

# Temiz Enerji Pazar Görünümü



**t** **dinamik**

Doğanın gücü, geleceğin enerjisi

**Doç. Dr. Muhsin MAZMAN**

**T Dinamik, Enerji Depolama Birimi Direktörü**

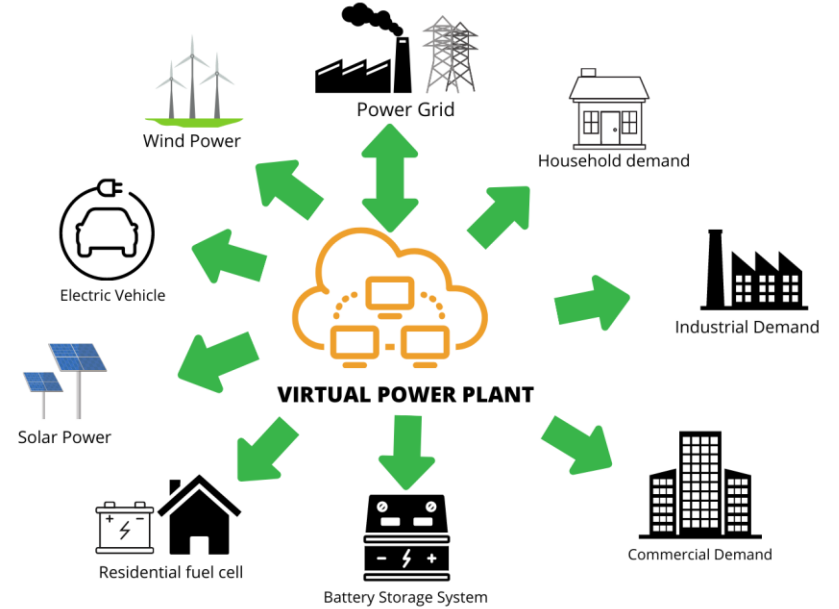
- **Kömür Çağı**



- **Petrol ve doğal gaz çağı**



# Elektrik ve dijitalizasyon çağına girdik



