

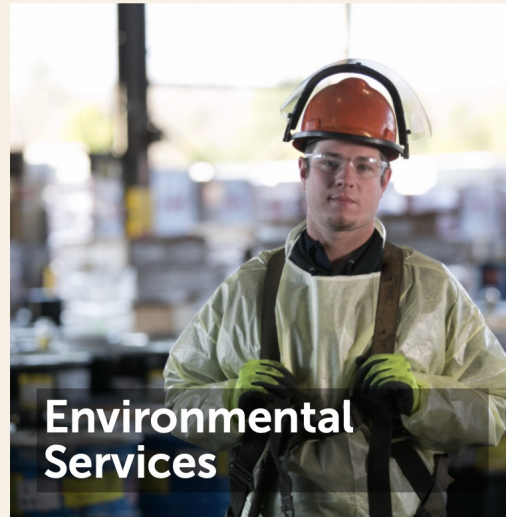
# Transportation Transition

**Jonathan Schalliol**  
**jon@hg.ventures**



# BUILDING A BETTER TOMORROW

Our purpose is to build a safer, more enriching and sustainable world by harnessing the power of family





**HG Ventures**

**Early & Growth**

Stage Investments

**\$50 Million**

Investment Target Each Year

**Hard Tech & Digital**

Startups

**Leveraging THG**

Help Entrepreneurs Succeed

*HG Ventures partners  
with entrepreneurs  
building a sustainable  
future in materials,  
infrastructure and  
industrial systems*

