

The Outlook for Electric Vehicle Sales Under the IRA: Implications for Auto Financing

FIFTH BIENNIAL CONFERENCE ON AUTO LENDING
12 JULY 2023

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*The views expressed here do not necessarily reflect the views of the
Federal Reserve Bank of Chicago or the Federal Reserve System.*



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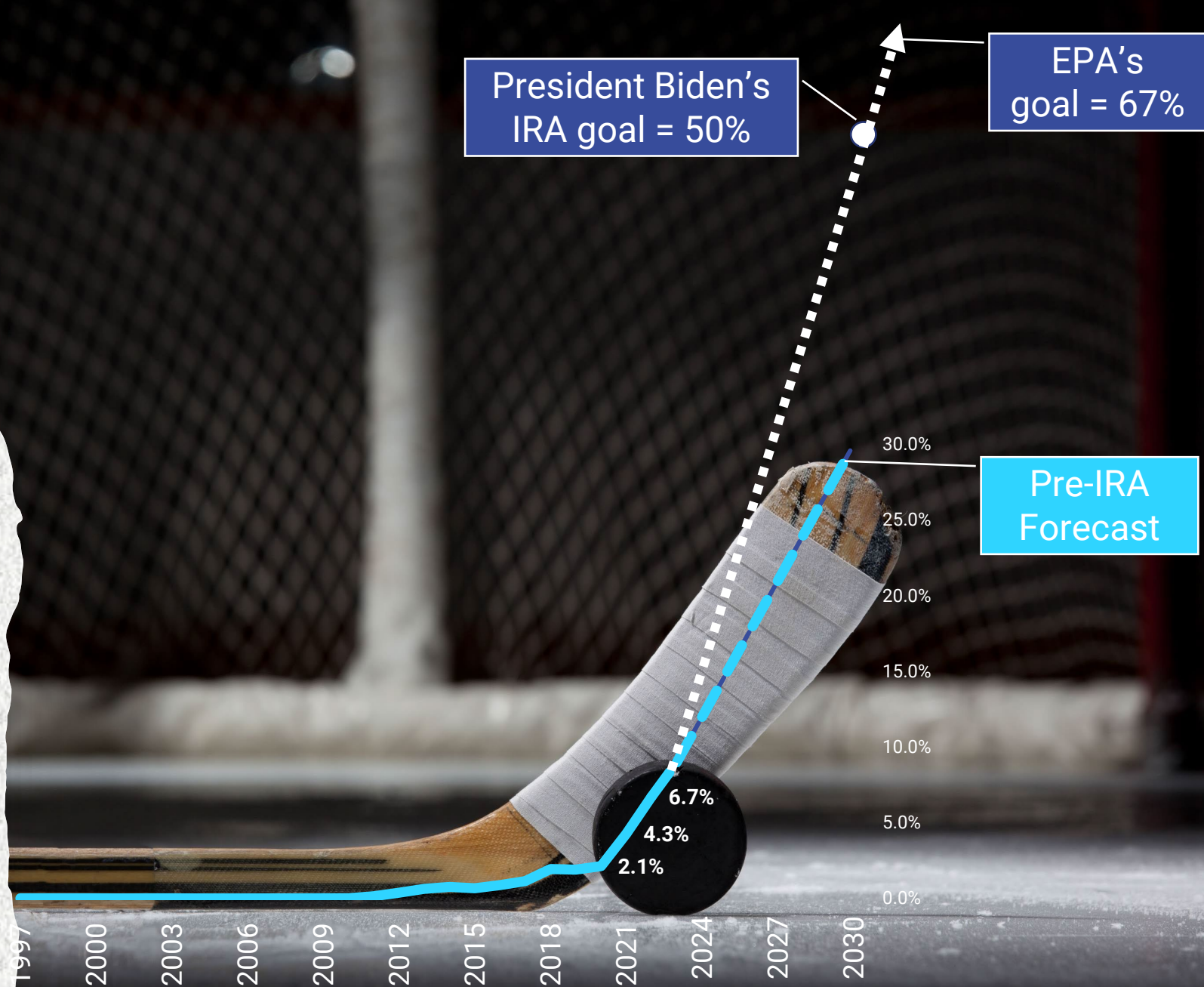


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TRENDS

2021:
The “Hockey Stick
Moment” for Electric
Vehicles in U.S.