# Enerji dönüşümü

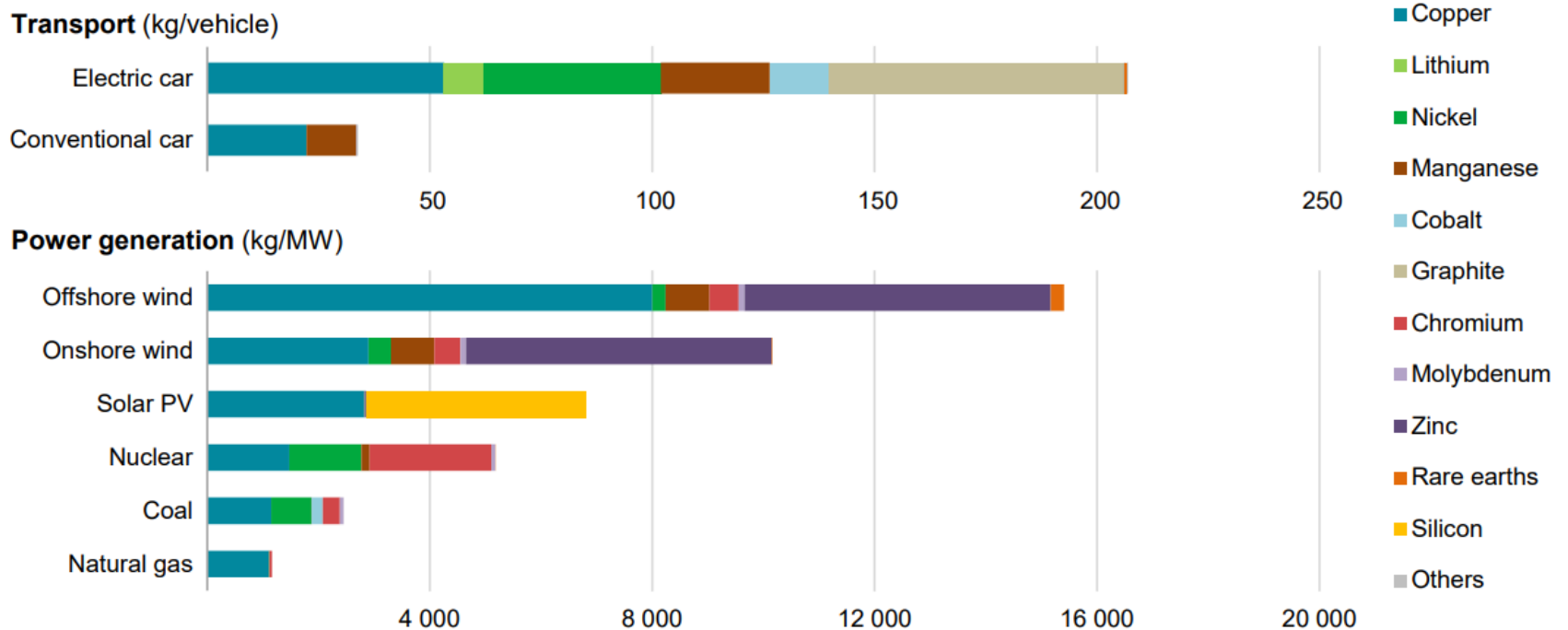


# Karbonsuz Temiz Bir Gelecek Tercih Deęil, Zorunluluk...



# Büyük Dönüşüm

Minerals used in selected clean energy technologies



# Büyük Dönüşüm

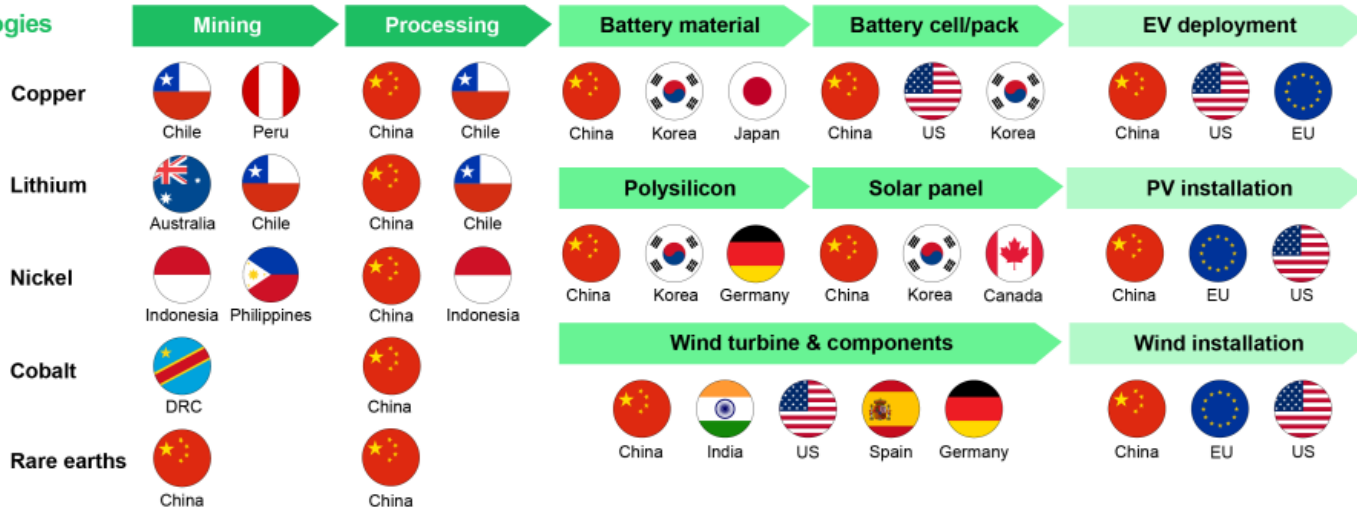
## Fosil yakıtlardan elektrik temelli dünyaya geçiş...

