

Net Sıfır Emisyon Politikalarında Elektrikli Arabalar

Bariş Sanlı

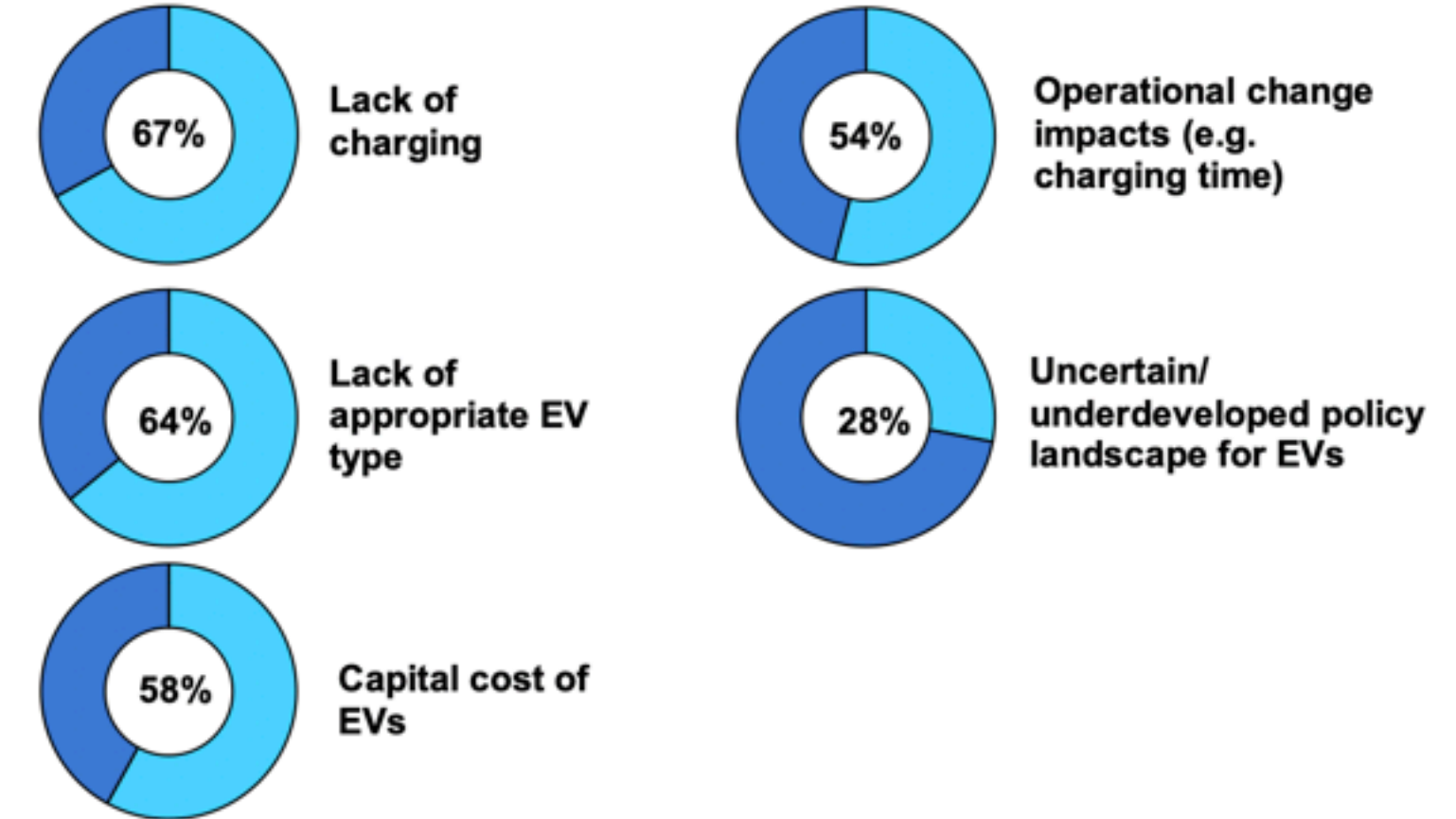
4 Haziran 2021 - Konya Enerji Zirvesi

Bu sunumdaki tüm görüşler şahsi görüşlerdir. Hiçbir kurum ya da kuruluşa atfedilemez.

Elektrikli Arabaların(EA) Önünde Engeller

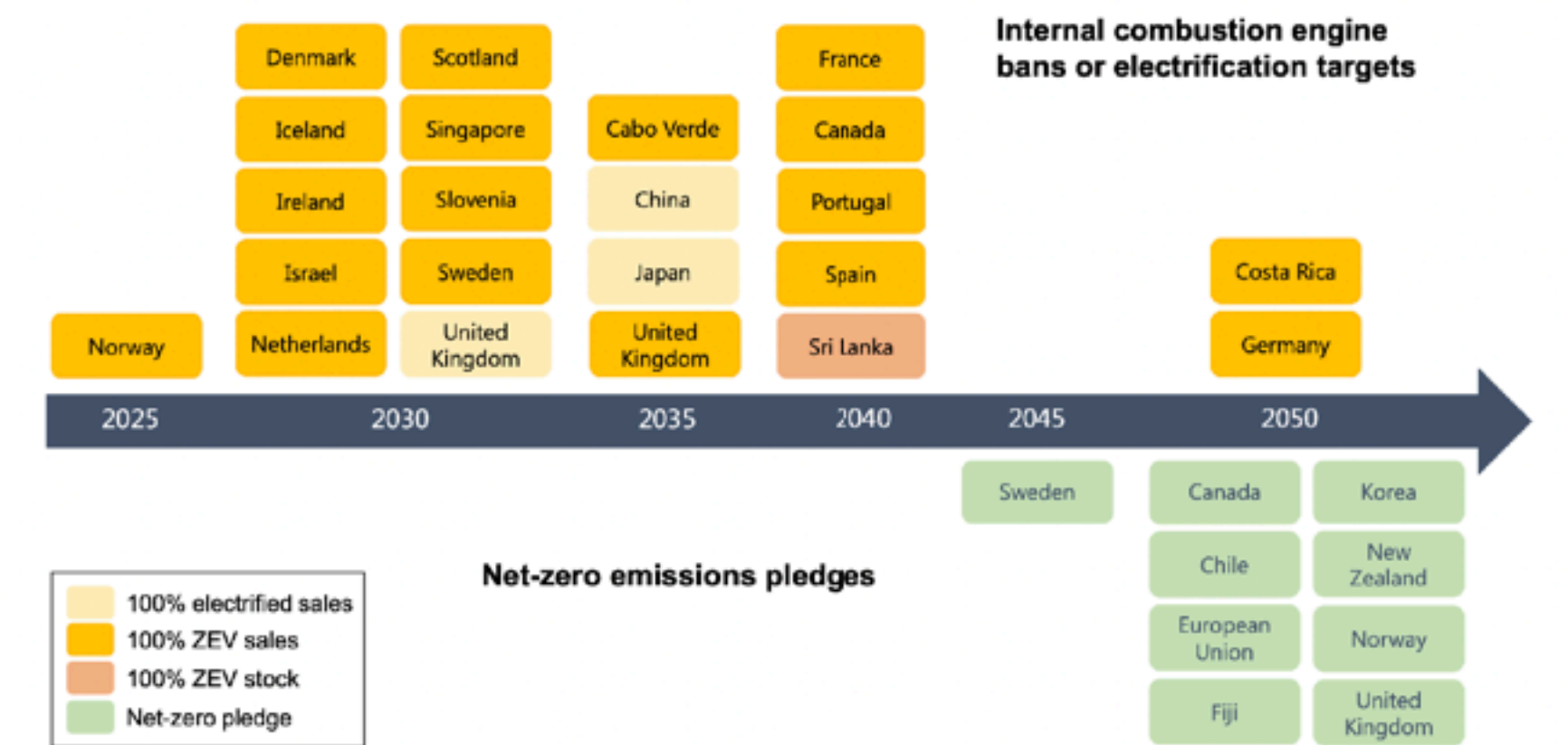
- En önemli 5 engel
 - Şarj altyapısı
 - Uygun EA modelinin olmaması
 - Satın alma maliyeti
 - İşletmesel değişiklikler (şarj zamanı)
 - EAlar için belirsiz/gelişmemiş politikalar

Top five barriers to EV adoption reported by EV100 members



Note: Percentages reflect the ranking of the barriers as significant or very significant by EV 100 member respondents.

Source: [The Climate Group \(2021\)](#).

