

GREEN CARS MARKET AFTER DIESELGATE

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Abstract:

Dieselgate can be considered a momentous crisis to strike out the dynamics of automobile market – which, given automobile market is made up of two parts, in deep and bitter competition (as far as theory and public discourse go), must be understood as (another) impulse meant for green cars (i.e., EVs – Electric Vehicles) market expansion and of ICEs (Internal Combustion Engine – i.e., ‘classical’ – automobiles) market shrinkage. The latter is, for the time being, according to current evidence, more or less theoretical; green cars market needs more than a Dieselgate to thrive, because scandal is, maybe, sometimes necessary for stimulating competition, but it can never replace whatever a party needs in order to outrun the other party of competition. And, in addition, EVs market cannot function without existence and advancement of other, complementary, markets – i.e. that comprising network of charging infrastructure of those very green cars –, whose growth is equally (if not worse still) problematic, especially in short run. In other words, specific characteristics of green vehicles, on one hand, and sound economic and social mechanisms, on the other hand, maintain the statu-quo which (still) exists in automobile market, and the current (relatively slow) speed of EVs market expansion.

Key words: Dieselgate, Evs, ICEs, competition, subsidies

JEL classification: L6, Q55

1. INTRODUCTION

At present moment, automobile market is a composite structured system, in the sense it is made up of two distinct, and even divergent, components: ‘classical’ – or ICEs – automobiles’ market, which, according to the wishes of environmentalists based, for most part, in Western societies *should* be descending, on one hand, and, on the other hand, *green* cars (or EVs – Electric Vehicles)’ market, which, according to the same, *should* be – and fast! – rising.

In fact, although EVs market has already gained ‘its place under the Sun’, it is by no means ruling the rust – not yet, anyway; there are several reasons for this, and maybe most important one is that, given ‘the other’ type of car is not, and simply cannot be, banned from market, all those eco-friendly cars simply *must compete* with ‘classical’ automobiles for their very existence – and must *win* competition struggle, if it is ‘meant’ for them to win the upper hand.

What seemed to put out this standoff is – and this, also, is the beginning for our analysis herein –, or, maybe, it would be better to say *was* so-called *Dieselgate*, i.e. the scandal that broke out in USA on basis of disclosure according to which VW cheated emission tests (*Dieselgate: Who? What? How?*, Transport & Environment, September 2016, pag. 3). But – and without being necessary to enter into much details as to intricacies of *Dieselgate* proper –, in practical terms, whilst in USA some practical steps were undertaken to – indirectly – insure EVs market was

buttressed as effect of *Dieselgate*, in Europe even less was achieved than in US, situation that simply *demand*s a critical study concerning what *might* put an end to standoff mentioned above.

So, where do car market stands today – mainly, from an European perspective? In order to answer this, it is needed to examine deeply both what *Dieselgate* was *really* about and what is *really* needed – and at what *real* costs – for and into a market economy if, ultimately, all cars will, or should, be only EVs.

2. FINDINGS

What we think of today as *green* cars were/are in existence – more or less – for as long as their fossil fuel-filled counterparts, but since their inception – and up to, approximately, the early 90's – they were treated as amusing curiosities, or, at best, as far-fetched embodiments of surreal idealism; now, however, the pendulum appears to be swinging back, and, maybe, *just maybe*, not for environmental/ecological concerns proper, but – i.e. ever since September 18, 2015 – as reaction to many a scheming action, in short, as reaction to what is known as *Dieselgate*.

For, in September 18, 2015, when US Environmental Protection Agency (US EPA) announced Volkswagen Group (VWG) went rogue by fitting illegal so-called 'defeat devices' so as to cheat emissions tests, all hell broke loose – or so it seemed. It seemed, because 'Dieselgate' does *not* seem to have reached Europe proper, where it *should* have in the first place, given there are 8.5 million VW automobiles fitted with illegal software in Europe, and only 500,000 in the US.