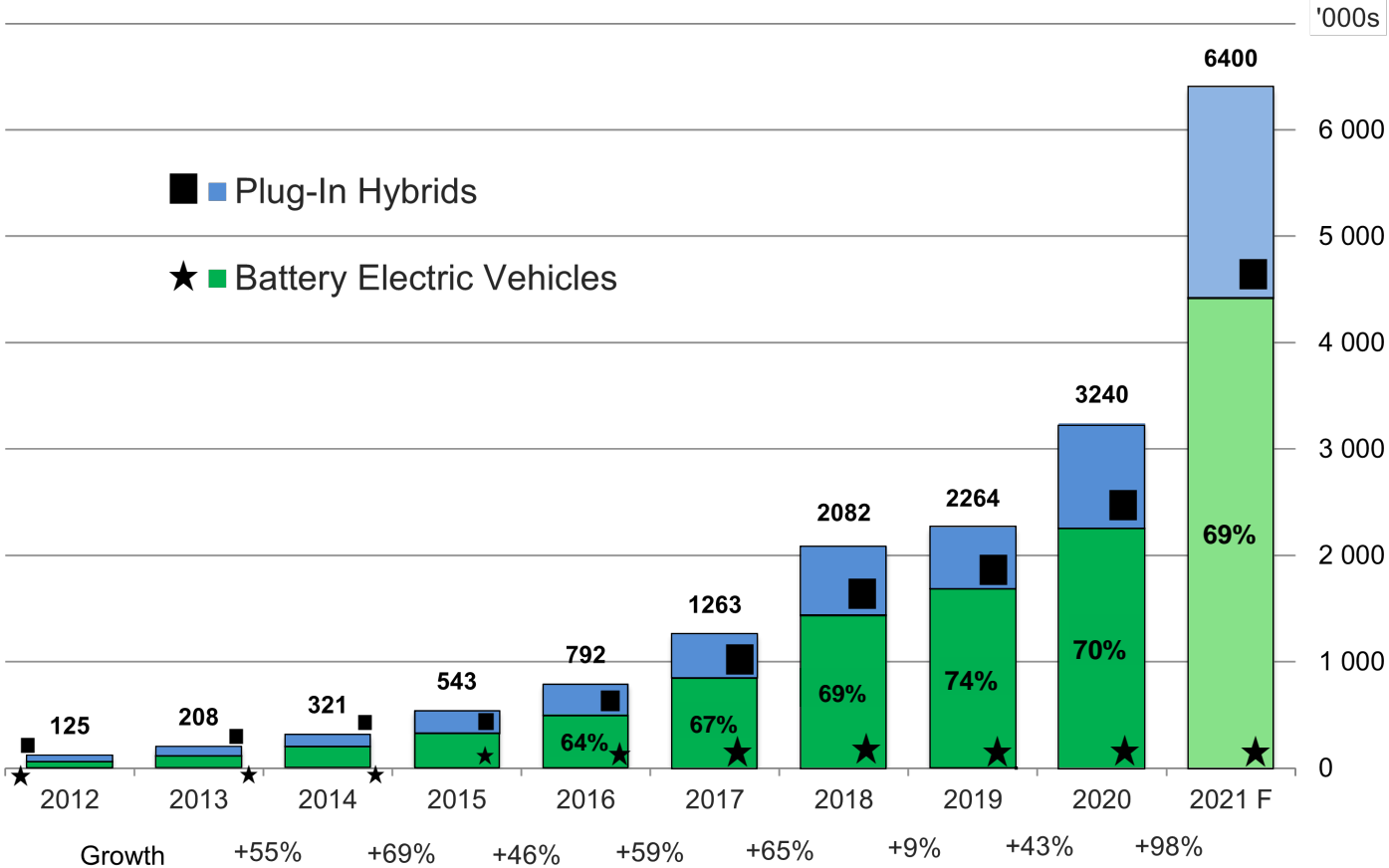
# Battery Materials



# Heavy Duty EVs



# Massive Plug-in Growth



■ Projected annual sales ★ Cumulative sales

500 million vehicles

400

300

