

**Retraining for the EV era - 02/23/2024**  
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**Speakers:**

- Kianna Scott (SVP of Learning & Development at ChargerHelp!)
- Rajeev YSR (Founder & CEO at EV Masterclass)
- Sunil Nair (VP of Zero Emissions & Fleet Technologies at New York MTA)
  
- Guest Comment by David Macholz (Assistant Dean of Transportation Programs at Suffolk County Community College)

**Part I. Literature** (for further reading about workforce retraining during the EV transition)

1. Bleything, Abby, et al. "Alternative Fuels in Transportation: Workforce Needs and Opportunities in Support of Reducing Reliance on Petroleum Fuels." 2016, <https://scholarworks.uvm.edu/cgi/viewcontent.cgi?article=1038&context=trc>.
2. Coffin, David. "How Does Increased EV Production Affect US Automotive Employment?" SSRN, 2022, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4191584](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4191584).
3. Combemale, Christophe, et al. "Workforce Analytic Approaches to Find Degrees of Freedom in the EV Transition." SSRN, 2023, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4699308](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4699308).
4. Agnihotri, Arpita, et al. "Ford: Talent Management Challenges for Electric Vehicles." *Sage Business Cases*, SAGE Publications, Inc., 2024, <https://doi.org/10.4135/9781071925041>.

**Part II. Recent News**

1. Charette, Robert N. "How EVs Are Reshaping Labor Markets." *IEEE Spectrum*, 2023, <https://spectrum.ieee.org/the-ev-transition-explained-2658797703>.
2. Frazin, Rachel, et al. "What Does the Transition to EVs Mean for Workers?" *The Hill*, 2023, <https://thehill.com/policy/energy-environment/4238445-what-does-the-transition-to-evs-mean-for-workers/>.
3. Ewing, Jack "Battle Over Electric Vehicles Is Central to Auto Strike" *The New York Times*, 2023, [https://www.nytimes.com/2023/09/16/business/electric-vehicles-uaw-gm-ford-stellantis.html?unlocked\\_article\\_code=1.bk0.BCe\\_fJ-5Vhc1\\_xU4&smid=url-share](https://www.nytimes.com/2023/09/16/business/electric-vehicles-uaw-gm-ford-stellantis.html?unlocked_article_code=1.bk0.BCe_fJ-5Vhc1_xU4&smid=url-share)

### **Part III. Questions (Summary)**

1. (To David Macholz) How is Suffolk Community College enabling the transition to the EV era for individuals who seek training there?

**Answer:**

Macholz describes how many schools, colleges, and universities are still in the phase of design and implementation of course structures and contents specific to the EV transition. Macholz took some of these aspects into his own hands by founding the Advanced Vehicle Technology Group, which, in partnership with Clean City organizations, provides training for fleets, municipalities, and trainer training programs for educational institutions. With this, Macholz aspires to integrate the missing educational components in the EV education landscape based on his experiences at Suffolk Community College.

2. Tesla versus non-Tesla charging infrastructure. Why does it work, or why does it not? What happened to the North American charging standard?

**Answer:**

Kianna Scott suggests that due to the sheer size and market share of Tesla, the company can provide a sophisticated standard, which has been tested thoroughly and is available throughout the U.S. While other automotive manufacturers do not have the same runway for EV technology as Tesla, they can benefit from it through adoption which is most likely a promising path forward for high uptime. However, Kianna Scott also notes that there will be manufacturers who choose against operating with the Tesla charging standard while still requiring uptime guarantees. Thus, Ms Scott concludes that training will be mission-critical, hoping that data collected from charging infrastructure will eventually become predictive to reduce training, diagnosis, and repair times.

3. What is the impact of the "Right of Repair Movement" on EV vehicles and charging infrastructure, as seen through the lens of training?

**Answer:**

Kianna Scott opens by highlighting that with a variety of proprietary systems comes a variety of training, which can quickly become a financial, logistical, or up-to-date barrier to the training of the EV workforce. Ms Scott calls for re-focusing on the goal of climate correction and emission reduction, for which system-agnostic training is key. Rajeev YSR resonates with Ms Scott and highlights that manufacturers are reaching a consensus on the fact that EV technology cannot be built in silos, referring to Tesla's open sourcing of their charging infrastructure technology.

4. What is the plan for non-battery-based propulsion at the New York City Metropolitan Transportation Authority (MTA)?

**Answer:**

Sunil Nair shares that the MTA actively seeks alternative propulsion methods, particularly in the hydrogen fuel-cell bus space. When considering the cost of installing charging infrastructure for and procuring and integrating of electric buses, fuel-cell-based technology could represent a competitive alternative, particularly as MTA could follow its successful CNG strategy.