Notwithstanding the legal part of this scandal, as far as economic trends go, this 'Dieselgate', however lacking in 'penetrating power' (i.e. outside U.S.A.), may yet act as an impulse for *green* cars industry – and correspondent market –; it this is – and if so, how much exactly – the case is what this study is going to focus on.

First of all, we consider following observation is as important as it is indeed necessary: it would be safe to being analysis of *green* cars market assuming – at least – consumers and inclined, on average, and of course in developed states, to buy a *green*/electric/hybrid car (i.e. whatever its label-cum-content is, or might be), **notwithstanding** its (much) higher price, due to a plethora of reasons and impulses, the 'environmental' one being just one of them, and, maybe, not even most important of them all – at least, in its current, e.g. 'real-and-thus-not-pure', form.

As defined in relevant literature, main factors for EV (Electric Vehicles) adoption are:

1. Competitiveness with ICEs (*L.E.K. Consulting / Executive Insights, Volume XX, Issue 34, 2018*)
2. Access to public charging infrastructure (*L.E.K. 2018*)
3. EV model availability (*L.E.K. 2018*)
4. EVs core design's limitations (cf. *Technological Response Options after the VW Diesel Scandal: Implications for Engine CO2 Emissions*, Sustainability 2018, 10, 2313; doi:10.3390/su10072313, pag. 13)

At least some of these factors are, as our analysis will underline, more complex – and, we must add, less than straightforward 'enablers' of EVs market – than they seem; because, above all else, they are interconnected, but not quite in the manner in which they will 'boost' one another *per* interests of EVs sector and market.

1. For the time being, given fact ICEs are, basically, not outlawed proper – and, at least in short run, cannot possibly be outlawed (*per* basic human rights, if nothing else) –, EVs **must** compete with ICEs; from this perspective, their 'fight' is not made easier by no known factor, especially not by current **consumer preferences**.

On one hand, on average, users of ICEs – especially of Diesel engine-fitted ICEs – are fond of a, let us say, "strong engine running on petrol", or, simply, of an old and, in its own terms, reliable technology; on the other hand, nobody can deny ICEs are, for the time being at least, (far) cheaper than EVs, which is the main reason ICEs are popular – i.e., appreciated by majority of costumers –, even in developed economies both able, at least in theory, to 're-invent' themselves as EVs 'users' and most willing, as far as public discourse is concerned, at least, to do just that.

A typical example has to be Denmark, whose economy experienced, between 2013 and 2017, *both* a considerable fall of EVs sales and a quick expansion of accessible charging points, the essential factor in consumers' decision to uphold ICE vehicle use being the relative (average) price of those two types of vehicles (L.E.K. 2018, pag. 6).

2. Access to (public) charging infrastructure is, clearly, *a* factor in promoting EVs and of *green* cars market expansion, but, definitely, not *the* (only) factor and, at any rate, not one which would **fate** this market to expand – i.e. forever. On the other hand, charging infrastructure for EVs, is neither cheap nor easily built up. Some details, in this respect, are worthwhile analysing. On one hand, there is a link, but one expensive to sustain in long term – as far as *actual* technologies are concerned – between EVs (i.e. EVs market *expansion*) and EVs infrastructure; for, so-called *green* cars are, for the time being:

- i. expensive
- ii. characterised by a high Life Cycle Cost (LCC) (European Roadmap, p. 44).

This, as far as EVs market is concerned: in short, a would-be-giant unsure on his feet; as for its charging infrastructure, there isn't much, yet, to brag about either. Main issue here is main fact discovered by relevant studies, which demonstrate public charging infrastructure is not yet an economy of scale – nor there are significant perspectives for it becoming one very soon; more specifically, that, trying to introduce, extensively, fast charge charging points is bound to generate a sharp increase in costs (European Roadmap, p. 22).