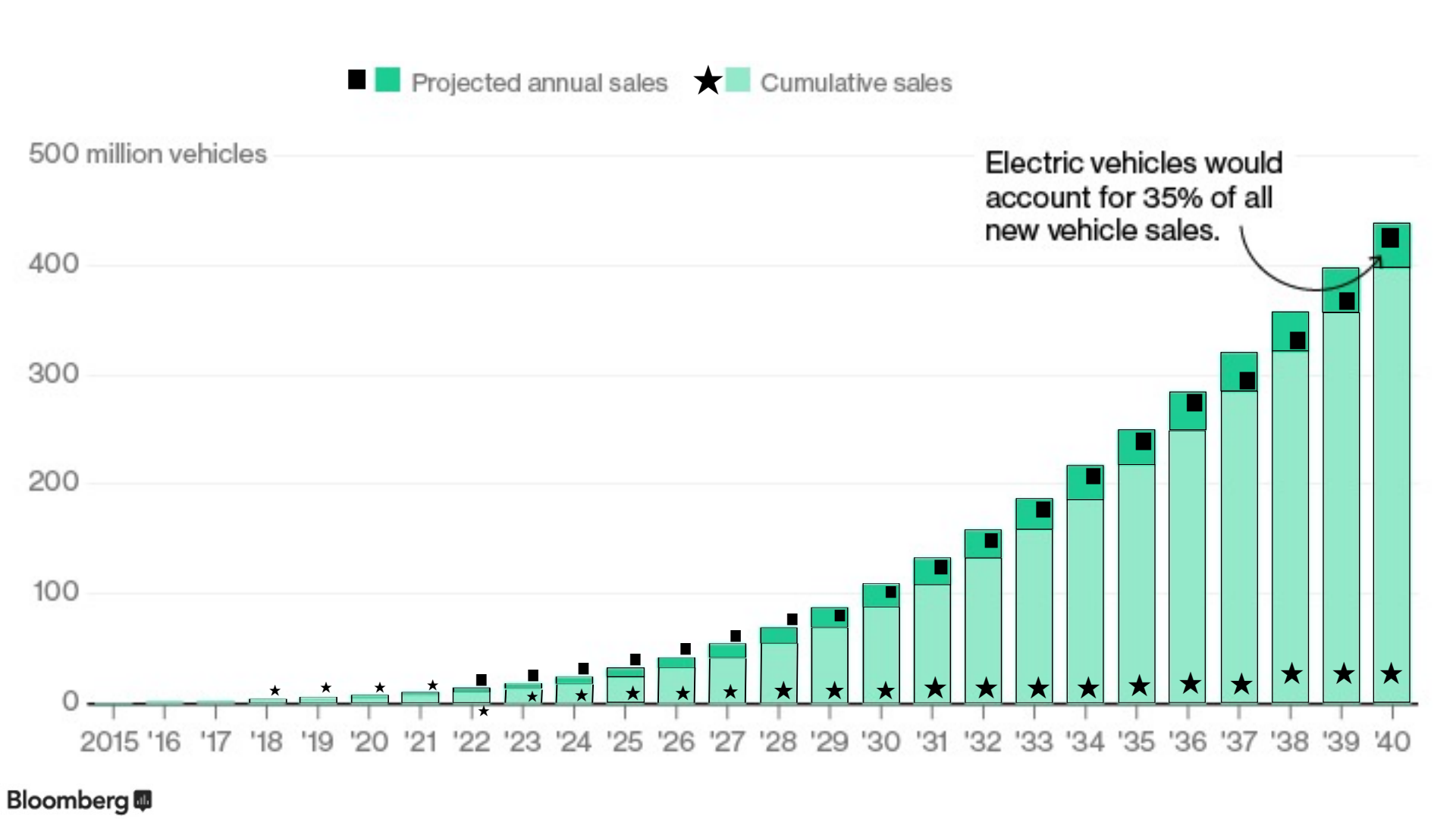
200

100

0

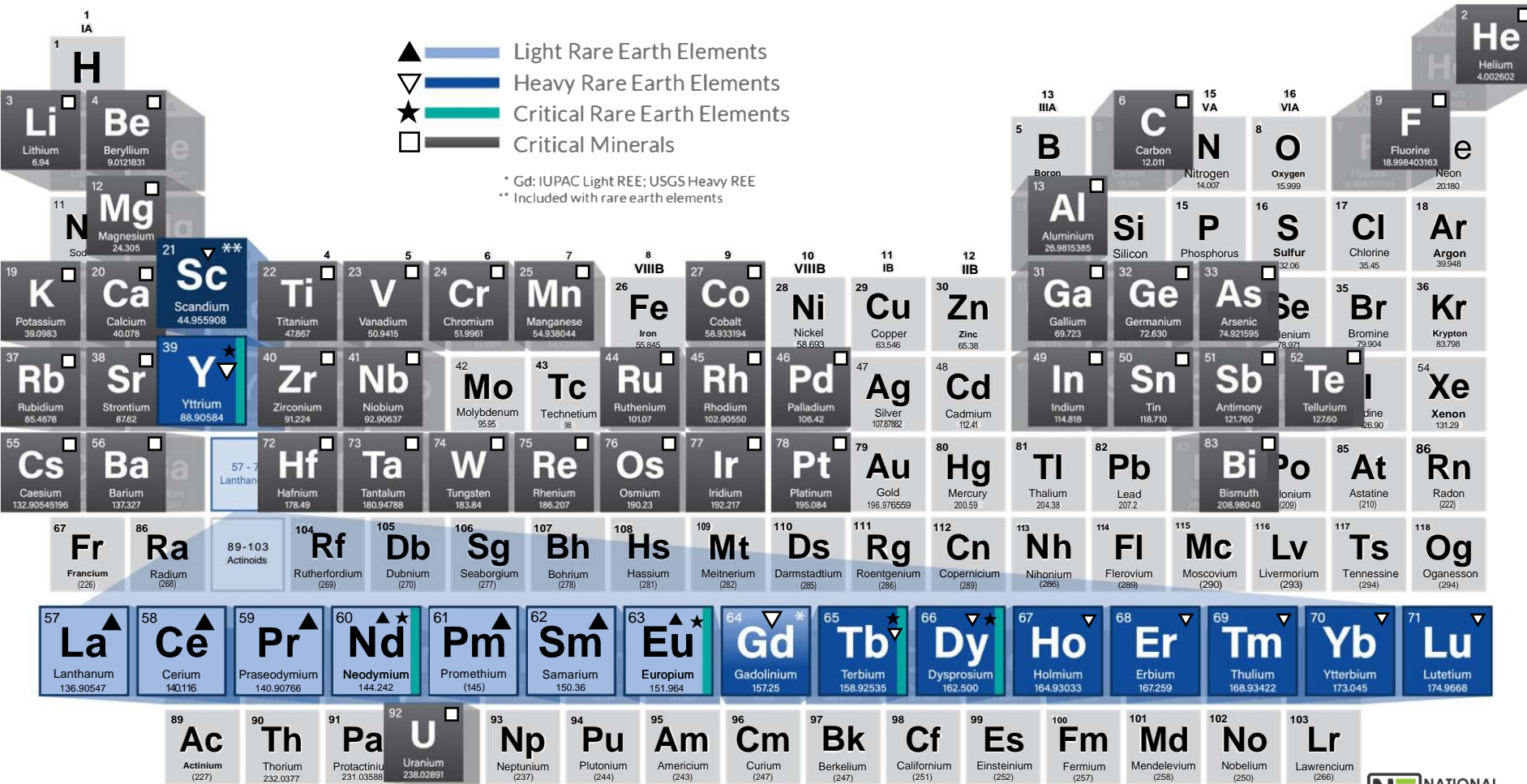
2015 '16 '17 '18 '19 '20 '21 '22 '23 '24 '25 '26 '27 '28 '29 '30 '31 '32 '33 '34 '35 '36 '37 '38 '39 '40