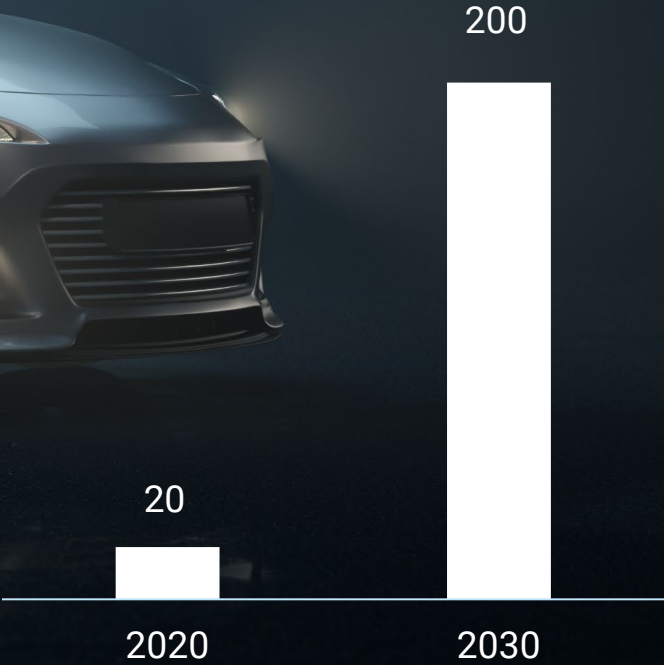


Battery Electric, Plug-in Hybrid, & Fuel Cell, Share of U.S. Sales

Source: Wards Informa

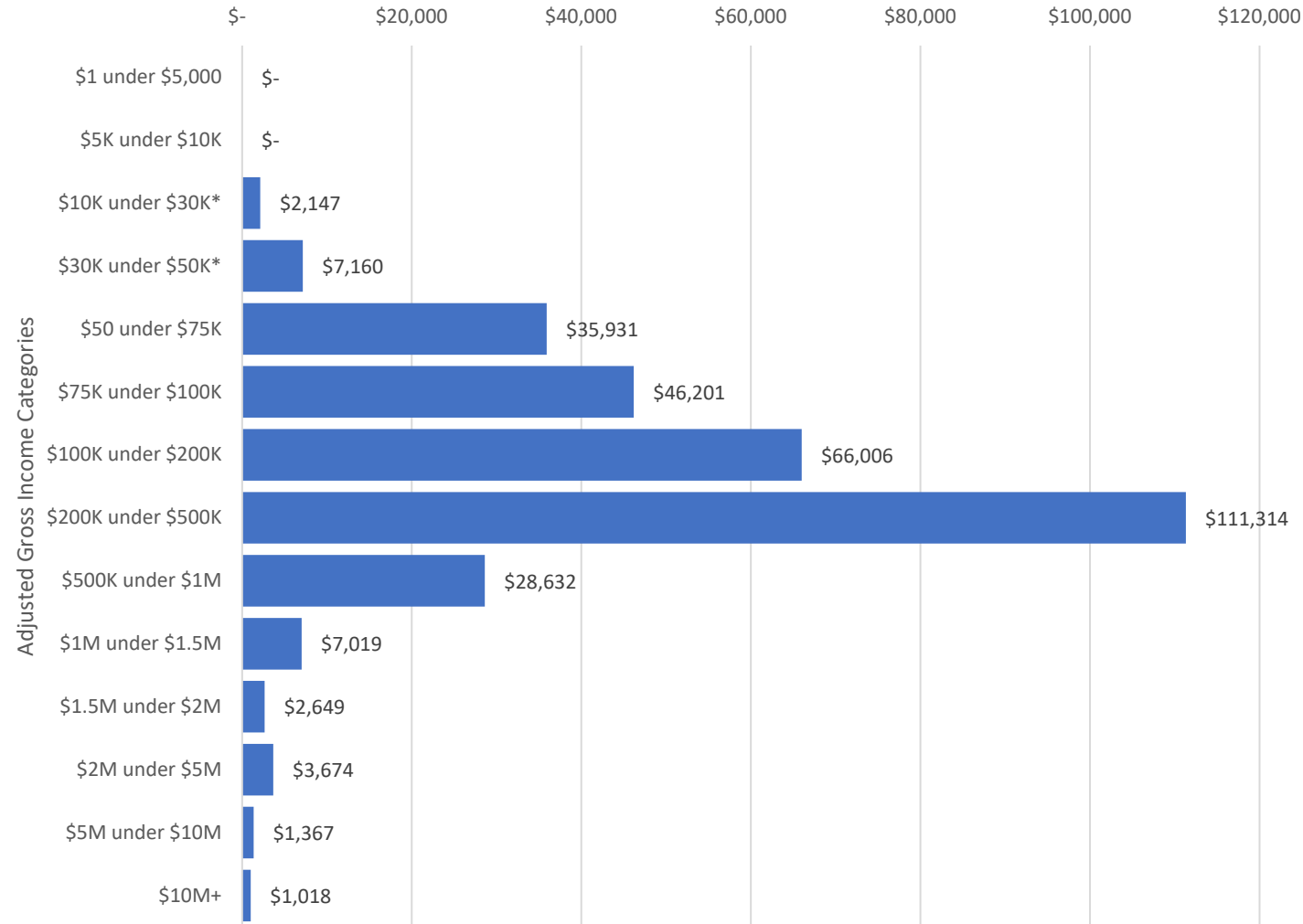
TRENDS

Forecast Increase in Number of EV/PHEV/FCEV Models Produced in North America



Source: Federal Reserve Bank of Chicago analysis of S&P Global Mobility global light vehicle production forecast, December 2022