Indicative supply chains of oil and gas and selected clean energy technologies

### Oil and gas

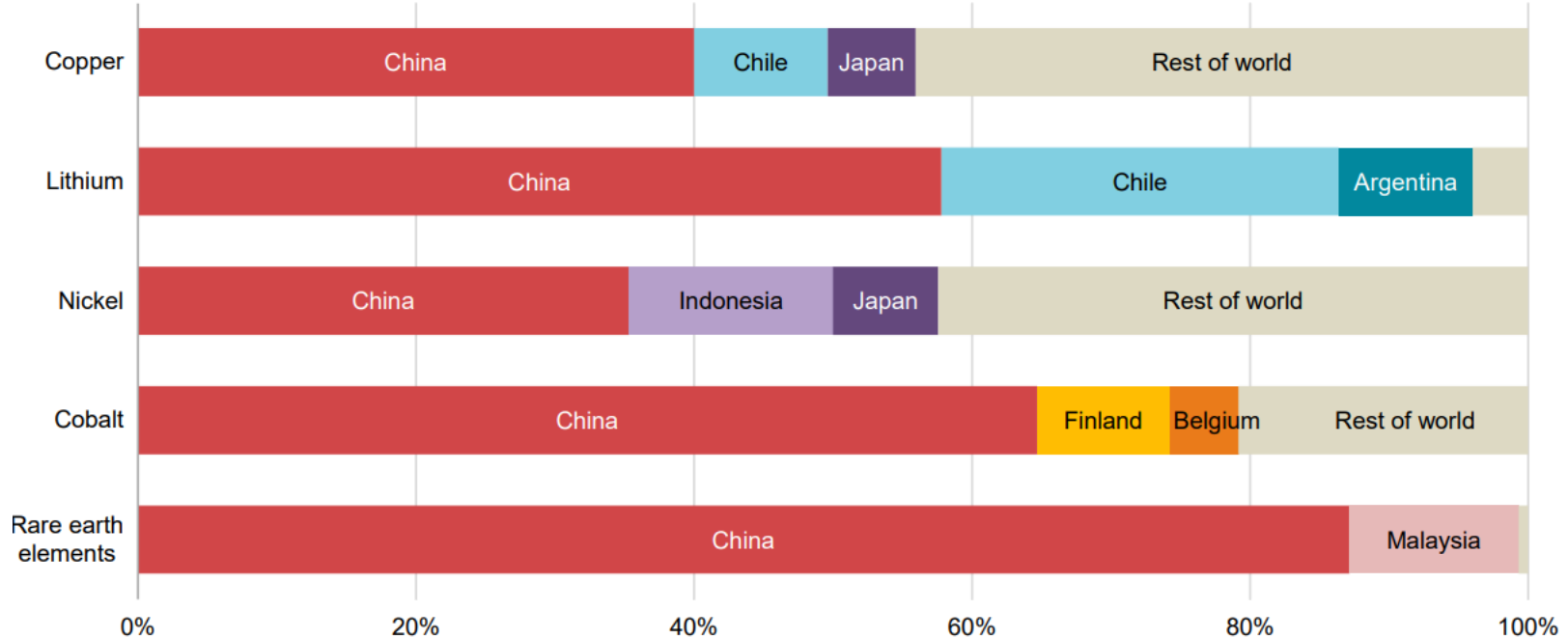


### Clean technologies



# Büyük Dönüşüm: Yeni Dünyanın Yeni Efendileri

Share of processing volume by country for selected minerals, 2019



## Top 20 Module Suppliers in H1 2023

(by shipment volume)

Rank	Module Supplier	Shipment (GW)
1	Jinko Solar	30-31
2	Trinasolar	27-28
2	LONGi Solar	27-28
4	JA SOLAR	24-25
5	CanadianSolar	≈14
6	risen	11.7
7	ASTRONERGY A CHINT COMPANY	11.5
8	TW SOLAR	11-12
9	DASOLAR	7-5
10	SUNTECH	4-5
10	Solargiga Energy	4.2-4.8
12	YINGLI SOLAR	3.8
13	DMEGC	3.6
14	环晟光伏 HUISENG SOLAR	3-5
15	GCL	2.5
15	DAN Solar	2.5
17	EGING PV	2.3-2.5
17	REDSOLAR	2.3-2.5
19	CECEP SOLAR	1.9
19	ZNSHINE SOLAR	1.9

## PVBL Top 20 Global Photovoltaic Inverter Brands 2024

(Reference: CNE, NETT and PVBL)

