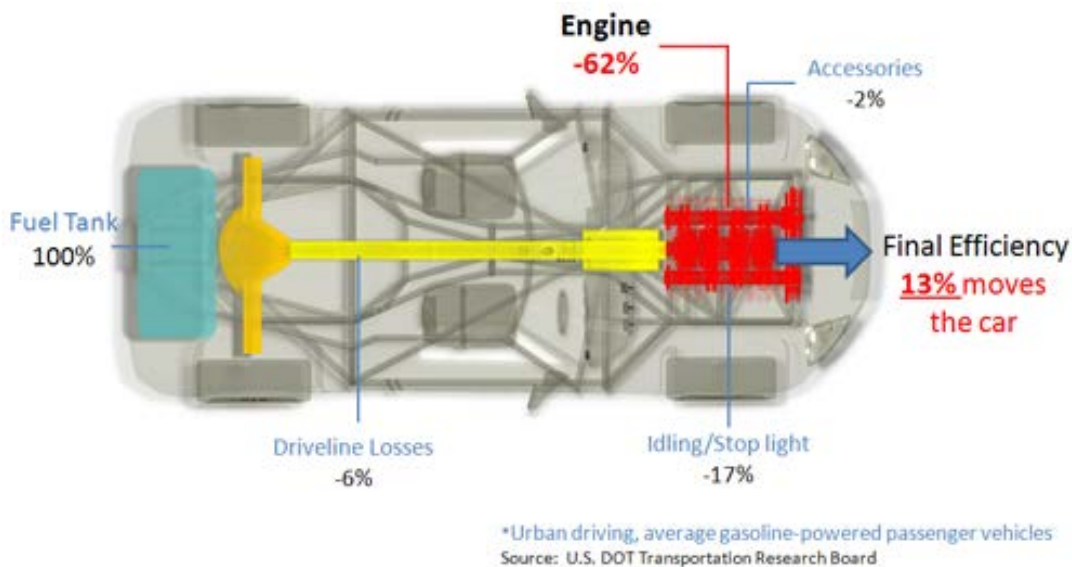
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In 6 minutes you will know:

- ✓ If Electric vehicles are suitable for your operations
- ✓ How to trial one on your site without spending any budget

The combustion engine paradox

Petrol and Diesel vehicles are said to be economical and practical. The picture below highlights what actually happens every time we fill our vehicles tanks with fuel.



When we pay **£ 55** at the pump (average fuel tank refill), here is where our money goes:

| | |
|-------------------------------|--------|
| Driveline losses: | £ 3.3 |
| Idling/stop: | £ 9.35 |
| Engine heat and fumes: | £ 34 |
| Energy moving the car: | £ 7.15 |

80 % of what **we pay** at the pump goes in **fumes** and **heat** due to the:

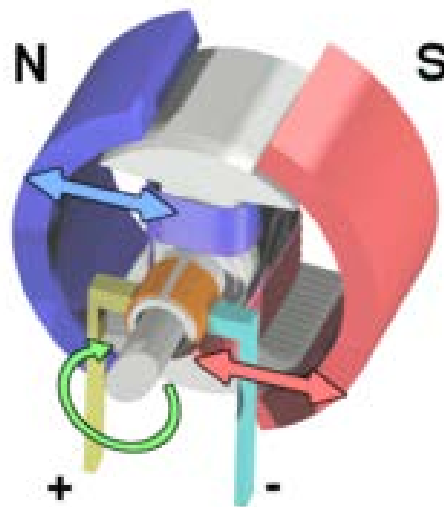
Fuel burning to power the engine.
(generating fumes)

Friction of the moving parts that constitute
the combustion engine. (generating heat)

At low speed, and in frequent stop and go
driving mode, this loss is maximal.

The electric engine reality

Electric motors operate through the interaction between an electric motor's magnetic field and winding currents to generate force within the motor. Electric motors can operate in both motoring and generating modes to also produce electrical energy from mechanical energy (when braking for instance).



When we pay **£ 2** to recharge our electric vehicle batteries, here is where our money goes:

| | |
|-------------------------------|---------------|
| Driveline losses: | £ 0.12 |
| Idle/Stop: | £ 0 |
| Engine heat: | £ 0,28 |
| Energy moving the car: | £ 1.60 |

80% of the energy supplied **reaches the tyres.**

The AC electric motor is made of magnets, which means little or no friction between the moving parts.

