



Morgan Lewis

POWER AND OPPORTUNITY: EVS, HYDROGEN, AND OTHER VEHICLE POWER

August 11, 2021

Levi McAllister

Arjun Prasad Ramadevanahalli

Presenters



Levi McAllister
Partner, Washington, DC



Arjun Ramadevanahalli
Associate, Washington, DC

Morgan Lewis

Morgan Lewis Automotive Hour Webinar Series

Series of automotive industry focused webinars led by members of the Morgan Lewis global automotive team. The 11-part 2021 program is designed to provide a comprehensive overview on a variety of topics related to clients in the automotive industry. Upcoming sessions:

SEPTEMBER 15 | SPACs and Other Vehicles for Investment in the Automotive and Mobility Sectors

NOVEMBER 10 | New Market Entry and the Anachronistic US Distribution System: What the Future Portends

DECEMBER 8 | The IP Anatomy of the Automotive Nervous System

Table of Contents

- EV Growth Trends
- Federal Policy Efforts
- Threshold Legal Issues and Considerations
- Automaker and Utility Opportunities
- Hydrogen and the Transportation Sector

EV Growth Trends

Morgan Lewis

Growth Overview

Over the last ten years, sales of plug-in electric vehicle sales have steadily increased, with nearly 327,000 EVs sold in US markets in 2019 alone – an increase of nearly 1900% from sales in 2011.



Then FERC-Chairman Neil Chatterjee spoke about “unleashing” and “harnessing” the power of EVs as the type of innovation and policy impact that FERC’s Order No. 2222 ruling could promote as a way to “pave[] the way for the grid of tomorrow.”


Current Outlook – Sales Forecasts

- Although unit sales declined slightly in 2019 and 2020, the amount of load that EVs represent increased significantly.
 - According to *Platts*, in 2018, EVs required 2.94 TWh of electricity.
 - However, in 2020, EV load requirements were 4.68 TWh.
- That increase in load requirements is consistent with non-auto capital investments made in the EV sector through the installation and deployment of charging stations. At the end of 2018, only a little more than 64,000 public charging stations were installed in the US. Only two years later, by the end of 2020, that number had increased by nearly 50% -- with approximately 96,000 public charging stations installed and operating in the US.

Current Outlook – Sales Forecasts

Significant short-term impacts due to the COVID-19 crisis

- Wood Mackenzie projects that global EV sales will drop 43% in 2020



Long-term predictions continue to show accelerating adoption

- By 2025, EVs hit 10% of global passenger vehicle sales, rising to 28% in 2030 and 58% in 2040 (Electric Vehicle Outlook 2020, BloombergNEF)

Current Outlook – Activity By States

- States are continuing to advance decarbonization and transportation electrification goals, of which EVs are an integral part
 - Recent legislation (NJ, CO)
 - New initiatives (NY)
- According to Atlas EV Hub, which tracks U.S. transportation electrification regulatory filings by investor-owned utilities, as of April 2020, almost \$3 billion in transportation electrification investments have been approved or are pending approval by state utility commissions

Federal Policy Efforts

Morgan Lewis

Biden Administration Initiatives

- Prior to January 20th:
 - Biden's campaign publicly supported a transition to clean transportation, including widespread use of electric vehicles.
 - Stated intention to use the power of federal procurement to increase demand for American-made, American-sourced clean vehicles.
 - Publicly supported an effort for the installation of a nationwide charging network of 500,000 chargers
 - Signaled support for EVs through its nomination of Secretary Granholm as Secretary of Energy.

Biden Administration Initiatives (continued)

- Post-Inauguration
 - On January 27, President Biden issued Executive Order 14008, which addresses (among other things) procurement of EV federal fleet.
 - Under Section 205, Biden mandated the development of a comprehensive plan that would stimulate clean energy industries by revitalizing the Federal Government's sustainability efforts.
 - The plan shall aim to use, as appropriate and consistent with applicable law, all available procurement authorities to achieve or facilitate clean and zero-emission vehicles for Federal, State, local, and Tribal government fleets, including vehicles of the US Postal Service.
 - Combined with his Buy American mandate, this E.O. would conceivably lead to direct support for the deployment of over 600,000 American-made EVs that would replace the existing federal government combustion engine fleet (currently about 650,000 vehicles in service).