Electric vehicles would account for 35% of all new vehicle sales.



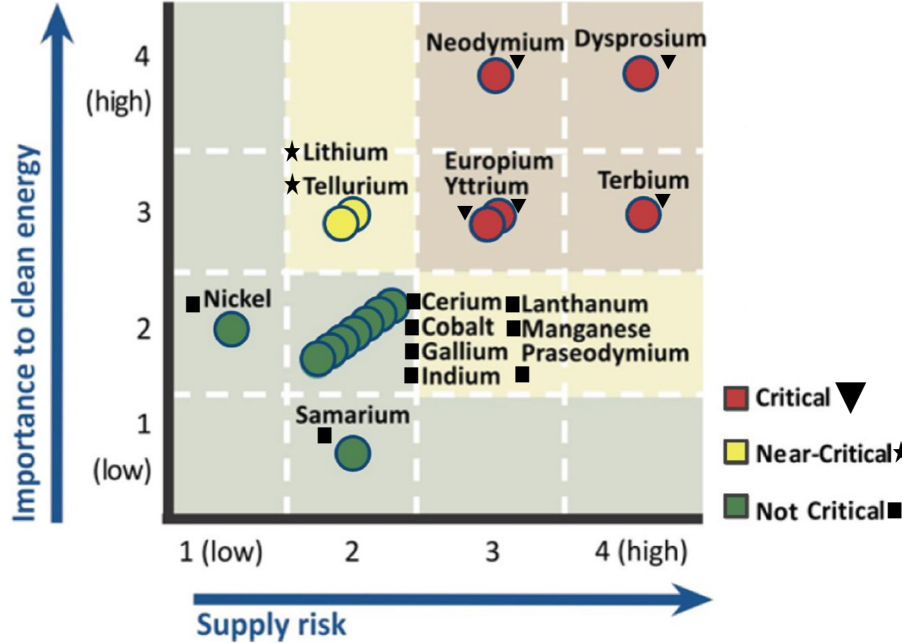




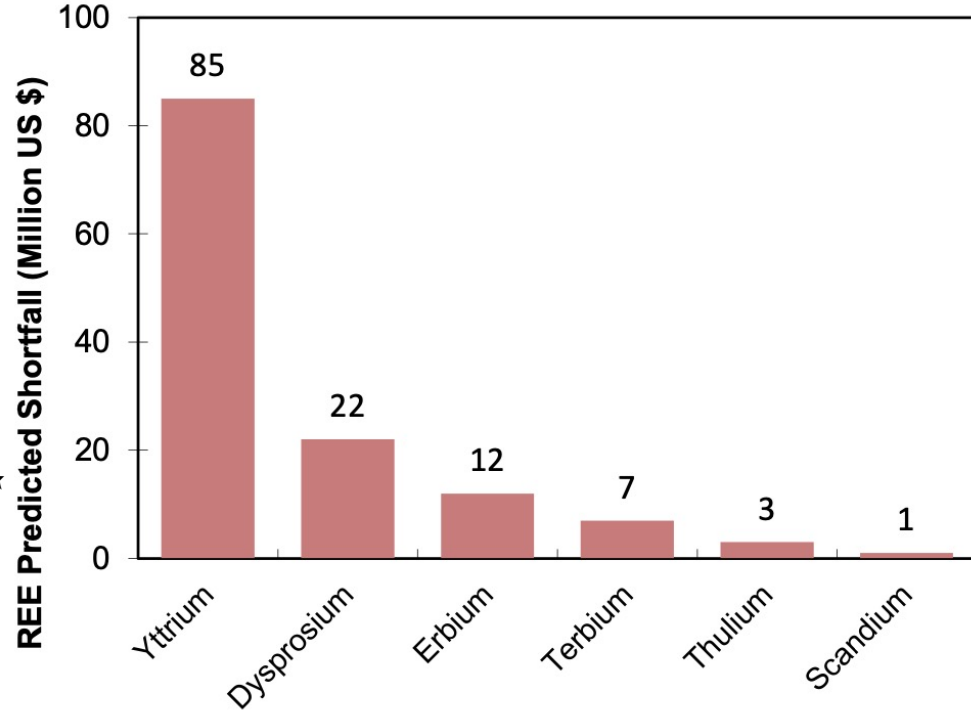


# Materials Criticality

Materials Criticality Matrix, Medium Term (2015-2025)<sup>4</sup>

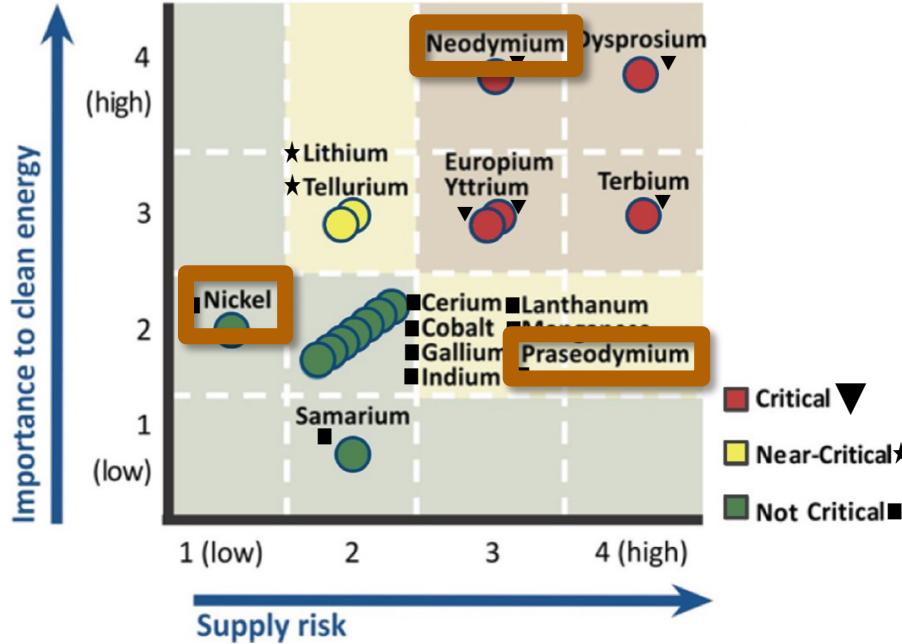


Rare Earth Element Predicted Shortfall<sup>13</sup>