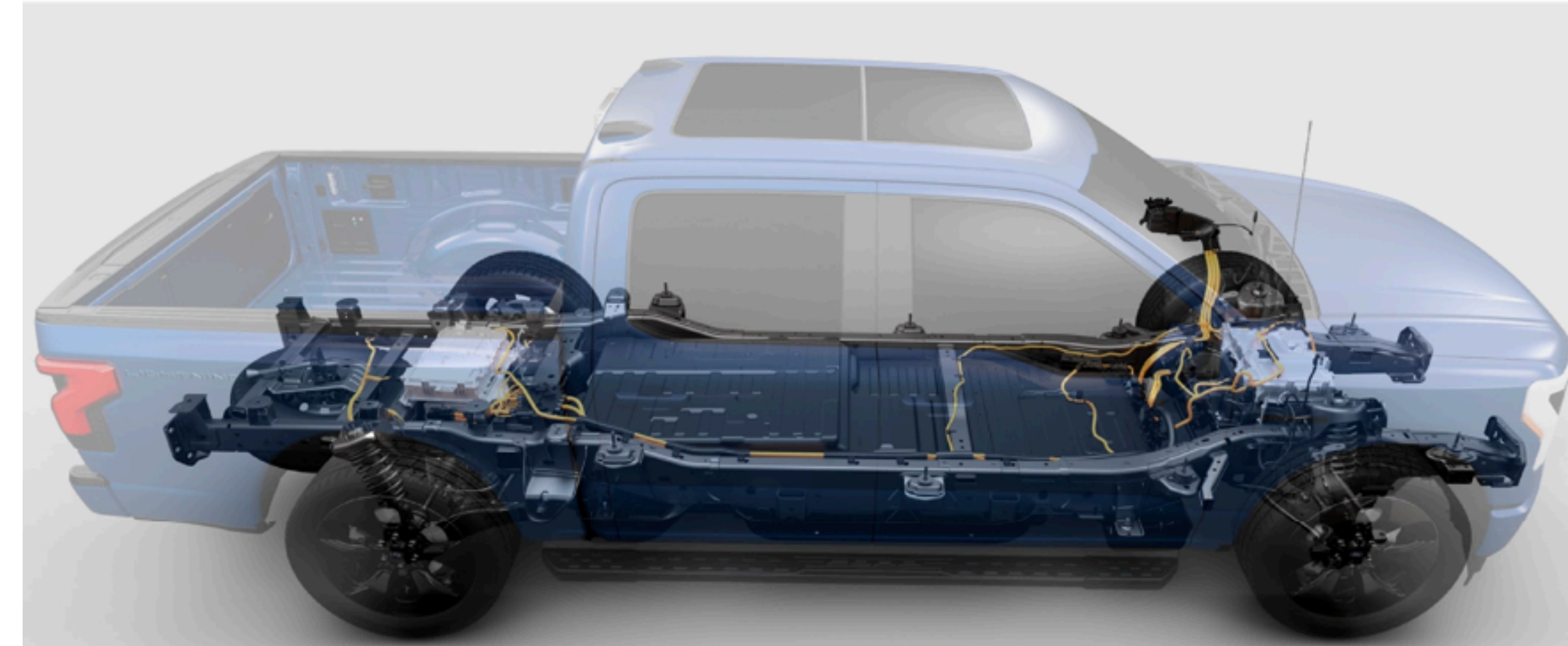


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Notes: Only countries that have either an ICE ban or electrification target or with net-zero emissions in law or proposed legislation have been included. Those with net-zero emissions policy documents only, e.g. Japan and China, have not been included. European Union refers to the collective pledge of the 27 member states. Some individual countries also have net-zero emissions pledges either in law or proposed legislation (Denmark, France, Germany, Hungary, Ireland, Luxembourg, Slovenia, Spain, Sweden and the Netherlands). The targets reflect the status as of 20 April 2021. Electrified vehicles here include battery electric vehicles (BEVs), plug-in hybrid electric vehicles (PHEVs), fuel cell electric vehicles (FCEVs) and hybrid electric vehicles (HEVs), depending on the definitions of each country. ZEV = zero-emission vehicle (BEVs, PHEVs and FCEVs)

En Önemli Test - F150 Lightning

- ABD'deki en popüler model
- En çok satan modelden EA stratejisi
- 9.6 kW'a kadar da elektrik verme
- Elektrikli prizleri, ön-arka bagaj
- Pil miktarı? (115-170 kWh)
 - 230 mil - 300 mil (dolu bagaj)
- **Tüketici isteyecek mi?**



FORD INTELLIGENT BACKUP POWER

Be prepared for what nature throws at you with the 2022 Ford F-150 Lightning. Available Ford Intelligent Backup Power, enabled by the 80-amp Ford Charge Station Pro, allows you to use your truck as a backup power source to your home during a power outage. * The power transfer can be triggered automatically or manually based on customer preference.

*When home is properly equipped and home transfer switch disconnects home from the grid.



TRUCK CHARGES UP

You get home and plug in your truck with the available 80-amp Ford Charge Station Pro. The F-150 Lightning charges using power from the grid.



GRID GOES DOWN

But what happens when the power gets knocked out by a storm? No problem. The Ford F-150 Lightning is there to help. You can set Ford Intelligent Backup Power to automatically or manually kick in and power your home just like a generator. *



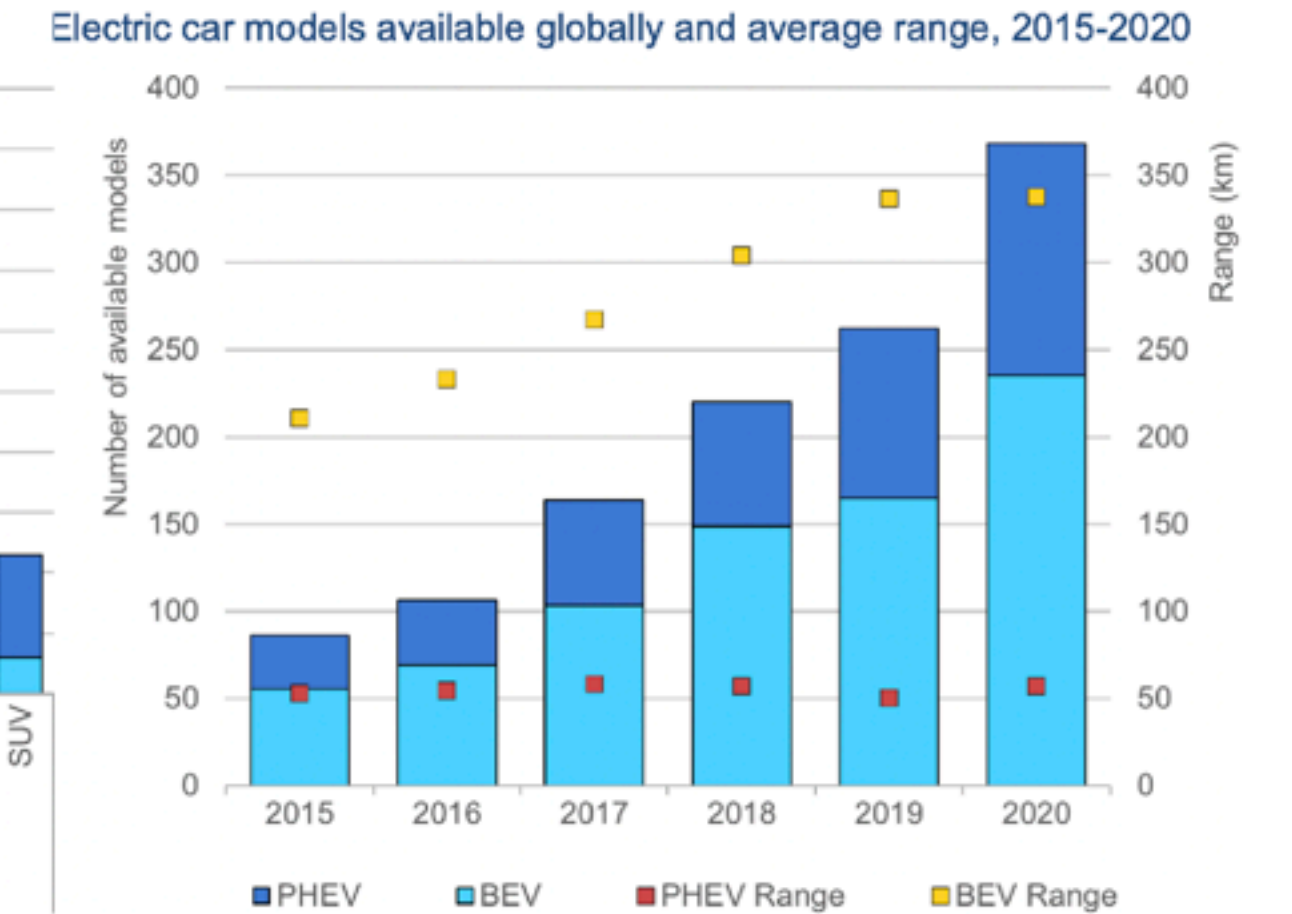
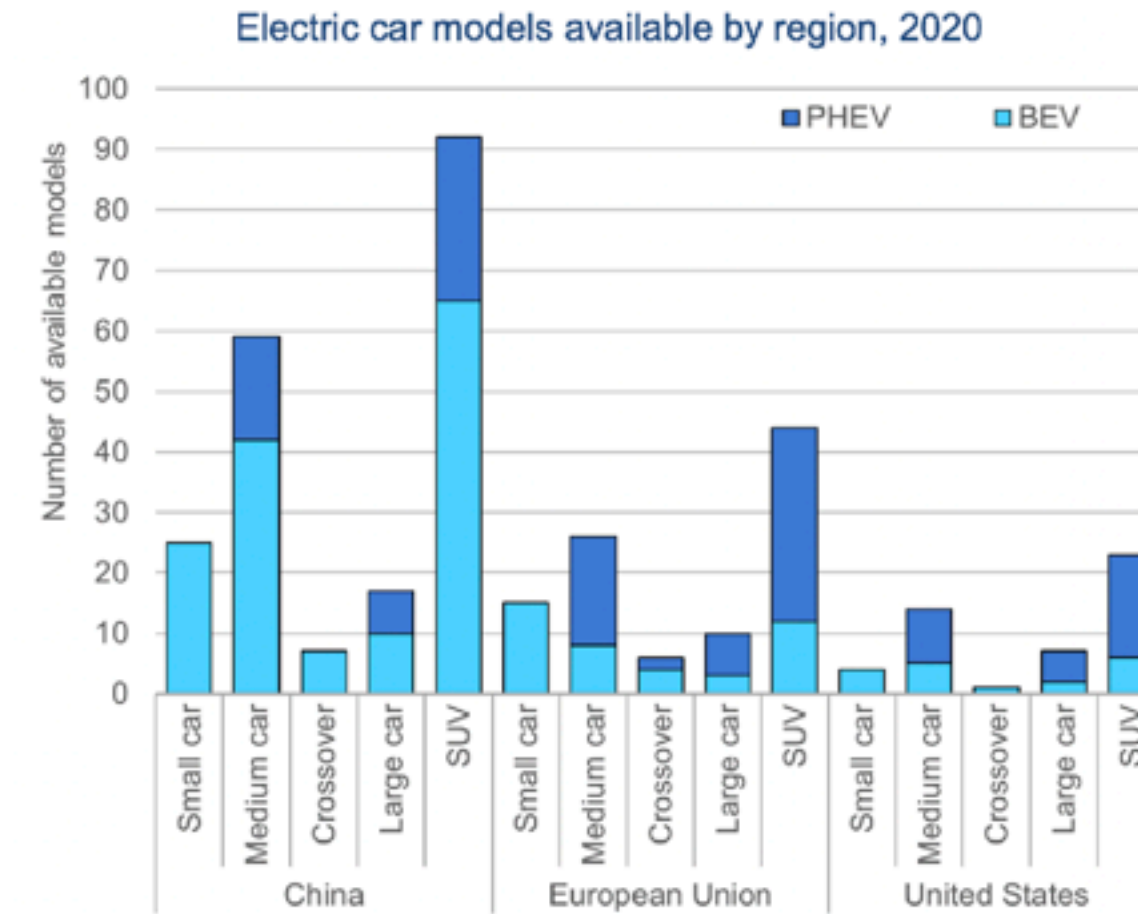
F-150 LIGHTNING GOES TO WORK