Biden Administration Initiatives (continued)

- Infrastructure Plan
 - Substantial monetary investment (\$174 billion)
 - Used to develop a network of 500,000 charging stations.
 - The Plan proposes that 50,000 diesel transit vehicles and 20% of existing school buses nationwide would be replaced with EVs or electrified.
 - Proposes to electrify the federal fleet of vehicles, including US Postal Service Vehicles.
 - The Plan specifically proposes a \$46 billion investment in federal procurement authority, which would be used for that purpose as well as others.
 - Proposes the continuation of certain tax incentives and also new point of sale rebates for purchasers of EVs made in America.
- More to come on this . . .

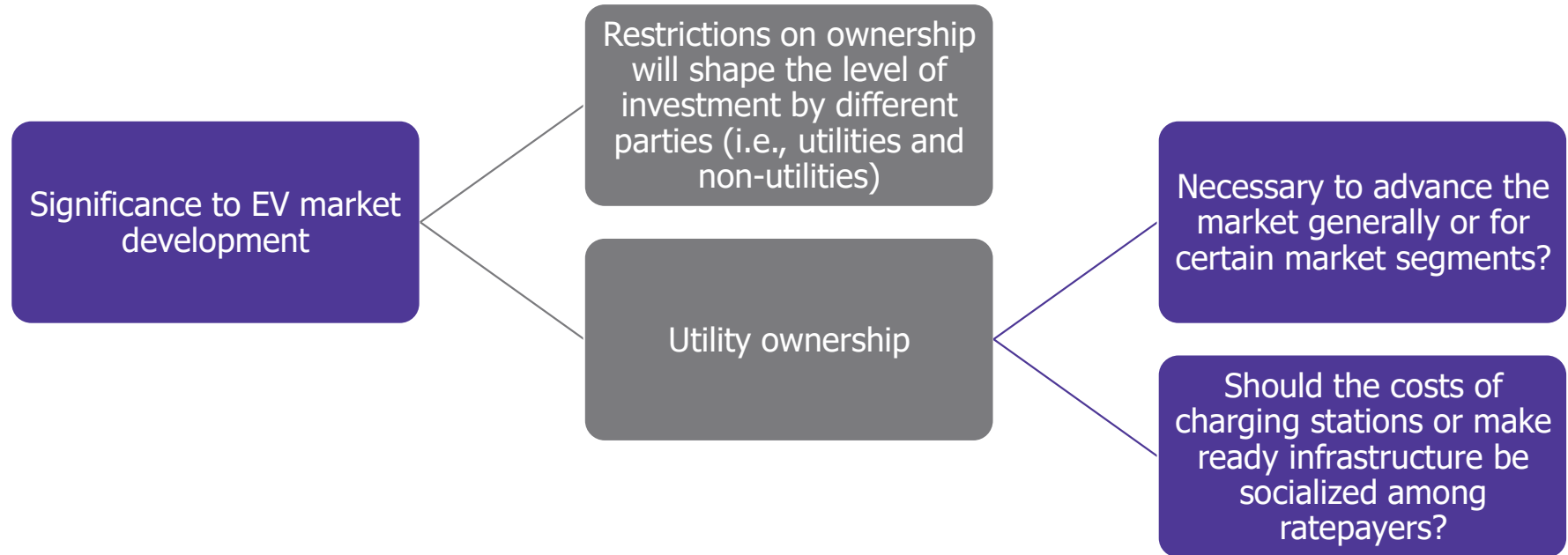
Biden Administration Initiatives (continued)

- August 5th Executive Order
 - Sets a nonbinding goal that 50% of all new passenger cars and light trucks sold in the United States be zero-emission vehicles by 2030.
 - The order includes a noninclusive list of zero-emission options, such as battery electric, plug-in hybrid electric, or fuel cell vehicles.
 - Directs the Environmental Protection Agency (EPA) to establish new multipollutant emission standards, to include greenhouse gas emissions, for light- and medium-duty vehicles for model years 2027 through at least 2030.
 - Directs the US Department of Transportation to establish new fuel economy standards for passenger cars and light-duty trucks for model years 2027 through at least 2030 and for heavy-duty pickup trucks and vans for model years 2028 through at least 2030. The order sets the goal for these final rulemakings as July 2024.

