

Lithium-Ion Car Battery Recycling Advisory Group

Meeting Minutes for 5.25.2021

1. **Call to Order, Roll Call, and Establishment of Quorum** – Caroline Godkin, Deputy Secretary for Environmental Policy and Emergency Response, CalEPA
 - Advisory Member roll call:
 - Ana-Maria Stoian-Chu (AS)
 - Mohammed Omer (MO)
 - Hannon Rasool (HR)
 - Terry Adams (TA)
 - Dan Bowerson (DB)
 - Mark Caffarey (MC)
 - Todd Coy (TC)
 - Toshiya Fukui (TF)
 - Perry Gottesfeld (PG)
 - Steve Henderson (PH)
 - George Kerchner (GK)
 - Bernie Kotlier (BK)
 - Jennifer Krill (JK)
 - Nick Lapis (NL)
 - Alison Linder (AL)
 - Nathan Nye (NN) for Teija Mortvedt (TM)
 - Geoff Niswander (GN)
 - Lou Ramondetta (LR)
 - Les Swizer (LS)
 - Absent for roll call
 - GK joined shortly after roll call
2. **Administrative items** – Mohammed Omer
 - Meeting is being video recorded and livestreamed
 - Public can ask questions and comment via chat or calepa.workshops@calepa.ca.gov
 - Welcome to Les Swizer—taking place of Alisa Reinhardt on behalf of California New Car Dealers Association
 - Matt Sheehan put together a matrix of programs related to EPR

- Approval of meeting minutes
 - Minutes approved
 - Updates and questions
 - MC: LKQ made acquisition of Green Bean Battery (NiMH battery packs)
 - AL: I have had trouble accessing videos and PowerPoints
 - MO: There is a delay because they need to be made ADA compliant. Easiest to follow up with Mohammed directly
3. **Presentation on California Zero Emission Vehicle Market Development Strategy and Permit Assistance Program** – Tyson Eckerle, Deputy Director, Zero Emission Vehicle Market Development; Manjeet McCarthy, Senior Permit Specialist
- Tyson Eckerle:
 - Three crucial goals for Zero Emission Vehicle (ZEV) market, in the context of this group this will mean a lot of batteries
 - ZEV market development strategy articulates core principles for collective action
 - Clearly identify metrics and targets
 - Identifies major stakeholder groups
 - Empower market actors to exceed expectations
 - Ensure lessons learned are incorporated
 - Strategy overview
 - 4 pillars:
 - Vehicles
 - Infrastructure
 - End users
 - Workforce
 - Core principles
 - Equity in every decision
 - Embrace all ZEV pathways
 - Collective problem solving
 - Public (policy) complements private (investment)
 - Design for resilience and adaptation
 - Outcomes
 - Improved air quality, reduced greenhouse gases, accessibility,

green jobs

- Resources for information
 - ZEV strategy website
 - ZEV Strategy document
 - Organized by stakeholder group
 - Updated every 3 years
 - State agency action plans
 - 29 agencies are involved
- Battery recycling actions
 - 2832 recommendation; key collaborators are CalEPA, CalRecycle, DTSC, CEC, Governor's Office, UC Davis, private entities, NGOs
- Budget/California Comeback Plan
 - \$3.2 billion investment over 3 years
 - ZEV drayage trucks, transit buses, school buses, light duty infrastructure, Clean Cars 4 All, Clean Vehicle Rebate Project, in-state manufacturing, labor workforce development
- Tyson.eckerle@gobiz.ca.gov
- Manjeet McCarthy
 - 20 years in experience helping businesses navigate permitting process and understand compliance requirements
 - Focuses on streamlining processes, serves as mediator between companies and agencies, customer service tools and desk, development of industry-specific quick-start guides.
 - Part of CA Investment Business Services Team → site selection assistance, facilitates collections with local resources

Questions

- CG: What kind of questions do you get about end-of-life batteries
 - TE: Mainly general questions about what we are going to do with the batteries. We have hand-wavy answers that we are thinking about reuse and need to work on the economics of recycling. We don't have solid answers but try to convey that we are thinking about it. In terms of the report, what are the no-regrets things we should be doing now? What are the implementation actions? In our role it's making sure we are building confidence in the market because people are asking well-founded answers. We can view this as a problem and as an opportunity; the more we can think about this as an opportunity if the economics work out and we can realize benefits in terms of grid resilience through second life, the

more helpful it will be.

