

NEMAs role in the IHP Alliance



National Electrical Manufacturers Association

Agenda



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NEMA OVERVIEW

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**ENERGY
TRANSITION
CAMPAIGN**

03

**WORK WITH IHP
SUPPLIERS**



NEMA OVERVIEW



MISSION

Premier forum to
advance the interests of
the electroindustry



VISION

An electrified, connected,
digitalized, automated,
resilient, sustainable,
and healthy society



MEMBER VALUE

Best in class convener,
advocate, and
communicator on our
industry's priorities

Member Value Pillars



INFLUENCE

NEMA drives the agenda and shapes the message to lawmakers and regulators, delivering over \$1 trillion in direct and indirect benefits to the industry



INTELLIGENCE

Decision-grade analysis and market reports help members shape their business strategy in today's dynamic market



INDUSTRY STANDARDS

Promote interoperability, efficiency, safety, resiliency, and sustainability through more than 700 standards, widely adopted in the NEC



LEARNING & NETWORKING

Curated communications, networking, and education

INDUSTRY PRIORITIES





Infrastructure Era

Enhance electroindustry access to public funding through high-quality information, supportive policies



Supply Chain Resilience

Establish a robust, resilient and understood supply of materials and components to meet current and future demand for products



Energy Transition

Accelerate transition to future energy system through electrification, energy efficiency, grid resilience, and energy storage



ENERGY TRANSITION CAMPAIGN



Objective

Accelerate transition to future energy system through electrification, energy efficiency, grid resilience, and energy storage





The Energy Transition

Accelerating the energy transition, through the electrification of the economy for a cleaner, more sustainable energy future

Accelerating the Energy Transition

The world is electrifying. Over the next decade, the U.S. government will invest hundreds of billions of dollars in an electrified energy system that is more resilient, sustainable, decarbonized and connected. This historic down payment on America's energy future is driving the private sector to leverage trillions of dollars toward this new energy future, which will create thousands of jobs, restore American manufacturing, and help foster economic growth.

Electrical systems are the backbone of this new electrified energy future. The electroindustry is the behind-the-scenes powerhouse that makes modern life possible, from smart lighting to connected electrified vehicles to solar energy generation.

By its very nature, the new electrified energy system is complex and interconnected, and the journey to achieve its promise is riddled with challenges and opportunities. Together, we must carefully navigate the road to electrification, identifying the accelerators and barriers to arriving at our destination. Over the next decade, we will be faced with choices that affect our ability to deliver the anticipated 12.2% rise in electricity demand, the expected appearance of 26.4 million electric vehicles on our roads by 2030, and the grid's ability to provide affordable, reliable energy to all Americans. We are committed to contributing our science and engineering know-how to making data-driven, well-informed choices that maximize investments in our electrified energy future and accelerate our arrival at our desired destination.

SELECT

[Energy Transition Opportunities](#)

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Mapping the Energy Transition

Explore each node of the modern electrified energy system through the interactive map below and learn more about what we can do together to accelerate our progress toward this vision of the future.



TRANSPORTATION

Emissions from the transportation sector are the largest source of greenhouse gas (GHG) emissions in the U.S., accounting for 27% of total U.S. GHG emissions in 2020.¹ The consensus solution for addressing transportation greenhouse gas (GHG) emissions is electrifying as much of transportation sector as technically feasible. For heavy duty trucks, maritime, aviation that cannot be electrified, the goal is to substitute carbon beneficial biofuels and hydrogen for existing fossil fuels.

Key Technologies

Electric vehicle charging including **Charging Stations** with smart metering systems.

Vehicle electrification components include **Batteries** and **battery management software**.

Integration of EV's requires smart chargers, vehicle to grid capabilities, energy management software and other components to link EV into load shifting, demand reduction and other grid programs.

Rail Electrification requires capacitors, insulators, smart meters, switchgear, and transformers.

Potential Market Size & Timing

The U.S. has passed legislation providing significant support to transportation electrification in the Infrastructure Investment and Jobs Act (IIJA) (\$7.5 billion to support EV's) and Inflation Reduction Act (IRA) (\$369 billion in total climate funding). In addition, there is \$2 billion in funding for semiconductors used in EV's in the CHIPS and Science Act.

