



Prices on electric cars will continue to drop until they're within reach of the average family.

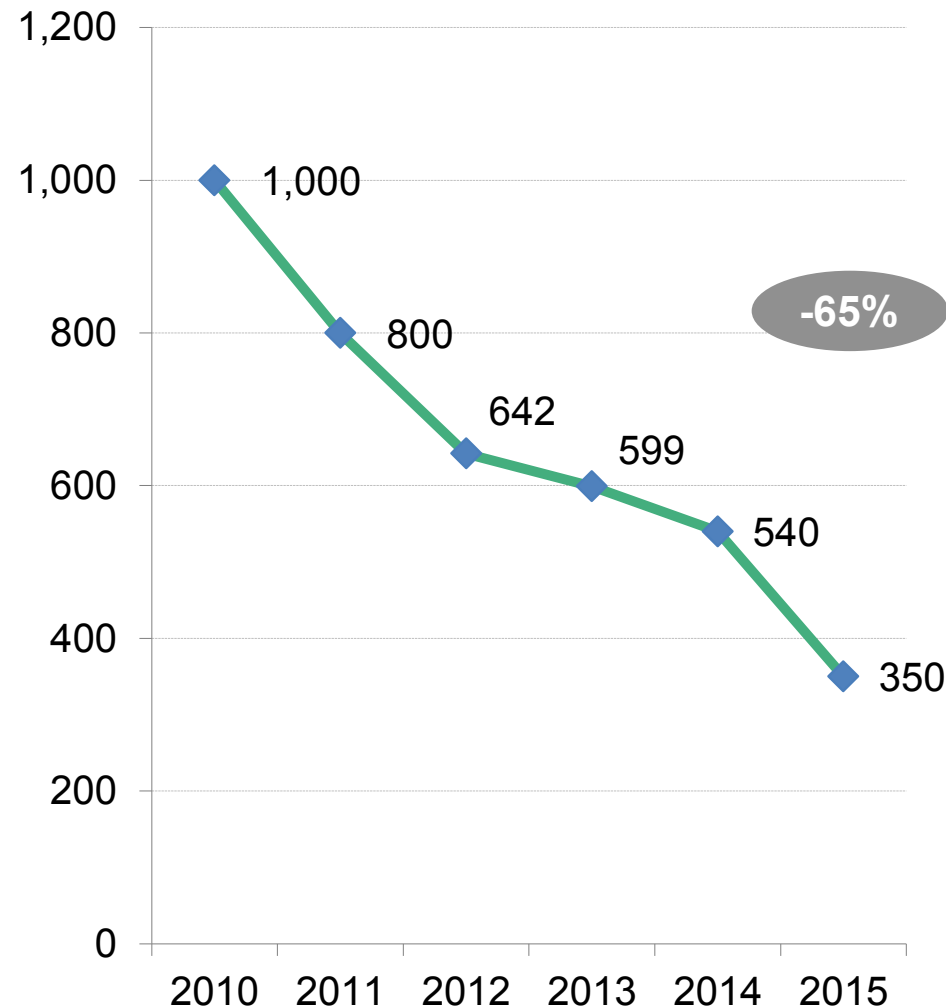


The Washington Post 1915

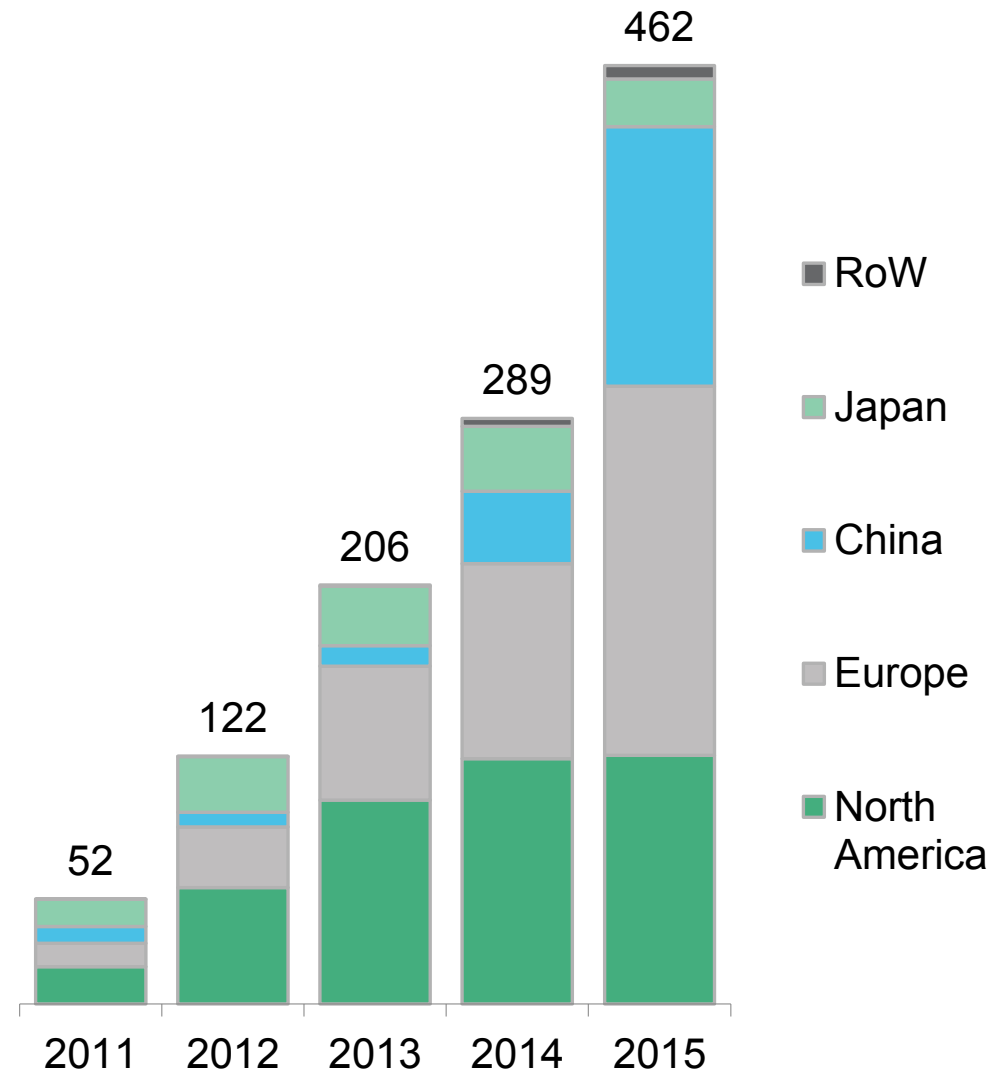
Images: Nissan, Detroit Electric, 2015, courtesy of EVASD

FALLING BATTERY COSTS, RISING EV SALES

Average battery pack price, 2010-15
(\$/kWh)



Electric vehicle sales, 2011-16
(thousands of vehicles sold)



Key drivers

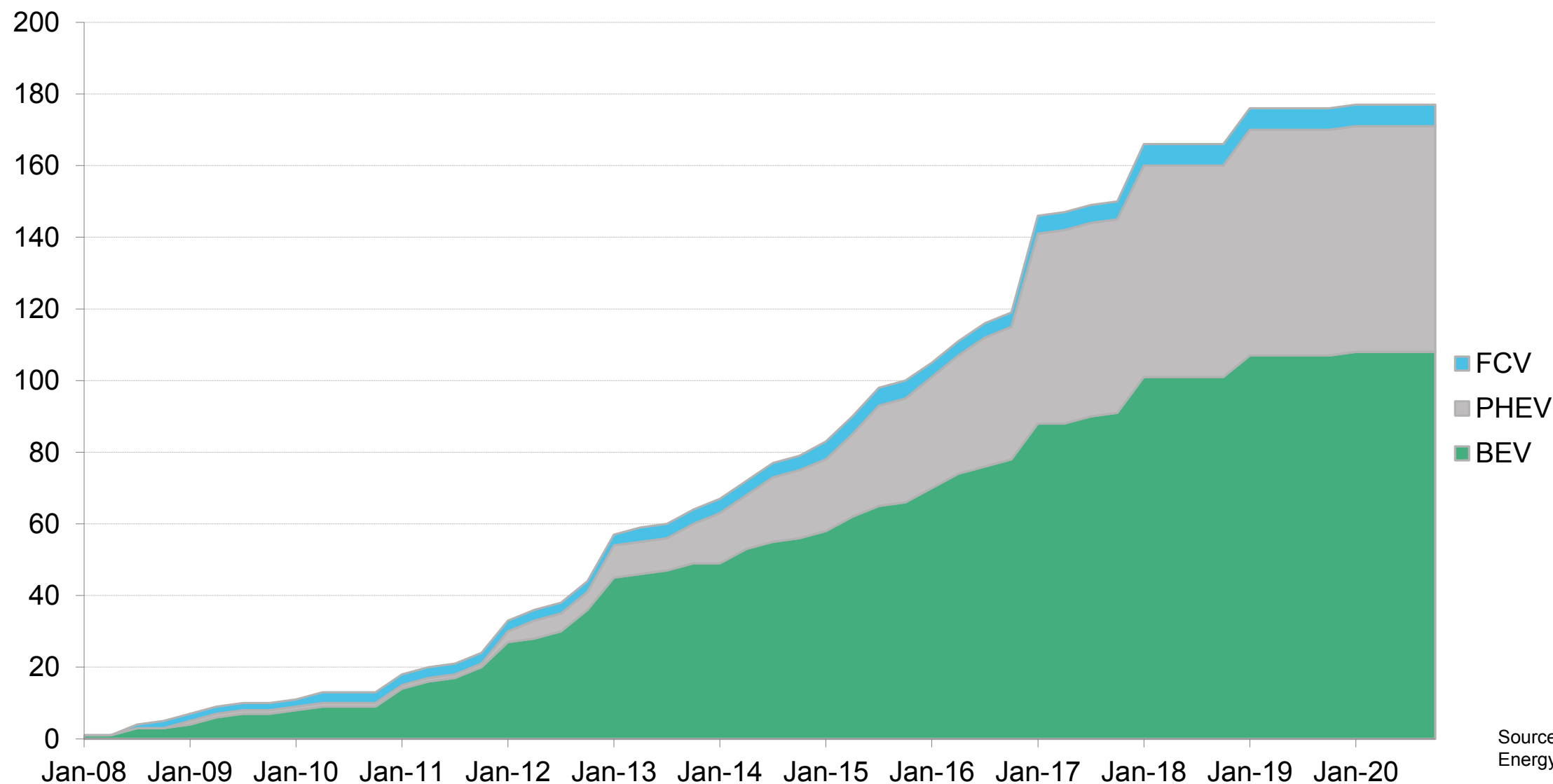
- Falling battery prices
- Purchase subsidies and fuel economy regulations
- New models
- Growing consumer interest/awareness

Note: Plug-in hybrid electric vehicles and battery-electric vehicles; light duty vehicles only. Excluding low-speed vehicles and hybrid electric vehicles without a plug. Battery prices are an average of BEV and PHEV battery packs

