

# Tesla may lose its crown as world's largest BEV producer to Chinese BYD in Q4, 2023 #31



July 2023

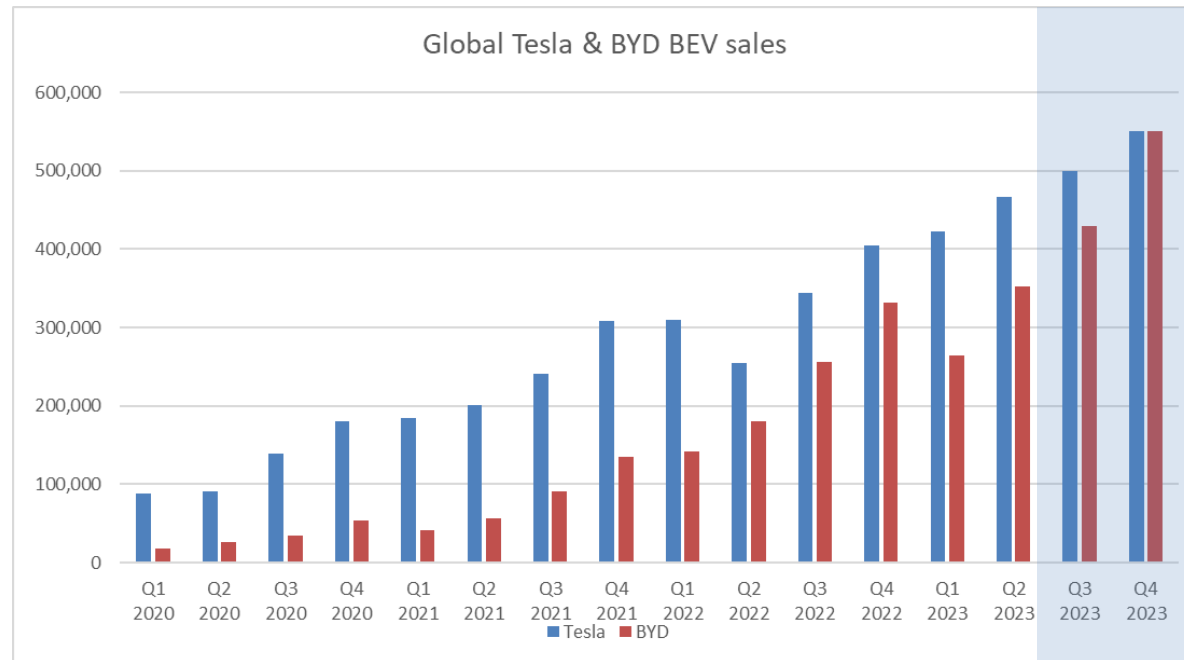
# Global BEV sales by Tesla and BYD

- Key takeaways:
1. Currently Tesla and BYD are respectively # 1 and 2 in the world in terms of selling the most BEVs
  2. From Q1, 2020 to Q2, 2023 (3.5Yrs) Tesla grew its BEV sales 426% and BYD grew its BEV sales 1856%
  3. BYD sales in % of Tesla sales was 20% in Q1, 2020 but had risen to 76% in Q2, 2023
  4. In other words, BYD is catching up to Tesla's lead and is now not far behind
  5. If BYDs growth sprint continues obviously BYD will dethrone Tesla within the next couple of quarters
  6. Both BYD and Tesla are not demand constrained meaning that how fast they can grow depends on how fast they can scale their production/supply

## Top 5 global BEV producers in 2022

| Vehicle maker           | BEV sales        | % of global    |
|-------------------------|------------------|----------------|
| Tesla                   | 1,314,330        | 16.85%         |
| BYD                     | 913,052          | 11.71%         |
| SAIC                    | 671,725          | 8.61%          |
| Volkswagen Group        | 571,067          | 7.32%          |
| Geely -Volvo            | 383,936          | 4.92%          |
| <b>Global BEV sales</b> | <b>7,800,000</b> | <b>100.00%</b> |