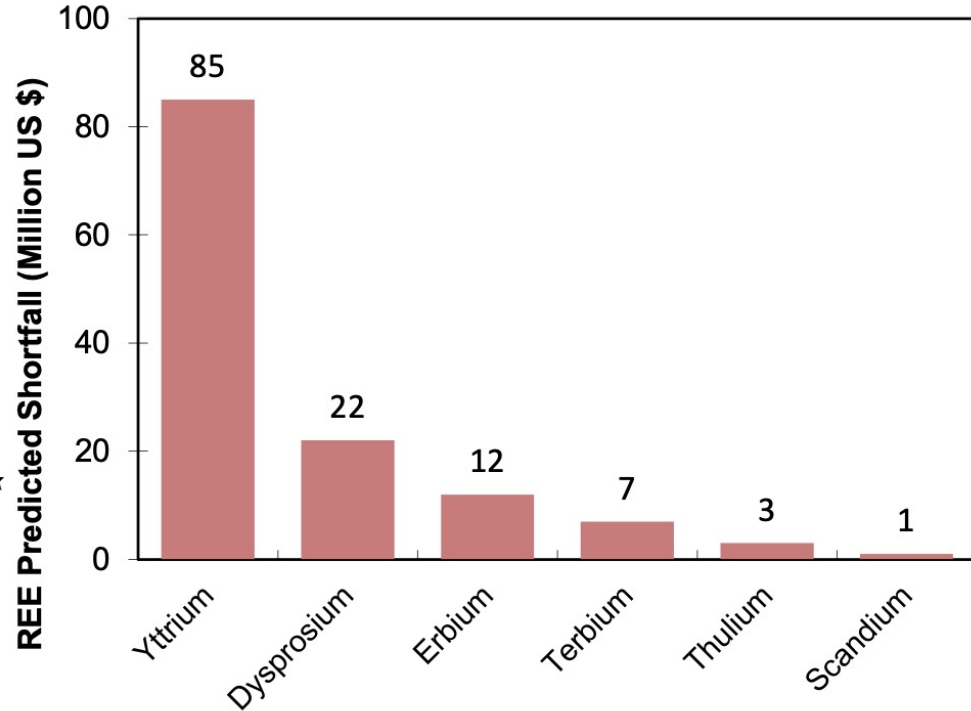


# Nickel Metal Hydride Batteries

Materials Criticality Matrix, Medium Term (2015-2025)<sup>4</sup>

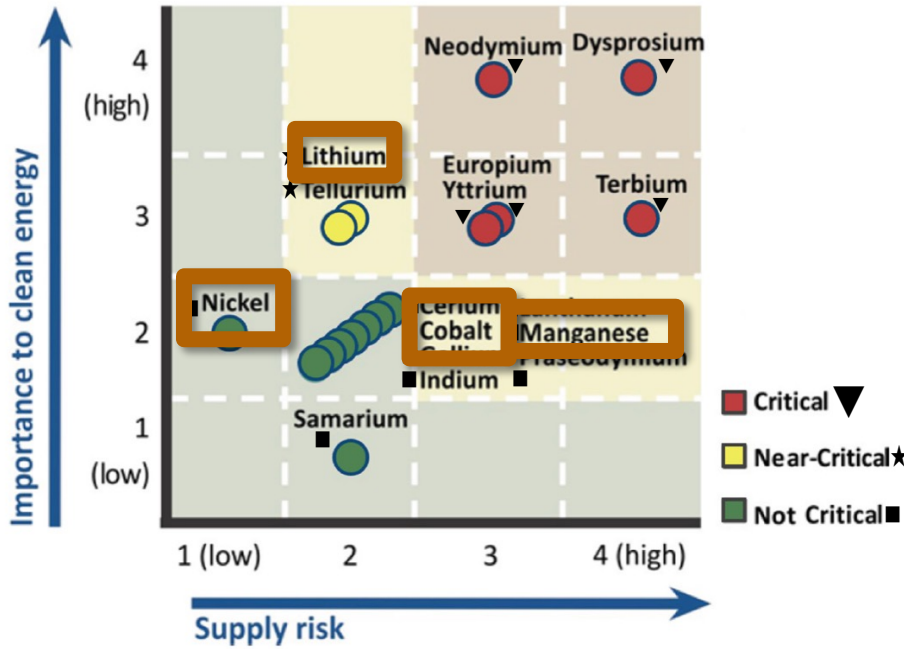


Rare Earth Element Predicted Shortfall<sup>13</sup>

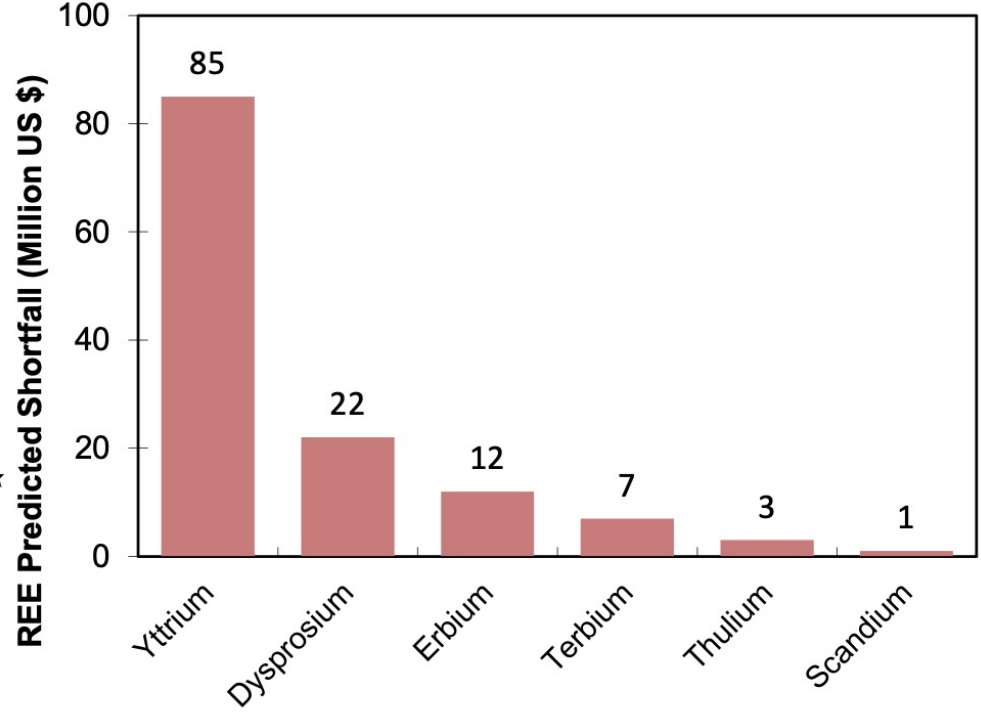


# Lithium-Ion Batteries

Materials Criticality Matrix, Medium Term (2015-2025)<sup>4</sup>