With the ability to off-board up to 9.6 kW of peak energy, F-150 Lightning can provide full-home power for up to three days, or as long as ten days if power is rationed. *

*When home is properly equipped and home transfer switch disconnects home from the grid. Based on 30 kWh use per day using the F-150 Lightning with the extended-range battery. Your results may vary depending on energy usage.

EA'larda Verimlilik ve Menzil

Araba model	Fiyat (ABD)	Verimlilik (km/kWh)	100km'de kWh tüketim	Gerçek menzil (km)	EPA Menzili (km)	Fark	Fiyat (TL, 8.7\$)
2021 Tesla Model 3 AWD	\$48,990	6.8	14.6	498.8	568.0	-%12.2	₺426,213
2021 Porsche Taycan RWD	\$85,470	5.6	17.8	471.4	362.0	%30.0	₺743,589
2019 Tesla Model 3 AWD	\$47,990	6.8	14.6	466.6	518.1	-%10.0	₺417,513
2021 Ford Mustang Mach-E AWD Extended Range	\$55,300	5.3	18.8	458.6	434.4	%5.5	₺481,110
2020 Porsche Taycan 4S	\$103,800	5.3	18.7	447.3	326.6	%36.9	₺903,060
2020 Tesla Model Y AWD	\$49,990	6.2	16.1	444.1	508.4	-%12.7	₺434,913
2021 Porsche Taycan Turbo Cross Turismo	\$153,500	4.7	21.3	395.8	TBD	TBD	₺1,335,450
2020 Hyundai Kona EV	\$37,190	6.3	15.9	382.9	415.1	-%7.8	₺323,553
2021 Volkswagen ID.4 First Edition	\$43,995	4.8	20.7	376.5	402.3	-%6.4	₺382,756.5
2020 Chevrolet Bolt EV	\$36,620	5.5	18.3	363.6	416.7	-%12.7	₺318,594
2021 Polestar Polestar 2	\$59,990	5.0	19.9	363.6	374.9	-%3	₺521,913
2020 Nissan LEAF SL +	\$43,900	5.5	18.3	305.7	345.9	-%11.6	₺381,930
2019 Audi e-tron	\$74,800	3.7	27.0	302.5	328.2	-%7.9	₺650,760
2020 Hyundai Ioniq EV	\$33,045	7.2	13.8	275.1	273.5	%0.6	₺287,491.5
2019 BMW i3s BEV	\$47,650	5.8	17.3	226.9	246.2	-%7.8	₺414,555
2020 BMW i3s REx	\$51,500	5.6	17.8	202.7	202.7	%0.0	₺448,050
2020 MINI Cooper SE	\$29,990	6.0	16.8	173.8	177.0	-%1.8	₺260,913
2015 Chevy Spark EV	\$25,995	5.6	17.8	101.4	131.9	-%23.2	₺226,156.5
2018 smart Electric Drive	\$28,750	5.5	18.3	82.1	91.7	-%10.5	₺250,125

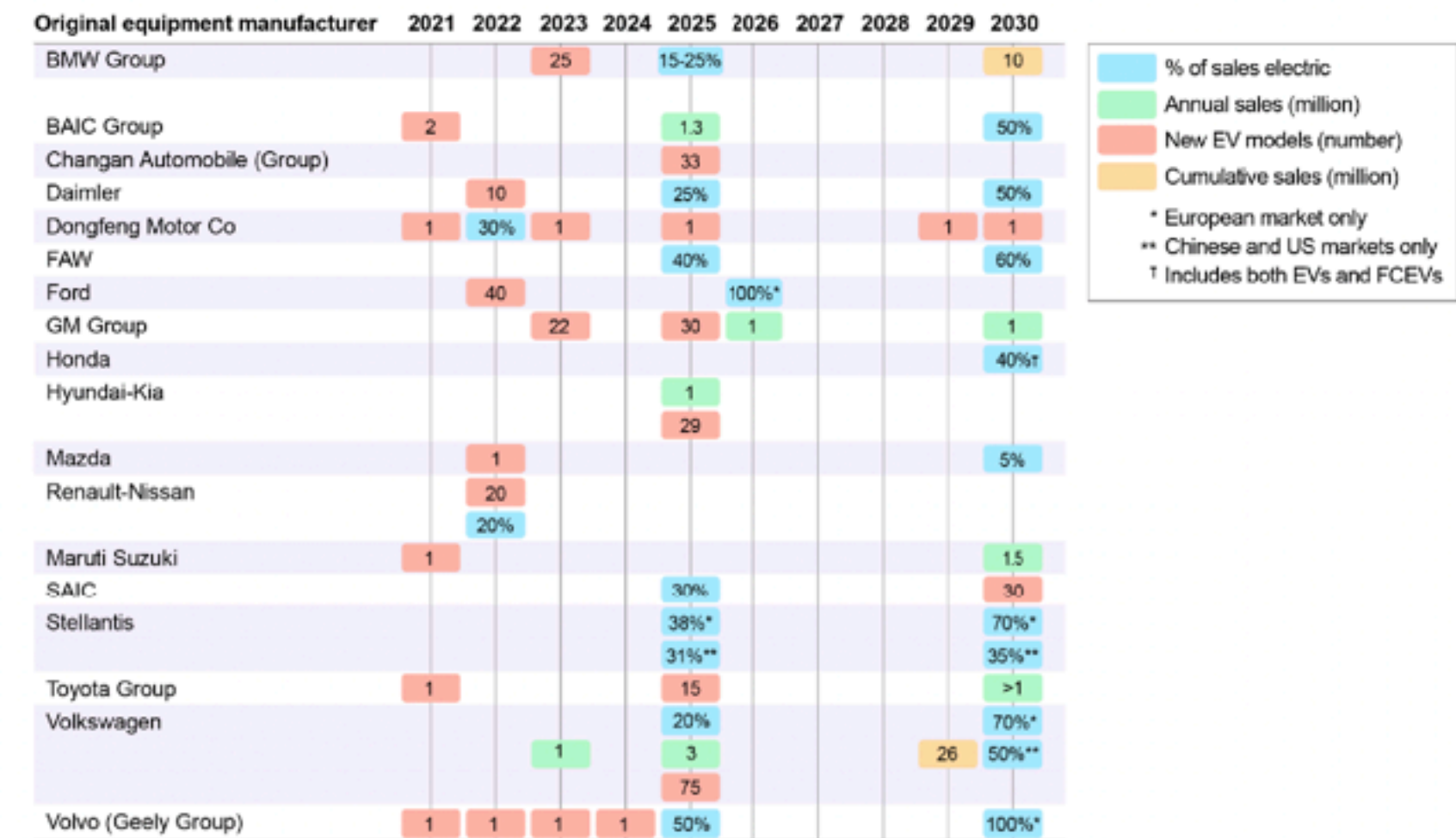


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Note: BEV = battery electric vehicle; PHEV = plug-in hybrid vehicle; crossover = a type of sport utility vehicle built on a passenger car platform rather than on a pickup truck.