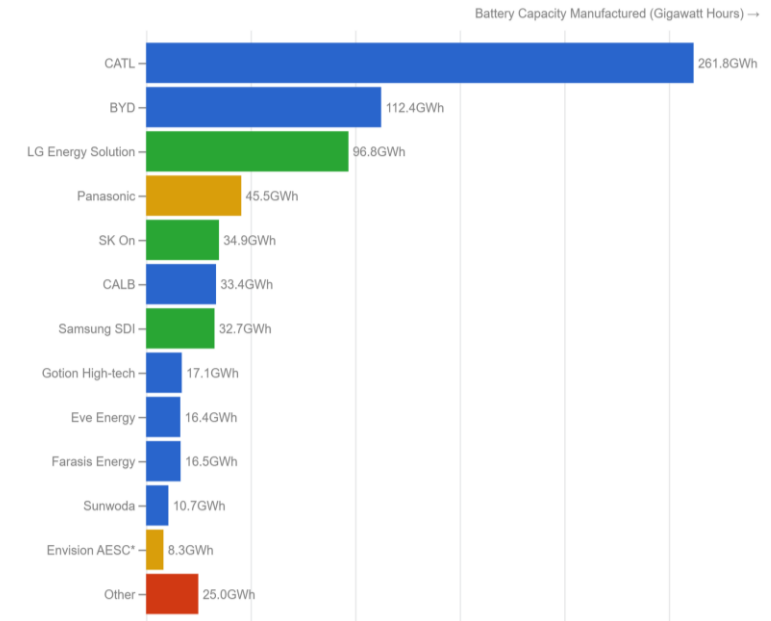
Infographic by AT Energy Team

Rank	Company	Score
1	SUNGROW Clean power for all	983.20
1	HUAWEI	983.20
2	solar edge	845.32
3	ENPHASE	834.73
4	SMA SMA Solar Technology Group	807.23
5	GOODWE Smart Energy Innovator	783.13
6	POWER ELECTRONICS	721.09
7	solis inverters	705.76
8	Growatt	690.58
9	SINENG	657.41
10	Deye 德業	558.51
11	Hopewind	493.56
12	KEHUA TECH	485.00
13	TBEA 特变电工	450.70
14	中国中车 CRRC	367.46
15	KSTAR	317.91
16	ASTRONERGY A CHINT COMPANY	287.66
17	houmiles	246.65
18	AiSWEI	184.69
19	APsystems ALTERNATE POWER	143.27
20	risen	125.84

## Chinese battery manufacturer accounted for ~65% of the global market in 2023

Total battery capacity manufactured by EV battery makers globally, 2023 (Gigawatt Hours)

■ China ■ Korea ■ Japan ■ Other



Source: HoloniQ

© HoloniQ 2024

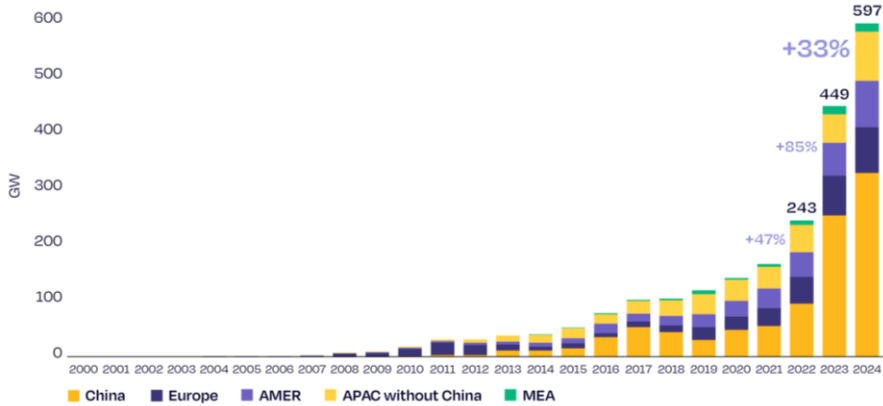
- Çin hakimiyeti;
  - PV %100
  - İnverter >%85
- Batarya >%65 (geri kalanı Kore ve Japonya)



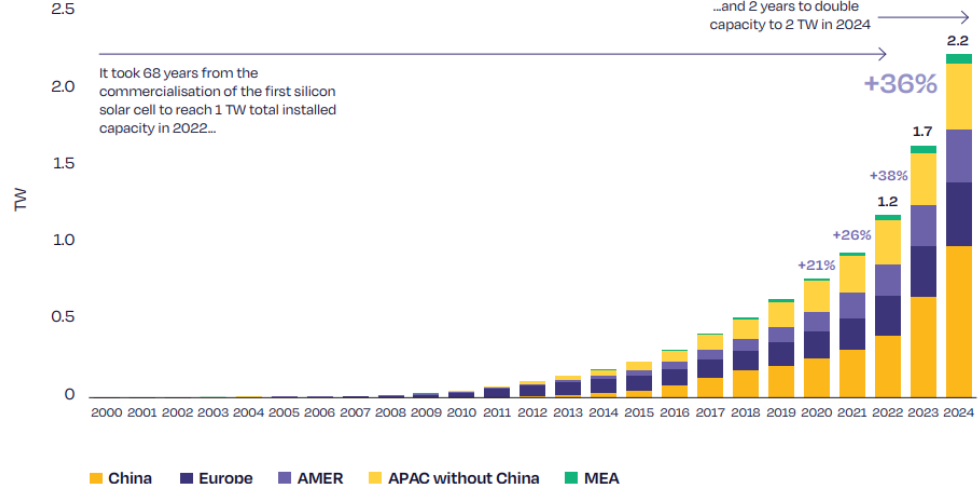
# Güneş 2024 ve Dünya Kurulu Kapasite

Record 597 GW of global solar capacity added in 2024; slower but steady  
33% annual growth