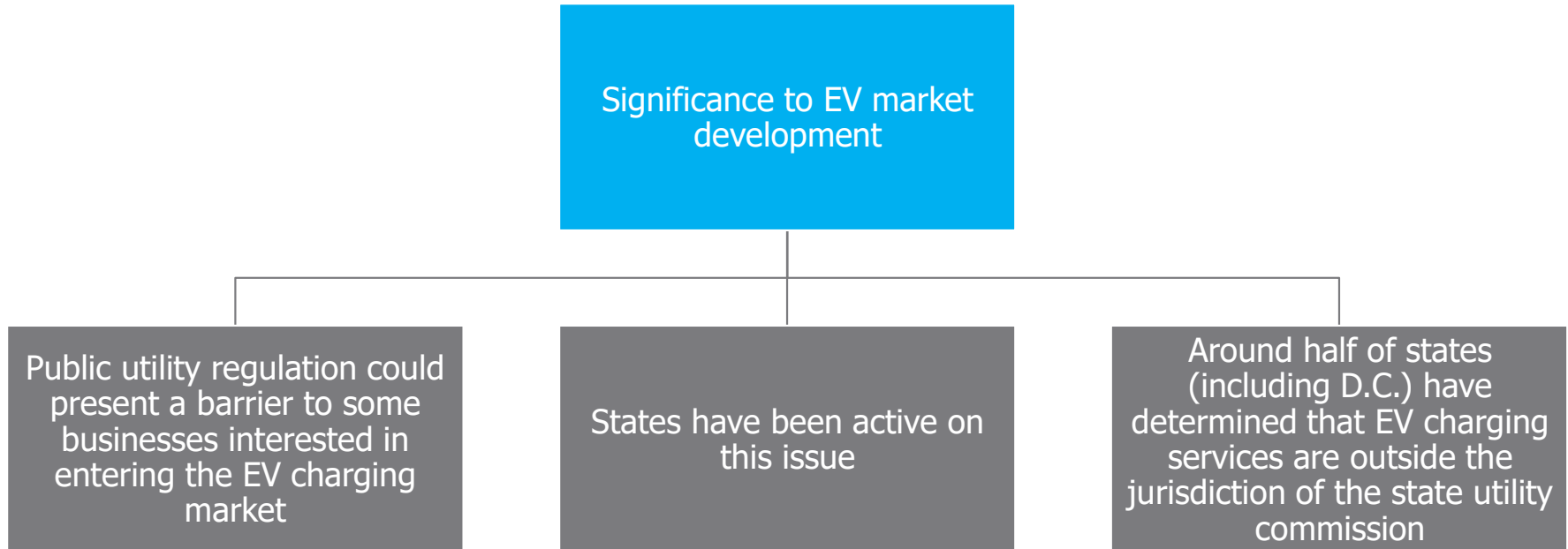
Threshold Legal Issues and Considerations