Source

Original equipment manufacturer announcements related to electric light-duty vehicles



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Notes: This table is based on the authors' understanding of OEM announcements and may not be complete. It includes only announcements related to electric light-duty vehicles (PHEVs and BEVs) and it excludes announcements related to hybrid vehicles and those that do not provide a clear indication of the EV share.

Sources: BMW (2021); BJEV-BAIC (2021); BYD (2021); Chery (2021); Changan Automobile (2021); Daimler (2021); Dongfeng (2021); FAW (2021); Ford (2021); GAC; General Motors; Honda (2021); Hyundai (2020); Mazda (2021); Renault-Nissan (2019); Maruti Suzuki (2019); SAIC (2021); Stellantis (2021); Toyota (2021); Volkswagen (2021).

Araba satışları yeterli mi?

- Türkiye'de 1000 kişiye araç 306
 - Sadece araba sayısı 13.1 milyon
- 57. sıra (Toplam araç sayısında 17.sıra)
- G.Kore hedef?
 - 30.7 milyon araç
 - 20 milyon elektrikli araba
- Ortalama 12-14 yaş
 - 1.5 milyon elektrikli araba satışı/yıl
 - 90 kWh/araba
 - 135 GWh/yıl pil fabrikası (tüm satışlar için, 2035?)

Rank ↕	Country or region ↕	Motor vehicles per 1,000 people ↕	Total ▼	Year
3	 United States	842	288,491,174 ^[6]	2019
74	 China	204	287,000,000	2021 ^[1]
17	 Japan	649	81,789,318	2019 ^[19]
50	 Brazil	364	77,191,524 ^[26]	2020
124	 India	70	57,500,000	2016 ^[50]
46	 Russia	388	56,673,511	2020 ^[25]
19	 Germany	561	46,474,594	2017 ^[17]
16	 Italy	655	39,545,232	2019 ^[18]
58	 Mexico	297	37,353,597	2015
31	 France	478	32,005,986	2017 ^[17]
34	 United Kingdom	471	31,200,182	2017 ^[17]
13	 Canada	685	25,060,399 ^[15]	2018
18	 Spain	648	23,500,401	2017 ^[17]
33	 South Korea	475	23,444,165 ^[21]	2019
12	 Poland	719	22,503,579	2018 ^[14]
119	 Indonesia	77	20,845,876 ^[48]	2019
57	 Turkey	306	19,822,371	2020 ^[17]
6	 Australia	789 ^[failed verification]	19,800,000 ^[9]	2020
60	 Thailand	281	19,138,351	2019
79	 Iran	178	14,130,000	2015
56	 Argentina	316	13,726,226	2015
39	 Malaysia	433	13,308,716	2015
126	 Nigeria	64	11,458,370 ^[51]	2017
106	 Egypt	109	10,695,694	2018
83	 South Africa	174	9,600,412	2015

Net Sıfırda Ulaştırma

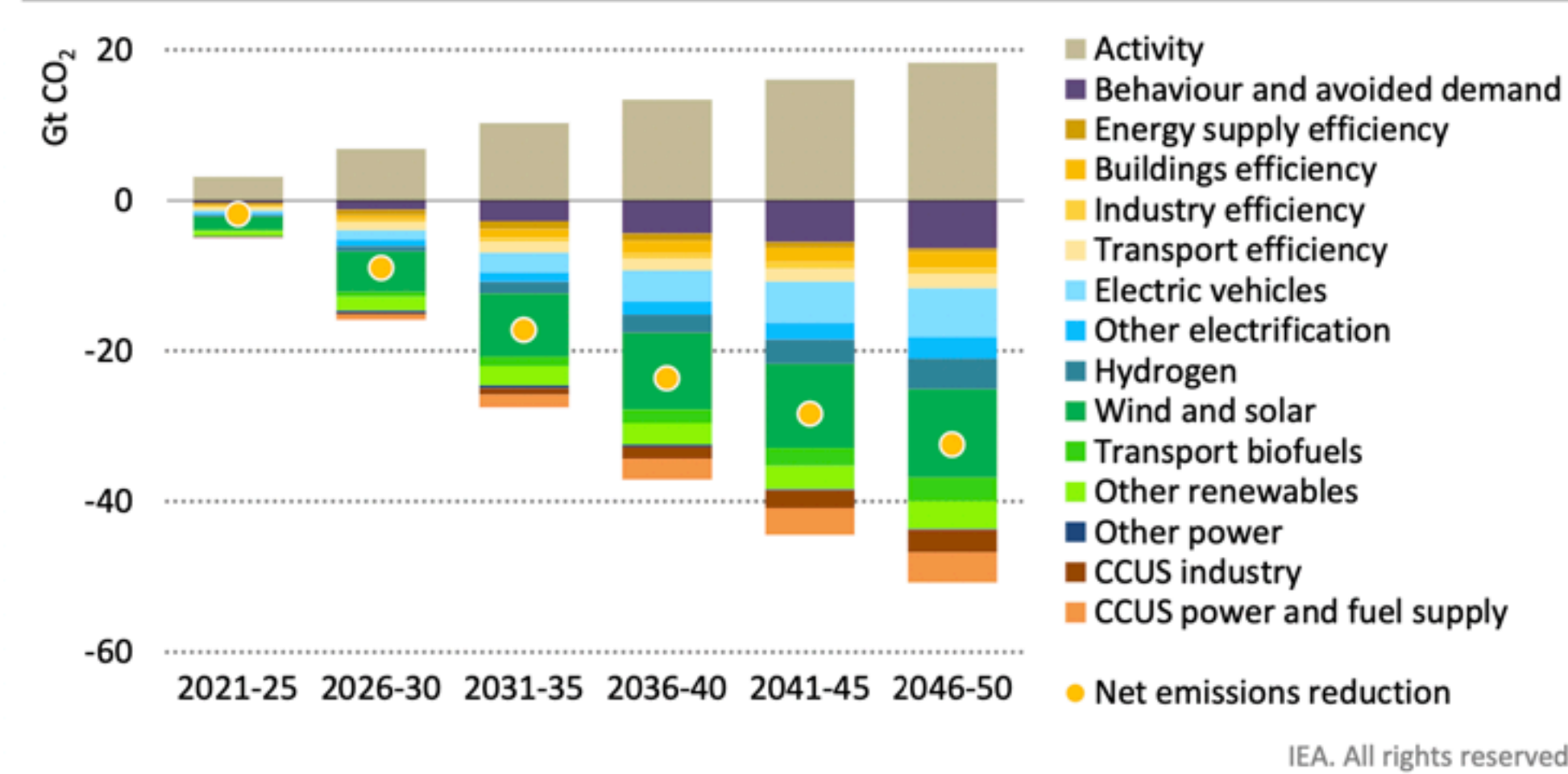
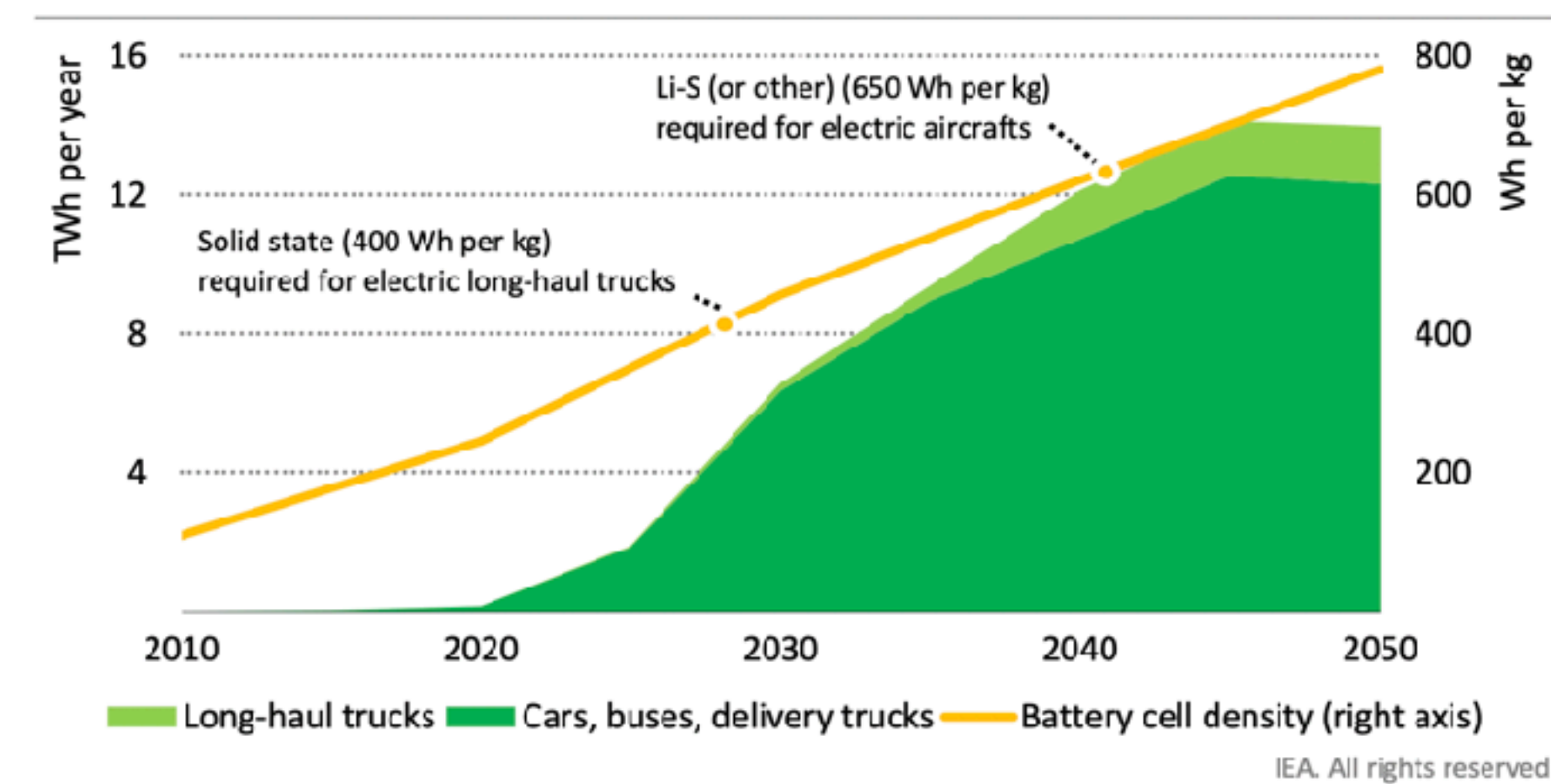