Annual solar PV installed capacity 2000-2024



Cumulative solar PV installed capacity 2000-2024



© SolarPower Europe

- Kurulumlar artarak devam ediyor
- Çin ana oyuncu(2025 te toplam kurulu gücü >1TW)
- Depolama pazarı daha da büyütüyor

# Sistem Entegratörleri Pazar Payı: 2024-2025

## 2024 Global BESS Integrator Shipments (AC): Company Rankings



- |   |             |   |    |                |   |
|---|-------------|---|----|----------------|---|
| 1 | Tesla       |  | 6  | Envision       |  |
| 2 | SUNGROW     |  | 7  | Powin          |  |
| 3 | CRRC        |  | 8  | NextEra Energy |  |
| 4 | Fluence     |  | 9  | Canadian Solar |  |
| 5 | HyperStrong |  | 10 | SCETL          |  |

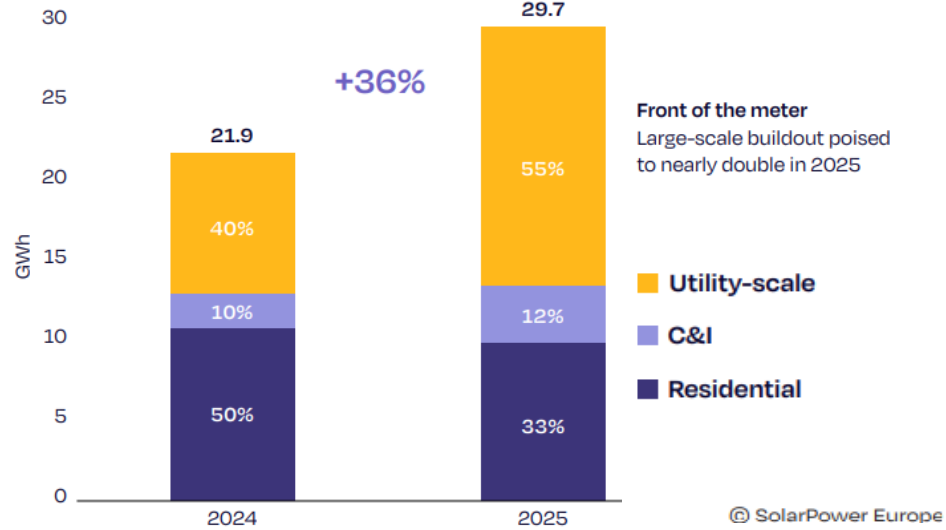
## 1H25 Global BESS Integrator Shipments: Company Rankings



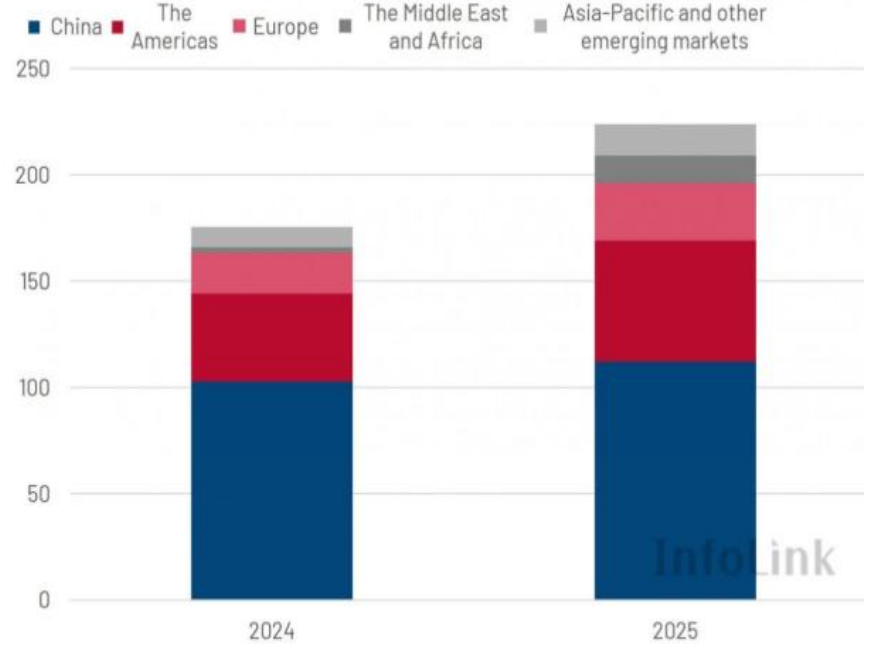
- |   |                        |   |    |                |   |
|---|------------------------|---|----|----------------|---|
| 1 | SUNGROW                |  | 6  | HUAWEI         |  |
| 2 | Tesla                  |  | 7  | Envision       |  |
| 3 | BYD                    |  | 8  | Canadian Solar |  |
| 4 | CRRC ZHUZHOU INSTITUTE |  | 9  | SCETL          |  |
| 5 | HyperStrong            |  | 10 | Fluence        |  |