Morgan Lewis

Issue 1: Network Charging Ownership



Issue 2 – Network Charging Regulatory Oversight



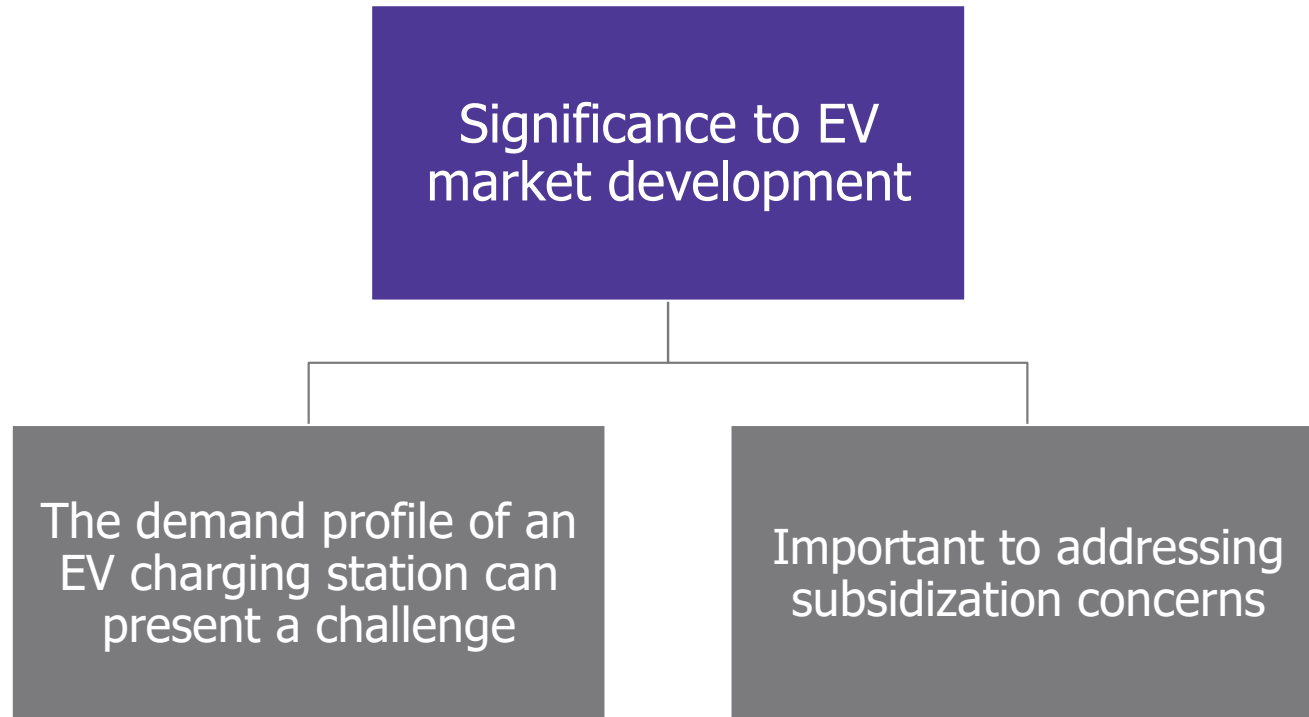
Issue 3 – Network Charging Demand Charge Management

- Demand charge management is often one of the biggest challenges that owners of EV charging stations confront. In short, demand charges are fees that a utility assesses to customers as part of its rate design that are based on the highest amount of power drawn (or demanded) by the customer during a defined period of time in a billing cycle. Demand charges are not tied to the total load requirement of a customer that visits a charging station or the total amount of power consumed by the charger.

Issue 4 – Mitigating Load Curve Impact

- Analysts expect that as EV deployment continues, existing load curves will be reshaped, with an increase in evening peak loads being the most prominent change. This makes sense because EV owners will return home from work, pull into the garage, and plug in their EV all within the same hour or several hours of one another. However, if steps can be taken to facilitate charging at times of low demand, EVs then reflect a potential opportunity for increased grid flexibility rather than a strain on peak demand periods.
- The idea of managed charging (or smart charging) presents that opportunity. Managed charging allows a utility or other third party to control vehicle charging in order to better correspond to the needs of the grid. This renders EVs similar to demand response resources. Further, in the future after interoperability issues are resolved, EVs could also serve as an additional resource to grid management through the provision of vehicle to grid services; this allows EVs to discharge stored energy onto the distribution grid when needed.

Issue 5 - What Rate Design Should Apply to EV Charging?