Source: Bloomberg New Energy Finance, Marklines

THE NUMBER OF EV MODELS AVAILABLE IS SET TO MORE THAN DOUBLE FROM 2015 TO 2019

Number of models available globally



Source: Bloomberg New Energy Finance

LOCAL POLLUTANTS, NOT GLOBAL ONES



Peer-to-peer car sharing



FlightCar

Peer-to-peer ride sharing

Bla Bla Car

scoop

On-demand ride-hailing

UBER



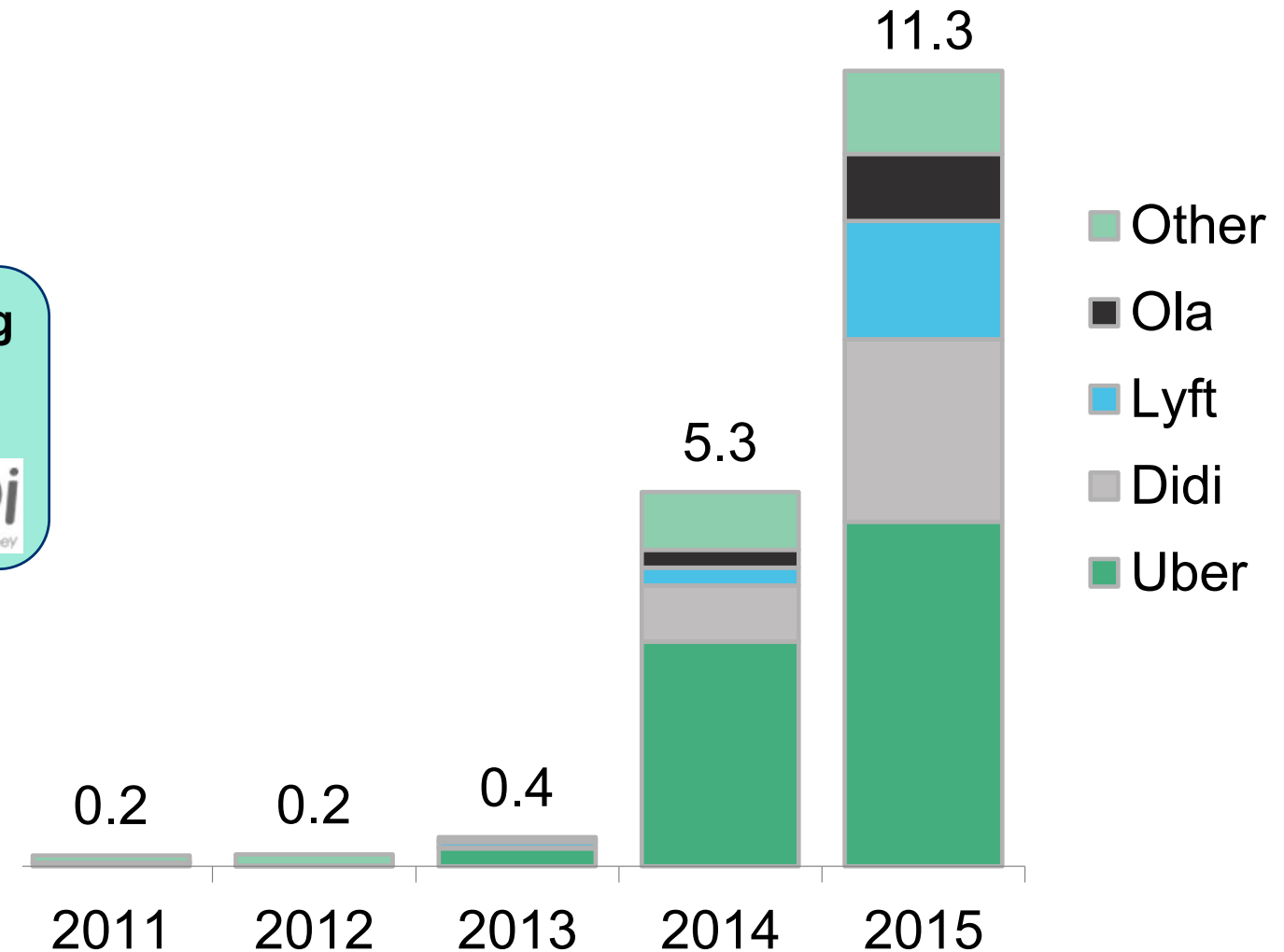
Operator car sharing



康迪 KANDI

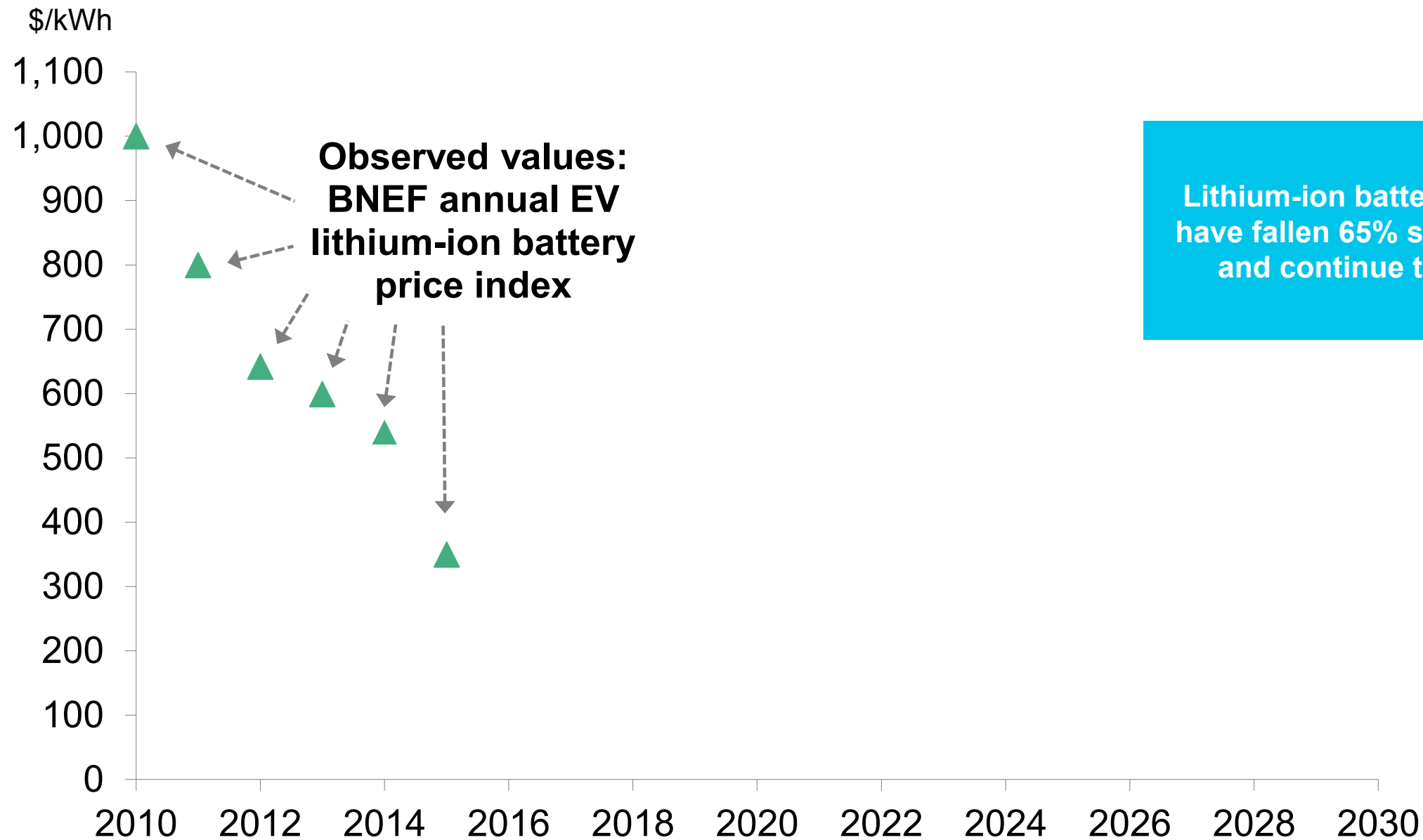


Investments in ride-hailing companies, 2011-15 (\$ billion)



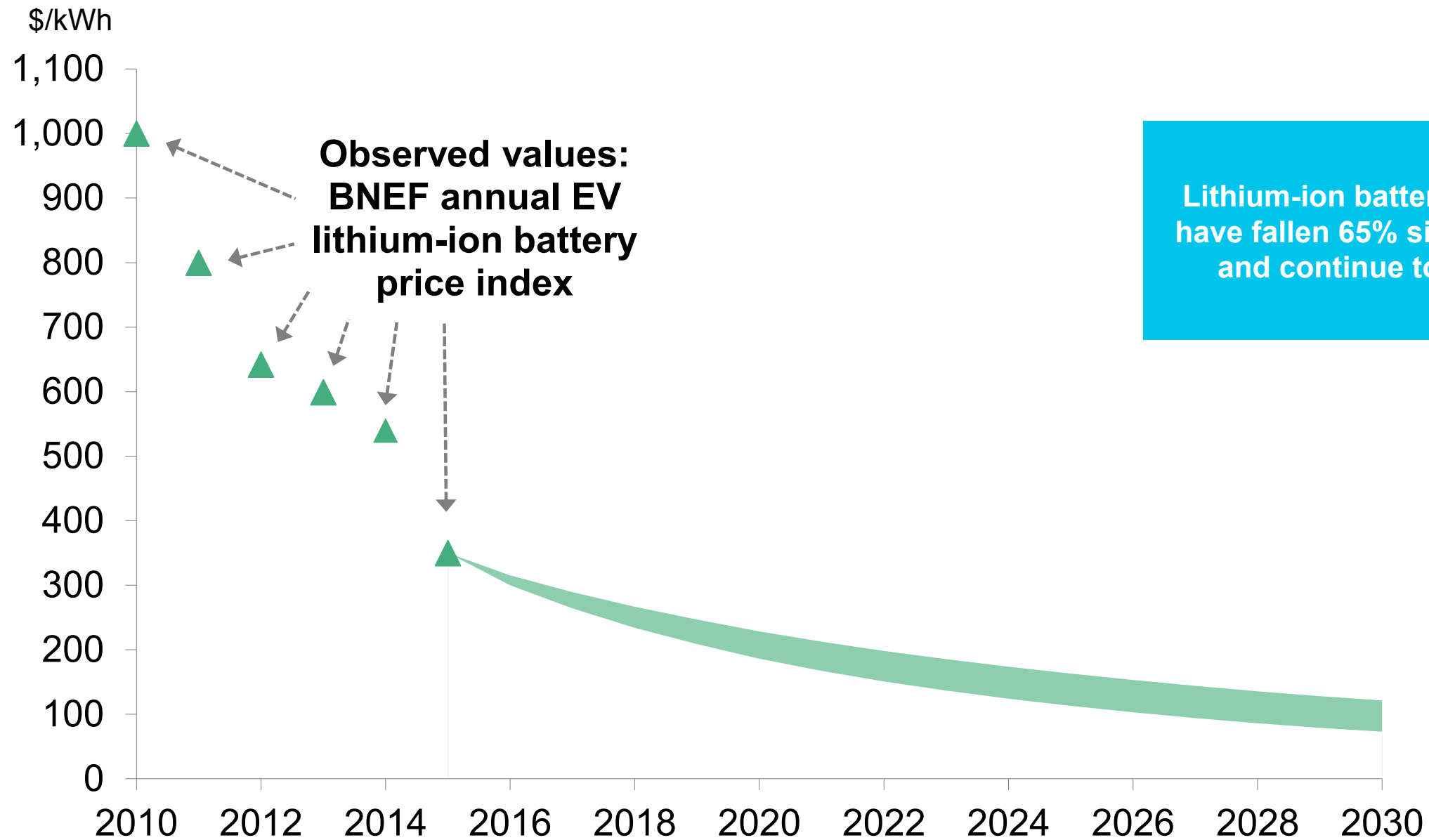
Source: Bloomberg New Energy Finance

EV LITHIUM-ION BATTERY PRICES, 2010-30 (\$/KWH)