Present situation in this field has, largely, a definite Scandinavian appearance: sales of new EVs in 2017 recorded a hands-down 'victory' for Norway, second place in this 'competition' being occupied by another Northern state, Iceland. As following graph shows, China and U.S.A. (more specifically, California, U.S.A.) come, respectively, forth and sixth:

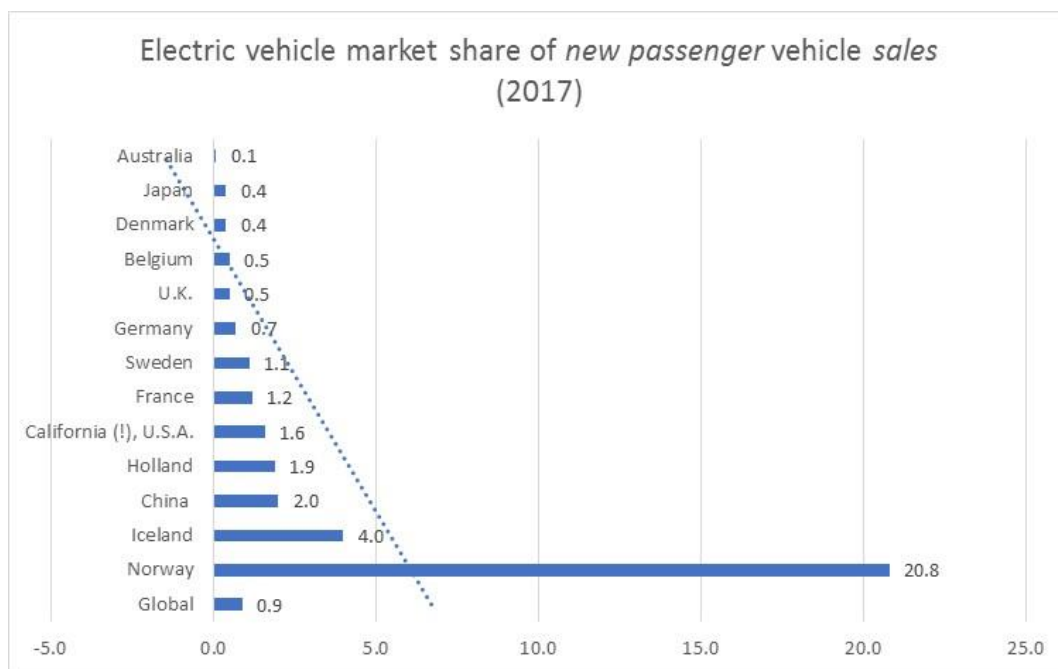


Figure 1. Electric vehicle market share of new passenger vehicle sales (2017)

Source: author's processed data from: L.E.K. Consulting / Executive Insights, Volume XX, Issue 34

Per overall European Union performance, our analysis highlights the undeniable fact EU, as a whole, does its level best to inforce *green* economic growth policies, so to speak – i.e., environment-oriented growth policy –, the relevant index for this conclusion being **average CO2 emissions per km from new passenger cars**; data for 2010-2017 interval, included in following table, shows a continual (average) decrease in CO2 emissions, recorded as such for all EU car array:

Table 1. Average CO₂ emissions per km from new passenger cars in European Union (g CO₂ per km)

Year	g CO ₂ per km
2010	140,3
2011	135,7
2012	132,2
2013	126,7
2014	123,4
2015	119,5
2016	118,1
2017	118,5

Source: EUROSTAT (sdg_12_30)

The graph which graphically renders data from table above is, in this sense, relevant as piece of evidence:

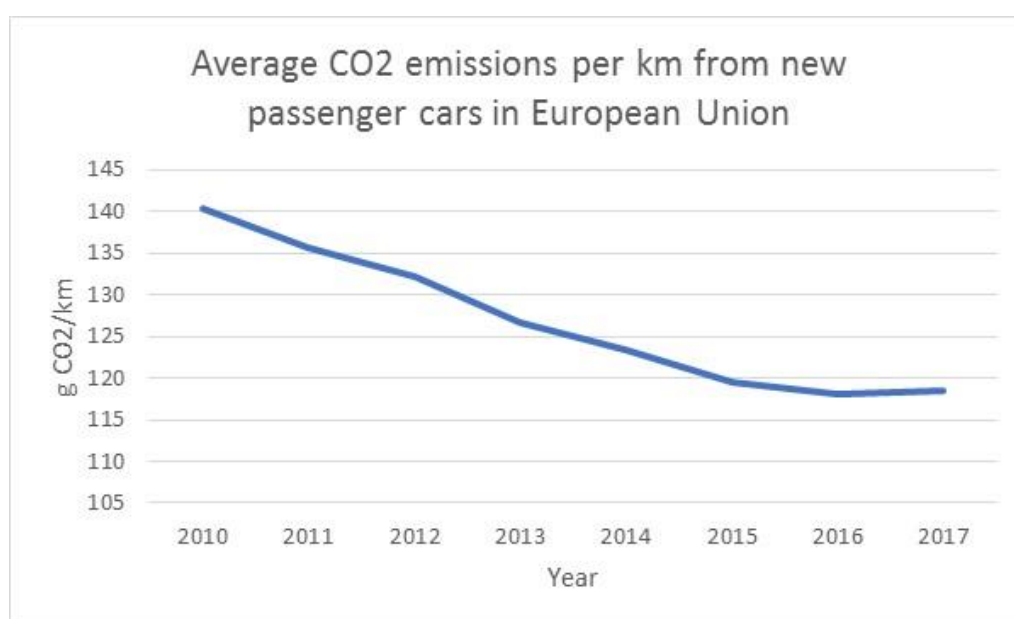


Figure 2. Average CO₂ emissions per km from new passenger cars in European Union, 2010-2017

Source: EUROSTAT data (sdg_12_30) processed by author

3. EV model availability

Relatively recent dynamics recorded in developed economies prove, if anything, present EVs market is, if anything, not yet a place where EVs would sell themselves, so to speak, anyway, basically that such automobiles they are not even, automatically, as (relatively) appealing as to being able to 'bury' the *other* type(s) of cars by the means of a (i.e. unique) international scandal, be it one such as *Dieselgate*.

This conclusion is basically sound, as sound, in fact, as economic laws due to which such results were recorded – in the interval 2013-2017 –, in no less developed economies than those of Denmark and Estonia, respectively (L.E.K. 2018, pag. 6). Main element to be found in both of these cases is EVs market – more specifically, EVs *selling* infrastructure – was bolstered by **fiscal incentives**, that is:

- A. Import tax exemptions, in Denmark
- B. Subsidies for EVs buyers, in Estonia.

Both failed, and for – one might feel compelled to say – all the good (economic) reasons, given such fiscal impulses generate both wanted and *unwanted* effects; as to the latter, it must be observed that:

- (I) Import taxes (Maddala, G.S., Miller, E. (1989), *Microeconomics: Theory and applications*, pag. 301)
 - Have a stimulating influence on non-domestic (i.e., foreign) output – in this case, of EVs/*green* cars, detrimental to any (possibly existent) domestic economic sector of EVs producers;
 - Tend to sensibly increase competition between local – if any – producers and foreign producers of *green* cars.
- (II) Subsidies make unavoidable for any short-run profits gained by (i.e. domestic) producers of EVs to disappear in long run, **as EVs market expands** in an extensive manner (Maddala, G.S., Miller, E. (1989), *Microeconomics: Theory and applications*, pag. 301).