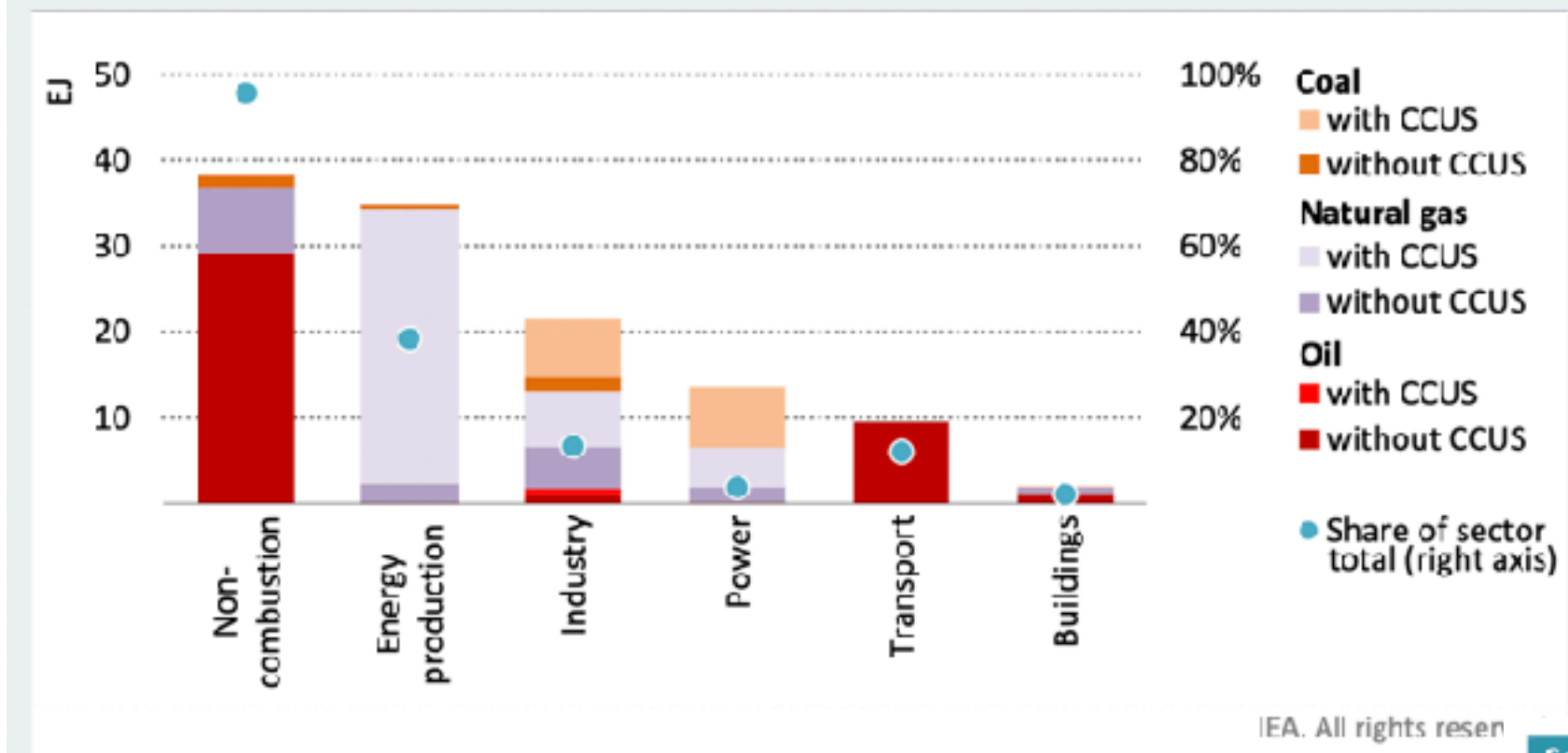
Figure 2.17 ▶ Battery demand growth in transport and battery energy density in the NZE



Nearly 20 battery giga-factories open every year to 2030 to satisfy battery demand for electric cars in the NZE; higher density batteries are needed to electrify long-haul trucks

Notes: Li-S = lithium-sulphur battery; Wh per kg = Watt hours per kilogramme.

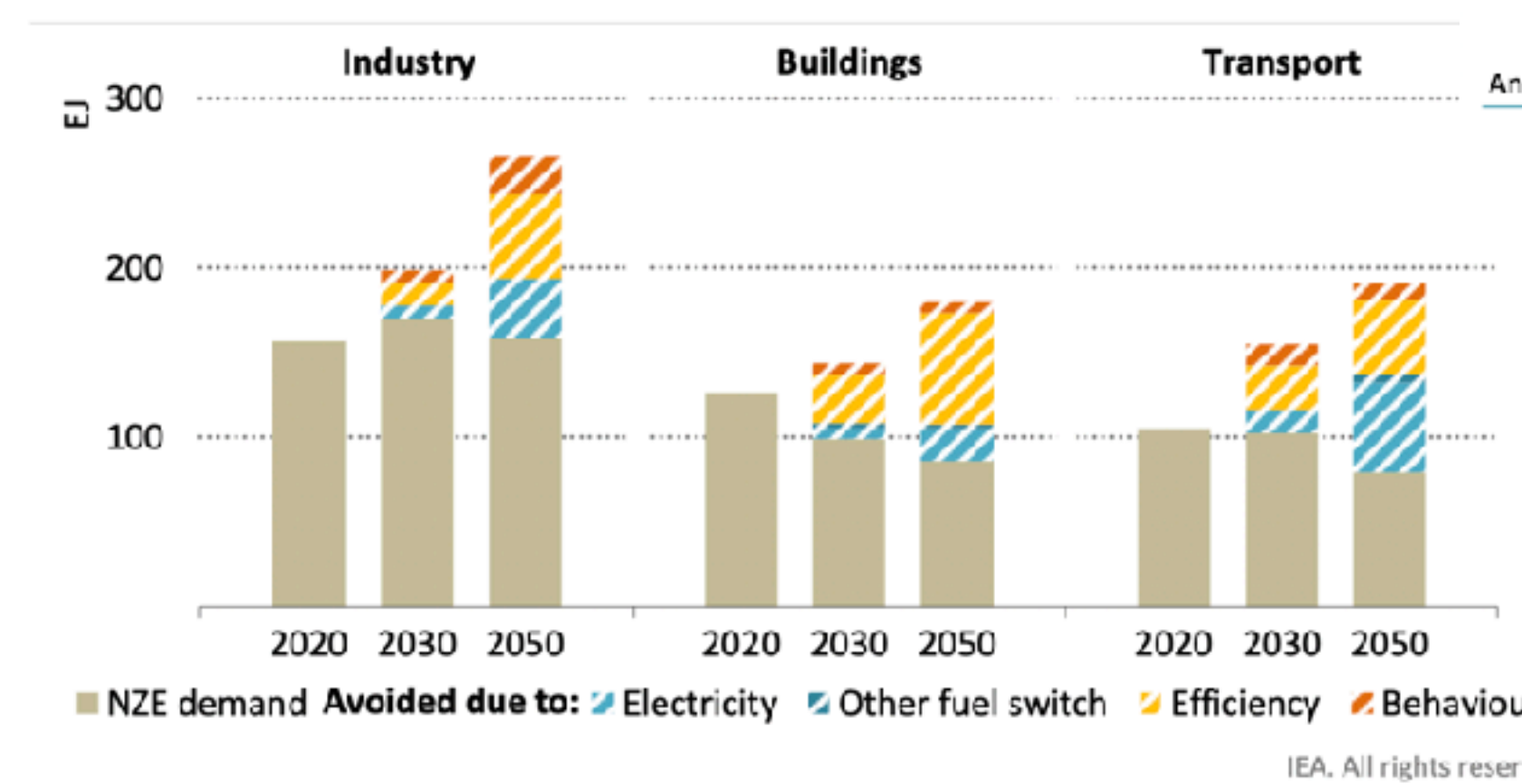
Figure 2.7 ▶ Fossil fuel use and share by sector in 2050 in the NZE



More than 30% of fossil fuel use in 2050 is not combusted and so does not result in direct CO₂ emissions, around 50% is paired with CCUS

Notes: Non-combustion includes use for non-emitting, non-energy purposes such as petrochemical feedstocks, lubricants and asphalt. Energy production includes fuel use for direct air capture.