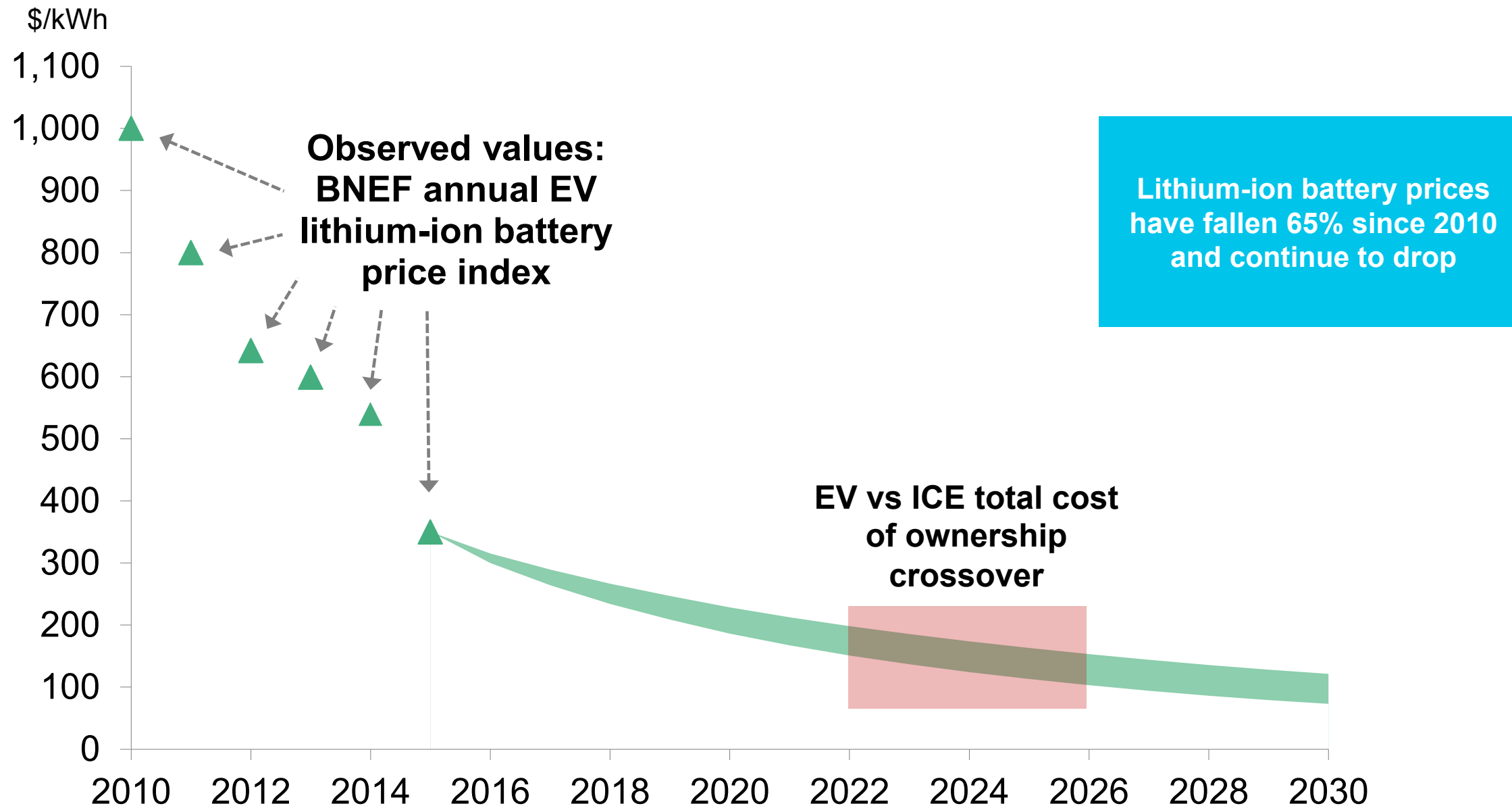
Source: Bloomberg New Energy Finance. Note: values shown are taken from BNEF's annual EV lithium-ion battery price survey. Forecast is based on a learning rate of 14-20%. EV cost parity is calculated on an unsubsidised total cost of ownership (TCO) basis. The date range reflects cross over with different vehicle classes in the US.

EV LITHIUM-ION BATTERY PRICES, 2010-30 (\$/KWH)



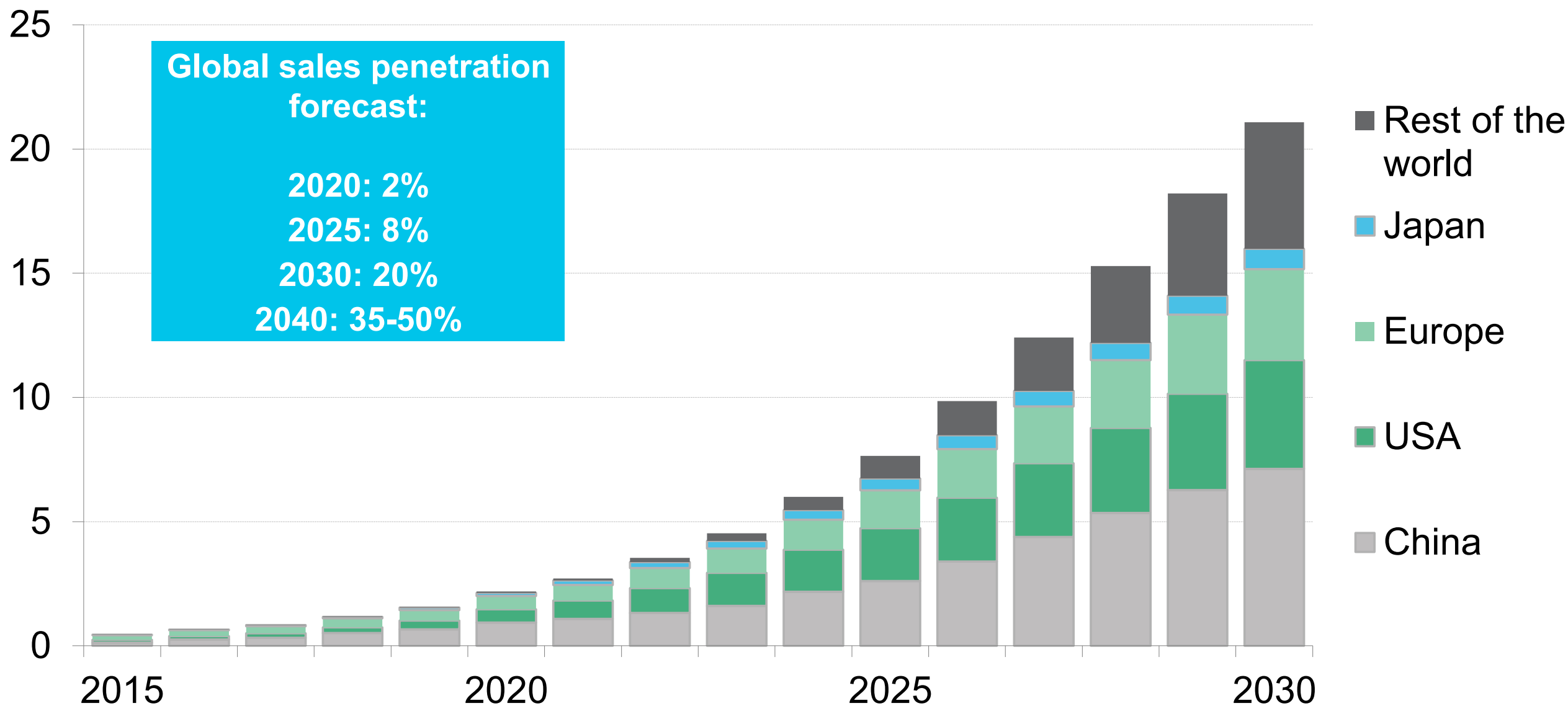
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EV LITHIUM-ION BATTERY PRICES, 2010-30 (\$/KWH)



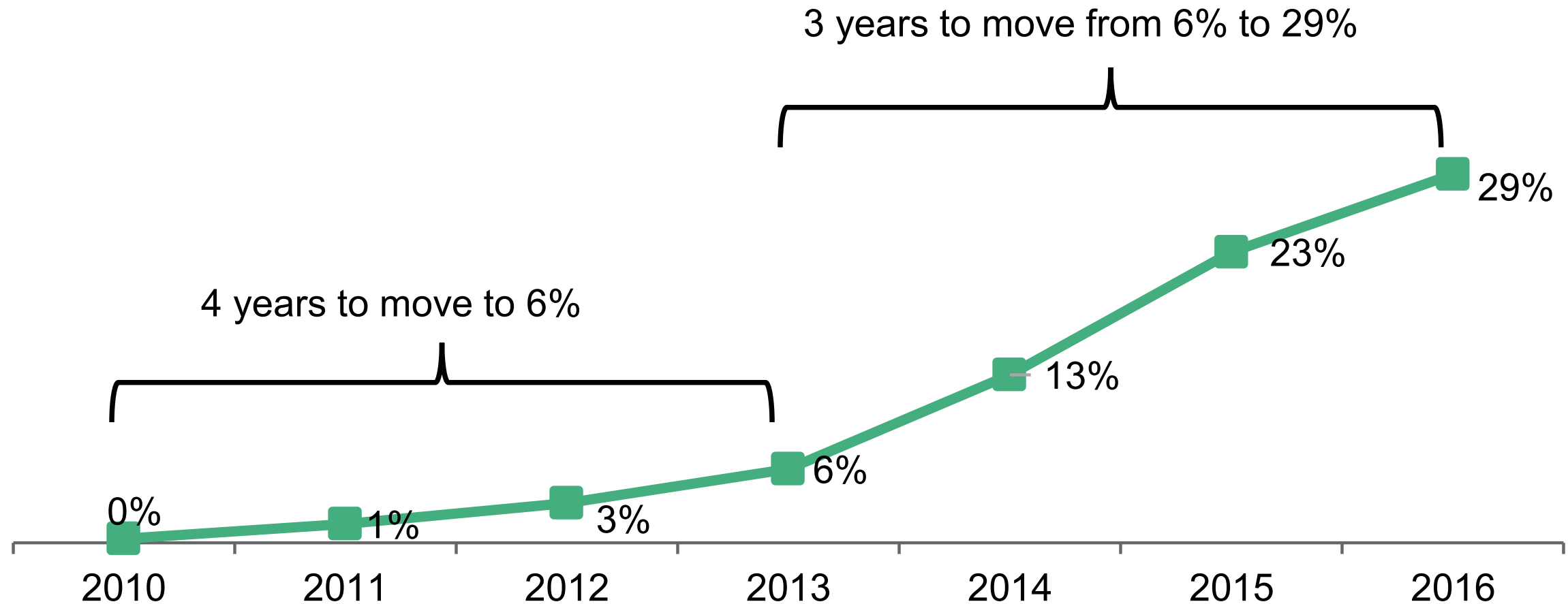
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GLOBAL EV SALES FORECAST BY REGION, 2015-30 (MILLIONS OF EVS SOLD PER YEAR)



Source: Bloomberg New Energy Finance. Note: forecast uses Gasoline and electricity prices from EIA's 2015 Annual Energy Outlook 'Low Oil Price' scenario (ranging from \$50 to \$65 per barrel between 2015 and 2025).