Issue 5 – Utility Rate Design Revisions

- Time-of-Use rates apply prices that vary by time period – prices that are higher in peak periods and lower in off-peak periods. A simple version of this involves two pricing seasons. However, a time-of-day rate is more complex, but could have two pricing periods within a day.
- Real Time Pricing features prices that vary hourly or even sub-hourly throughout the year for some or all of a customer's load. Customers are notified of the rates in advance, in some instances the day prior to the rates or on an hour-ahead basis. In the context of EVs, this approach gives EV charging station owners the maximum flexibility in operating their stations in a way to mitigate the highest prices. Of course, it also requires ongoing monitoring of applicable rates.
- Some state regulators or legislatures are exploring the imposition of rates that are specific to EVs. For example, a utility might consider proposing a commercial tariff that provides for rates applicable only to EV charging station owners in an effort to address the fast and energy-intensive nature of a charging station. In that vein, proposed legislation in New York would require utilities to propose commercial tariffs for fast charging in an effort to help fleet operators go electric.

Automaker and Utility Opportunities

Morgan Lewis

Automaker Initiatives and Opportunities

- Partnerships between automakers and network charging service providers
- Provision of new services beyond auto sales?
 - EV fleet fueling
 - Over-the-air updates
 - Potential assisted or self-driving capabilities
 - Ability to monitor drivers of fleets
 - Alerts when a vehicle is disabled (for fleets)

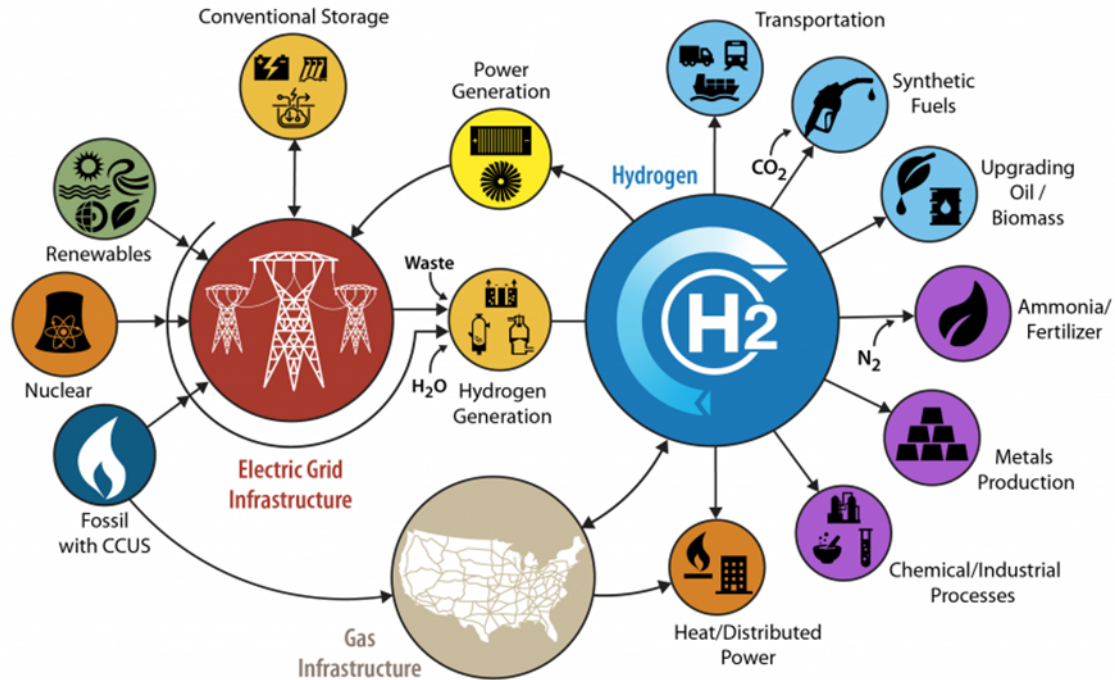
Utility Initiatives and Opportunities

- Development of utility regional alliances
 - Electric Highway Coalition
 - Expected to comprise 14 utility members
 - Develop EV charging network across the South, Midwest, and East Coast
 - Midwest Utility Coalition
 - Expected to comprise 10 members