- After the IIJA investments, there could be 1.2 million charging stations by 2030 (46,000 today).
- The EV market is projected to be \$53 trillion by 2050.²
- EV's are rapidly expanding, with battery, hybrid, and plug-in hybrid vehicles comprising over 10 percent of cars/SUV's sold in the US.³ Globally, EV purchases are increasing by 50% per year.
- By 2030, 48 million electric vehicles could be on the road if federal EV target sales are met.⁴

Barriers

- **Battery reliability and charging capacity** are consumer's top concerns with buying EV's.⁵
- **Lack of EV charging stations** for highways, rural areas, and even parts of urban areas.
- **Costs of EV's** remain higher than traditional cars due to battery and other components.
- **Grid reliability:** Increase in EV charging could overwhelm grid during certain hours.
- **Grid carbon intensity:** Without decarbonization of the grid, EV's are still running on fossil fuels.
- **Lack of alternatives for heavy duty engines** including trucks, trains, and maritime.
- **Decarbonized aviation** requires low carbon fuels and zero carbon alternatives to the jet engine.

Accelerators

- **Aggressive implementation of the IIJA and IRA** to support:
 - EV purchases by individuals, fleets and federal government.
 - EV charging infrastructure deployment
 - Domestic battery and critical component manufacturing and recycling.
 - New clean generation resources to meet increased transportation electrification.
- **Additional federal policies** to drive sector decarbonization such as a Low Carbon Fuel Standard.
- **State policies** supporting transportation electrification such as strengthening tail-pipe emissions regulations, future bans on fossil-fuel cars, and state Low Carbon Fuel Standards.
- **Funding for Development of solutions for large engine applications** including carbon beneficial biofuels and hydrogen, and matching engine technology to utilize the new fuels.
- **Extension of the Smart Grid to transportation system** so that EV's contribute to load shifting, demand response, emergency power and other necessary grid capabilities.

¹ <https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions>

² <https://about.bnef.com/electric-vehicle-outlook/>

³ <https://www.eia.gov/todayinenergy/detail.php?id=51218>

⁴ <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/building-the-electric-vehicle-charging-infrastructure-america-needs>

⁵ Thomas Gersdorf, Russell Hensley, Patrick Hertzke, Patrick Schaufuss, and Andreas Tschiesner, The road ahead for e-mobility, McKinsey, January 27, 2020.

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Transportation ∨[Download QuickFacts](#) ↓[View All Details](#) →

Description

[Key Technologies](#)[Potential Market Size & Timing](#)[Barriers](#)[Accelerators](#)