Norway % EV penetration rates in total new car sales, 2010 – H1 2016 (%)

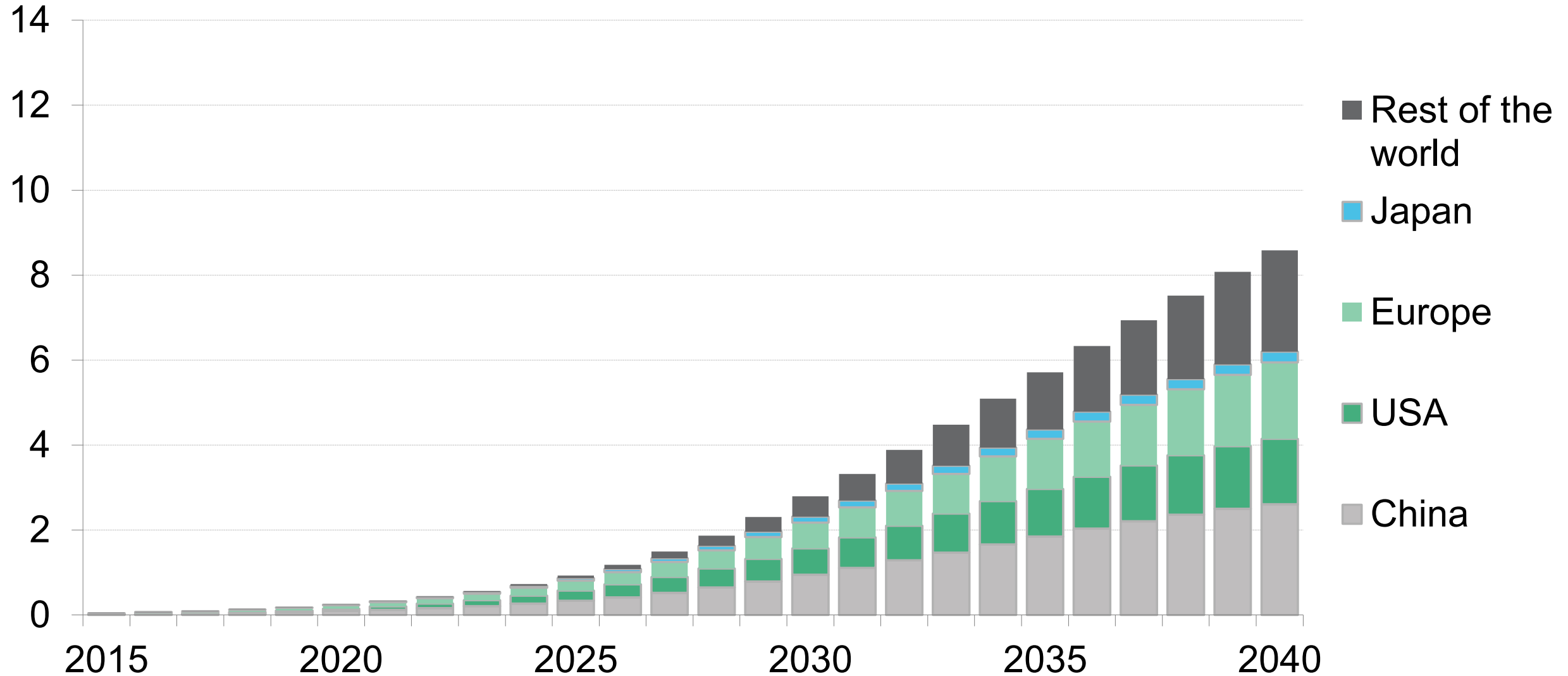


Source: Bloomberg New Energy Finance, Marklines. Note: BEV + PHEV included in EV total

CRUDE OIL DISPLACEMENT FROM EV SALES

2015-40 – CONSERVATIVE CASE (MILLION BARRELS PER DAY)

M barrels per day

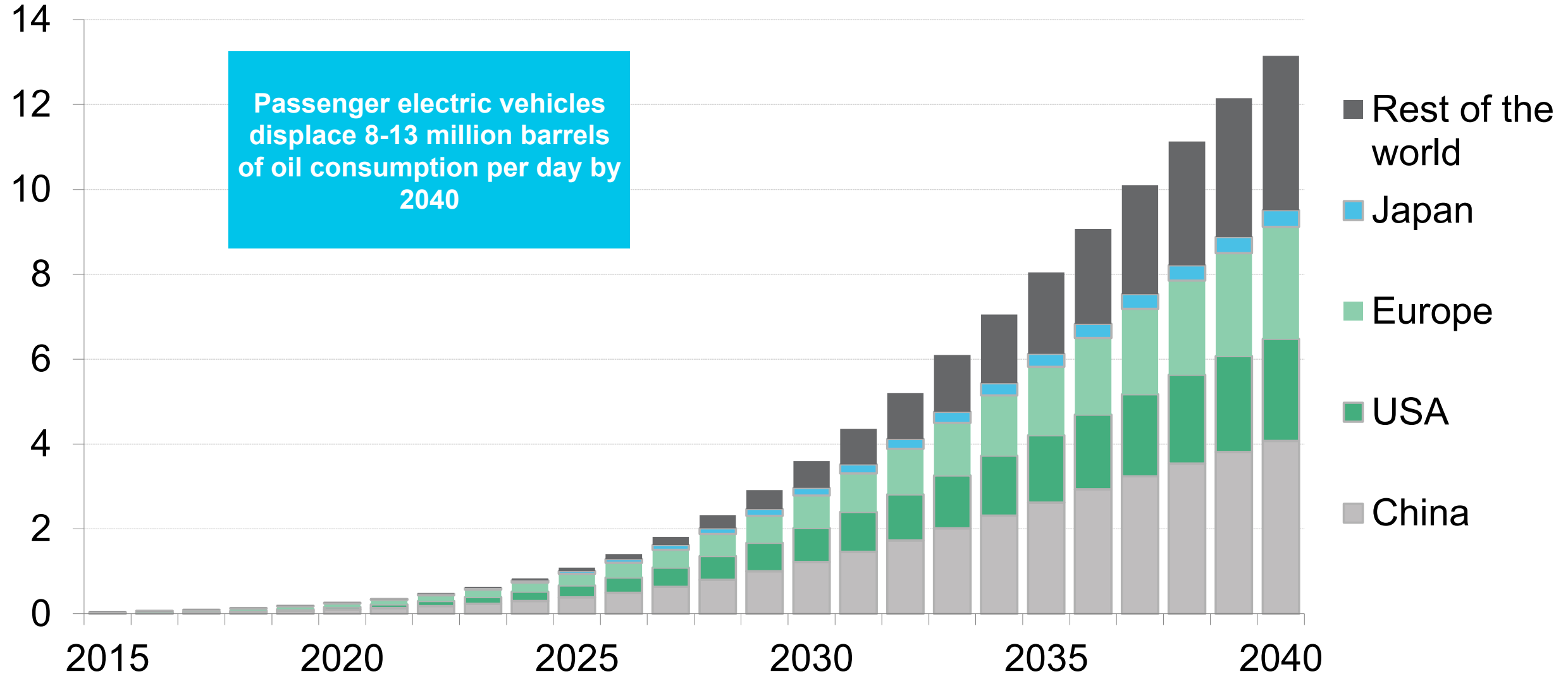


Note: Main assumptions: Passenger vehicles only. Average vehicle life: 14 years, fuel economy of average replaced vehicle in 2040: 45 miles per gallon, 2040 average vehicle distance travelled: 13,400 miles. **Source:** Bloomberg New Energy Finance