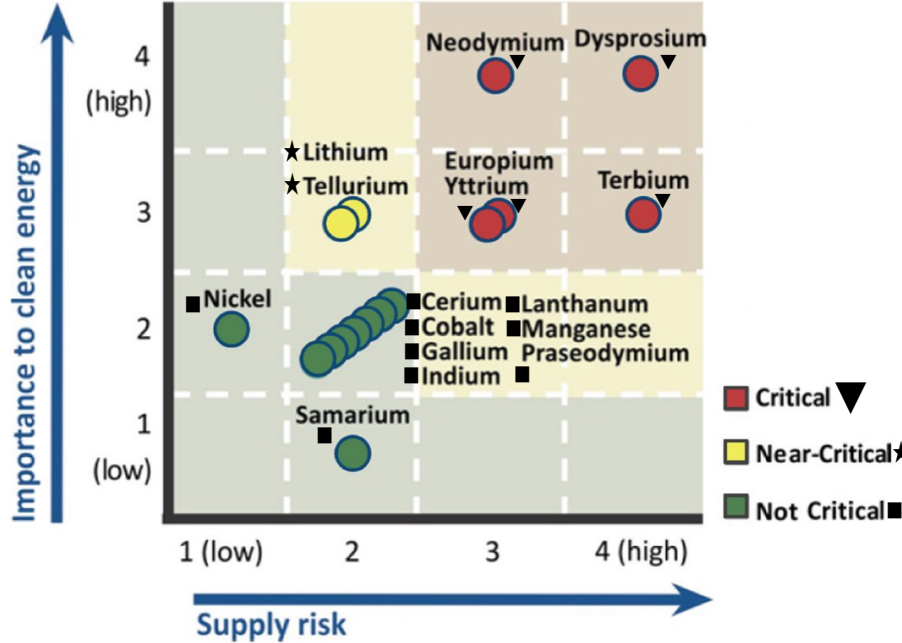


Rare Earth Element Predicted Shortfall<sup>13</sup>

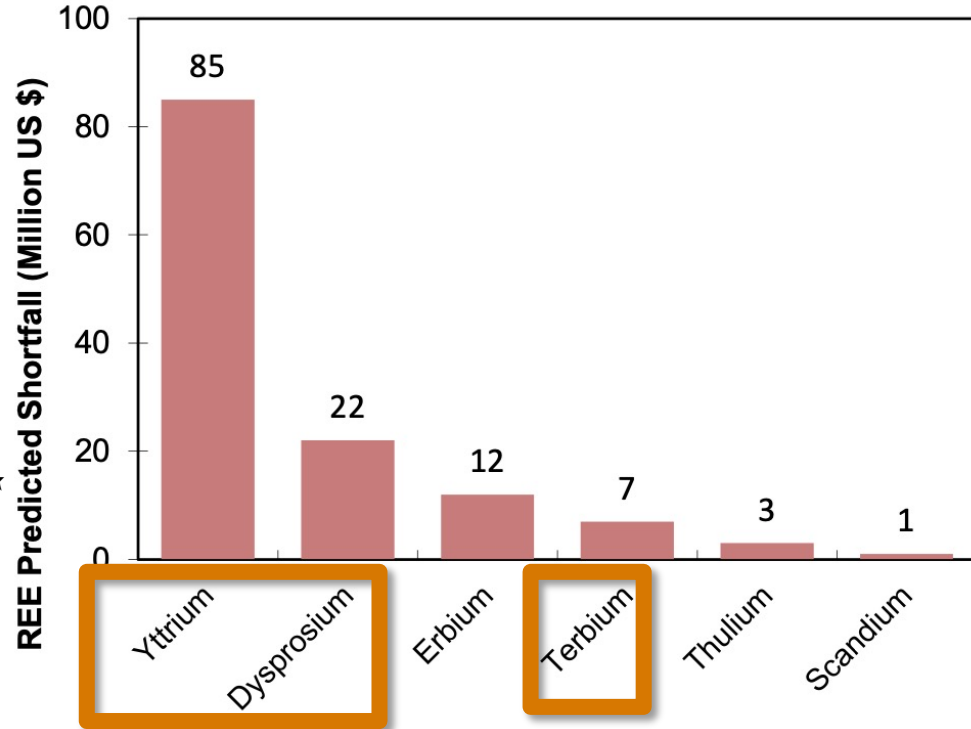


# EV & Windmill Motors (Magnets)

Materials Criticality Matrix, Medium Term (2015-2025)<sup>4</sup>



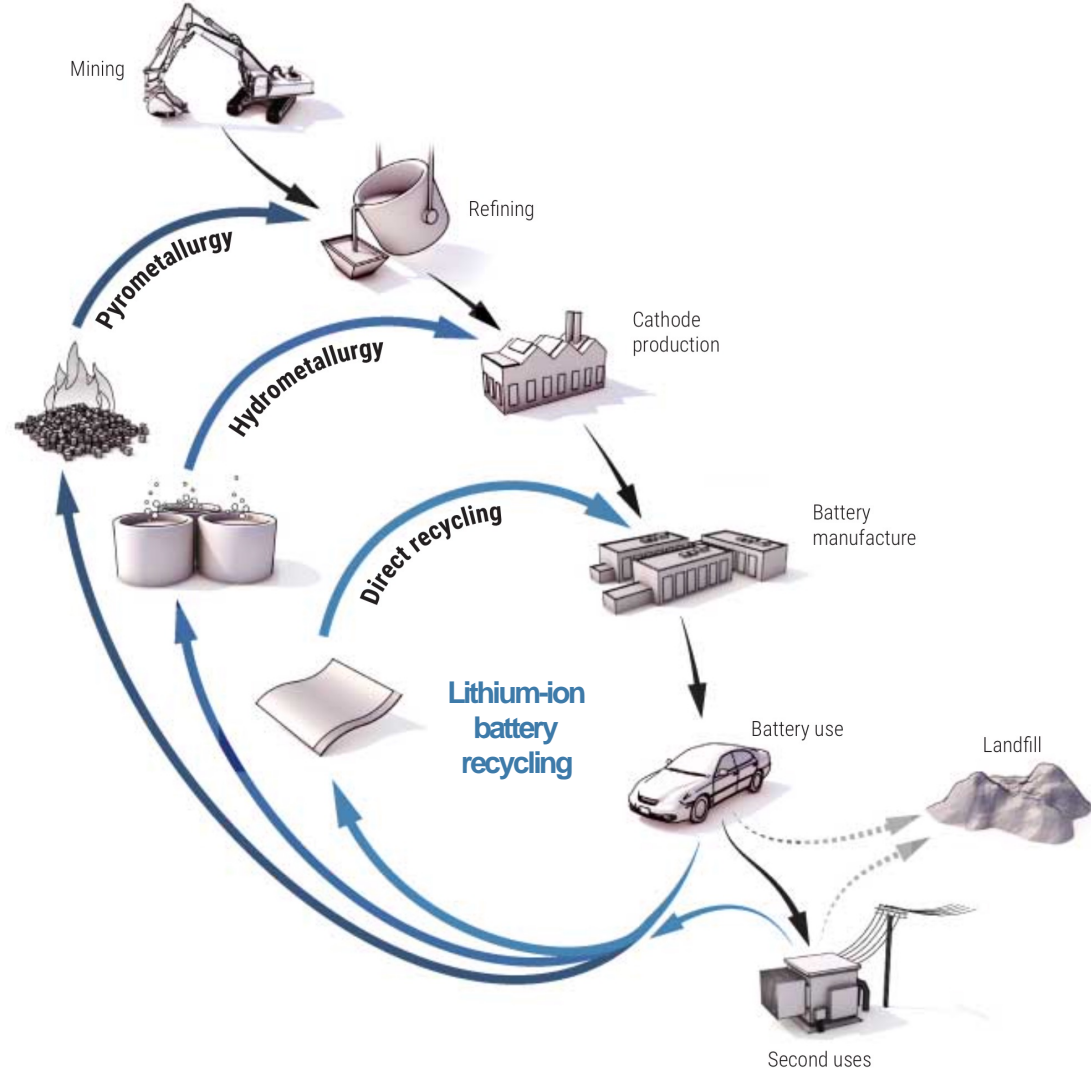
Rare Earth Element Predicted Shortfall<sup>13</sup>