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# #1 Tesla / BYD strength

## Tesla strength:

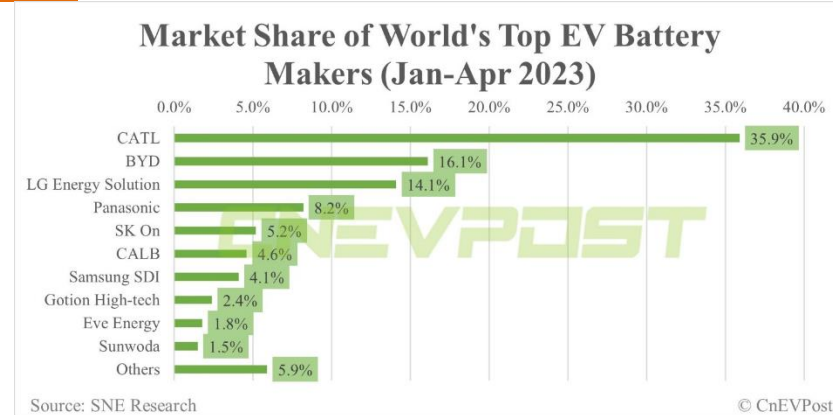
- 1. Tesla's factories most efficient at making vehicles at low cost at scale
- Musk repeatedly said that Tesla's main product and strength is their factories making their vehicles, etc
- Musk have also said it is a 100 times harder** in the auto-industry to get to mass production at a profit than to make a working prototype of the product. For rockets it is 10X harder
- Tesla production tech** like in-house software controlling machines and people, giga presses, structural battery pack, rare-earth free motors, few models



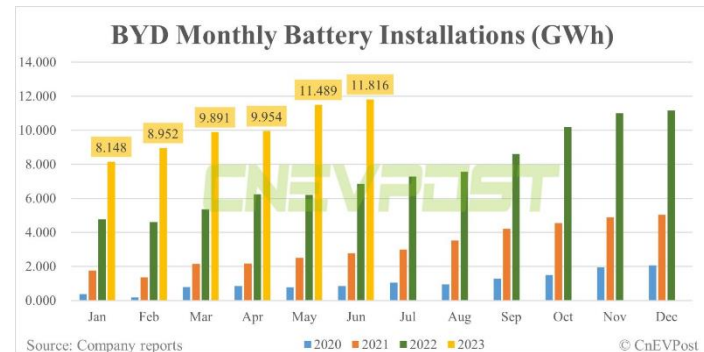
Source/attribution: Giga Texas by Joe Tegtmeier <https://www.youtube.com/watch?v=UIR22Ah-Eek>

## BYD strength:

- 1. BYD is world's 2<sup>nd</sup> largest battery manufacturer making all BEV battery cells and packs in-house at lowest cost
- BYD is so good at making batteries that they also sell them to Tesla and other BEV makers



Source/attribution: <https://cnevpost.com/2023/06/05/global-ev-battery-share-jan-april/>