## Part IV. Summary of Memos

### Themes from Other Memos

#### Workforce & Training

1. **Skilled Workforce Need:** There is a pressing need for skilled professionals in the EV sector, including manufacturing, maintenance, and infrastructure development. The transition to EVs demands a comprehensive rethinking of workforce training and deployment.
2. **Global Talent Gap:** The above-mentioned shortage represents an opportunity for regions such as India, which previously succeeded in providing IT specialists during the Dot-Com boom. This previous success indicates the possibility to re-orientate the educational agenda and coordinate educational outputs with the needs of the rapidly advancing EV industry globally.
3. **Employment Transition:** Concerns were raised about the future of the automotive maintenance workforce due to EVs' increased reliability and longer service intervals. Some memos questioned whether workers could be transitioned into related jobs such as charger maintenance, battery recycling, or other mobility industries.
4. **Training and Upskilling:** The significance of training and upskilling ICE technicians and others in the automotive and energy industries to complement the EV transition was a recurrent theme. The general labor shortage poses challenges to maintenance resolution on charging stations, emphasizing the need for comprehensive training programs.
5. **Equity and Accessibility:** Some memos touched upon the need for equitable workforce development, ensuring that opportunities in the EV sector are accessible to those most vulnerable to industry shifts and addressing labor exploitation issues, particularly concerning lithium demand.

#### Technology, Innovation, & Sustainability

1. **Urban Transit Electrification:** The shift to electric buses, especially in large urban areas like New York City, represents logistical, technical, and environmental challenges. However, it also offers opportunities for upskilling the workforce locally and creating regional training hubs to support this transition.
2. **Innovation and Standardization:** Most memos resonated with the critical issues raised during the panel, such as the dire need for charging standards, the right-to-repair movement, and the potential for gender inclusiveness in the EV industry.
3. **Alternative Propulsion Methods:** The memos resonated with the MTA's proposal on hydrogen operations for urban mobility and the suitability of alternatives, such as electric trolley buses, for certain urban contexts. However, they also discussed the environmental

implications of hydrogen fuel and the need for a more holistic approach to urban transit sustainability.

4. **Lifecycle and Maintenance of EVs:** Interest was expressed in understanding the lifecycle and maintenance requirements of EVs, how these differ from ICE vehicles, and the implications for the cost of maintenance from a consumer perspective.

## Part V - My Reflection

The "Retraining for the EV Era" panel discussed the need for skilled professionals in the rapidly evolving Electric Vehicle (EV) industry, highlighting challenges and opportunities in education, workforce development, and infrastructure standardization. The panelists and a short guest comment by David Macholz shared insights on the global shortage of specialized EV engineers and related workforce, the transition challenges of electrifying urban transport systems like New York's MTA, and the importance of collaborative efforts to establish comprehensive training programs.

### Key Insights and Perspectives:

- **Rajeev YSR (EV Masterclass):** Stressed the global shortage of specialized EV engineers and proposed that the talent pool in India, reminiscent of the IT boom, could be a significant contributor to the EV sector. Mr YSR's EV Masterclass program aims to leverage this opportunity and provide the necessary training locally to address this EV specialist shortage globally.
- **Sunil Nair (MTA):** Discussed the practical challenges and opportunities in electrifying New York's MTA bus fleet, emphasizing the need for upskilling and regional training hubs to support this transition. Mr Nair also highlighted the potential role of hydrogen fuel cells in urban mobility, a possibly viable alternative to battery-based vehicle operations.
- **Kianna Scott (ChargerHelp!):** Underlined the critical need for a trained workforce to support reliable EV infrastructure and mentioned ChargerHelp!'s collaborative efforts with various organizations to establish robust training programs. Ms Scott also highlighted the role of general standardization of charger infrastructure, the need for system-agnostic EV technician training.

### Reflections and Future Directions:

- **A Common Goal:** The EV transition is needed for one collective goal: Correcting our climate to avert the worst-case scenario. Thus, the field must overcome educational and training gaps through innovative programs, collaborative efforts among industry stakeholders, and a commitment to inclusivity and sustainability.

- **Global Shortage and Local Supply:** EVs represent a permanent shift requiring significant changes in workforce training, development, and deployment. While we witness a need for more talent and knowledge globally in this sector, solutions are being found locally and regionally. Thus, the EV transition can represent a significant gateway to more inclusive and equal harnessing of local talent and technologies.
- **Alternative to Battery-Powered Systems:** Sunil Nair's point on how fuel-cell-based technologies could provide an attractive and viable alternative shows that more research is needed, particularly in the mass-transportation aspect of sustainable mobility. The audience also suggested considering established alternatives, such as electric trolley busses, which could be promising in certain contexts.

### **Conclusion:**

The "Retraining for the EV Era" panel concluded that while the shift to EV technology poses considerable challenges, particularly in workforce development and infrastructure, it also offers substantial opportunities for growth, innovation, and collaboration. The panelists emphasized the importance of aligning educational outputs with industry needs, fostering inclusive training environments, and embracing alternative technologies like hydrogen to ensure a successful and sustainable transition to a climate-corrective future.