TRANSPORTATION

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Map URL

<https://energytransition.nema.org/>



WORK WITH IHP SUPPLIERS

The IHP Supplier Community

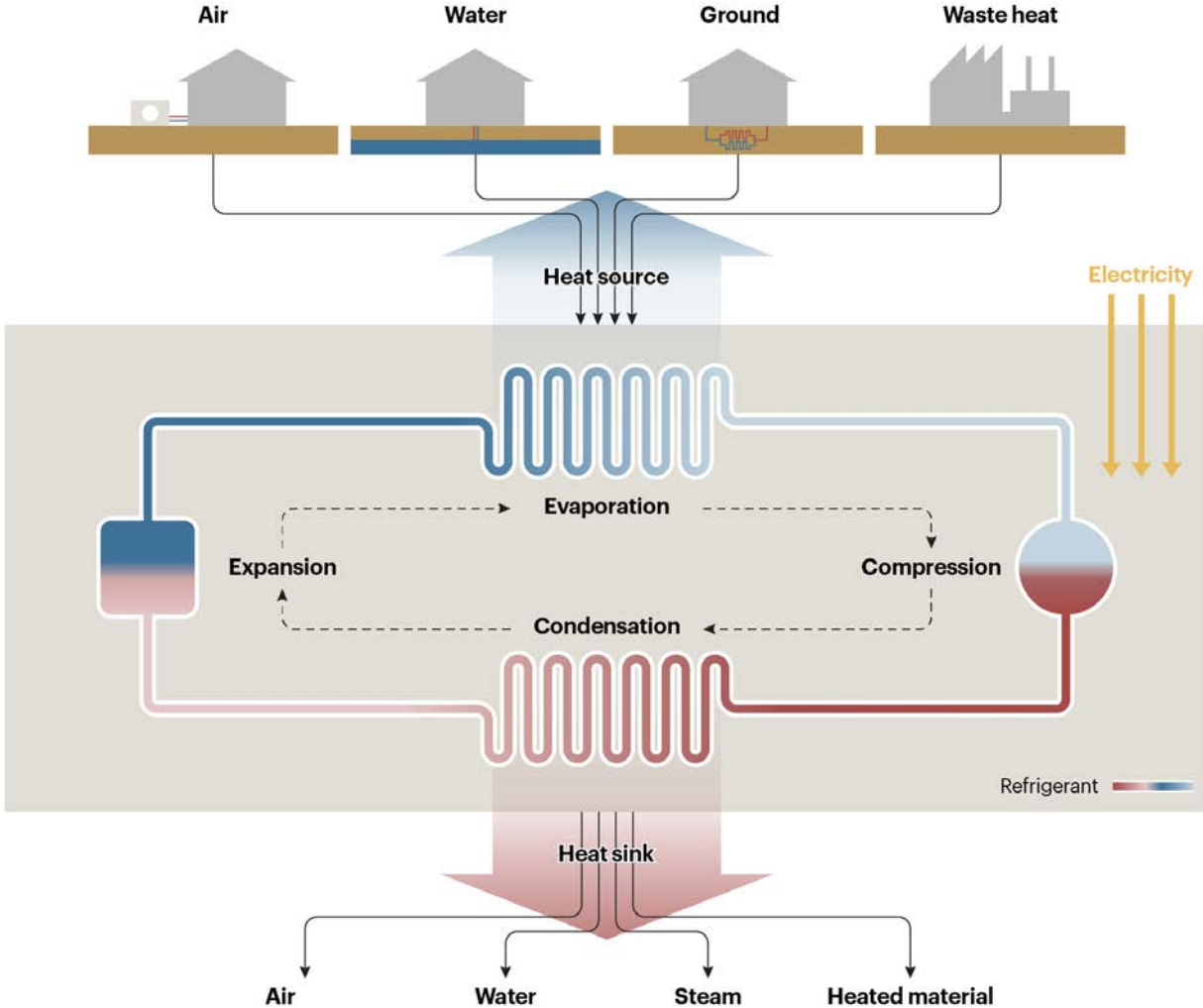
Heat Pump Manufacturers

- Armstrong International
- Copeland
- Daikin
- Danfoss
- GEA
- Johnson Controls
- Mayekawa
- Mitsubishi
- Nyle
- Siemens Energy
- Skyven Technologies
- Trane
- Wellons

Refrigerant Suppliers

- Chemours

The Role of the Refrigerant



Source International Energy Agency

Heat Pump Refrigerants

Importance

- Low Toxicity
- Non-Flammable
- Zero Ozone Depletion Potential
- Very Low Global Warming Potential (GWP)
- Excellent Thermodynamic Properties

Selection Criteria

- Pressure
- Critical Temperature
- Energy Efficiency
- Synthetic vs. Natural Refrigerants

December 2022 IHP Supplier Meeting

- Discussion on the status of the domestic market
- Barriers
 - Workforce limitations
 - Educational aspects
 - Codes and regulatory constraints
 - Limited commercial availability of IHPs in US
- Enablers
 - Manufacturing companies decarbonization goals
 - Interest from the RTC
 - DOE Challenge
 - IRA Tax Credits
 - States and Cities requiring electrification
- Interest in increasing domestic IHP manufacturing
- NEMA represents a neutral forum for these supplier discussions

Next IHP supplier meeting is planned for December 2023



Thank You

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