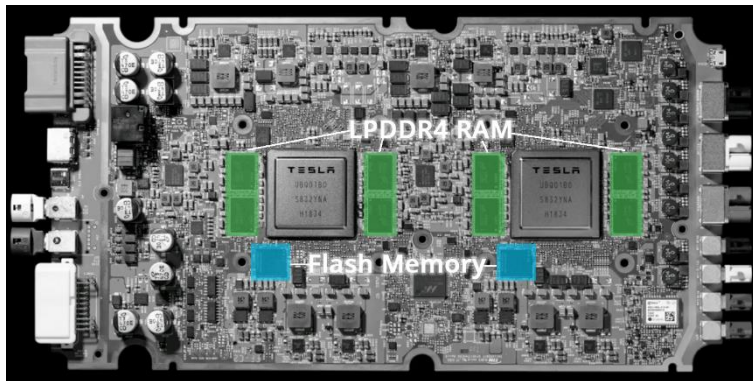


Source/attribution: <https://cnevpost.com/2023/07/02/byd-sells-253046-nevs-jun/>



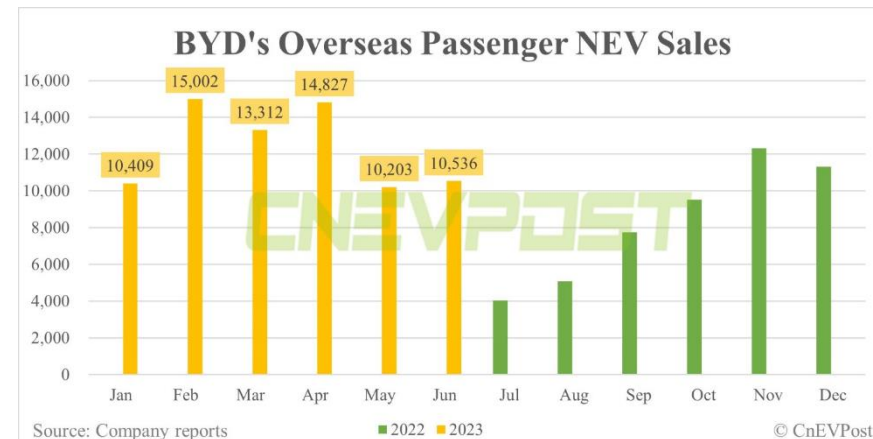
# Key Tesla / BYD weakness

- **Tesla weakness:**
- 2. **Geopolitical: 100% of Tesla's production will be shot down if China invades Taiwan and trade between China and West ends abruptly as a result**
- **Problem is that all of Tesla's batteries** currently uses components that are made in China like battery grade graphite, lithium carbonate, manganese, etc
- **Also many of Tesla's electronic components** like the FSD computer board is assembled in China
- Tesla are building its own supply chain for these items outside of China but it will take many years to fully localize production outside of China and Taiwan
- Tesla's own battery production ramp is taking much longer than hoped for likely less than 1GWh cumulated



Note: Tesla FSD computer for HW3

- **BYD weakness:**
- 2. **BYD has little success so far exporting vehicles with sales not growing the past 8 months**
- It may be too early to judge BYD's success or not in selling BEVs and PHEVs overseas



Source/attribution: <https://cnevpost.com/2023/07/02/byd-sells-253046-nevs-jun/>



Note: Tesla battery production



# Other Tesla/BYD strengths & weaknesses

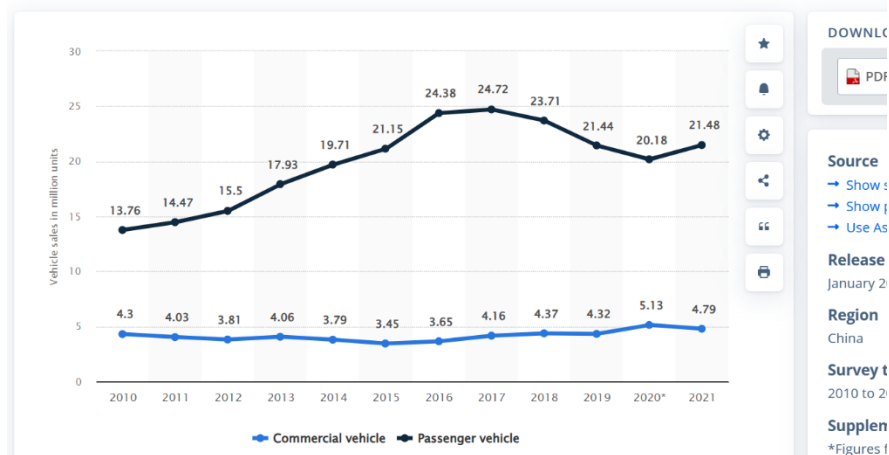
- **Tesla strengths & weaknesses:**

3. **Strength: Global charging network** that is much more reliable and extensive than the competition
4. **Strength: Best in industry in-vehicle software** with full integration for Tesla charging network, navigation, driver assist system FSD, Sentry vehicle security, cloud based user profiles, Tesla phone app, etc
5. **Strength: Pure BEV maker** no legacy manufacturing
6. **Strength: Tesla spend zero on marketing** as Elon Musk is capable of keeping Tesla in the news for both traditional media and fan social media

- **BYD strengths & weaknesses:**

3. **Strength: Incorporation in China** having A) world's largest auto market with 26M sales in 2021, B) best supply chains for BEV production, C) the most proactive authorities that are hell bend on transitioning China from ICEVs to BEVs
- For comparison, US auto market 13.75 million vehicles in 2022, European sales were 12.8 million vehicles in 2022
4. **Weakness:** Still makes PHEVs that they need to end but BYD has ended production of pure ICEV

Passenger and commercial vehicle sales in China from 2010 to 2021 (in million units)