Hydrogen and the Transportation Sector

Morgan Lewis

Multi-Sector Application



Potential Roles in the Transportation Sector

- Emissions reduction decarbonization tool
 - Transportation accounts for a very large portion of domestic CO2 emissions
 - Commercial end uses are difficult to decarbonize (e.g. long-haul trucking, marine shipping)
 - Offers carbon abatement opportunity for upstream fuel producers
- Use as a flexible and low-emissions fuel source
- Fuel cell subsystems
 - Light duty vehicles and buses
 - Heavy-duty applications

Challenges

Delivery

- Bridging the gap between production centers to end users
- No national network of fueling stations

Storage

- Currently, only limited industrial pipeline and storage infrastructure

Cost

- High cost to produce using conventional methods (e.g. thermal processes, gasification, electrolysis)
- Use of “zero carbon” electricity sources is 2.5x – 4x more costly than conventional production from fossil sources

Safety and Regulation

- Leakage
- Questions over jurisdiction for interstate transportation

Potential Delivery Solution

Limited existing hydrogen delivery network

- Delivery relies on limited pipeline infrastructure (1,600 miles, mostly for industrial sector) and trucking

Blending hydrogen into the natural gas stream is being evaluated as a potential solution

- European Hydrogen Backbone
- Domestic utility pilot programs

Leveraging existing natural gas infrastructure

- Saves time and costs, limits exposure to regulatory uncertainty for new capital projects
- Industry already has experience with hydrogen-natural gas interchangeability, albeit at lower concentrations (i.e. below 20% blend)

“Big, Hairy, Audacious Goals”

- The U.S. DOE launched its “Hydrogen Shot” to accelerate development of cost-effective hydrogen production
 - Framework for hydrogen deployment
 - Cost reduction is a central goal for the Hydrogen Shot
 - Move from \$5/kg to \$1/kg within 10 years
- Estimated potential for 16% CO2 emission reduction by 2050 across the country
 - Supports Biden Administration’s goal of net-zero emissions by 2050
- Stakeholder outreach beginning soon

Questions?

Levi McAllister, Washington, DC

+1.202.739.5837 | levi.mcallister@morganlewis.com

Arjun Ramadevanahalli, Washington, DC

+1.202.739.5913 | arjun.ramadevanahalli@morganlewis.com

Coronavirus COVID-19 Resources

We have formed a multidisciplinary **Coronavirus/COVID-19 Task Force** to help guide clients through the broad scope of legal issues brought on by this public health challenge.

Morgan Lewis

To help keep you on top of developments as they unfold, we also have launched a resource page on our website at www.morganlewis.com/topics/coronavirus-covid-19

If you would like to receive a daily digest of all new updates to the page, please visit the resource page to [subscribe](#) using the purple “Stay Up to Date” button.