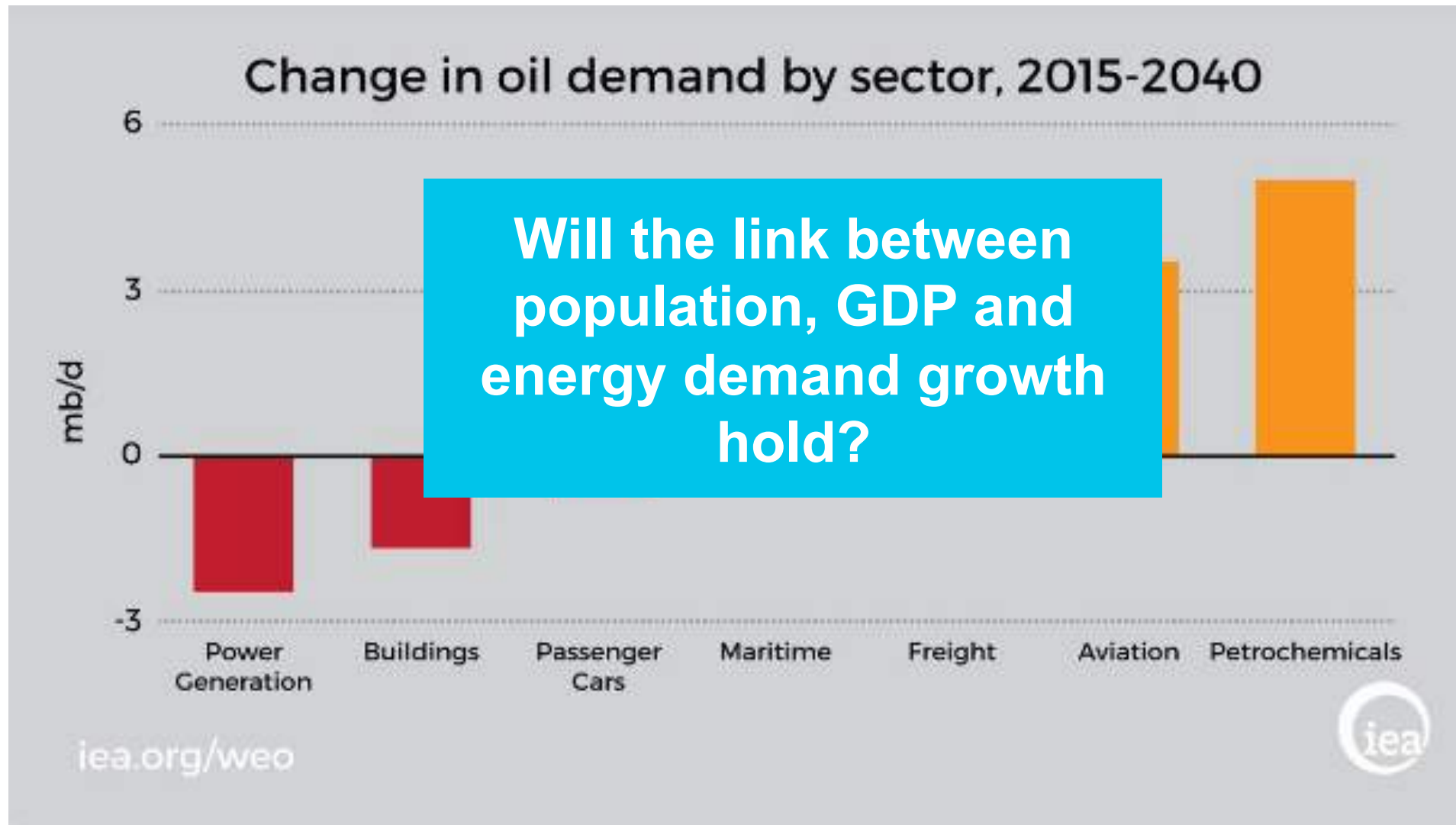
CRUDE OIL DISPLACEMENT FROM EV SALES

2015-40 – AGGRESSIVE CASE (MILLION BARRELS PER DAY)

M barrels per day

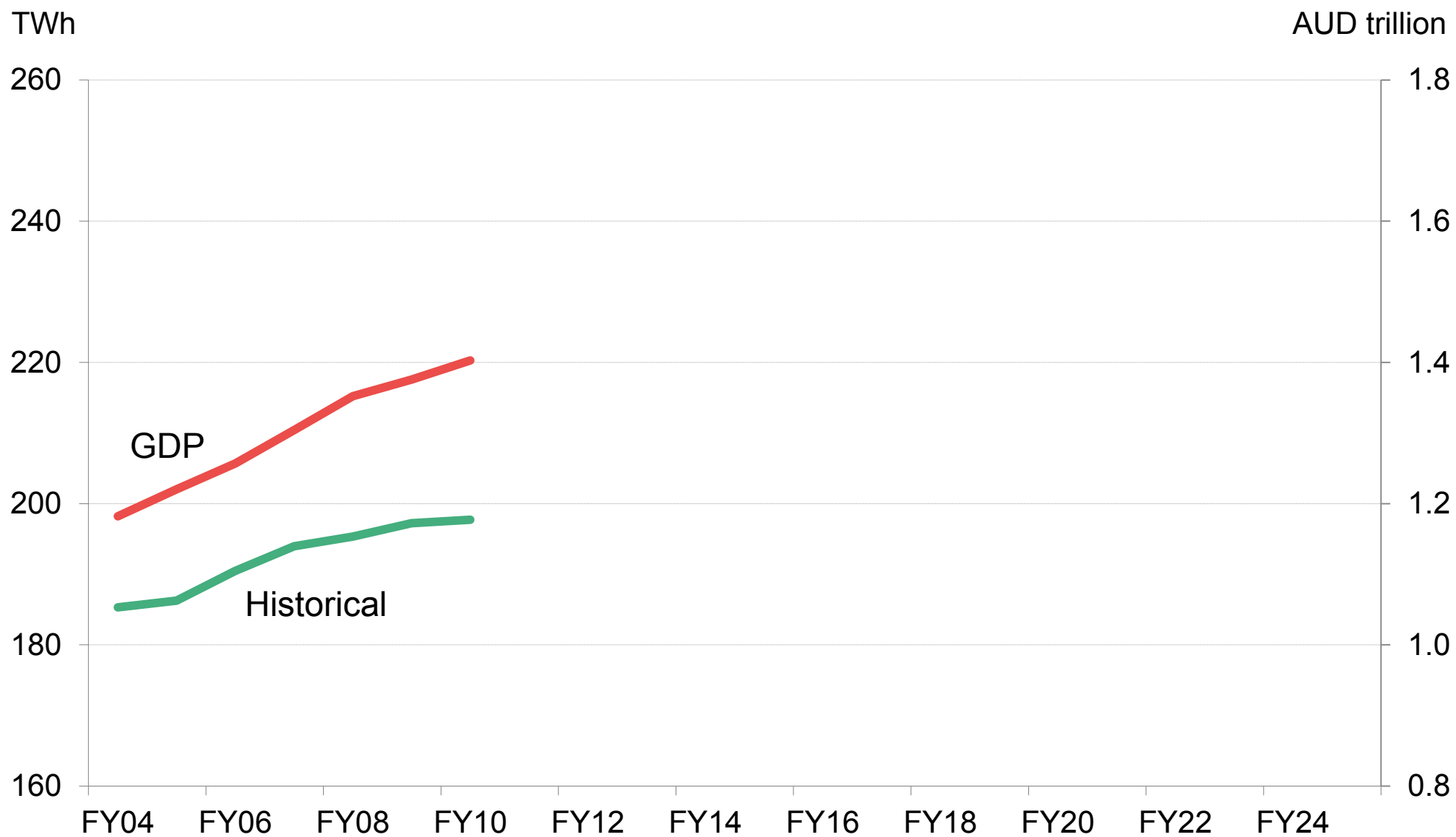


Note: Main assumptions: Passenger vehicles only. Average vehicle life: 14 years, fuel economy of average replaced vehicle in 2040: 45 miles per gallon, 2040 average vehicle distance travelled: 22,600 miles. **Source:** Bloomberg New Energy Finance



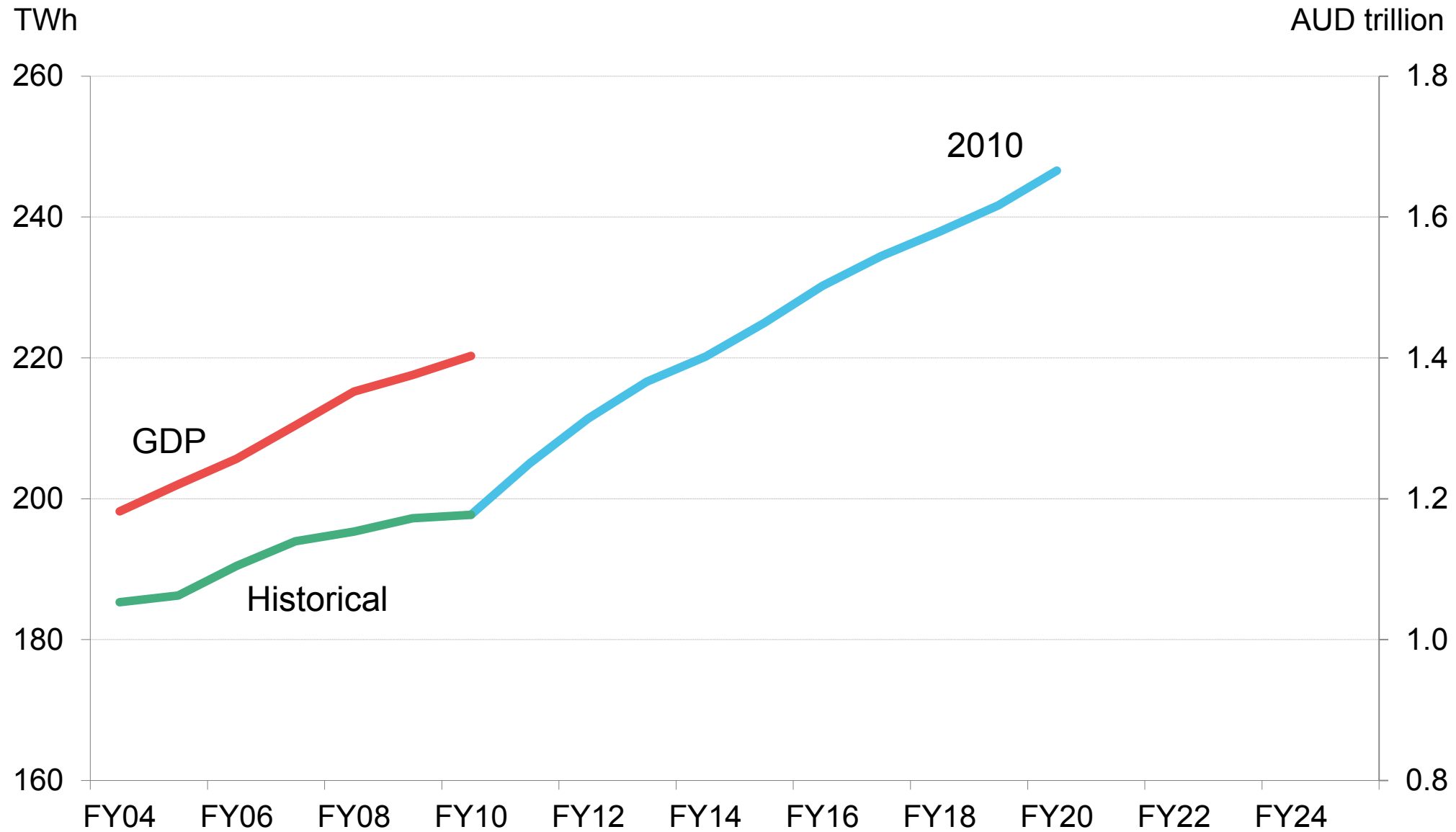
Source: IEA World Energy Outlook 2016.