Figure 2.13 ▶ Total final consumption and demand avoided by mitigation measure in the NZE



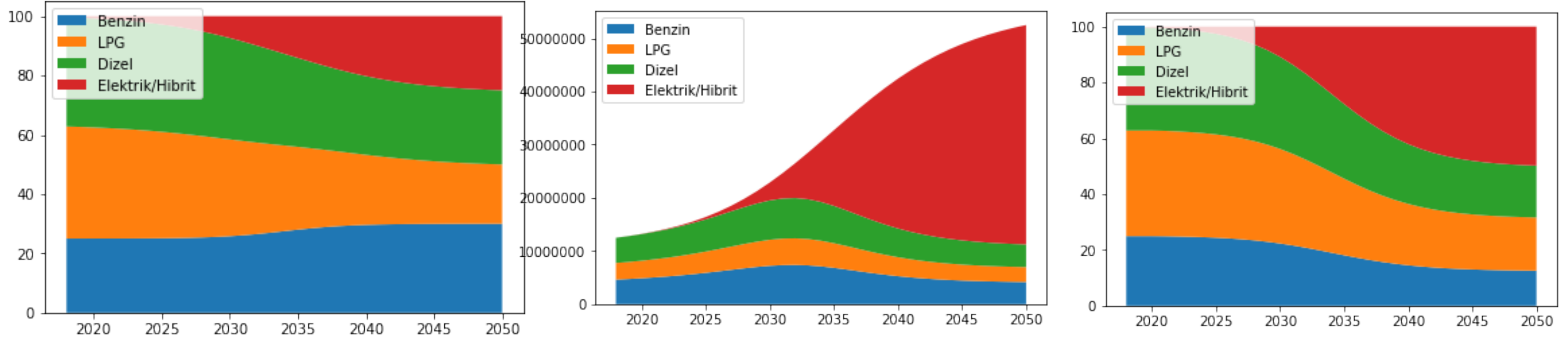
Energy efficiency plays a key role in reducing energy consumption across end-use sectors

Notes: CCUS = carbon capture utilisation and storage. Other fuel switch includes switching to hydrogen-related fuels, bioenergy, solar thermal, geothermal, or district heat.

Sector	2020	2030	2050
Share of electricity in total final consumption	20%	26%	49%
Industry			
Share of steel production using electric arc furnace	24%	37%	53%
Electricity share of light industry	43%	53%	76%
Transport			
Share of electric vehicles in stock: cars	1%	20%	86%
two/three-wheelers	26%	54%	100%
bus	2%	23%	79%
vans	0%	22%	84%
heavy trucks	0%	8%	59%
Annual battery demand for electric vehicles (TWh)	0.16	6.6	14

Açık Kaynak - Türkiye Elektrikli Araba Tahmini

- iki senaryo + (2030 sonrası sadece elektrikli/hibrit araç)



```
In [13]: plot(x,y)
         title("2050 yılına kadar 1000 kişiye düşen araç sayısının gelişimi")
```

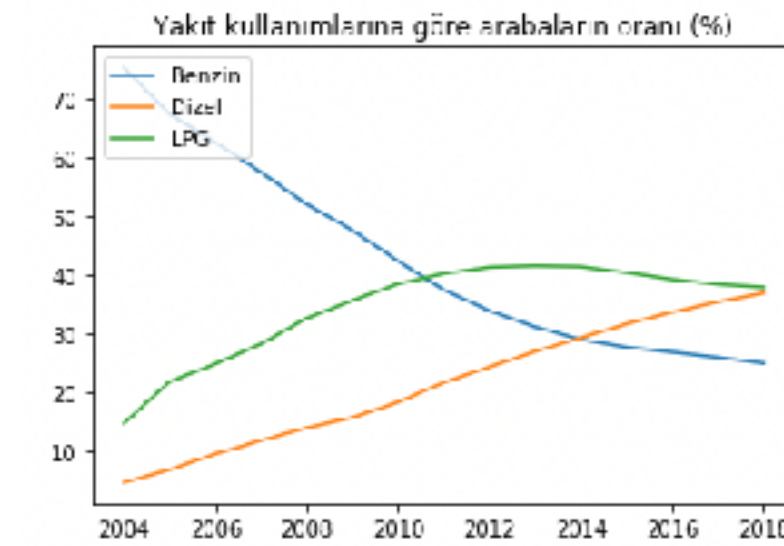
```
Out[13]: Text(0.5, 1.0, '2050 yılına kadar 1000 kişiye düşen araç sayısının gelişimi')
```



Nüfus artış tahmini

Nüfus projeksiyonu excel dosyasında var. Fakat yine s-eğrisi ile nispeten doğrusal ilk değer-son değer yaklaşımı ile bir nüfus öngörüsü de hesaplayabiliriz. Bu sefer hızımız 0.1, ilk değerimiz 83 milyon, son değerimiz de 105 milyon olsun

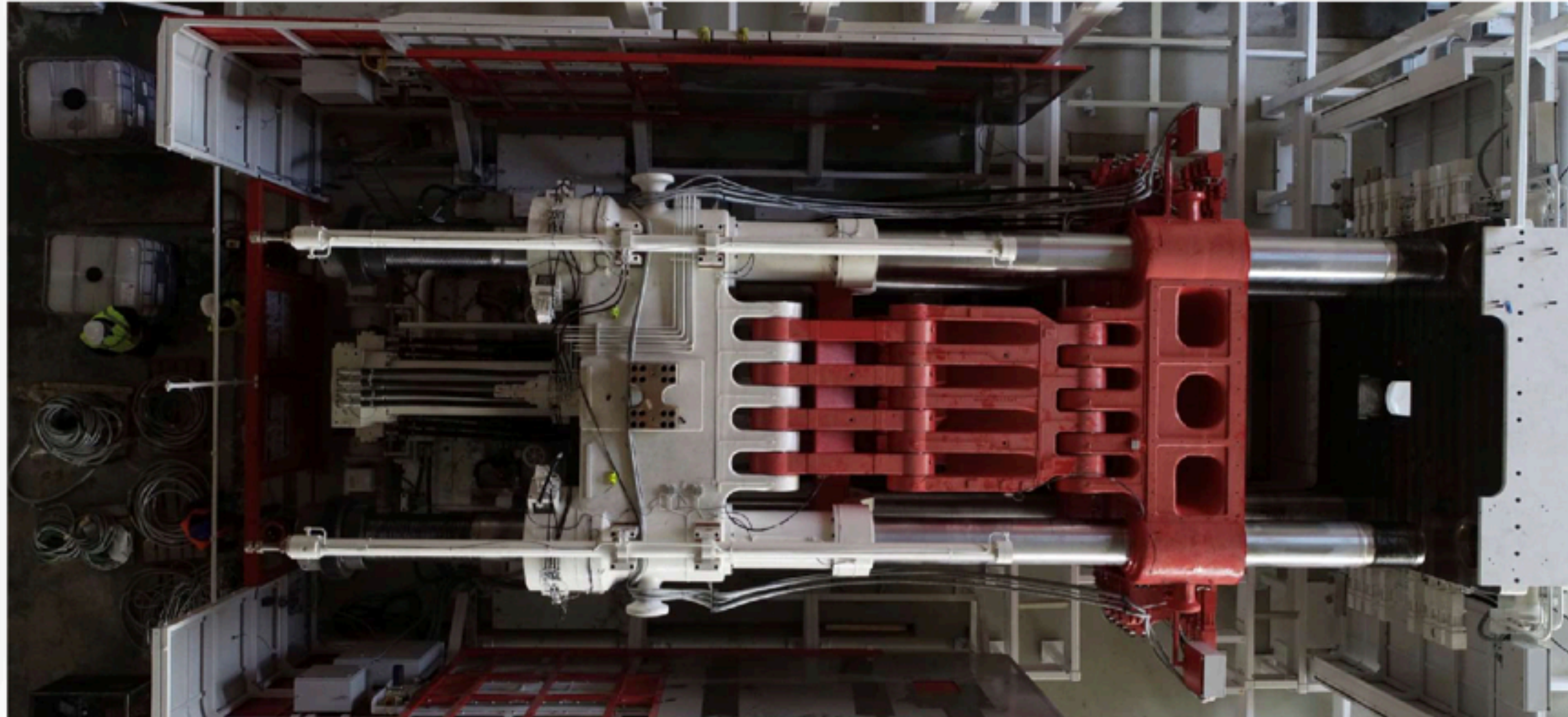
```
Text(0.5, 1.0, 'Yakıt kullanımına göre arabaların oranı (%)')
```