Distribution of 2020 Qualified EV Tax Credits by AGI (2021 Filing Year, Individual Returns, \$ thousands)



POLICY

70% of 2020
30D tax credits
went to filers with
\$100K+ AGI

Source: IRS Statistics of Income, [All Returns Tax Credits by AGI](#)

* Categories combined due to data disclosure

GM & Tesla had already reached the program cap (200K vehicles) in 2018 & 2019

INFLATION REDUCTION ACT

The IRA has many aspects

Climate Change

Prescription Drug Prices

Corporate Taxes & Tax Enforcement

Clean Energy Manufacturing

Clean Vehicle Incentives*

* BEV, PHEV, FCEV

INFLATION REDUCTION ACT

IRA incentives are
an alphabet soup of
IRS tax code sections
& government programs

30D

New Retail Clean
Vehicle Tax Credits

45W

Commercial Clean
Vehicle Tax Credits

25E

Used Retail Clean
Vehicle Tax Credits



45X

Manufacturing
Tax Credits

48C

Advanced Energy
Project Credit

ATVM

Advanced Vehicle
Technology Program

DMCG*

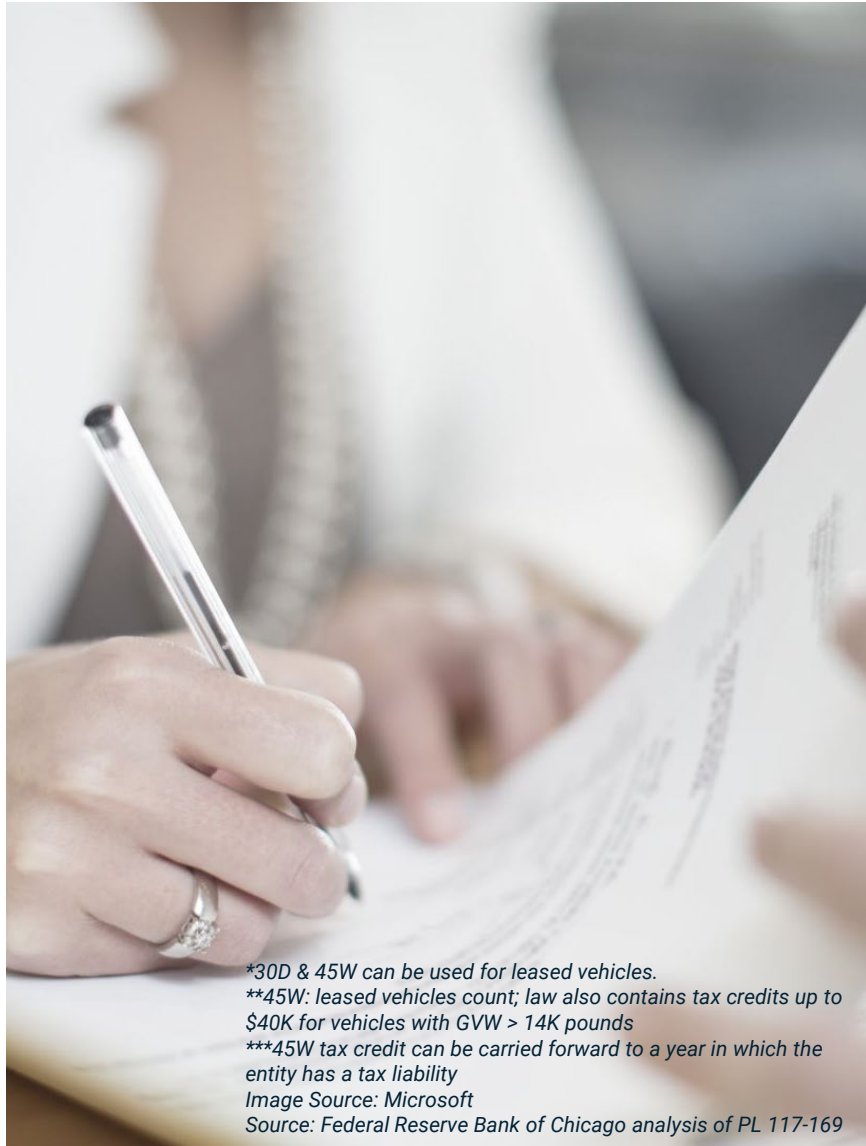
Domestic Manufacturing
Conversion Grants



** I don't think anyone uses this acronym*

INFLATION REDUCTION ACT

Comparing 30D, 45W, & 25E



*30D & 45W can be used for leased vehicles.
 **45W: leased vehicles count; law also contains tax credits up to \$40K for vehicles with GVW > 14K pounds
 ***45W tax credit can be carried forward to a year in which the entity has a tax liability
 Image Source: Microsoft
 Source: Federal Reserve Bank of Chicago analysis of PL 117-169

