

Vehicle 2 Grid

or (...) tax 2 tax

or (...) speculation 2 speculation

or (...) cost 2 cost

or (...) strategy 2 strategy

or (...) wind 2 coal

or otherwise

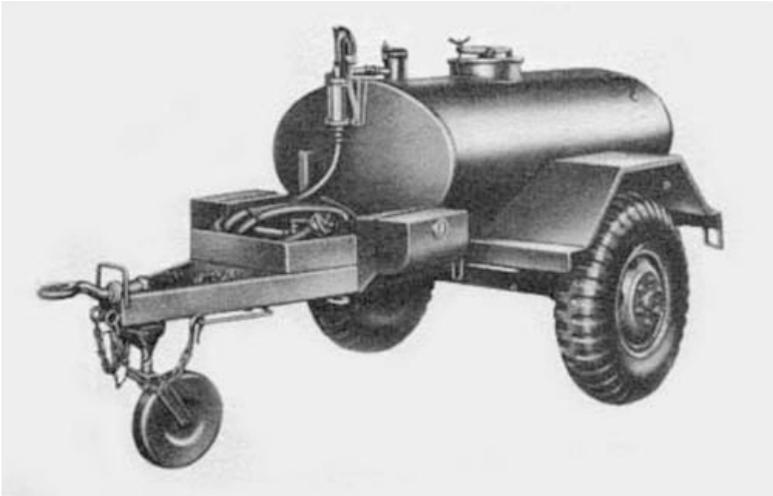
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V2G, old or new?

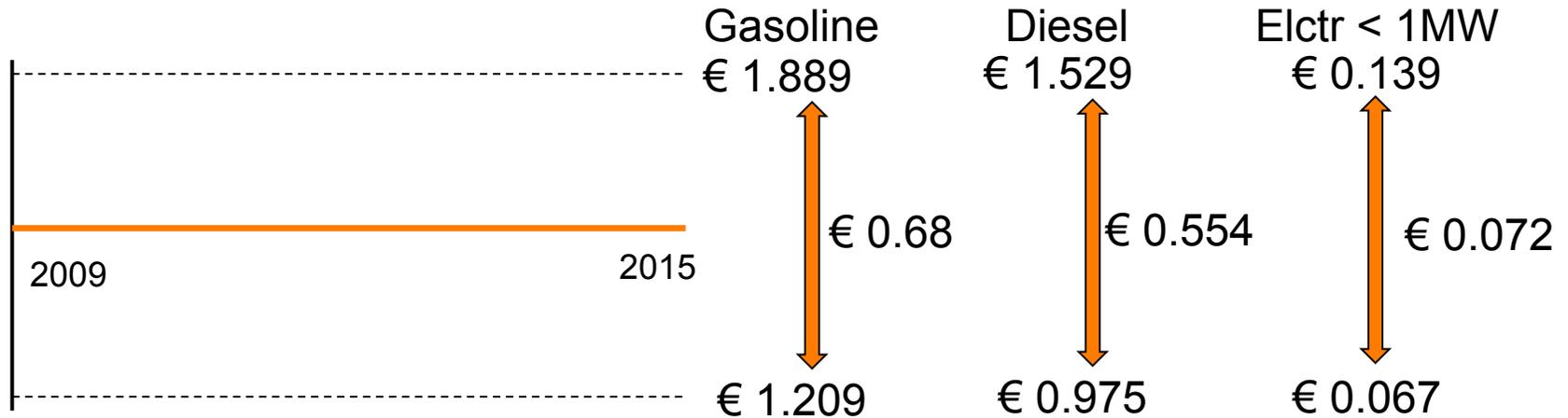
(Impact? Maybe. Who benefits)



It is all about SPREAD

Spread

(why and where to find it)



Source:
cijfernieuws.nl and
CBS for power

| | Gasoline | Diesel | Electricity |
|-------------|----------|---------|-------------|
| Spread 2010 | € 0.104 | € 0.030 | € 0.041 |
| Spread 2011 | € 0.110 | € 0.010 | € 0.047 |
| Spread 2012 | € 0.180 | € 0.120 | € 0.031 |
| Spread 2013 | € 0.110 | € 0.070 | € 0.040 |
| Spread 2014 | € 0.310 | € 0.250 | € 0.072 |



Spread (what's in it for consumers)

Assume energy consumption 50 liters/wk, or 100 kWh/wk

If you:

•bought at the lowest price between 2009 – 2015

And

•sold at the highest price between 2009 -2015

in other words: over a **9 year period** you had it **all** right

| | |
|--------------------|--|
| Profit gasoline | $2.600 \times \text{€ } 0.680 = \text{€ } 1768.00$ |
| Profit diesel | $2.600 \times \text{€ } 0.554 = \text{€ } 1440.40$ |
| Profit electricity | $5.200 \times \text{€ } 0.072 = \text{€ } 374.00$ |



V2G financial reward negligible (other reasons *maybe* make it attractive)

- Bank finance based on current spread not available
- Banks reluctant to finance (asset based) private individuals for V2G solutions
- Legal constraints V2G
- Tax load to follow new business propositions
- Local DC power generation
- Connection charges in combination storage less expensive
- Connection constraints
- Unusual set of circumstances
- Complete integration is questionable, other alternatives better

Why arbitrage to grid? (and who stands to gain)

- **Reduce kWh purchase price: buy cheap (compared to ...)**
- **Reduce grid connection cost (less ampères)**
- **Abuse the system, charge @ office, discharge @ home**
- **Speculation: buy low, sell high**
- **Strategic: mitigate risk-to-charge during black-outs**
- **Combine local energy production, local local smart grid**
- **Improve on GHG emission (f.e. wind @ night preferred)**
- **Other ideas**

Conclusion

(perspective commercial bank)

- Spread electricity on demand side not attractive compared to f.e. diesel (where V2G does not happen)
- Financing opportunities demand side for V2G non existent for retail customers (asset based)
- Industrial propositions may be eligible for financing
- V2G for the time being: a tax-game and nothing else
- Abuse of the system is too easy
- Widening the spread is the **only** option to promote V2G

Thank you for your attention