**What can be done?**

**Startups and Innovative Solutions**

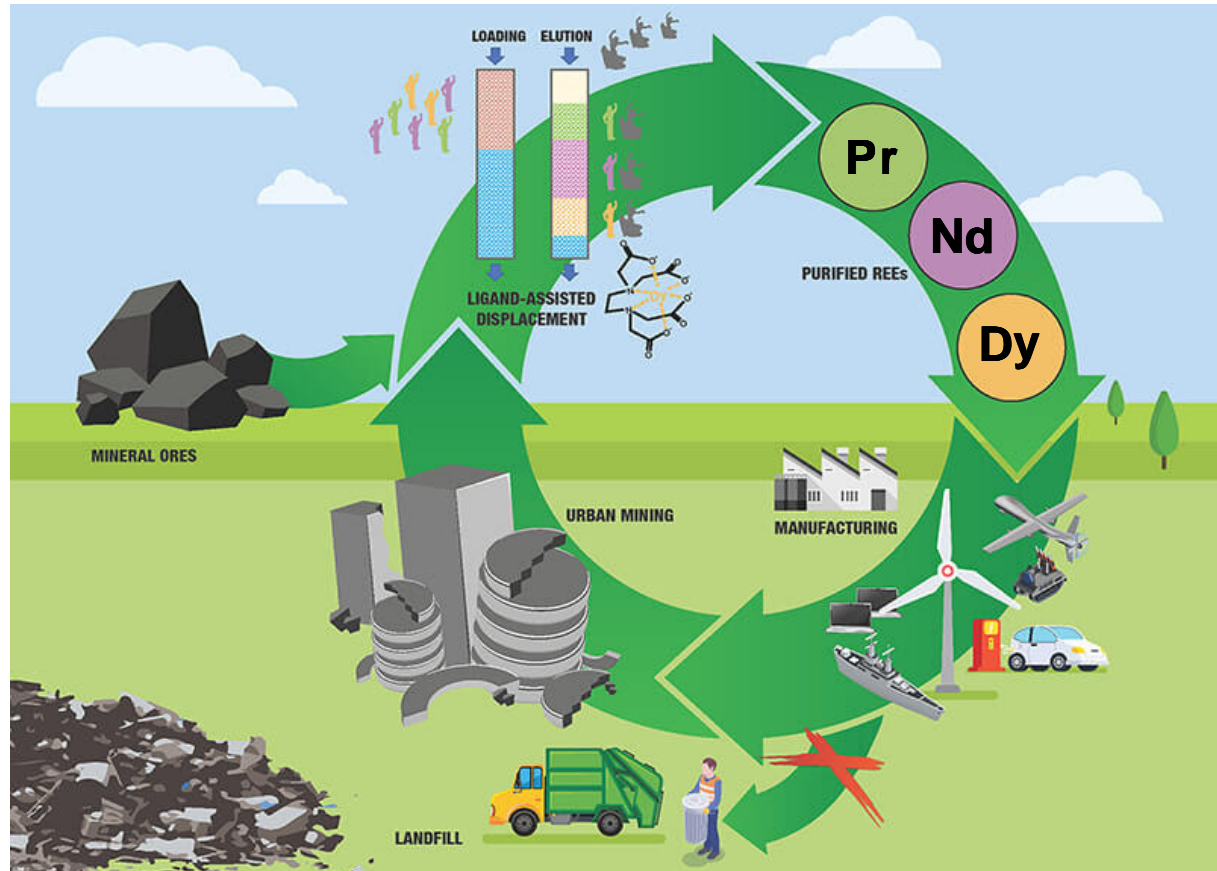
# Circular Battery Supply Chains





# Circular Motor & Magnet Supply Chains

Purdue Chemical  
Engineering Professor,  
Linda Wang with  
American Rare Earth