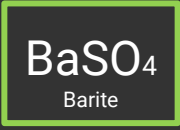
Requirement	30D New Clean Vehicle Credit (up to \$7,500)*	45W Commercial Clean Vehicle Credit (<14K) (up to \$7,500*,**)	25E Used Clean Vehicle Credit (up to \$4,000 or 30% price)
Qualified manufacturer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Clean Air Act compliant vehicle	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GVW < 14K pounds	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Battery >= 7 kWh	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Purchaser must have tax liability	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> ***	<input checked="" type="checkbox"/>
Vehicle must be sold by a dealer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Not for resale	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Original use	<input checked="" type="checkbox"/>		
Assembled in North America	<input checked="" type="checkbox"/>		
Price caps (30D: MSRP \$55K cars, \$80K others; 25E: Transaction price \$25K)	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Modified Adjusted Gross Income Caps (30D: \$300K Married/\$225K Head of Household/\$150K Single; 25E: half of 30D \$150K/\$112.5K/\$75K)	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
\$3,750 if meet critical mineral content targets	<input checked="" type="checkbox"/>		
\$3,750 if meet battery component content targets	<input checked="" type="checkbox"/>		
No critical mineral or battery components source from a foreign entity of concern	<input checked="" type="checkbox"/>		
Must be for business use		<input checked="" type="checkbox"/>	
At least 2 years old			<input checked="" type="checkbox"/>
First resale after 16 August 2022			<input checked="" type="checkbox"/>

INFLATION REDUCTION ACT 30D

“Critical Minerals” & Others

(i) extracted or processed in the United States, or in any country with which the United States has a free trade agreement in effect, or
(ii) recycled in North America

1 IA H Hydrogen 1.008																	18 VIIIA He Helium 4.002602						
3 Li Lithium 6.94	4 IIA Be Beryllium 9.0121831																	13 IIIA B Boron 10.81	14 IVA C * Carbon 12.011	15 VA N Nitrogen 14.007	16 VIA O Oxygen 15.999	17 VIIA F Fluorine 18.998403163	18 VIIIA Ne Neon 20.1797
11 Na Sodium 22.98976928	12 IIA Mg Magnesium 24.305	3 IIIB	4 IVB	5 VB	6 VIB	7 VIIB	8 VIIIB	9 VIIIB	10 VIIIB	11 IB	12 IIB	13 IIIA Al Aluminium 26.9815385	14 IVA Si Silicon 28.085	15 VA P Phosphorus 30.973761998	16 VIA S Sulfur 32.06	17 VIIA Cl Chlorine 35.45	18 VIIIA Ar Argon 39.948						
19 K Potassium 39.0983	20 Ca Calcium 40.078	21 Sc Scandium 44.955908	22 Ti Titanium 47.867	23 V Vanadium 50.9415	24 Cr Chromium 51.9961	25 Mn Manganese 54.938044	26 Fe Iron 55.845	27 Co Cobalt 58.933194	28 Ni Nickel 58.6934	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.630	33 As Arsenic 74.921595	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.798						
37 Rb Rubidium 85.4678	38 Sr Strontium 87.62	39 Y Yttrium 88.90584	40 Zr Zirconium 91.224	41 Nb Niobium 92.90637	42 Mo Molybdenum 95.95	43 Tc Technetium (98)	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.90550	46 Pd Palladium 106.42	47 Ag Silver 107.8682	48 Cd Cadmium 112.414	49 In Indium 114.818	50 Sn Tin 118.710	51 Sb Antimony 121.760	52 Te Tellurium 127.60	53 I Iodine 126.90447	54 Xe Xenon 131.293						
55 Cs Caesium 132.90545196	56 Ba Barium 137.327	57 - 71 Lanthanoids	72 Hf Hafnium 178.49	73 Ta Tantalum 180.94788	74 W Tungsten 183.84	75 Re Rhenium 186.207	76 Os Osmium 190.23	77 Ir Iridium 192.217	78 Pt Platinum 195.084	79 Au Gold 196.966569	80 Hg Mercury 200.592	81 Tl Thallium 204.38	82 Pb Lead 207.2	83 Bi Bismuth 208.98040	84 Po Polonium (209)	85 At Astatine (210)	86 Rn Radon (222)						
87 Fr Francium (223)	88 Ra Radium (226)	89 - 103 Actinoids	104 Rf Rutherfordium (267)	105 Db Dubnium (268)	106 Sg Seaborgium (269)	107 Bh Bohrium (270)	108 Hs Hassium (269)	109 Mt Meitnerium (278)	110 Ds Darmstadtium (281)	111 Rg Roentgenium (282)	112 Cn Copernicium (285)	113 Nh Nihonium (286)	114 Fl Flerovium (289)	115 Mc Moscovium (289)	116 Lv Livermorium (293)	117 Ts Tennessine (294)	118 Og Oganesson (294)						