AUSTRALIA NATIONAL ELECTRICITY MARKET ACTUAL VS FORECAST ELECTRICITY DEMAND



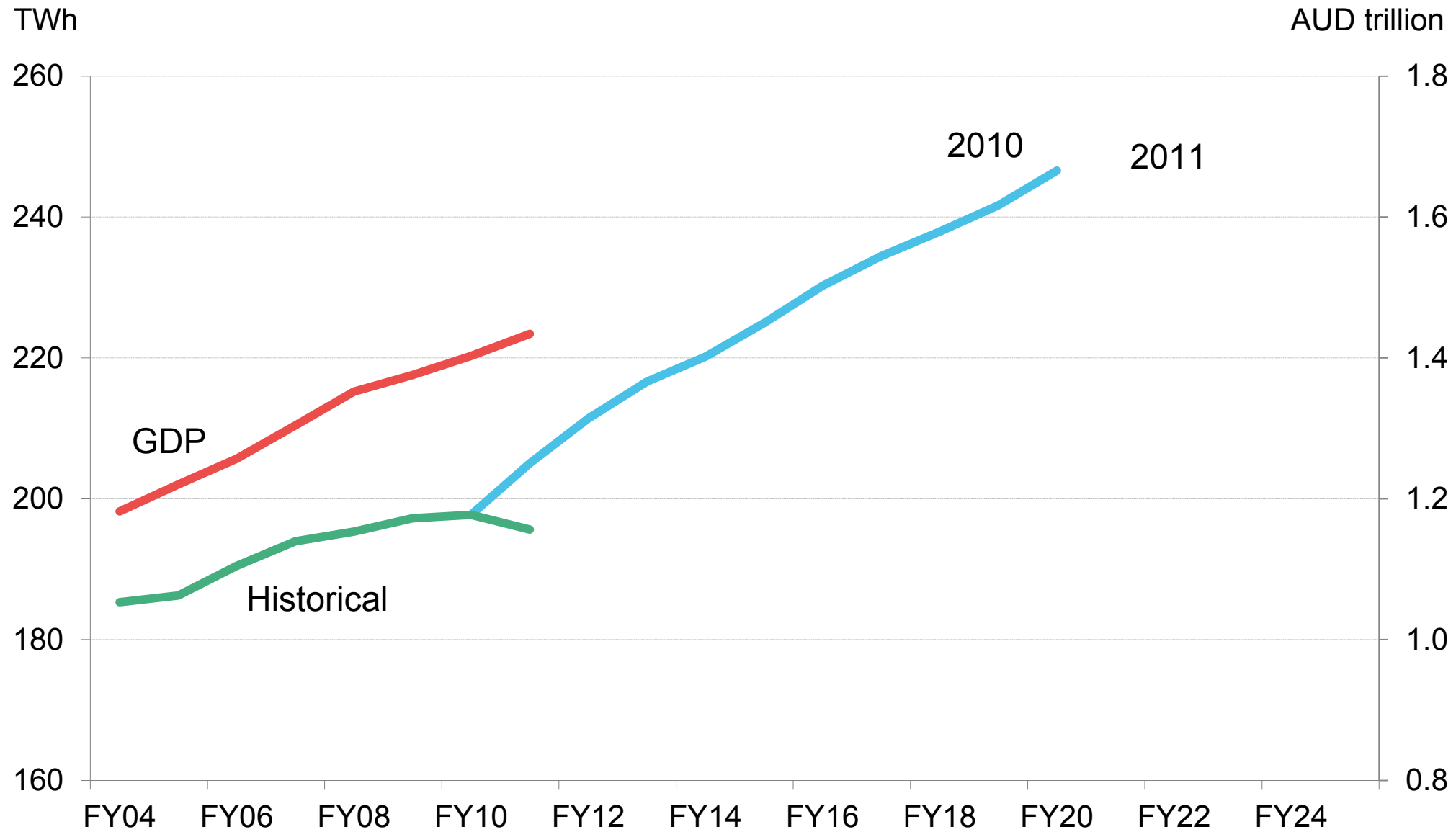
Source: Australian Energy Market Operator, Reserve Bank of Australia, Bloomberg New Energy Finance