# Dünyada toplam 175.4 Wh Kurulum

Europe annual BESS installed capacity 2024-2025



Installed capacity of global energy storage market, Unit: GWh

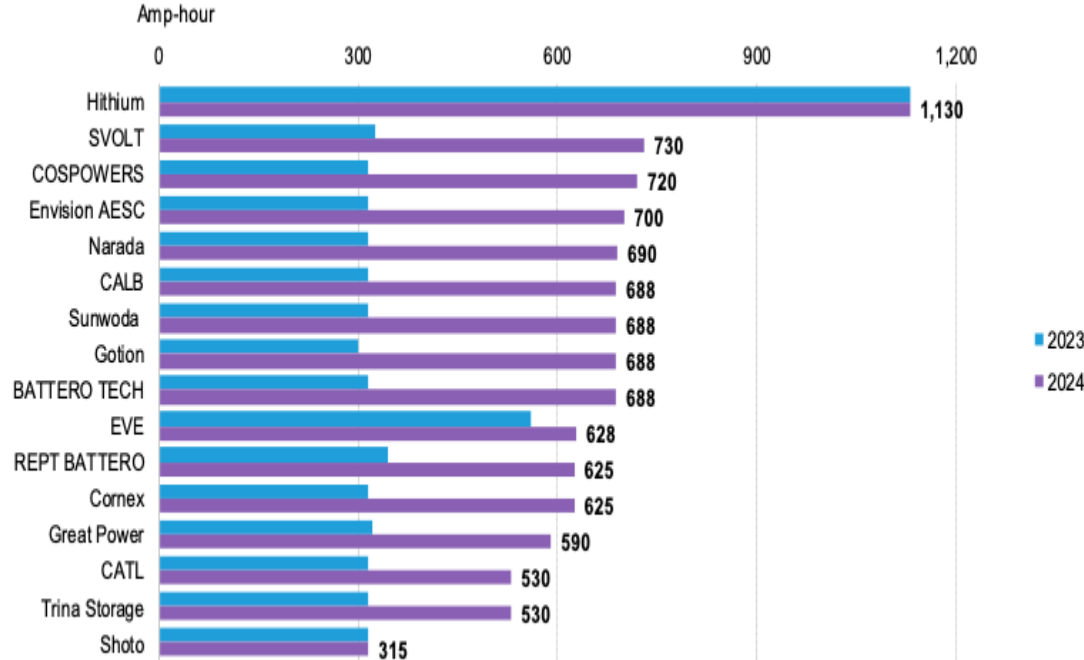


\*Source: InfoLink energy storage (ESS) supply chain database

**Dünyada toplam 175.4 Wh Kurulum**  
**2025 te beklenti yaklaşık 230 GWh**

# Hedef Daha Büyük Pil

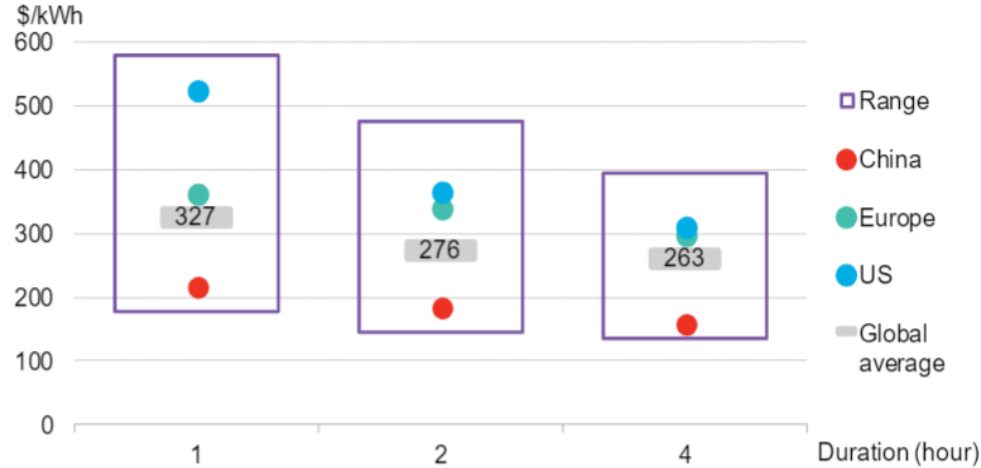
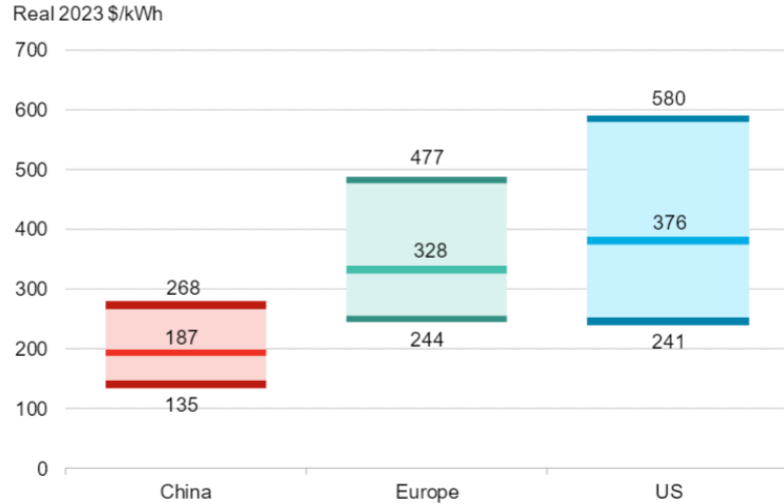
## Selected companies' announcements on larger lithium-ion battery cells



- Çoğu marka >314 Ah
- Daha büyük Ah li çözümler için çalışılıyor.
- Ana konteyner 2 saat
- >5MWh

Source: BloombergNEF, company announcements. Note: Data as of October 2024. 2023 and 2024 represent the year companies announced their biggest battery cells for stationary storage application, not the year the cells are mass-produced.