57 La Lanthanum 138.90547	58 Ce Cerium 140.116	59 Pr Praseodymium 140.90766	60 Nd Neodymium 144.242	61 Pm Promethium (145)	62 Sm Samarium 150.36	63 Eu Europium 151.964	64 Gd Gadolinium 157.25	65 Tb Terbium 158.92535	66 Dy Dysprosium 162.500	67 Ho Holmium 164.93033	68 Er Erbium 167.259	69 Tm Thulium 168.93422	70 Yb Ytterbium 173.045	71 Lu Lutetium 174.9668
89 Ac Actinium (227)	90 Th Thorium 232.0377	91 Pa Protactinium 231.03588	92 U Uranium 238.02891	93 Np Neptunium (237)	94 Pu Plutonium (244)	95 Am Americium (243)	96 Cm Curium (247)	97 Bk Berkelium (247)	98 Cf Californium (251)	99 Es Einsteinium (252)	100 Fm Fermium (257)	101 Md Mendelevium (258)	102 No Nobelium (259)	103 Lr Lawrencium (266)

INFLATION REDUCTION ACT: 30D

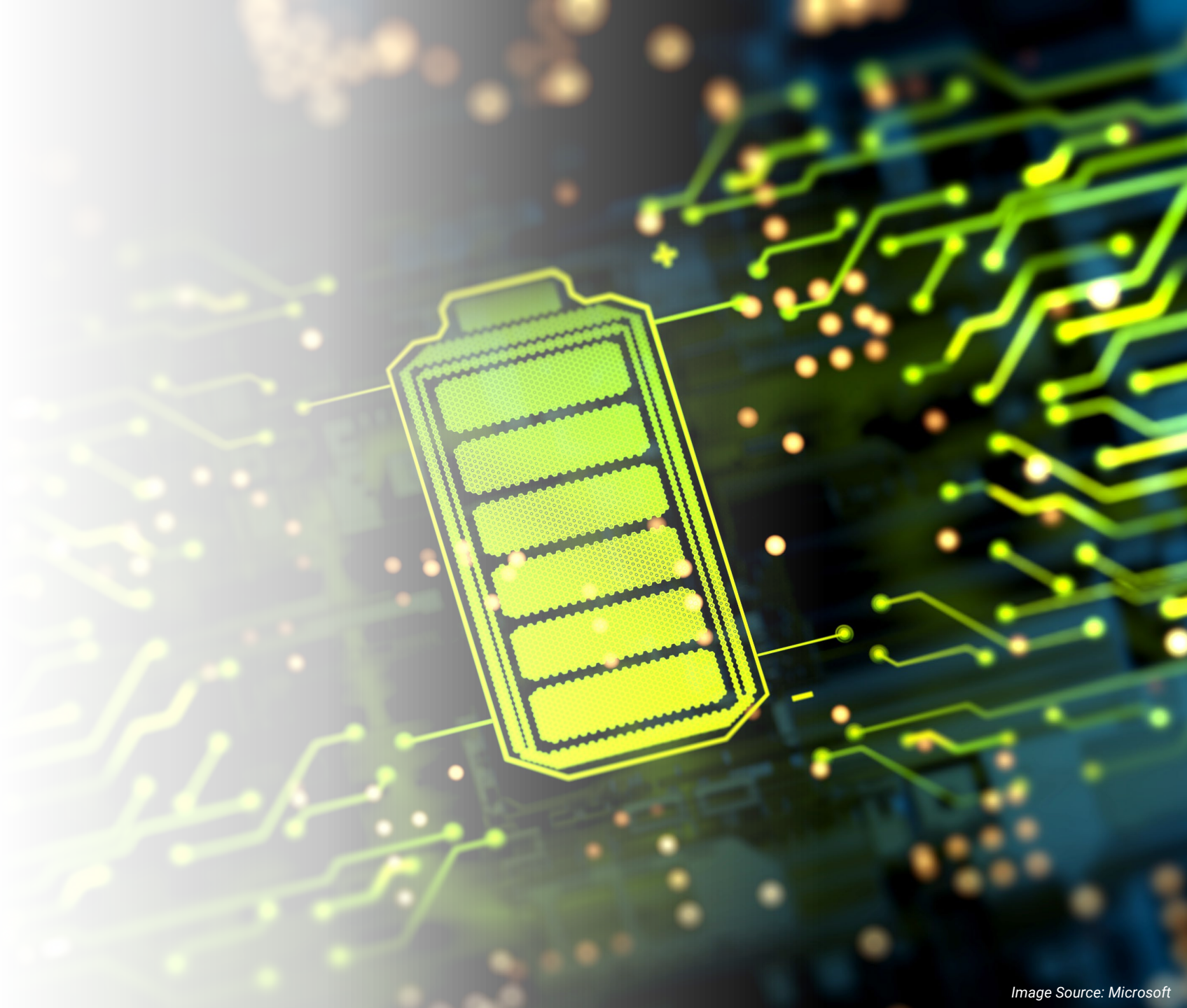
Critical minerals content requirements

	<2024	2024	2025	2026	2027	2028	2029	2030	2031	2032
Critical Minerals (Sourced from U.S. or free trade agreement countries)	40%	50%	60%	70%				80%		
	↑ Starting 1 January 2025, no <u>critical minerals</u> can be extracted, processed, or recycled by a foreign entity of concern									



So, what are battery components?