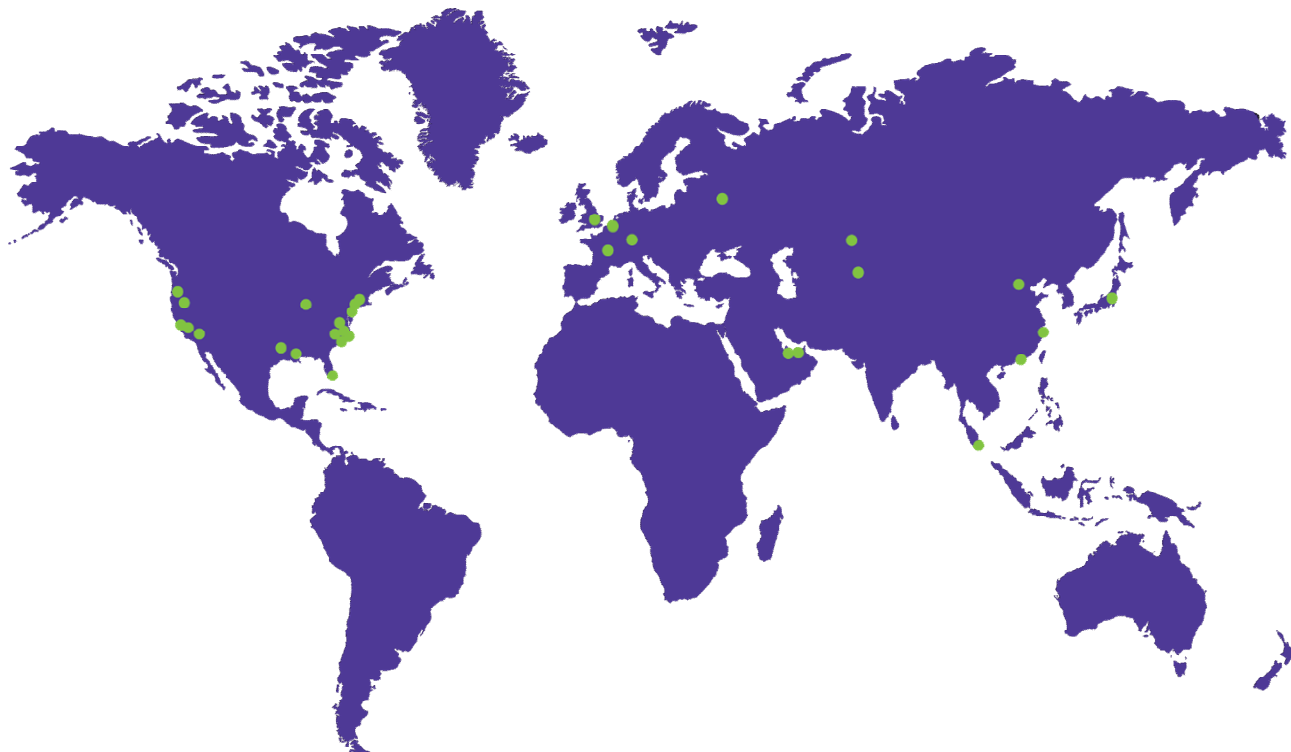


Our Global Reach

Africa
Asia Pacific
Europe
Latin America
Middle East
North America

Our Locations

Abu Dhabi
Almaty
Beijing
Boston
Brussels
Century City
Chicago
Dallas
Dubai
Frankfurt
Hartford
Hong Kong
Houston
London
Los Angeles
Miami
Moscow
New York
Nur-Sultan
Orange County
Paris
Philadelphia
Pittsburgh
Princeton
San Francisco
Shanghai
Silicon Valley
Singapore
Tokyo
Washington, DC
Wilmington



Morgan Lewis

Our Beijing and Shanghai offices operate as representative offices of Morgan, Lewis & Bockius LLP. In Hong Kong, Morgan, Lewis & Bockius is a separate Hong Kong general partnership registered with The Law Society of Hong Kong. Morgan Lewis Stamford LLC is a Singapore law corporation affiliated with Morgan, Lewis & Bockius LLP.

THANK YOU

© 2021 Morgan, Lewis & Bockius LLP
© 2021 Morgan Lewis Stamford LLC
© 2021 Morgan, Lewis & Bockius UK LLP

Morgan, Lewis & Bockius UK LLP is a limited liability partnership registered in England and Wales under number OC378797 and is a law firm authorised and regulated by the Solicitors Regulation Authority. The SRA authorisation number is 615176.

Our Beijing and Shanghai offices operate as representative offices of Morgan, Lewis & Bockius LLP. In Hong Kong, Morgan, Lewis & Bockius is a separate Hong Kong general partnership registered with The Law Society of Hong Kong. Morgan Lewis Stamford LLC is a Singapore law corporation affiliated with Morgan, Lewis & Bockius LLP.

This material is provided for your convenience and does not constitute legal advice or create an attorney-client relationship. Prior results do not guarantee similar outcomes. Attorney Advertising.