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The transition of the automotive industry in Europe*

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https://www.federmeccanica.it/images/eventi/the_automotive_industry_towards_environmental_sustainabilitypdf.pdf

Introduction

- A sector that is never ripe forever
 - 70's: oil shock
 - 80's: digitalization
 - 90's: pollution
 - 00' climate change
 - 10', '20... autonomous driving, sharing, *electric*
- And it is important
 - About 8% of GDP and employment in EU, 13 million employed
 - Significant spillovers on other sectors

An interesting topic from an interdisciplinary perspective

- CASE: Connected, Autonomous, Shared, Electrical
- Climate change (25% of 10%)
- Geo-political (raw materials, economic leadership, power of retaliation, cooperation...)
- Social change
 - Ageing
 - Changes in people symbolic consumption
 - ...

Electric?

- Electric Motors vs ICEs
 - Fewer moving parts (e.g. pistons, valves, pumps...)
 - Modular design (ICE highly non-linear)
 - Lower number of components → easier and cheaper assembly
 - Lower cost of maintenance
 - An “empathy” for autonomous driving

Why electric?

Do not confuse pollution with climate change

- Less CO2 but:
 - From well to wheel
 - Extraction of raw materials, battery production
 - Not all electrical energy comes from renewables
 - Bigger plants are more efficient
 - Transport of energy
- Less pollution?
 - EV are heavier → brakes, tyres
- Quieter in town
- ...?

Global market evolution over the last 25 years

Passenger car production									
	1998	2007	2013	2023	var % 98/23	var % 98/07	var % 07/23	Var % 13/23	Var ass 98/23
EUROPE*	16.695.610	19.331.225	17.383.144	15.449.729	-7,5	1,6	-20,1	-11,1	-1.245.881
EU**	14.464.448	14.427.667	11.341.479	9.551.152	-34,0	0,0	-33,8	-15,8	-4.913.296
France	2.558.231	2.550.869	1.458.000	1.026.690	-59,9	0,0	-59,8	-29,6	-1.531.541
Germany	5.348.115	5.709.139	5.439.904	4.109.371	-23,2	0,7	-28,0	-24,5	-1.238.744
Italy	1.402.382	910.860	388.465	541.953	-61,4	-3,5	-40,5	39,5	-860.429
NAFTA	7.629.569	6.475.498	7.106.013	3.025.512	-60,3	-1,5	-53,3	-57,4	-4.604.057
USA	5.554.373	3.924.268	4.368.835	1.745.171	-68,6	-2,9	-55,5	-60,1	-3.809.202
China	507.103	6.381.116	18.085.213	26.123.757	5051,6	115,8	309,4	44,4	25.616.654
Japan	8.055.763	9.944.637	8.189.323	7.765.428	-3,6	2,3	-21,9	-5,2	-290.335
S. Korea	1.625.125	3.723.482	4.122.604	3.908.747	140,5	12,9	5,0	-5,2	2.283.622
World	37.262.942	53.049.391	65.462.496	68.020.264	82,5	4,2	28,2	3,9	30.757.322
* EU15+Uk+new East countries that joined EU + Turkey; **EU15+UK									
Source: our elaboration on OICA data									

Summing up, in the last 25 years

- **2 winners**
 - 1 big winner: **China** (+25.6 millions of cars, +5,000%)
 - 1 small winner: **S. Korea** (+2.3 millions of cars, +140%)
- **A lot of big losers**
 - **EU + UK**: -4.9 millions of cars (-34%)
 - **France**: -1.2 millions of cars (-60%)
 - **Italy**: - 0.9 millions of cars (-61%)
 - **USA**: -3.8 millions of cars (-69%)
- **“Average performers”:**
 - **Japan**: -0.3 millions of cars (-3.6%)
 - **Germany**: -1.2 millions of cars (-23%)
 - **Wider EU** (including Turkey & new East countries): -1.2 millions (-7.5%)
- **NOT a zero-sum however: WORLD**: +30.7 millions of cars (+82%)

The Chinese BIG overtaking

- Car production in China as a % of the number of cars produced in some areas (my elaborations on OICA data)
- Year of the overtaking
 - Italy: 2003,
 - USA: 2006
 - Germany: 2007
 - Japan: 2008
 - EU15: 2010
- Between 1998 and 2022, China's GDP at purchasing power parity (source IMF)
 - From less than 2 times to almost 10 times the Italian one;
 - from less than ⅓ of US GDP to being 20% higher.

➔ The dynamics of car production are extraordinary even when evaluated within the exceptionality of the overall dynamics of the Chinese economy.