AUSTRALIA NATIONAL ELECTRICITY MARKET ACTUAL VS FORECAST ELECTRICITY DEMAND



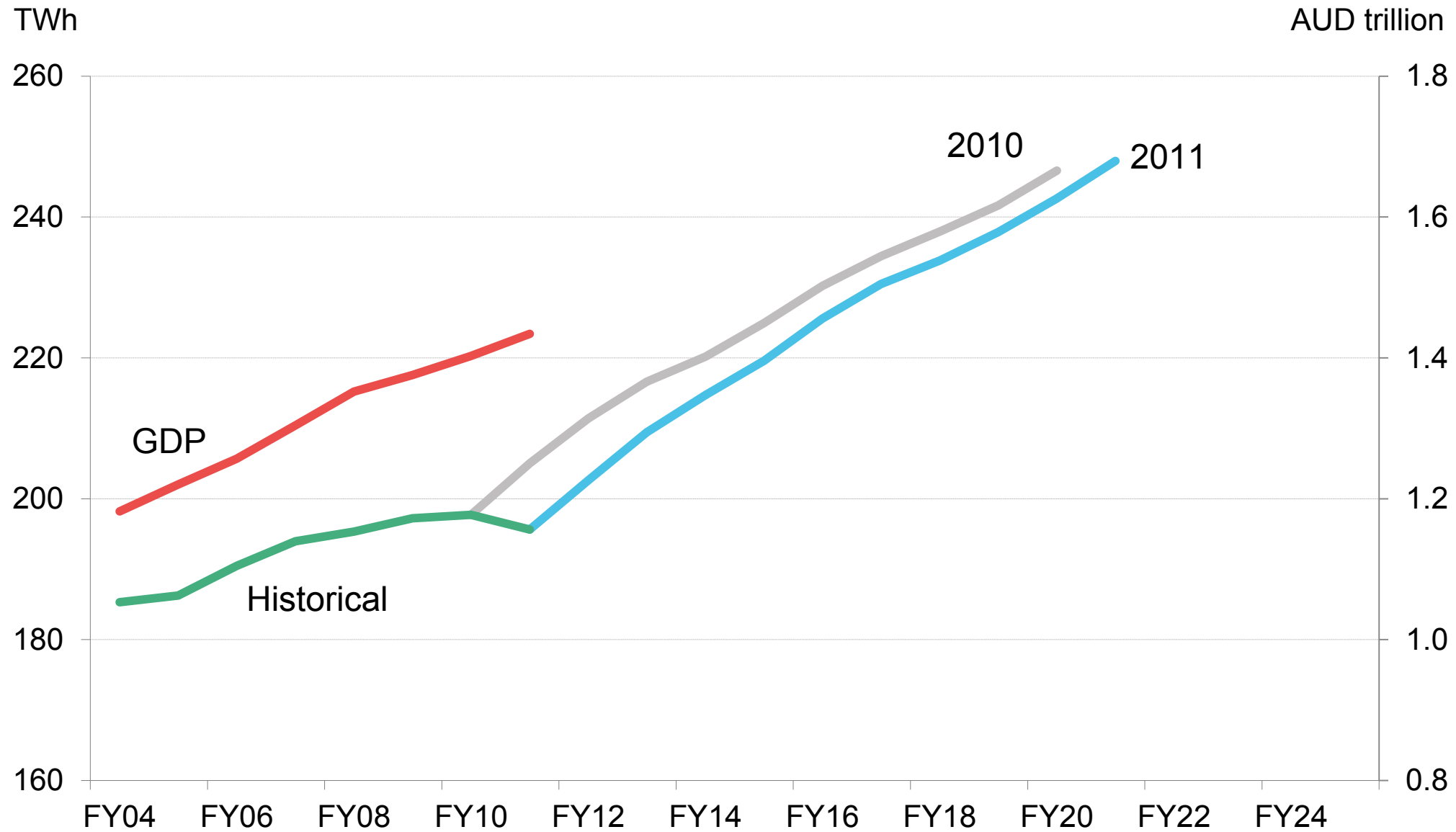
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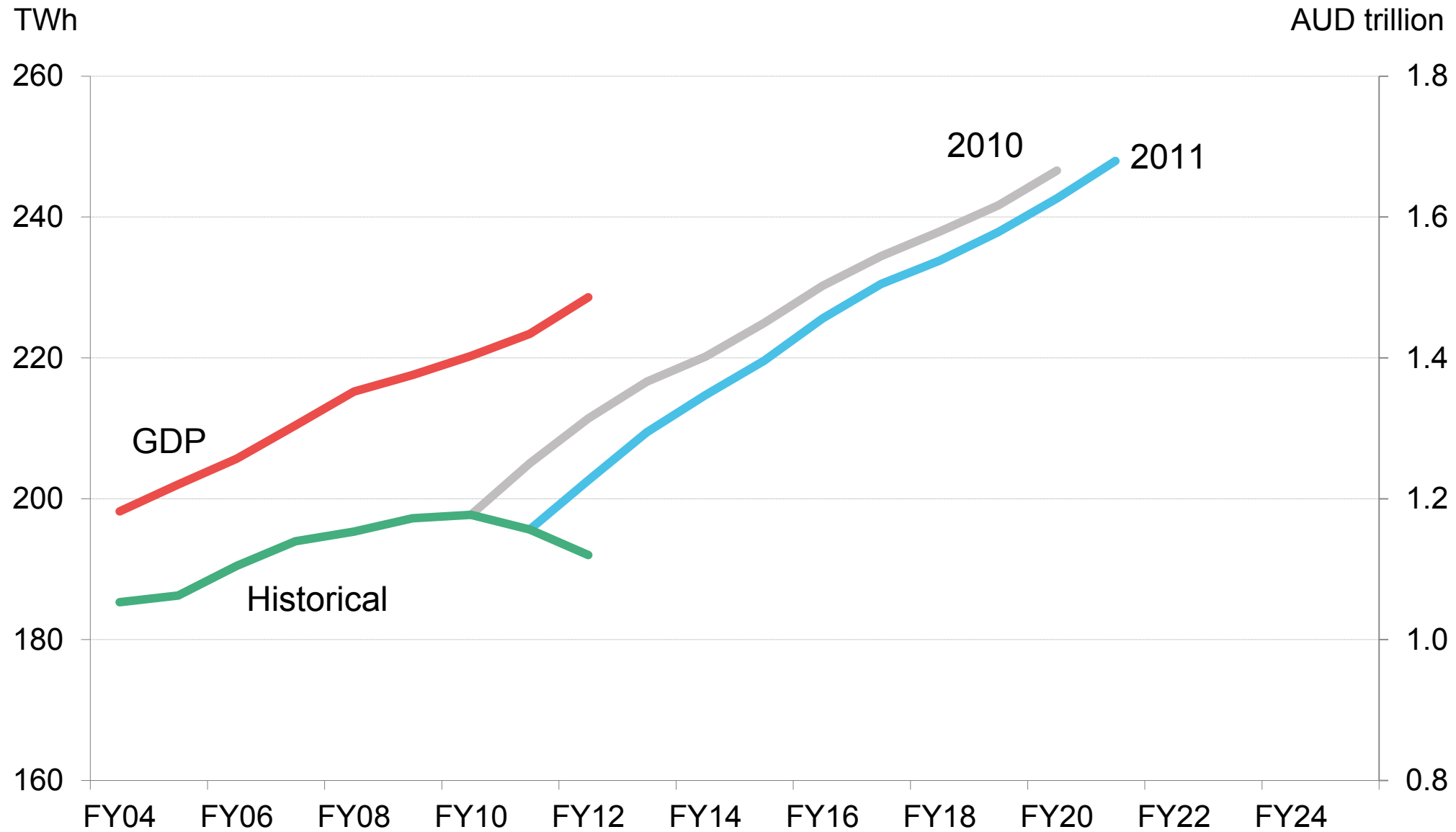
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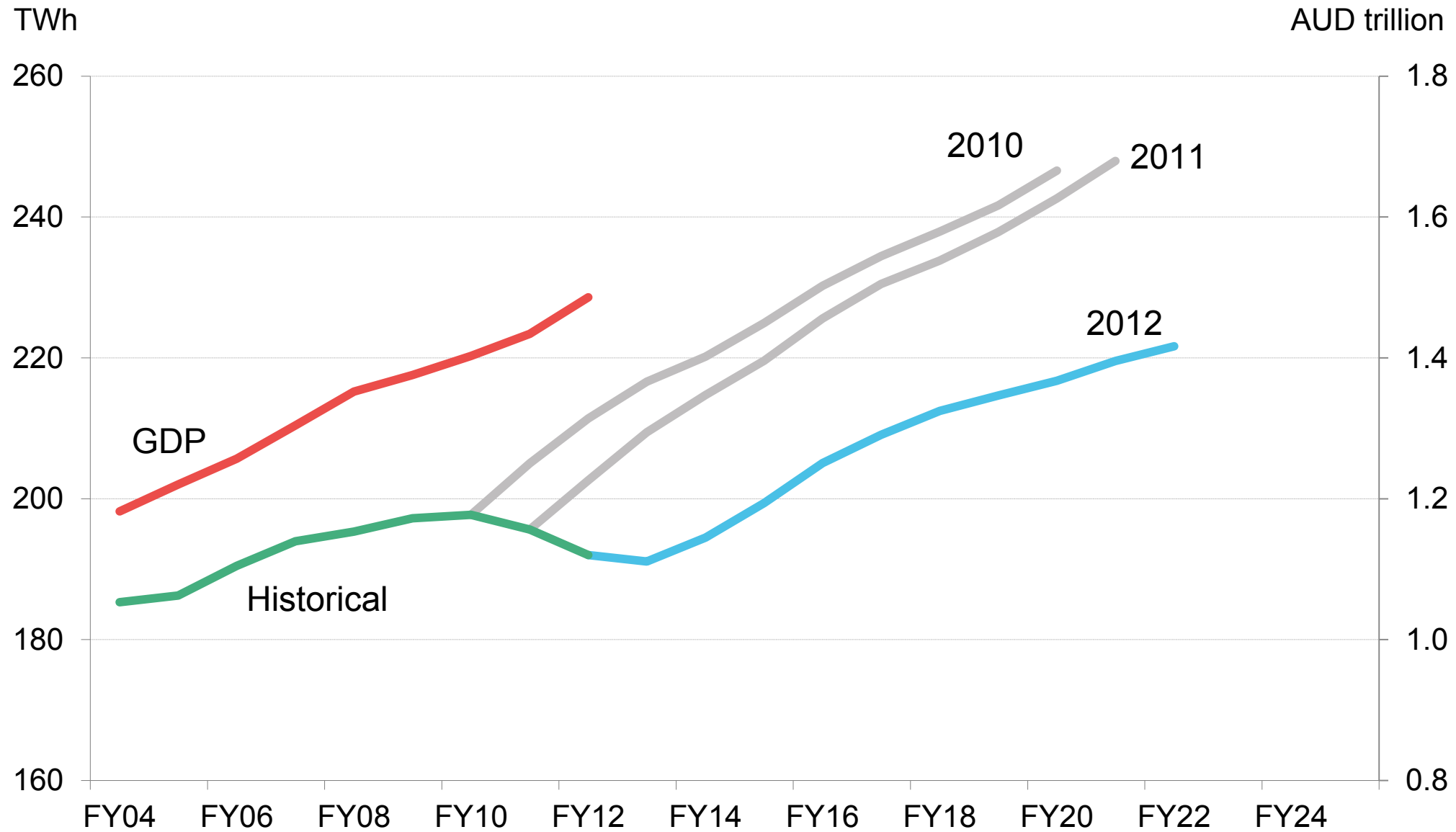
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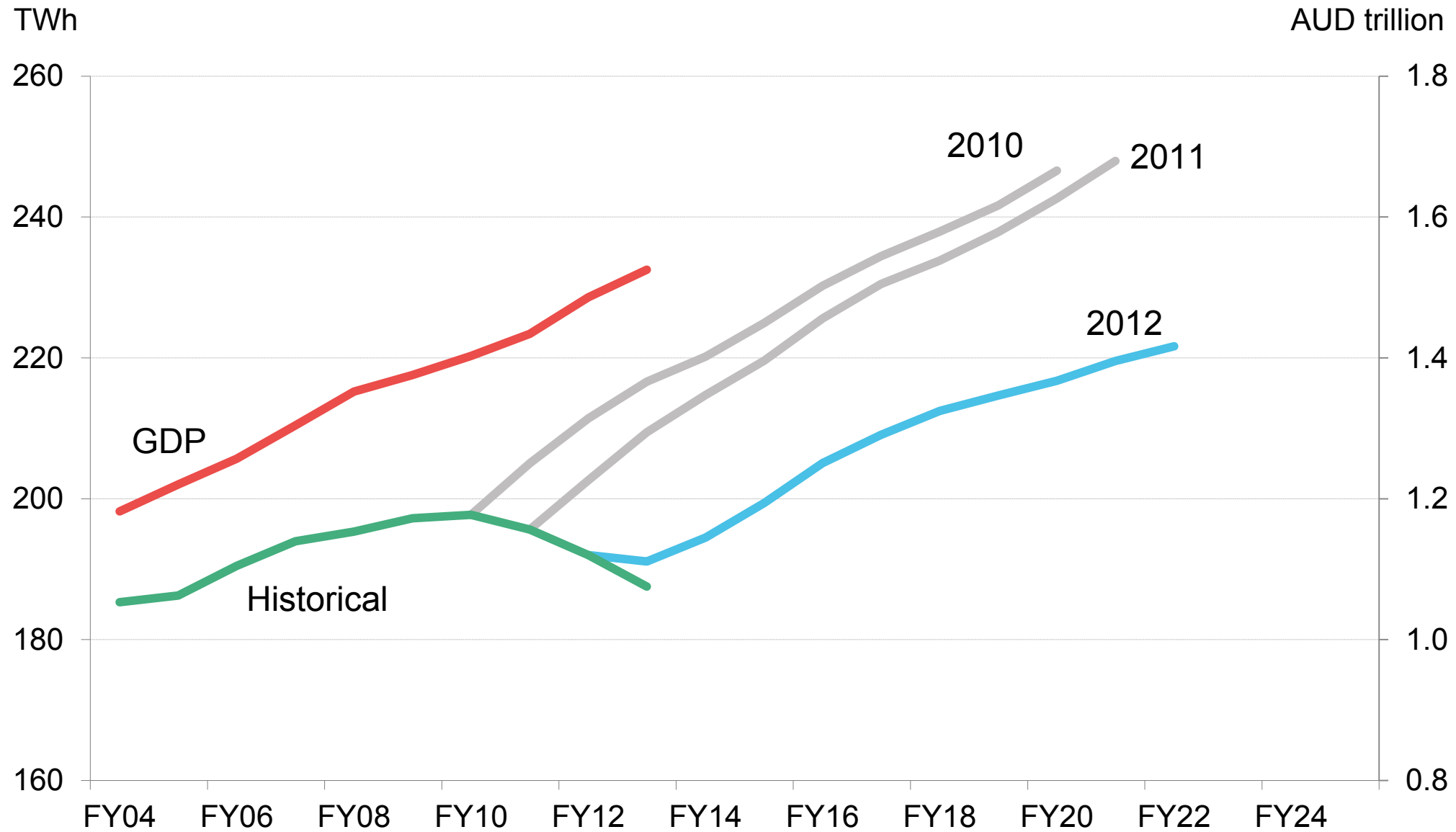
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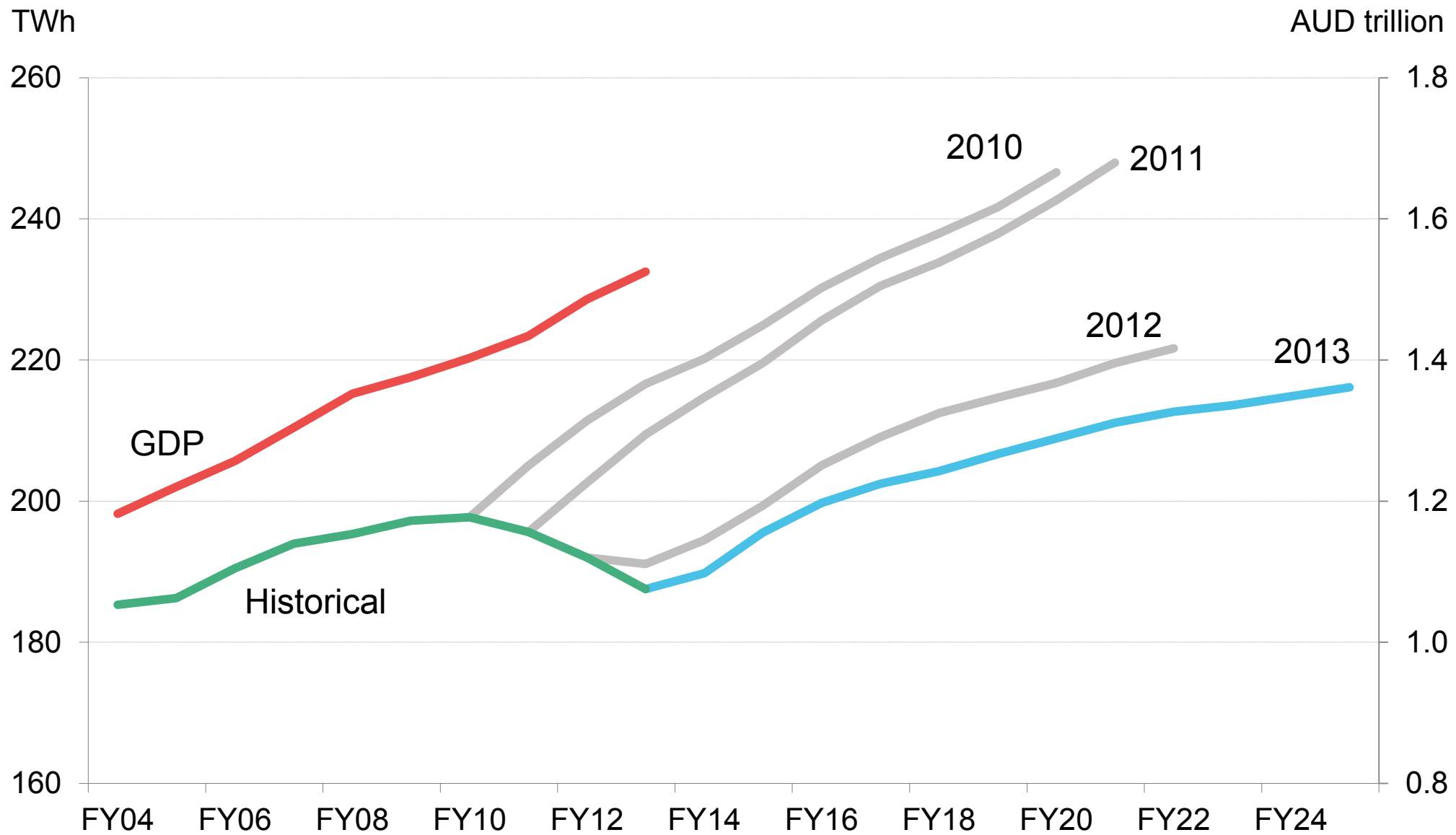
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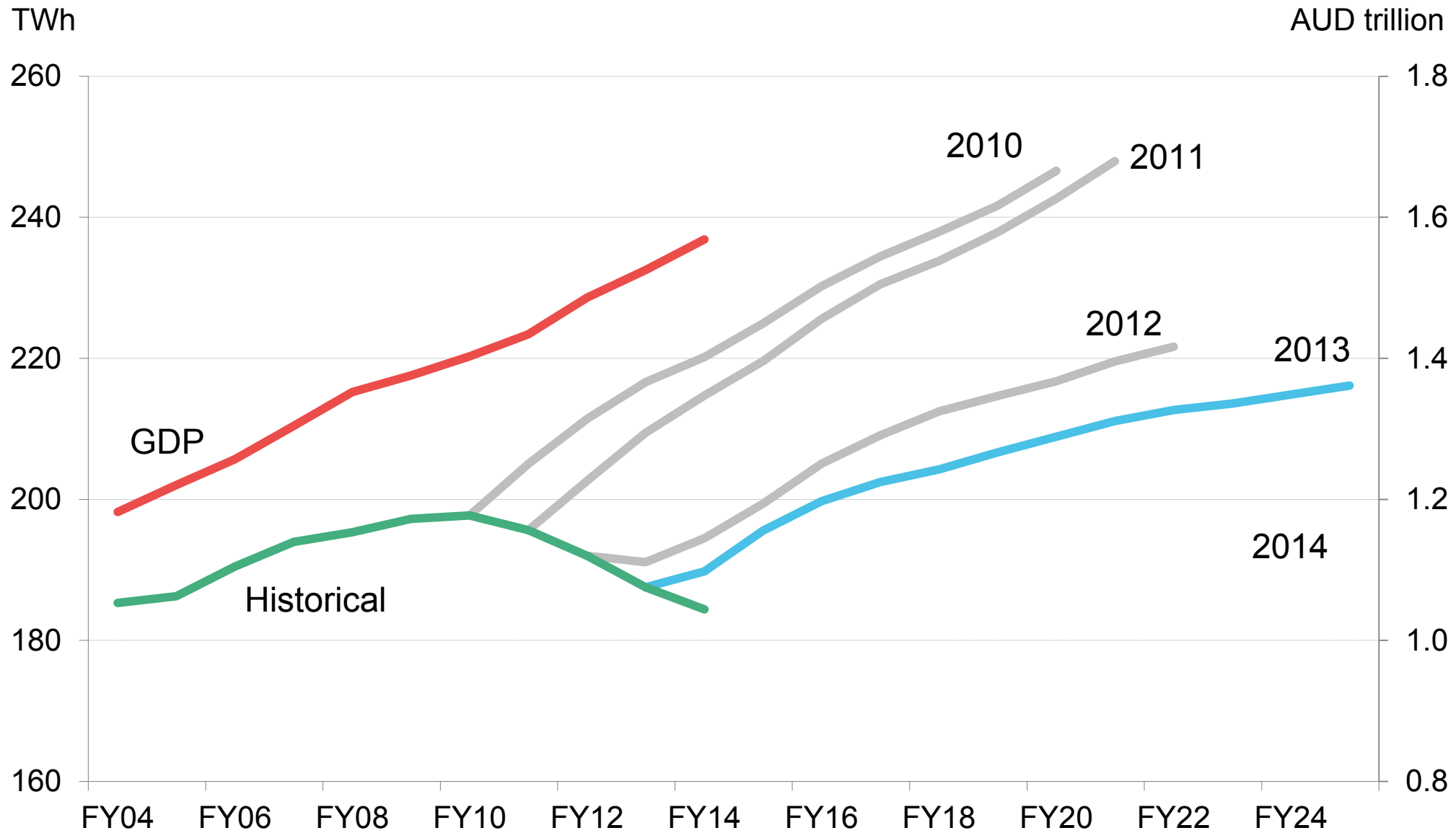
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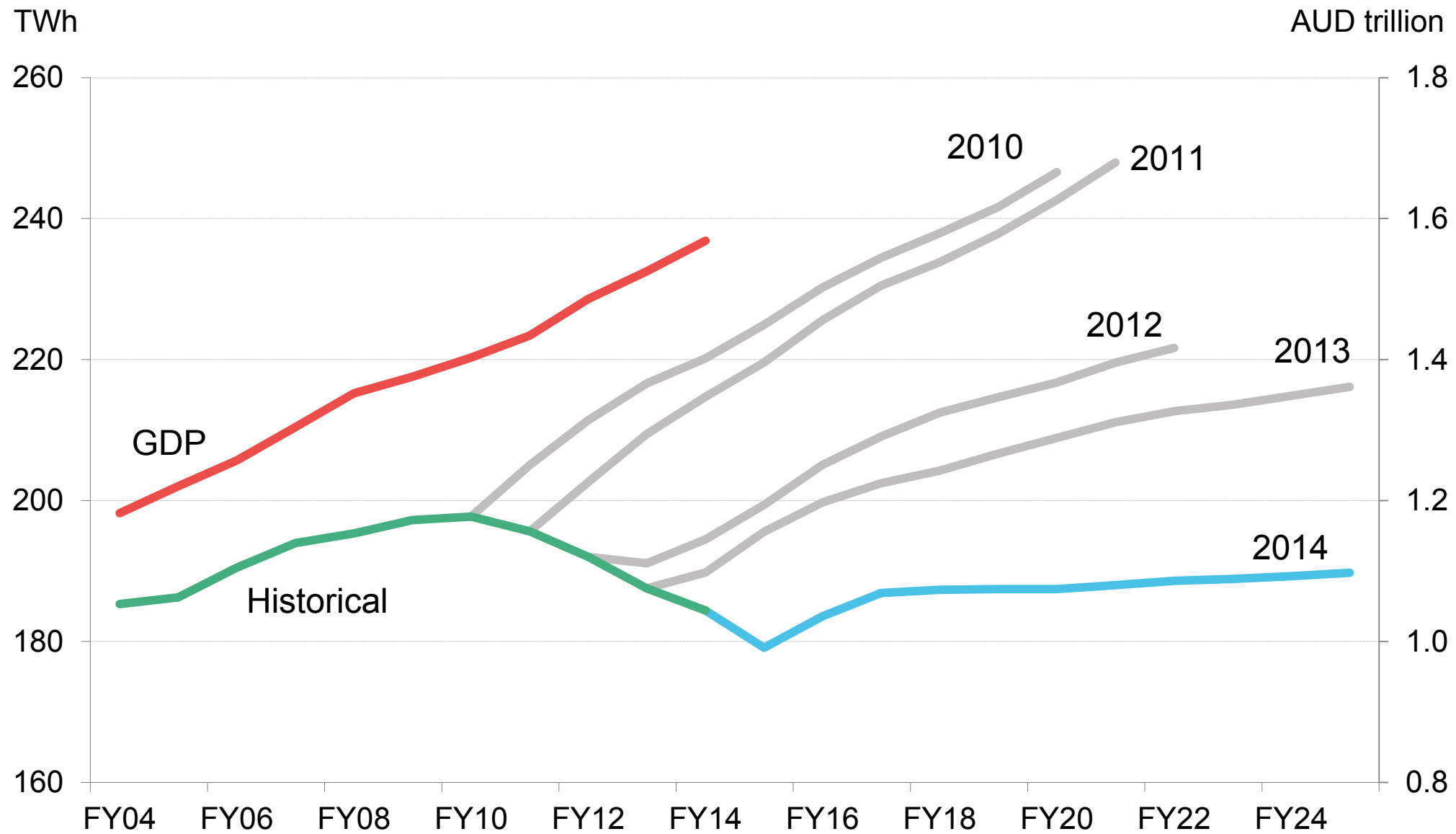
Source: Australian Energy Market Operator, Reserve Bank of Australia, Bloomberg New Energy Finance