Source/attribution: <https://www.statista.com/statistics/233743/vehicle-sales-in-china/>

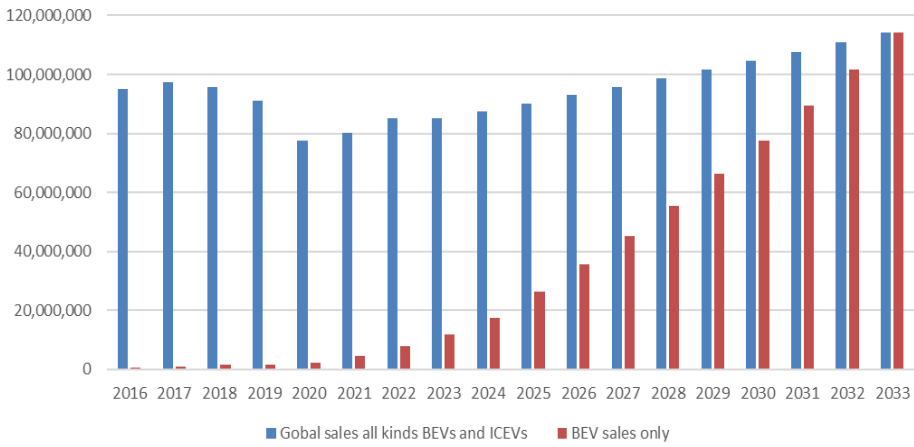


Note: Tesla supercharger station

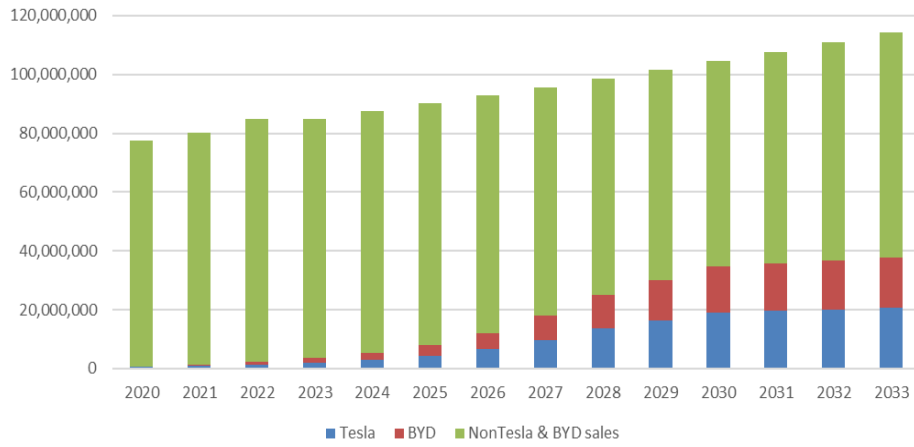


# Past & future Tesla/BYD vehicle sales growth

Global vehicle sales



Global vehicle sales



## Global battery electric vehicle (BEV) sales

| Year                     | Global vehicle sales all kinds BEV and ICEV | Annual growth | BEVs sold globally | Annual growth BEV market | BEV global market share | Change in BEV share of global market | ICE vehicles sold globally | Annual growth ICE market |
|--------------------------|---|---------------|--------------------|--------------------------|-------------------------|--------------------------------------|----------------------------|--------------------------|
| 2016                     | 94,976,569                                  |               | 477,700            | 0.50%                    |                         | 0.50%                                | 94,498,869                 | 0.50%                    |
| 2017                     | 97,302,534                                  | 2.45%         | 801,600            | 67.80%                   | 0.82%                   | 0.32%                                | 96,500,934                 | 2.12%                    |
| 2018                     | 95,634,593                                  | -1.71%        | 1,367,800          | 70.63%                   | 1.43%                   | 0.61%                                | 94,266,793                 | -2.32%                   |
| 2019                     | 91,227,182                                  | -4.61%        | 1,624,600          | 18.77%                   | 1.78%                   | 0.35%                                | 89,602,582                 | -4.95%                   |
| 2020                     | 77,621,582                                  | -14.91%       | 2,165,400          | 33.29%                   | 2.79%                   | 1.01%                                | 75,456,182                 | -15.79%                  |
| 2021                     | 80,145,988                                  | 3.25%         | 4,599,400          | 112.40%                  | 5.74%                   | 2.95%                                | 75,546,588                 | 0.12%                    |
| 2022                     | 85,016,728                                  | 6.08%         | 7,800,000          | 69.59%                   | 9.17%                   | 3.44%                                | 77,216,728                 | 2.21%                    |
| 2023                     | 85,016,728                                  | 0.00%         | 11,700,000         | 50.00%                   | 13.76%                  | 4.59%                                | 73,316,728                 | -5.05%                   |
| 2024                     | 87,567,230                                  | 3.00%         | 17,550,000         | 50.00%                   | 20.04%                  | 6.28%                                | 70,017,230                 | -4.50%                   |