# LFP Bataryalarda Bölgeler ve C-rate Bazlı Değişim



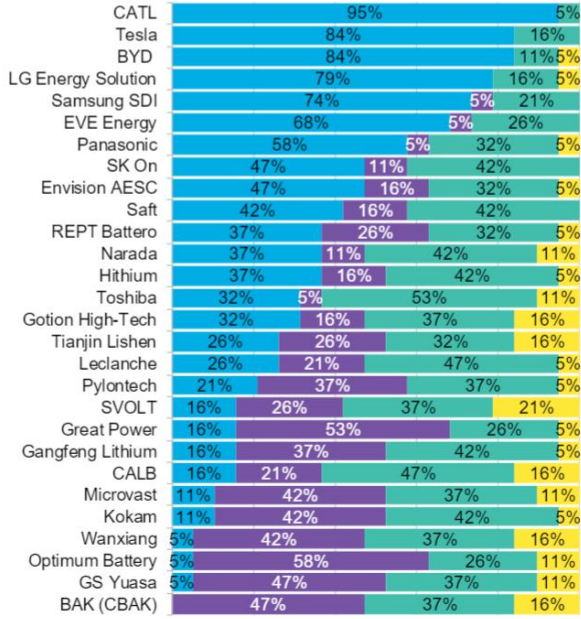
Source: BloombergNEF. Note: Averages prices for all project durations. Pricing based on usable capacity. Prices converted using December 2023 exchange rate. Only LFP prices were submitted for turnkey systems in 2023.

Source: BloombergNEF. Note: Pricing based on usable capacity. Prices converted using December 2023 exchange rate. Only LFP prices were submitted for turnkey systems in 2023.

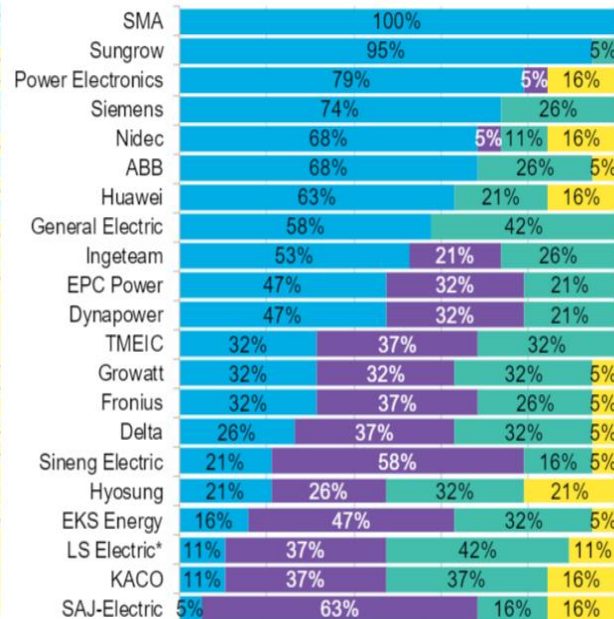
- Çin fiyatları en düşük,
- ABD ile aralarında x2 fark var
- 2 ve 4 saatlik depolamalar 2025'te 100 \$/ kWh sınırının altında
- Pil düzeyin de fiyat 30-40 \$/ kWh sınırına geldi