- Electrode active materials
 - Cathode
 - Anode & anode foils
 - Solid metal electrode
 - Separator
 - Electrochemically active materials including solvents, additives, and electrolyte salts that contribute to the electrochemical processes necessary for energy storage
- Battery cells that can store at least 12 Wh of energy
- Battery modules
 - 2 or more battery cells configured electrically in series or parallel to create voltage or current, or
 - No cells but with aggregate capacity of not less than 7 kWh (or in a FCEV, not less than 1 kWh)



INFLATION REDUCTION ACT: 30D

Battery components content requirements

	<2024	2024	2025	2026	2027	2028	2029	2030	2031	2032
Battery Components (North American assembled)	50%	60%	70%	80%	90%			100%		
	↑ Starting 1 January 2024, no <u>battery components</u> can be manufactured or assembled by a foreign entity of concern									

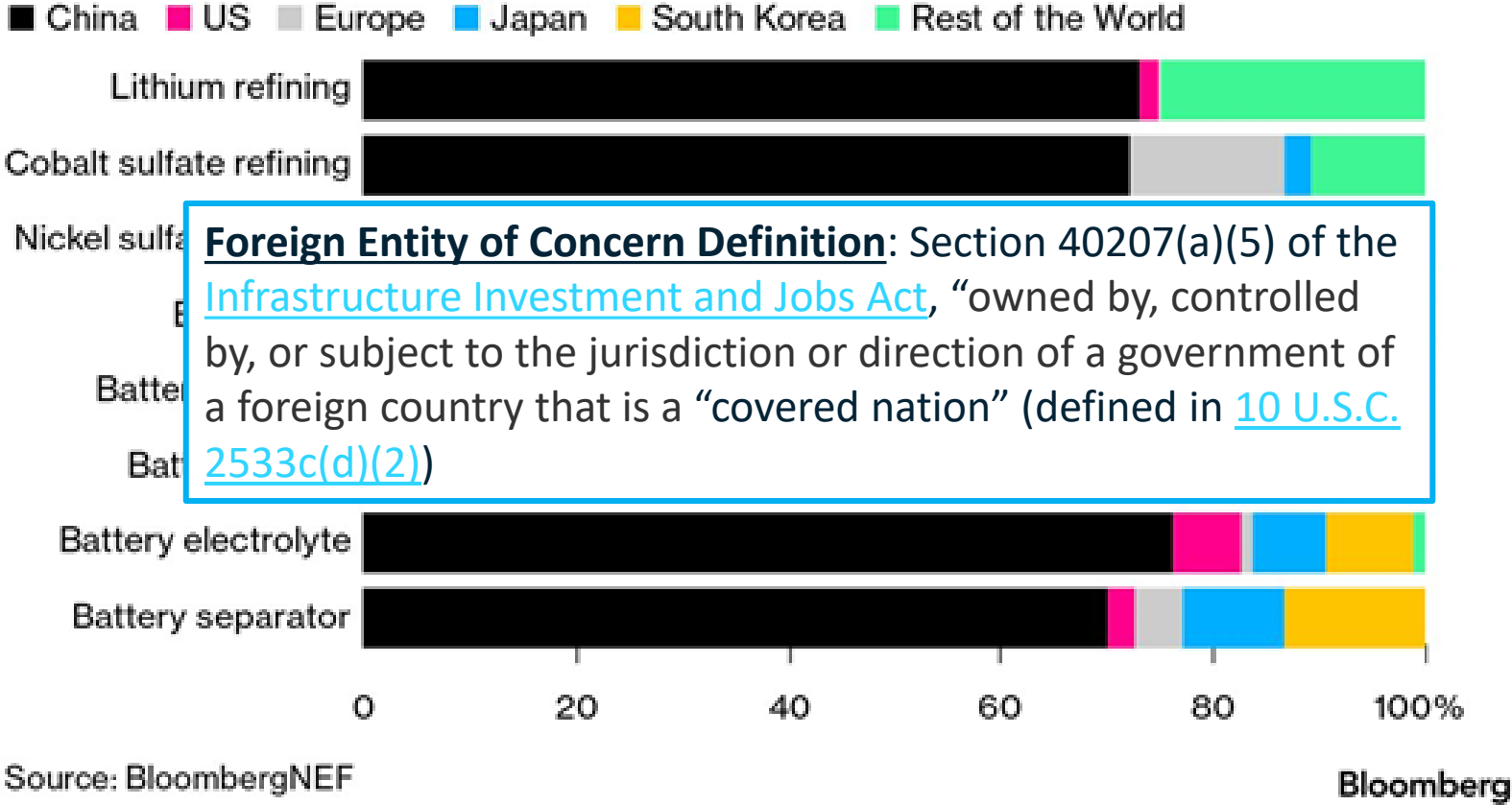


Image Source: Microsoft

“These rules will be addressed in future guidance.”