| 2025                     | 90,194,247                                  | 3.00%         | 26,325,000         | 50.00%                   | 29.19%                  | 9.15%                                | 63,869,247                 | -8.78%                   |
| 2026                     | 92,900,074                                  | 3.00%         | 35,538,750         | 35.00%                   | 38.25%                  | 9.07%                                | 57,361,324                 | -10.19%                  |
| 2027                     | 95,687,076                                  | 3.00%         | 45,134,213         | 27.00%                   | 47.17%                  | 8.91%                                | 50,552,864                 | -11.87%                  |
| 2028                     | 98,557,689                                  | 3.00%         | 55,515,081         | 23.00%                   | 56.33%                  | 9.16%                                | 43,042,607                 | -14.86%                  |
| 2029                     | 101,514,419                                 | 3.00%         | 66,340,522         | 19.50%                   | 65.35%                  | 9.02%                                | 35,173,897                 | -18.28%                  |
| 2030                     | 104,559,852                                 | 3.00%         | 77,618,411         | 17.00%                   | 74.23%                  | 8.88%                                | 26,941,441                 | -23.41%                  |
| 2031                     | 107,696,647                                 | 3.00%         | 89,261,173         | 15.00%                   | 82.88%                  | 8.65%                                | 18,435,475                 | -31.57%                  |
| 2032                     | 110,927,547                                 | 3.00%         | 101,757,737        | 14.00%                   | 91.73%                  | 8.85%                                | 9,169,810                  | -50.26%                  |
| 2033                     | 114,255,373                                 | 3.00%         | 114,255,373        | 12.28%                   | 100.00%                 | 8.27%                                | 0                          | -100.00%                 |
| <b>Annualized growth</b> |   |               |                    |                          |                         |                                      |                            |                          |
| <b>2016 to 2022</b>      |   | -1.83%        |                    | 59.28%                   |                         |                                      |                            | -3.31%                   |
| <b>2022 to 2032</b>      |   | 2.70%         |                    | 29.28%                   |                         |                                      |                            | -19.19%                  |
| <b>2016 to 2032</b>      |   | 0.98%         |                    | 39.81%                   |                         |                                      |                            | -13.57%                  |