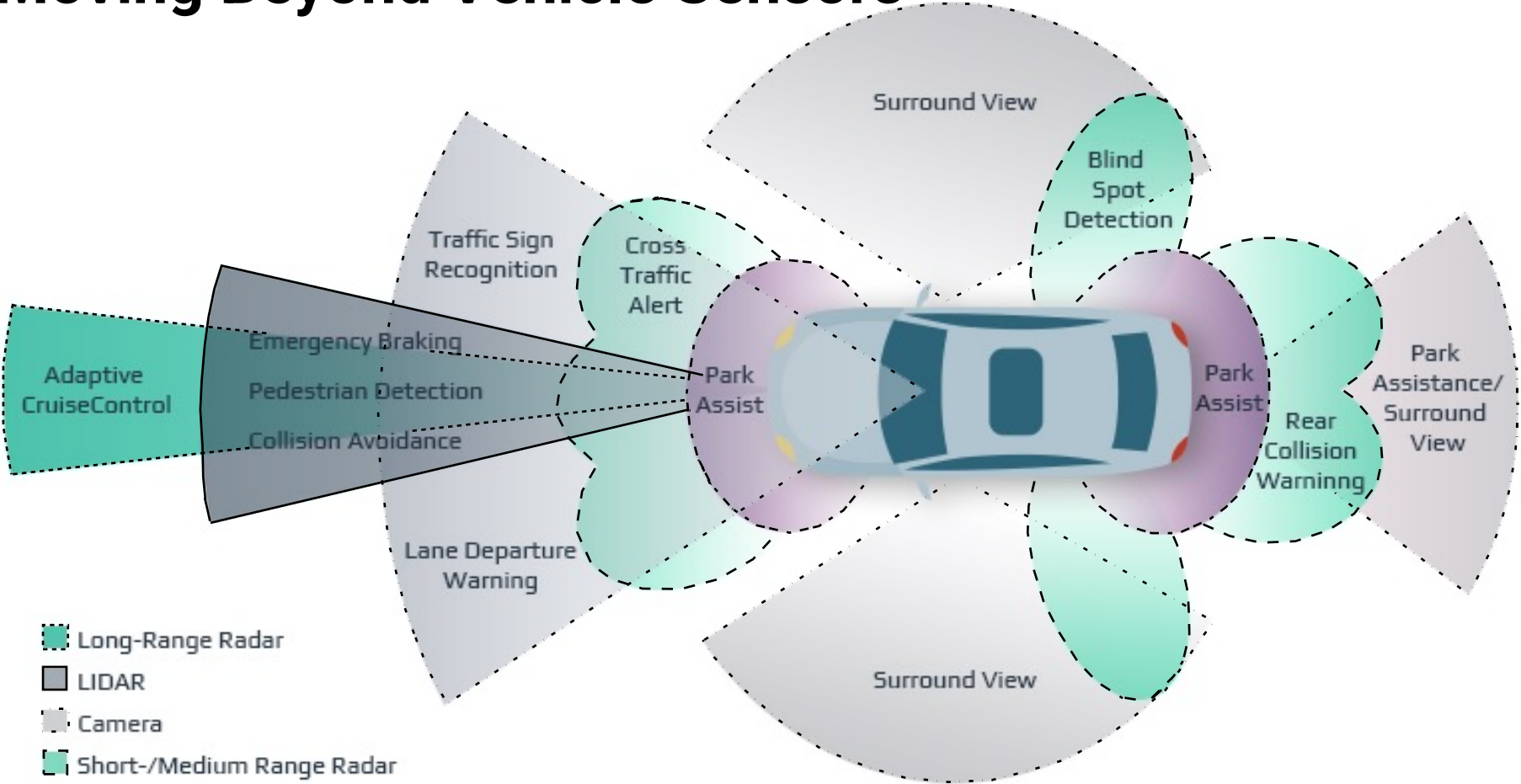


# Electrify The Roads

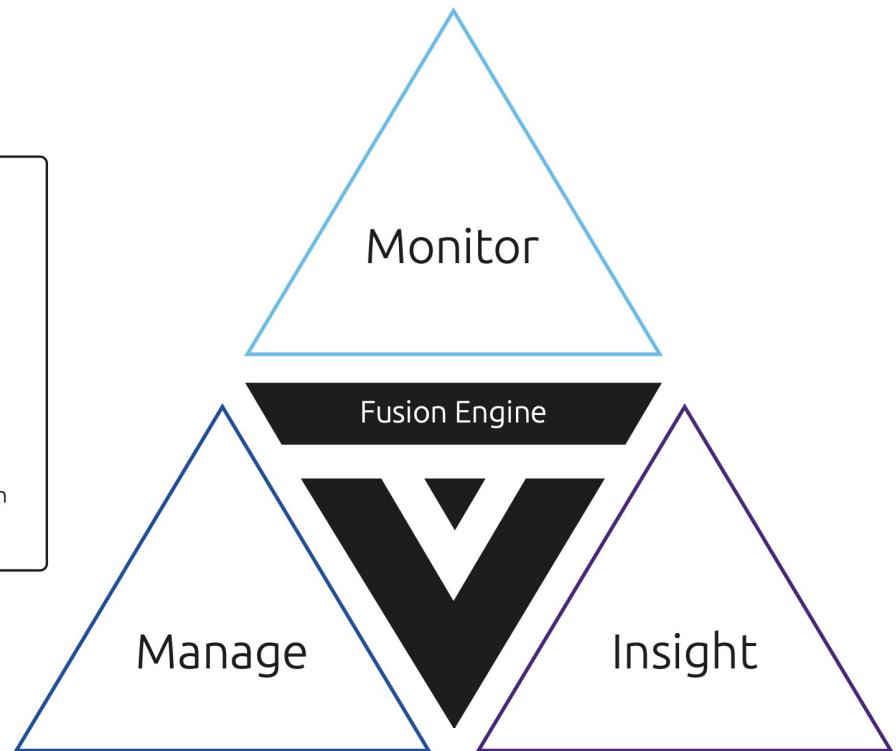
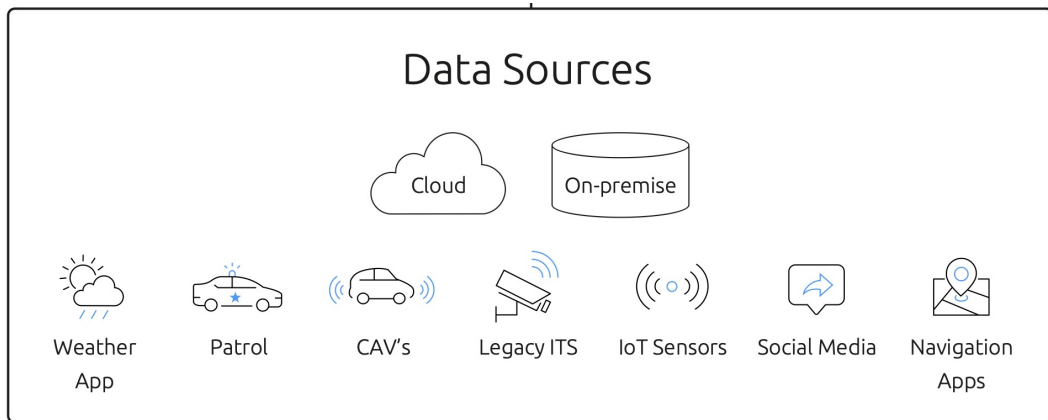
European Commission



# Moving Beyond Vehicle Sensors



# Moving Beyond Vehicle Sensors





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