Electricity doesn't require any combustion in the engine. No combustion means no fumes. For these reasons, electric engines have an efficiency of 70 to 80%.

At low speed and in frequent stop and go applications. Electric engines have a very high efficiency



1. Project overview:

Based on the fact that only 15% of the combustion engine energy reaches the tyres, Goupil Industrie started searching for an alternative more efficient solution to power utility vehicles which operate in urban or stop and go applications (delivery, bin collection, general maintenance, cleaning etc ...) The result of this research is that since 1992, the Bordeaux based factory has developed, build and supplied more than 7000 Electric Utility Vehicles in more than 50 countries.

This business case outlines how the use of Electric Utility Vehicles for urban and suburban operations makes business sense in terms of efficiency, carbon footprint, and vehicles operating costs.

2. Project Scope:

Replacing conventional petrol/diesel vans with Electric and Hybrid vehicles for the following operations:

- a. Logistics and delivery (Parcel delivery, mail collection)
- b. Facilities management (Large industrial sites, Defence, Leisure)
- c. Parks maintenance and cleaning (Councils, NHS, Universities)
- d. General maintenance: All types of environments where high speed high mileage aren't needed (45 Mph max speed, 80 Miles daily range)

3. Example of applications in the UK :

The section below will present 3 examples of operations where the implementation of Electric vehicles was successful and resulted in significant savings and an improved efficiency.

a) Logistics and delivery



1. *Operational requirements :*

- a. Having a compact van for urban deliveries but with a high volume capacity
- b. Reducing running costs of delivery vehicles by 40%
- c. Significantly reducing the carbon footprint of every parcel delivered

2. *Benefits after 2 years:*

- a. The useful volume of 6 cubic meters allowed more efficiency in deliveries while the compact body of the vehicle didn't block the traffic
- b. Vehicles running costs dropped by 60% Vs previous heat engine vans
- c. The average carbon footprint per parcel dropped by 60%

b) Facilities management



1. *Operational requirements :*

- a. Gaining more efficiency by developing a bespoke design for food delivery and vending vans on military sites
- b. Reducing variations in vehicles operating costs due to fuel prices volatility
- c. Ticking the green and innovation box when bidding for public tenders while promoting a green corporate image

2. *Benefits after 2 years:*

- a. The bespoke design allowed more products to be transported and displayed
- b. Eliminating fuel powered vehicles when possible resulted in a better visibility over “fuel” expenses all along the vehicles lifetime
- c. With a limited implementation cost, electric vehicles quickly delivered an innovative corporate image

c) **Bin collection:**



1. *Operational requirements :*

- a. Having a vehicle that doesn't block the traffic when collecting bins
- b. Reducing vehicles operating costs in urban areas
- c. Reducing noise pollution

2. *Benefits after 2 years:*

- a. The compact size of the Goupil vehicles allowed the bins to be picked up from pedestrian and high traffic areas with a reduced impact on the traffic
- b. Vehicles running costs dropped by 80% in stop and go mode
- c. Bin collection rounds became completely silent, and harmless to the environment



4. The 6 reasons to trial a Goupil Electric Vehicle this month:

- The cost for one charge is less than 2 Euros. This represents an 80% saving in fuel expenses.
- Maintenance costs are minimal thanks to the reduced wear and tear allowed by the limited number of moving parts
- The relative stability of electricity prices Vs Diesel ones allows fleet managers to have more accurate vision over their future “fuel” costs
- A saving of 6 Tons in CO2 emissions over 5 years
- For more efficiency Goupil can bespoke the vehicles to your needs
- ***Most importantly***, we are so confident in the solutions we offer that we would like to visit you to discuss your operations, advice about the feasibility of switching to electric or hybrid vehicles, and deliver a vehicle to your site for a trial. ***This is all free, and commitment free.***