## Tesla and BYD global BEV sales growth

| Year                     | Tesla sales globally | Annual growth | Tesla share of global market | Year                     | BYD sales globally | Annual growth | BYD share of global market | Global sales that are not Tesla/BYD |
|--------------------------|----------------------|---------------|------------------------------|--------------------------|--------------------|---------------|----------------------------|-------------------------------------|
| 2016                     | 76,297               |               | 0.08%                        | 2016                     |                    |               |                            |                                     |
| 2017                     | 103,181              | 35.24%        | 0.11%                        | 2017                     |                    |               |                            |                                     |
| 2018                     | 245,162              | 137.60%       | 0.26%                        | 2018                     |                    |               |                            |                                     |
| 2019                     | 367,481              | 49.89%        | 0.40%                        | 2019                     |                    |               |                            |                                     |
| 2020                     | 499,647              | 35.97%        | 0.64%                        | 2020                     | 133,000            |               | 0.17%                      | 76,988,935                          |
| 2021                     | 936,222              | 87.38%        | 1.17%                        | 2021                     | 325,000            | 144.36%       | 0.41%                      | 78,884,766                          |
| 2022                     | 1,313,851            | 40.34%        | 1.55%                        | 2022                     | 910,000            | 180.00%       | 1.07%                      | 82,792,877                          |
| 2023                     | 1,939,015            | 47.58%        | 2.28%                        | 2023                     | 1,597,000          | 75.49%        | 1.88%                      | 81,480,713                          |
| 2024                     | 2,908,523            | 50.00%        | 3.32%                        | 2024                     | 2,395,500          | 50.00%        | 2.74%                      | 82,263,207                          |
| 2025                     | 4,362,784            | 50.00%        | 4.84%                        | 2025                     | 3,593,250          | 50.00%        | 3.98%                      | 82,238,213                          |
| 2026                     | 6,544,176            | 50.00%        | 7.04%                        | 2026                     | 5,389,875          | 50.00%        | 5.80%                      | 80,966,024                          |
| 2027                     | 9,816,263            | 50.00%        | 10.26%                       | 2027                     | 8,084,813          | 50.00%        | 8.45%                      | 77,786,000                          |
| 2028                     | 13,742,769           | 40.00%        | 13.94%                       | 2028                     | 11,318,738         | 40.00%        | 11.48%                     | 73,496,182                          |
| 2029                     | 16,491,323           | 20.00%        | 16.25%                       | 2029                     | 13,582,485         | 20.00%        | 13.38%                     | 71,440,612                          |
| 2030                     | 18,965,021           | 15.00%        | 18.14%                       | 2030                     | 15,619,858         | 15.00%        | 14.94%                     | 69,974,973                          |
| 2031                     | 19,533,972           | 3.00%         | 18.14%                       | 2031                     | 16,088,453         | 3.00%         | 14.94%                     | 72,074,222                          |
| 2032                     | 20,119,991           | 3.00%         | 18.14%                       | 2032                     | 16,571,107         | 3.00%         | 14.94%                     | 74,236,449                          |
| 2033                     | 20,723,590           | 3.00%         | 18.14%                       | 2033                     | 17,068,240         | 3.00%         | 14.94%                     | 76,463,543                          |
| <b>Annualized growth</b> |                      |               |                              | <b>Annualized growth</b> |                    |               |                            |                                     |
| <b>2016 to 2022</b>      |                      | 60.70%        |                              | <b>2020 to 2022</b>      |                    | 161.57%       |                            |                                     |
| <b>2022 to 2032</b>      |                      | 31.37%        |                              | <b>2022 to 2032</b>      |                    | 33.67%        |                            |                                     |
| <b>2016 to 2032</b>      |                      | 41.68%        |                              | <b>2020 to 2032</b>      |                    | 49.49%        |                            |                                     |

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# Sources/attribution for previous slides

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- Slide 3: Musk 100x harder to mass produce at a profit than it is to make a prototype 2019 mar: <https://www.businessinsider.com/elon-musk-says-building-factory-100-times-harder-than-making-car-2019-3?r=US&IR=T>
- Slide 3: Musk Tesla's factories is the main product not what they make 2017: <https://www.inverse.com/article/28215-elon-musk-factory-important-tesla-cars#:~:text=During%20a%20quarterly%20call%20with%20investors%20on%20Wednesday%2C,to%20cutting-edge%20increases%20in%20automation%20and%20manufacturing%20technology.>
- Slide 3: Musk The factory is the product: <https://twitter.com/elonmusk/status/1348716679774265344>
- Slide 3: Mining of lithium ore 18 million tons annually, copper ore 3600 million tons and iron ore 3500 million tons: See my video #22 <https://youtu.be/fq4Tzq4lt54>
- Slide 5: US auto market 13.75 million vehicles in 2022. <https://www.statista.com/statistics/199974/us-car-sales-since-1951/#:~:text=The%20U.S.%20auto%20industry%20sold%20nearly%202.86%20million,peaked%20in%202016%20at%20roughly%2017.5%20million%20units.>
- Slide 5: Europe auto market 12.8 million in 2022: <https://www.acea.auto/publication/economic-and-market-report-state-of-the-eu-auto-industry-full-year-2022/#:~:text=In%202022%2C%20global%20new%20car%20registrations%20reached%2066.2,impacted%20by%20semiconductor%20shortages%20and%20the%20Russo-Ukrainian%20conflict.>
- Slide 5: 1.41 billion people in China and 0.33 in US and Europa: <https://tradingeconomics.com/china/population> <https://tradingeconomics.com/>