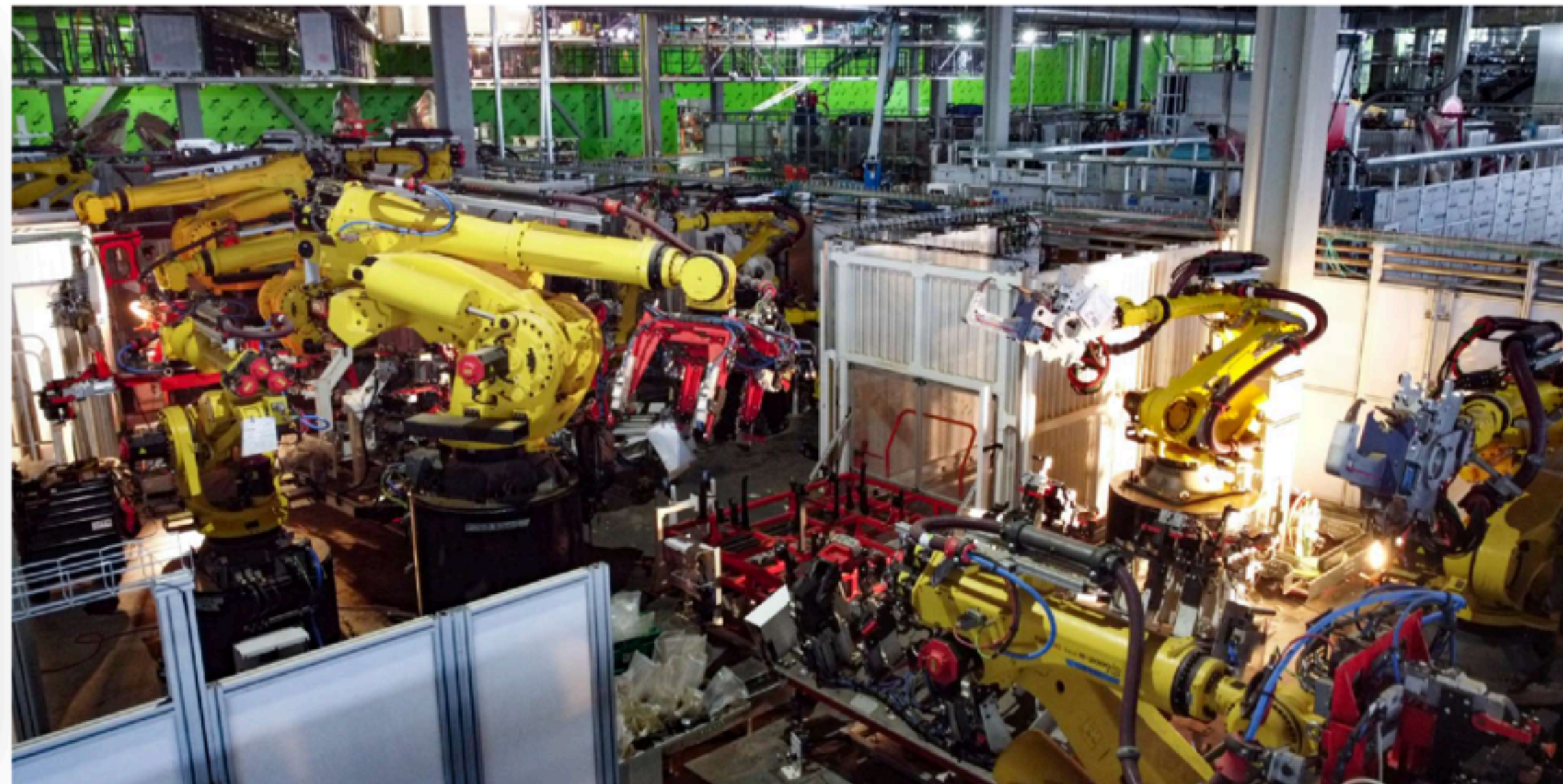
Tesla Cephesi

- Giga pres (gigacasting)
- 8000 ton - Cybertruck
- 6000 ton - Model Y

GIGAFACTORY BERLIN - GIGA CASTING



GIGAFACTORY TEXAS - MODEL Y FACTORY INTERIOR



Elon Musk @elonmusk · Jan 18, 2021
Replying to @RationalEtienne @OwenSparks_ and @Tesla
With our giant casting machines, we are literally trying to make full-size cars in the same way that toy cars are made

Tesla Oracle @TeslaOracle_com

The Únibody Casting Machine!