5. Cost benefit analysis and justification

The table below highlights the cost savings and the cost comparison for a Goupil Electric Vehicle Vs a standard Diesel/petrol van (Total Cost of Ownership)



| | Diesel or Petrol Van | Goupil Electric Van |
|--|-------------------------|--------------------------|
| Year 1 | | |
| Acquisition Cost ⁽¹⁾ | £13,000 | £16,000 |
| Road Tax ⁽²⁾ MOT Test ⁽³⁾ | £130 | N/A |
| Fuel (Based on 150 miles per week) ⁽⁴⁾ | £1,820 | £312 |
| Servicing – 2 Services per annum ⁽⁵⁾ | £400 | £310 |
| TOTAL | £15,350 | £16,612 |
| Year 2 (+2.5% inflation) | | |
| Road Tax, MOT (Not applicable Year 1) Fuel, Servicing | | No Road Tax or MOT req'd |
| TOTAL | £2,409 | £627 |
| Year 3 (+2.5% inflation) | | |
| Road Tax, MOT, Fuel, Servicing | | No Road Tax or MOT req'd |
| TOTAL | £2,525 | £643 |
| Year 4 (+2.5% inflation) | | |
| Road Tax, MOT, Fuel, Servicing | | No Road Tax or MOT req'd |
| TOTAL | £2,588 | £659 |
| Year 5 (+2.5% inflation) | | |
| Road Tax, MOT, Fuel, Servicing | | No Road Tax or MOT req'd |
| TOTAL | £2,653 | £676 |
| TOTAL COST OF OWNERSHIP AFTER 5 YEARS (capital investment+operating costs) ⁽⁶⁾ = | £25,525 | £19,217 |



| If operating in London - Including Congestion Charge: | | |
|--|-----------------|--|
| For engine vehicles add £9 per day x 5 days Per week x 52 weeks per year x 5 years = | £11,700 | Electric vehicles are exempt from the London Congestion Charge |
| TOTAL OPERATING COSTS AFTER 5 YEARS OF OWNERSHIP = | £37,225 | £19,217 |
| CO2 Emissions after 5 years (based on 150 Miles/week and 50 weeks per year operation) | 4,8 Tons | 1) Electricity from Fossile energy: 360 Kg of CO2 emissions 2) Electricity from renewable energy: 0 G CO2 emissions |
| Moreover a Goupil is a working tool that can be adapted to the operational requirements | | |

Explanation of how above costs are calculated:

- 1) Acquisition Cost - This is a “typical” cost for a new small van or pickup.
- 2) This figure is based on a Euro 4 or Euro 5 light goods vehicle registered from 2003 onwards. Any vehicle registered before that date is currently liable to an annual road fund licence fee of £210.
- 3) This cost is currently around £55.
- 4) This figure is based on either diesel or fuel costing around £7 per gallon and the vehicle achieving around 30 miles per gallon.
- 5) The servicing costs allow for one major and one minor service per annum.
- 6) This figure excludes insurance. Insurance is 50% cheaper on Goupil vehicles.



6. The corporate impact of running Electric Utility Vehicles

| | Finance | Corporate responsibility and Health and Safety | Marketing | Operations |
|---|---------|--|-----------|------------|
| <i>Flat costs due to the limited variations in Electricity prices</i> | ✓ | | | |
| <i>Low operating costs</i> | ✓ | | | |
| <i>Easier Maintenance</i> | | | | ✓ |
| <i>Savings on Road Tax and MOT</i> | ✓ | | | |
| <i>Delivers a green message instantly seen by everyone</i> | | ✓ | ✓ | |
| <i>Enhance the image of an innovative company</i> | | | ✓ | |
| <i>Reduces stress when driving (smoother drive)</i> | | ✓ | | ✓ |
| <i>Improves operations efficiency by adapting the vehicle to the exact operational requirements</i> | | ✓ | | ✓ |
| <i>Onsite maintenance</i> | ✓ | | | ✓ |



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7. The Goupil Range

The GOUPIL ELECTRIC UTILITY VEHICLES range consists of 2 models available in more than 12 different bodies and combinations:

Goupil G3 Electric

- Electric only operation.
- Only 1.1 metres wide with a short or long wheelbase.
- Maximum speed of 25 Mph.
- 65 Miles range.
- Over 20 versions available including vans, tippers and pick-ups.



Goupil G5 Electric Hybrid



- Electric or electric hybrid operation.
- 45 Miles, range in electric mode plus range extending hybrid mode (200 Miles).
- Maximum speed of 45 mph.
- Over 20 versions available including 6m3 capacity van, tippers and pick-ups.