China's Grip on the EV Supply Chain

The country dominates much of the battery industry



Countries of Particular Concern

The most recent Countries of Particular Concern designations were made by the Secretary of State on November 30, 2022:

Burma, People’s Republic of China, Cuba, Eritrea, Iran, the Democratic People’s Republic of Korea, Nicaragua, Pakistan, Russia, Saudi Arabia, Tajikistan, and Turkmenistan.

Source: [Countries of Particular Concern, Special Watch List Countries, Entities of Particular Concern - United States Department of State](#)

INFLATION REDUCTION ACT

Review of Major Manufacturing Incentive Provisions



45X

Manufacturing Tax Credits

- Production credits for solar, wind, batteries, minerals etc.
- Electrode active materials
- Battery cells (\$35/kWh)
- Battery modules (\$10-45/kWh)
- Applicable critical minerals (10% costs incurred)

48C

Advanced Energy Project Credit

- \$10B in tax credits for qualifying projects
- Establish, expand, or re-equip facilities to produce a wide variety of clean energy products:
 - BEV/PHEV/FCEVs
 - Energy storage
 - Fuel cell equipment

ATVM

Advanced Vehicle Technology Program

- +\$3B to an existing direct loan program
- No longer capped at \$25B
- Establish or expand facilities to produce:
 - Advanced technology vehicles
 - Components with low or zero emissions

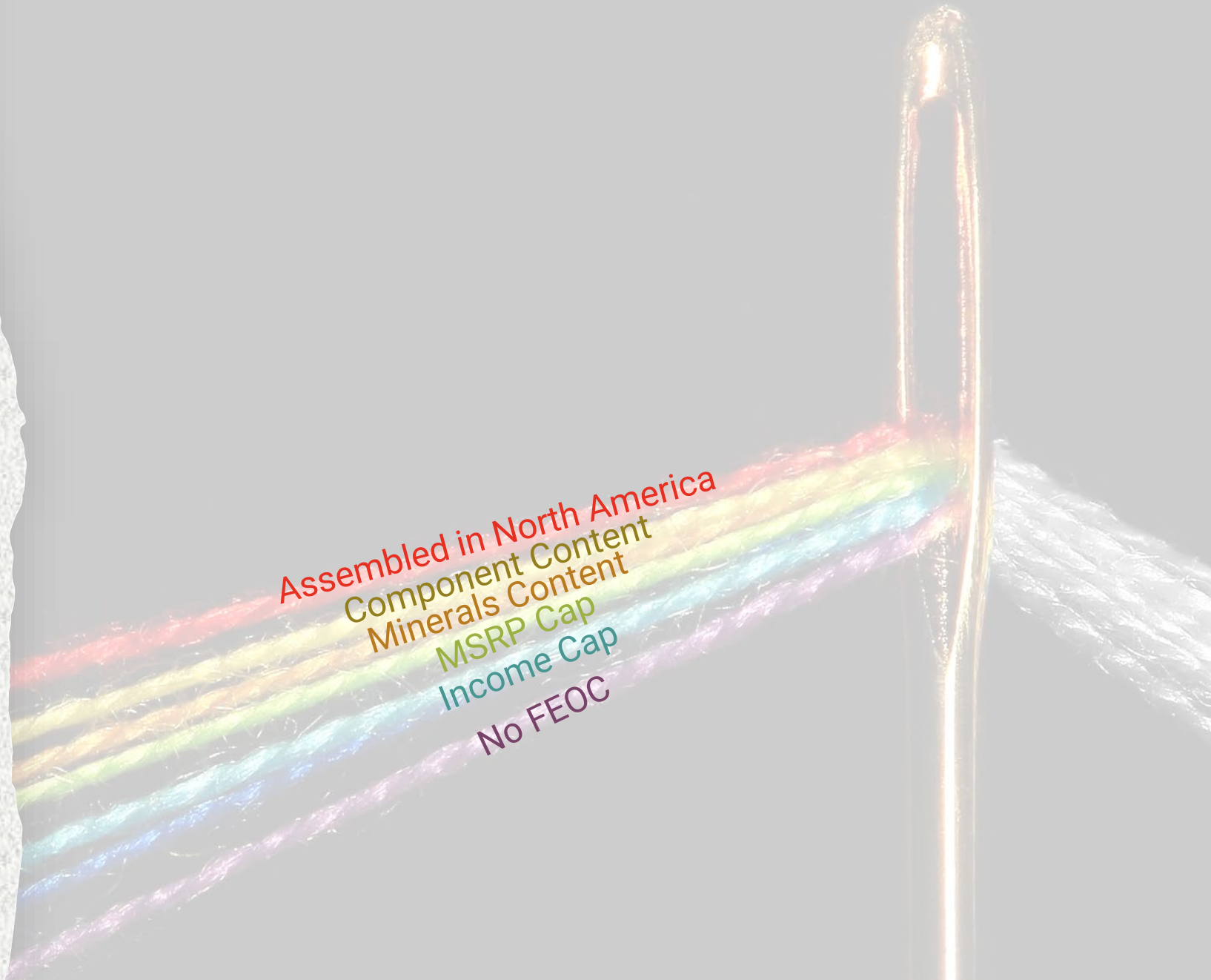
DMCG

Domestic Manufacturing Conversion Grants

- Grants for re-equipping, expanding, or establishing a manufacturing facility in the U.S. to produce:
 - HEV
 - PHEV
 - BEV
 - FCEV