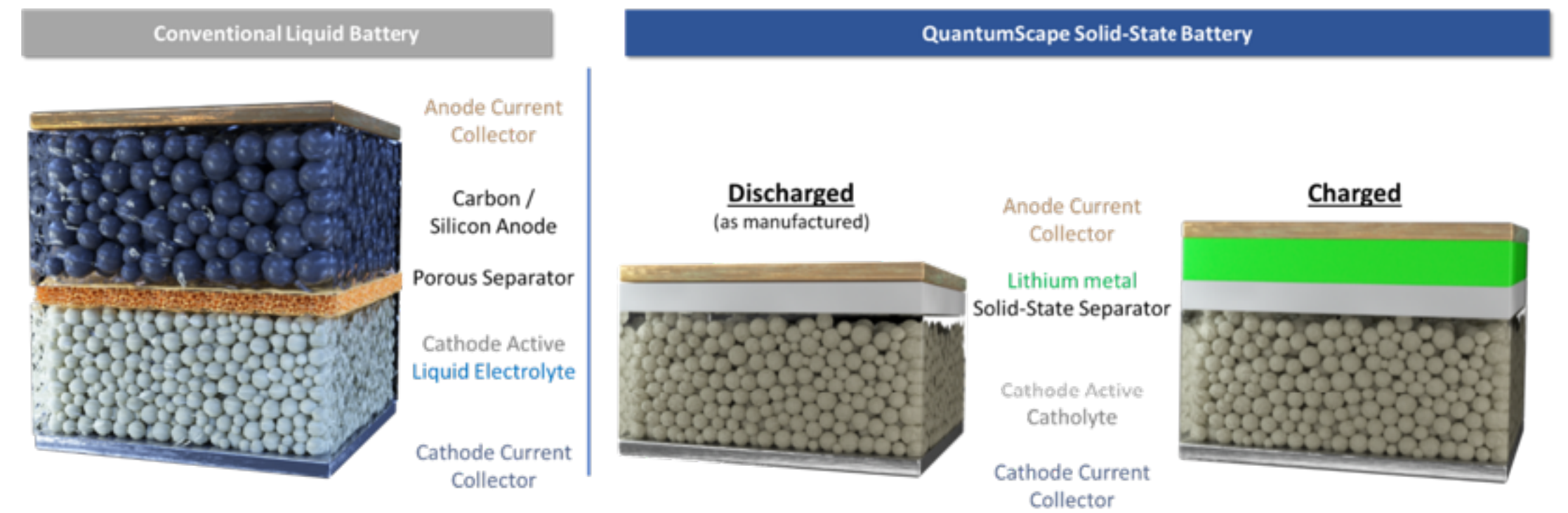
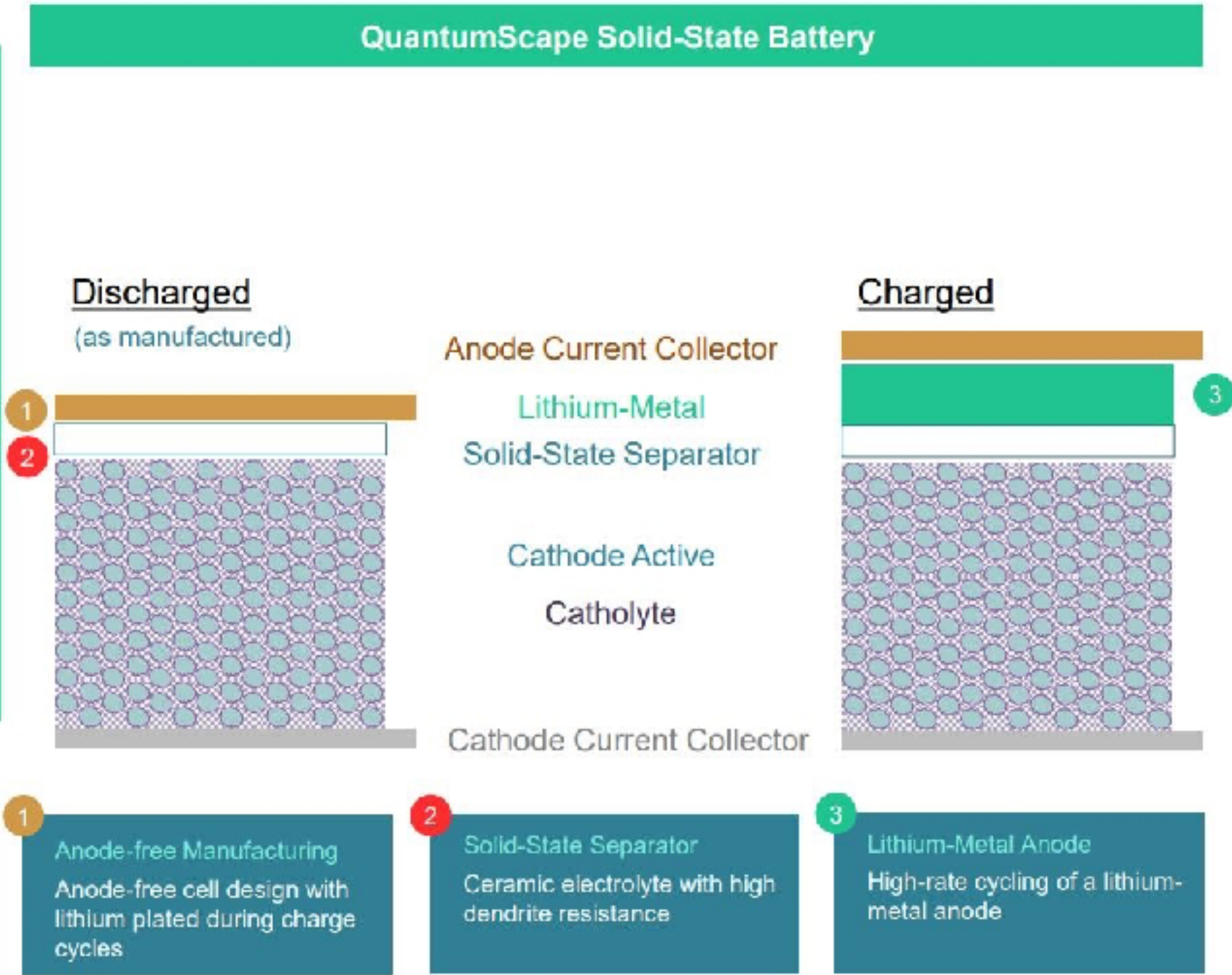
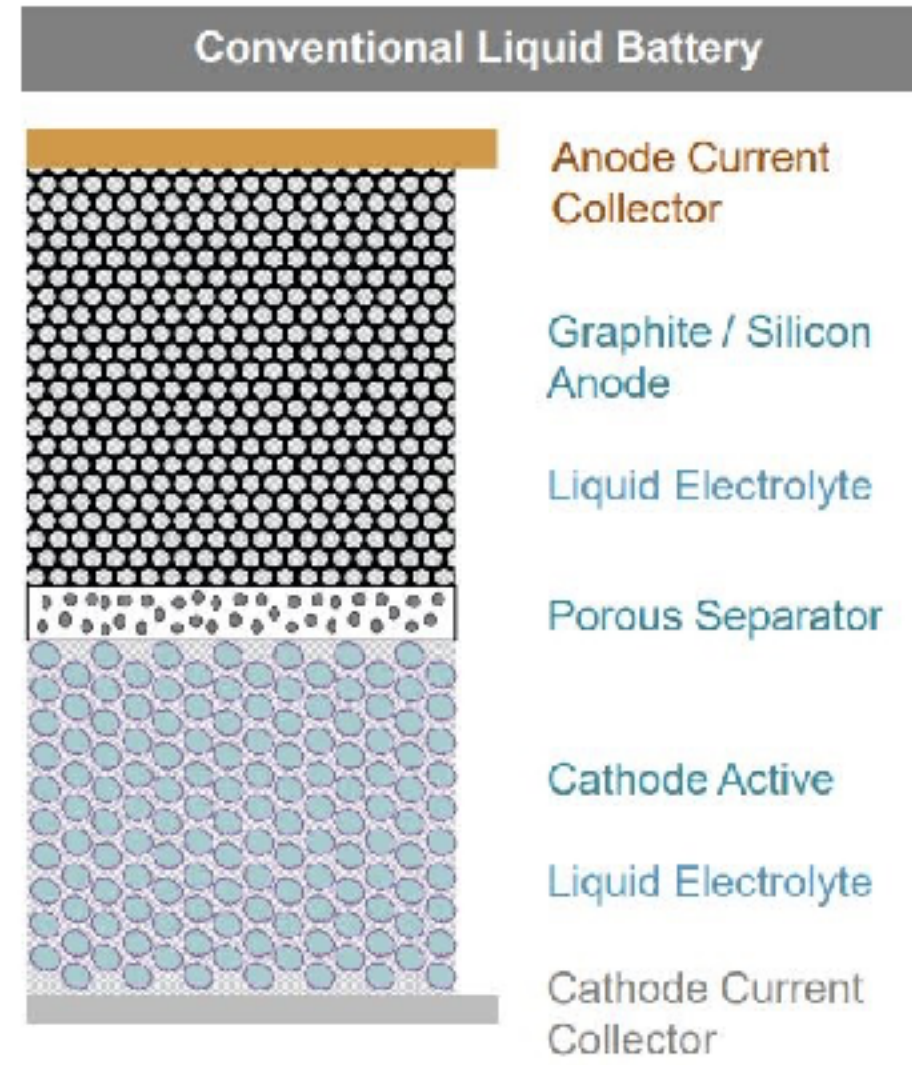
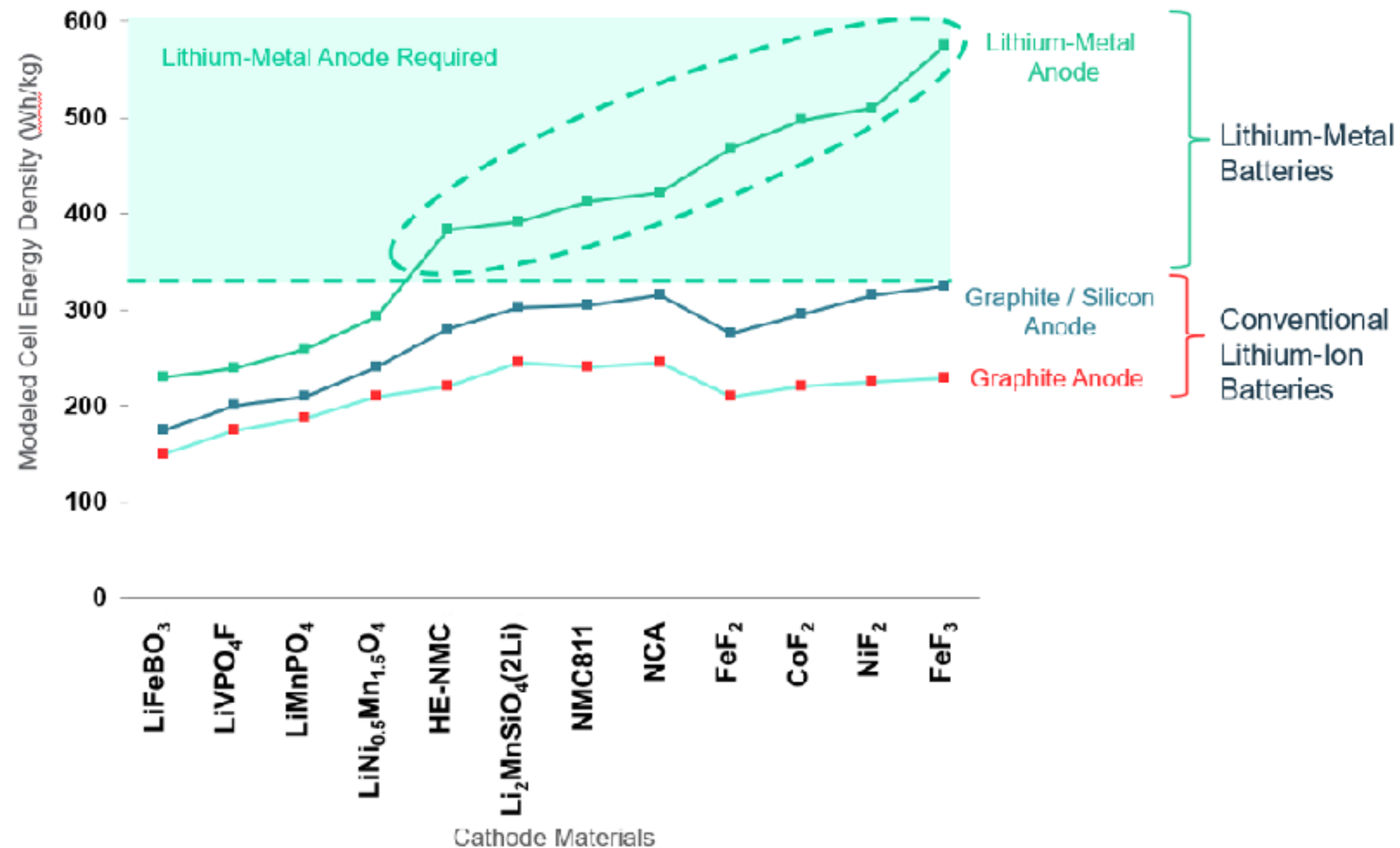
Tesla production to take a giant leap after obtaining the patent for a '...
Tesla has obtained the patent for a giant car die called a 'Multi-
Directional Unibody Casting Machine'. Tesla production will speed up ...
xautoworld.com

9:39 AM · Jan 18, 2021

44 2 Share this Tweet

Katı Hal Pilleri

- 1000 km menzil - 10 dakika şarj
- Toyota (1000 patent)
- 30 yılda %90 pil performansı



Sorular

- IEA - 2035'de artık içten yanmalı motorlu araç satılmayacak mı?
 - Tüketicie ne zaman söylenecek?
- Ulusal hedef belirlenmesi kimin görevi ? (Ulaştırma/Enerji/Sanayi)
- Vergi/Finansal düzenlemeler?
 - Motorlu taşıtlarda ÖTV dengesizliği
 - Akaryakıt vergileri
- Yeni vergiler
 - Şarj istasyonunda (TL/dakika)
 - Kullanırken (krş/km) - Yol kullanım vergisi

teşekkürler

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