	1998	2023
Italy	36%	4800%
Germany	9%	636%
EU	4%	274%
Japan	6%	336%
USA	10%	1500%

Market evolution over the last 25 years

Table 2: % weight on the world car production			
	1998	2007	2023
EUROPE*	44,8	36,4	22,7
EU**	38,8	27,2	14,0
France	6,9	4,8	1,5
Germany	14,4	10,8	6,0
Italy	3,8	1,7	0,8
NAFTA	20,5	12,2	4,4
USA	14,9	7,4	2,6
China	1,4	12,0	38,4
Japan	21,6	18,7	11,4
South Korea	4,4	7,0	5,7
TOTAL	100,0	100,0	100,0
* EU15+Uk+ new est countries that entered EU + Turkey; **EU15+UK			
<i>Source: our elaborations on OICA data</i>			

Electric Vehicles (EV)

- China's success in the field of electric cars is, if anything, even more sensational. In 2023:
 - over 6 million battery electric cars (BEVs) sold (+22% compared to 2022);
 - over 9 million NEV electric vehicles (BEV+PHEV) produced compared to 3.3 and 1.6 million produced, respectively, in Europe and North America (source CAAM and BloombergNEF , 2023).

Export

- 2018: ¼ export Japan
- 2024: China 5.9 million vs 5.1 Japan
- China Automotive Comm. Scale
 - 2020: **deficit** \$31 billion
 - 2022: **surplus** \$7 billion
- Excess production capacity: 25% (6 million cars)
- ➔ increasing pressure on exports
- Retaliation
 - E.g.: VW Group first seller in China (6th in EV) sells about 6 million cars

Jan-Jul 2024 Top 10 Retailed Selling Manufacturers of Passenger Vehicles

Rank	Brands	Sales	% YoY	% Share
1	BYD	1700K	22.7%	14.7%
2	FAW-VW	886K	-10.2%	7.7%
3	Geely	877K	30.2%	7.6%
4	Chang'an	736K	-1.7%	6.4%
5	SAIC-VW	599K	-5.3%	5.2%
6	Chery	597K	67.5%	5.2%
7	GAC-Toyota	421K	-15.9%	3.6%
8	FAW-Toyota	390K	-9.6%	3.4%
9	BMW	368K	-6.4%	3.2%
10	NISSAN	365K	-6.9%	3.2%

Data Source: CPCA China Passenger Car

Jan-Jul 2024 Top 10 Retailed Selling Manufacturers of NEVs

Rank	Brands	Sales	% YoY	% Share
1	BYD	1700K	22.7%	34.1%
2	Geely	364K	107.1%	7.3%
3	Tesla-CN	325K	-0.3%	6.5%
4	Chang'an	308K	80.3%	6.2%
5	SGMW	254K	19.8%	5.1%
6	Li Auto	240K	38.5%	4.8%
7	SERES	220K	631.5%	4.4%
8	GAC-Aion	194K	-23.7%	3.9%
9	Chery	152K	205.2%	3.1%
10	GWM	140K	31.4%	2.8%

Data Source: CPCA China Passenger Car Association

Economic policy in China 1

- State aid to producers (?)
- *Public procurement* (support to demand+ “demonstration effect”)
 - China, end of 2020: (Liu et al 2023) total government purchases 550,000 EV).
 - Italy: out of approximately 37,300 cars owned by public administrations, only less than 1,200 (about 3%) are electric and 70% of the total are Euro 4 level or lower.
- Financial incentives
 - At the beginning (2009-2012) in proportion to fuel consumption savings
 - 2013-15 : measured in kilometres that can be travelled with one charge of electric energy.
 - Then also battery energy density, maximum speed, average energy consumption per 100km.

Economic policy in China 2

→ Between 2012 and 2021 (Chu et al, 2023):

- Fleet's average mileage has doubled to 391 km per charge
- Average battery capacity and density increased by approximately 60%, reaching 47 kWh and 141 Wh/kg, respectively.
- Average electricity consumption per 100 km decreased by approximately 15% between 2017 and 2021, reaching 12.1 kWh/100km.

— Non-financial incentives

- Exemption from auctions/lotteries for license plates
- Traffic restrictions and yellow lanes ...
- Development of charging points