INFLATION REDUCTION ACT

Many passes
through the “eye of
the needle” to
qualify for the
consumer credit

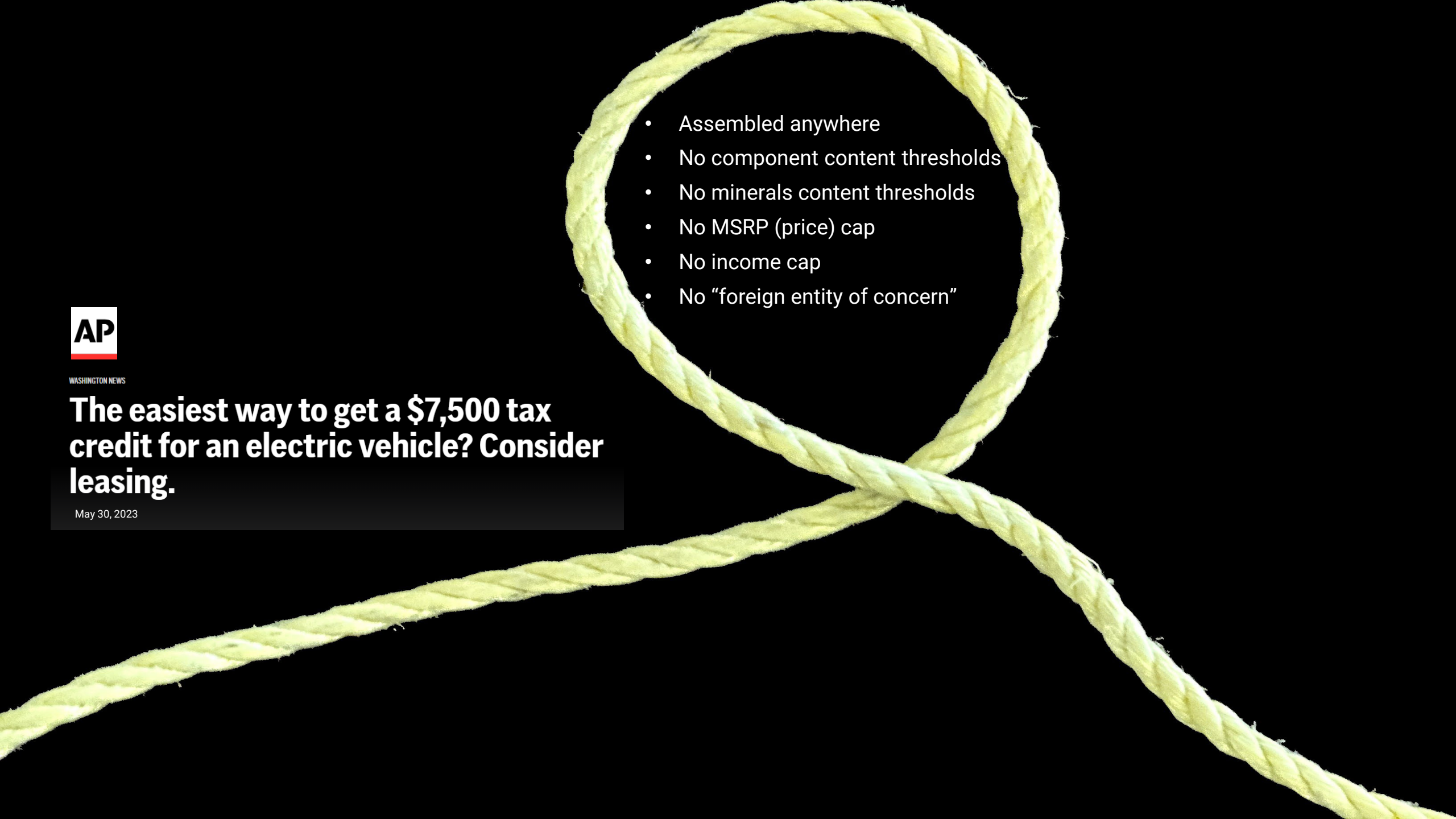


Assembled in North America
Component Content
Minerals Content
MSRP Cap
Income Cap
No FEOC

One Weird Trick



Get \$7,500 off the purchase of any electric vehicle with this one weird trick

- 
- Assembled anywhere
 - No component content thresholds
 - No minerals content thresholds
 - No MSRP (price) cap
 - No income cap
 - No “foreign entity of concern”



WASHINGTON NEWS

The easiest way to get a \$7,500 tax credit for an electric vehicle? Consider leasing.

May 30, 2023

INFLATION REDUCTION ACT

Cost parity remains elusive—
even with IRA producer & consumer credits





www.chicagofed.org

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