# Banka Açısından Finansal Uygunluk Derecesi: 2023

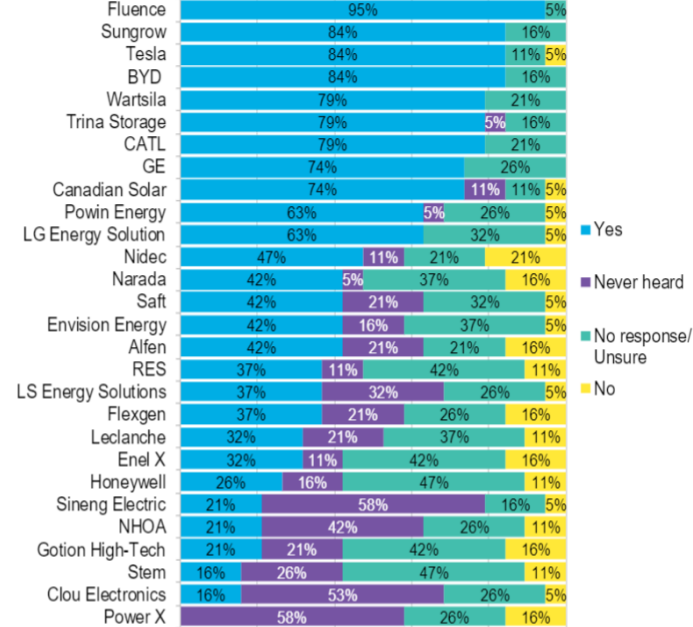
## Pil Üreticisi



## PCS Üreticisi



## Sistem Entegratörü



Source: BloombergNEF, survey participants.

Türkiye

**Sana bir iyi bir de  
kötü haberim var.**

**Kötü Haber;  
Hala yaşıyoruz.**

**İyi Haber;  
Henüz ölmedik.**

**Anton Çehov**

# Enerji Bakanlığımız: Verilmiş Kapasiteler

- Lisans: 10GW
- Öz tüketim 5.1.h.: 26GW
- YEKA: 5400MW
- Güneş +Depolama: 15 GW

**Toplam: 56.4 GW**

- Rüzgar dahil >70 GW kapasite tahsisi
- Rüzgar + güneş >8GW/yıl kapasite



**HEDEF: 2035'e kadar 120 GW Güneş+Rüzgar**

# Türkiye'de İlk Projeler

Tip	Supporter/situation	investor	Installer	Supplier	Power (MW)	Energy (MWh)	
Pilot Projects	Pilot Projects By Elder (Electricity Distribution Services Association) -Operated in 2022	ADM (Denizli2)	Inovat	LG Energy	0,25	0,224	
	Operated in 2024	EnerjiSA Enerji	Watox	Huawei	2	2,5	
	Operated in 2024	Polat Enerji	Watox	Huawei	4	4	
Comercial	Under contract						
	Under contract Operating in 2025	Polat Enerji	Tdinamik	Sungrow	10	13,5	
	Under contract Operating in 2025	EGESA	Pomega	Pomega	20	20	
	Under contract Operating in 2025	Polat Enerji	Inovat	PE+CATL	12,80	15,2	
	Under contract Operating in 2025	OZE Enerji	Elin	Kehua+CATL	29	29	
	<b>2025 TOTAL Instalation</b>					<b>71,8</b>	<b>77,7</b>
	Under contract Operating in 2026	HK Enerji	Chint-Astro Energy	Chint-Astro Energy	10	10	
	Under contract Operating in 2026	Polat Enerji	Rolls-Royce	Rolls-Royce(SMA+CATL)	109	130	
	Under contract Operating in 2026	Entek Enerji	Inovat	PE+CATL	100	110	
	Under contract Operating in 2025	Aksa	Aksa BESS (Antep ve Urfa)	EVE	110	110	
	Under contract Operating in 2025	Eksim	Chint-Astro Energy	Chint	35	70	
	<b>Min. Operating in 2026(More will be contracted)</b>					<b>364</b>	<b>430</b>

**TEŞEKKÜRLER...**