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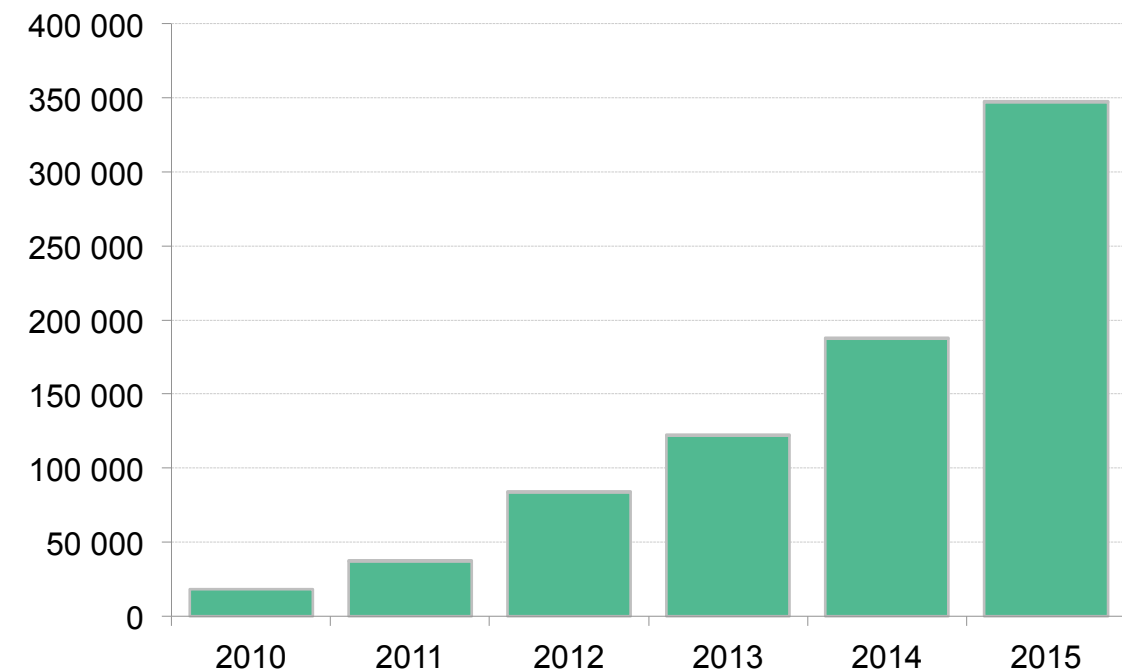


Source: Australian Energy Market Operator, Reserve Bank of Australia, Bloomberg New Energy Finance



CHINA'S LOW SPEED EV MARKET SHANDONG PROVINCE EXAMPLE

- Typically two-seater
- Top speed: 60km/h
- Cost: \$5,000-7,000
- Unsubsidized, unregulated and growing very rapidly
- Template for emerging economies?



Source: Shandong Motor Vehicle Industrial Bureau,
Bloomberg New Energy Finance, Mitsubishi

Thanks!

MARKETS

Renewable Energy
Energy Smart Technologies
Advanced Transport
Gas
Carbon and RECs

SERVICES

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Asia Pacific Service
EMEA Service
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Events and Workshops

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change in the energy system

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