The underlying reason(s) for all this? First of all, it is a fact fiscal policy is ‘meant for’ applying to, and stimulating, economic processes materialised in *any* part of the world they can be reached using that policy, be it directly or indirectly. For, as it is well known by any economist, fiscal impulses are meant, ultimately, to boost *consumption* – exactly, aggregate demand –, strategy which:

- α. *Should* involve a competition steep enough to *insure* consumer will buy only the best quality material he could buy – at an affordable price, it goes (almost) without saying;
- β. *Could* involve a collateral plan of government authorities aimed at protecting, by all means legal, *domestic* economy – but, in this specific case, output capacities of EVs is sensibly more limited than those designed for producing ‘classical’ ICEs, so that – as in Romanian economy – a local economy’s branch dedicated for EVs may not even, or at best barely, exist.

Secondly, market expansion is one thing, whilst (average) profit per producer – in any economic branch, of course – is completely another.

4. Although ‘EVs core design’ may sound a little (too) grand, it is nothing more than a succinct description of what *green* cars/EVs are **not** about: *they are*, simply, **not as good** (i.e., *environment-friendly*) *as one would want to believe*. And the main cause is any automobile – ICEs, for most part, but EVs as well – pollutes the environment in more than one manner, for which problem no *satisfying* solution has, so far, being found – e.g., an automobile design able to reduce to ‘satisfactory’ levels **all** the types of pollution it generates.

A typical example is the way automobiles pollute through their ‘chemical’ processes – *via* emissions of CO₂ **and** NO_x; so far, no successful procedures are in place to successfully tackle *both* these emissions simultaneously (*Technological Response Options after the VW Diesel Scandal: Implications for Engine CO₂ Emissions*, Sustainability 2018, 10, 2313, pag. 13), so for, on average, any given automobile either CO₂ **or** NO_x are systemically and systematically sensibly reduced, *but not both*.

Not yet, anyway – and this makes us conclude in a similar manner to that many others draw their conclusions from similar data and premises: it is, for now, more or less false to state there is such a thing as a ‘perfect’ environmental-friendly car; all cars pollute one manner or another, some less, some more, but, what is drastically important, given basically *all* cars pollute in more than one way, current technologies just **do not make a sensible difference** between ICEs and EVs to tip the balance in latter’s direction, for benefit of *all* car users.

3. CONCLUSION

Green cars market does *not* fare – after *Dieseldgate* – as well as one could have expected it, for the basic reason *this* expectation is as erroneous as it is ‘logical’ – i.e. when one gives facts no more than a fleeting glance; *Dieseldgate*, not any more than *Watergate*, did not and could not achieve miracles overnight.

What is more, categorically **the** most destructive effect *Dieselgate* could have had would have been to make *green* car producers, sellers, etc. to believe they **really** were entitled to this, that or the other setback of ICEs market generated by this scandal; entitlement is an extremely ‘sandy’ foundation for any person and in any environment, and EVs market, more so EVs producers **must prove** their products are better than ‘classical’ – i.e. more polluting – cars, with or (especially) without *Dieselgate*.

From this point of view, in fact, there is so much more: the ‘ideal’ situation would be, in our opinion too, for EVs market to design, build and sell products **as good** – at the very least – **as they themselves would and should want them to be**, which is nearly perfect, i.e. absolutely non-pollutant. And, most certainly, the reason for this not yet being a solid reality is *not* activities carried out by the ‘other team’ (ICEs producers, etc.).

On the other hand, measures taken for forcefully shrinking the share of fossil fuel cars – as it is the case in U.S.A., where everything else *but* Diesel trucks&c. is, nowadays (2019), practically *banned* – do not make, for now, a clear-cut case: while, from a moral point of view, *coercing* people into not using (any more) whatever they *like* to use (i.e. on a daily basis) has definitely all the **wrong** features, on the other hand, it seems, on basis of evidence available at the moment, **timing** is, if expanding *green* car market is to be obtained through coercive measures taken at the expense of the other ‘party’, the very core of this issue.

In other words, measures taken in order to achieve this goal – more specifically, economic ones, even more clear, fiscal measures – need to be undertaken not too late but not too early, either: as relevant literature underlines it, share of registration of new passenger cars powered by alternative fuel fluctuates because of this.

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