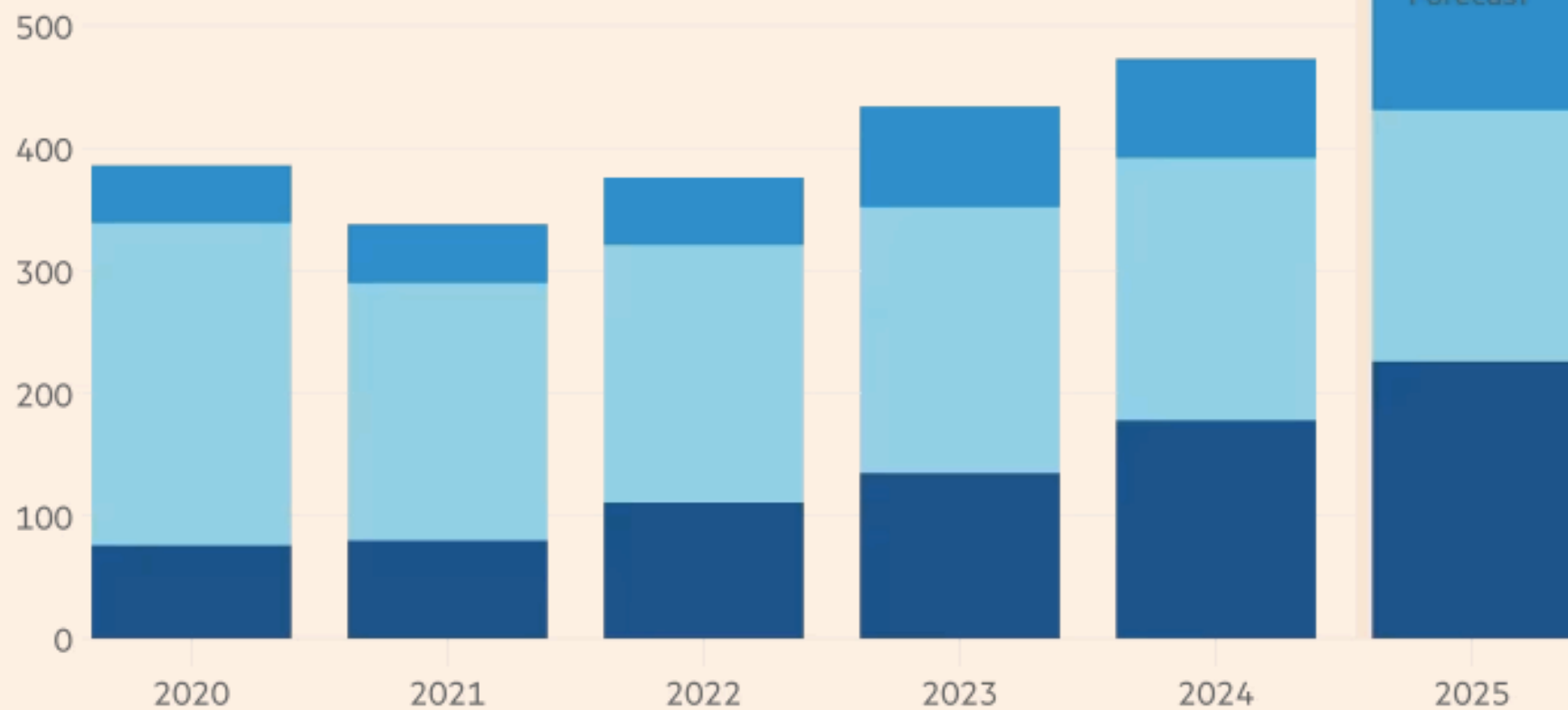
What path for the transition?

Straight to EV or longer time with Phev?

- Tesla vs Toyota “philosophy”
 - Bottleneck in raw materials for EV batteries?
 - Time to build charging infrastructure?
- Also in China Phev are gaining momentum
 - In 2024 production of NEV vehicles +34.4% (12.9 million, 41% of market share +9 % points)
 - Share of Phev increasing 40% of total NEV
 - According to S&P Global Mobility Global new model launches
 - ICE and Phev +9%
 - Hybrids +43% (116 models)
 - Petrol -4%
- In EU
 - 2019-23 n. of EV sold x6
 - BUT in 2024: -5.6% y/y, market share down from 14.6% to 13.6%
- Can you build a revolution without desires?

Global new model launches

Electric Petrol Hybrids



Petrol cars include mild hybrids; electric includes range extended EVs

Source: S&P Global Mobility

What strategy for Europe?

- Accept the fact that Green Deal DID NOT deliver a European Technological leadership in EV
- Reevaluate the redistributive mechanisms determined by *carbon neutrality policies*: e.g. between 2018 and 2022 Tesla sold *carbon credits* for a total amount of \$4.8 billion → hidden distorting effects.
- We should
 - Reconsider today's regulatory constraints in terms **of exhaust emission density** and **not of absolute emissions** → European production biased towards heavy, fast and expensive cars (see Pardi 2022)
 - more gradual transition towards electric with an important role for low-energy hybrid vehicles and vehicles developing other technologies (e.g. hydrogen, bio-fuels , etc.).
 - the “technological bar” should be progressively raised

What about the future?

- Technological leadership moved towards China;
- Such a technological and cost supremacy will continue (huge economies of scale, access to key raw materials and also proven innovation capacity).
- China to further develop “Local for Local” policy: we need to learn how to interact and operate.
- Europe will continue to represent an important interlocutor and a significant market.
- It is the task of politics, businesses and the social partners to ensure that this development occurs with the utmost respect for economic, social and ethical values that are not negotiable.
- ITALY:
 - long history in the automotive sector, technological districts, the excellent quality of our production and the overall reliability of our companies can make our country attractive for foreign direct investments.
 - But the dimensional growth of Italian companies is a fundamental condition

Finally

- Effective technological neutrality
- A possible European leadership in H2?
- As de Meo (Renault CEO) puts we need a European policy that favours the transition from “electric monotheism” to the “bouquet” of technological neutrality.
- Not single winning technology but a future with a plurality of technologies?