- MO: The subcommittees talk a lot about permitting streamlining and the time it takes to permit a facility in California. Are you getting a lot of interest in this question? It takes both sides—regulatory agencies and private businesses that want to set up facilities that might require a permit. Has there been interest on both sides? What can each party do to improve the working relationships?
 - MM: When a company comes to us, I sit in their initial meetings and we figure out what kind of business it is and what they will need. The approach we adopt is bringing everyone to the table at the very beginning who will be participating in any kind of permitting that will be required. We let the companies know that a main issue will be California Environmental Quality Act (CEQA). This is the most time-consuming process and I have talked to a lot of local cities and counties who have done pre-CEQA approvals, so when a company goes there, they only have to do a mini-CEQA which can cut a process down from 7-10 months to 90 days. So that's one of the suggestions and that works well. The other thing is to from the very beginning to let the businesses know what exactly it is going to take for us to permit them so they are aware of it. In a lot of cases what I have done is if it's going to be a manufacturing facility, I have had the Air Resources Board (CARB) and Water Boards working with the company from the very beginning during the first introduction so they can work together. The Governor's Office (GO) is also working on a permitting streamline process and we will be participating soon, but they are still in the initial stages where they are trying to figure out how they want to go about it.
- PG: Does the GO have any plans to put forward recommendations based on this committee to influence state or national policy on battery reuse or recycling?
 - TE: Yes, we have to make assessments on what we can implement within the GO vs. legislature but having a laundry list will be extremely helpful. Manjeet laid out the permitting process. Another question is scale and is this something we need to elevate.
- AL: Two-part questions. First question: this committee has been operating under the assumption that a policy to reuse and recycling batteries is that it could create jobs in California but to Manjeet's point it does have potential to be a polluting or unpopular industry that will be difficult to locate. Does the state view this as something to retain within the state and who would be the decisionmakers about that opportunity?
 - TE: What do you think? I would assume yes
 - AL: I would say yes because we have the regulations and political will to do this well so that is an incentive to keep it in California to ensure it's done properly and capture the economic benefits. But I could see how on a higher level there could be other motivations.
 - TE: Yes, your assumptions are correct.

- AL: Second part; you mentioned one of your jobs is to help businesses site their facilities. Despite what this policy recommends we are kind of at a point where you could start doing that analysis. Do you think that type of analysis could be a good recommendation of this committee?
 - MM: Our California business investment team has conversations with them finding out exactly what they would like to do, do they need to be near a port, railroad, airport, etc. So, once we determine what will be beneficial, we contact our economic dev local partners and have a site selection sheet that companies complete where they list priorities and we share that information with local partners and they at that point respond if they are interested in having the company come to them. Then we have a meeting with local reg agencies, partners, companies. We do site tours with companies. If local community wants the company to come, they try to attract the company. That's how we do it. That's how we realized that certain counties have simplified their use permitting process; they work at the speed of the business not at the speed of the State or county. We work with local air and water districts and see if there is anything we can do to expedite the process.
 - *Is there any difference for a hazardous treatment facility? Can that still be streamlined at a local level?*
 - AL: My suggestion is to proactively create a list of criteria for businesses and scan for it to help businesses in advance.
- MO: Reading comment from Lauren Roman (LR) from chat: "The Australian government created a grant program to support development and implementation of technologies that can streamline permitting for battery minerals mining and exporting from AU. Perhaps CA can find innovative solutions similarly."
- JK: To add a couple of points on the idea of primary sourcing minerals for battery technology growth, if you aren't aware my organization EarthWorks works to address the adverse impacts from mineral and energy extraction. In the US it is governed by outdated laws; there's no royalty or fund from clean-up costs. This is an issue that California grapples with actively, and mining is the most toxic industry in the US. We've been encouraging a hierarchy of responsible material sourcing for this battery transition beginning with recycling, we recently commissioned new research from the University of Technology Sydney looking at global mineral reserves and soon-to-be technology for recycling. Our analysis is that is that recycling could offset between 25-55% of new mining for batteries. We also feel new mining must be independently certified since it is governed by such an outdated and antiquated law.
- MS: Can local governments also create a streamlined process for permitting?
- MM: They take a parcel of land and pre-assess it so that whoever is applying only has to do the CEQA process for that specific business type. Not many districts have done that but I was in a small town between Fresno and Modesto

who had done it.

- AL: Jennifer, was this under a best-case scenario?
- JK: Yes, and also these are minerals that we have never demanded at this scale before.

4. **Presentation by California Auto Dismantlers Association on Sustainable End-of-Life Policy Solutions for Lithium-ion Batteries** – Tom Novak, Vice President

Business Development, Pick-n-Pull

- State of California Auto Dismantlers Association (SCADA) is a statewide trade association to serve Licensed Automobile Dismantlers in education, government, business and social activities
- Automobile dismantling
 - Full vs. Self-service; for self-service, public goes in and picks their own parts.
- Licensed dismantler requirements
 - Zoning approval, use permit, other permits
 - Storm water permit, EPA identification number, hazardous materials business plan, safety and injury/illness prevention program, workers comp insurance (among others)
 - Licensed dismantler requirements for vehicles processed
 - Proper management and disposal of various materials
 - Federal reporting requirements
 - They accept these additional costs to maintain regulatory compliance
- How end-of-life vehicles (ELVs) are acquired
 - Insurance companies → auctions
 - City and county programs
 - Tow companies
 - Non-profits
 - Private parties
 - Cars with LIBs and NiMHs are currently showing up in all these channels
- Auto recycler's sustainable recycling solutions
 - Reuse of battery in similar application; best and highest value
 - Repurpose for new use
 - Recycling; lowest value but there is a market. Only option for damaged

batteries

- Recycling damaged batteries is costly
 - Must be stored in a segregated processing area, shipping requirements are \$1,500 plus
- Possible policy solutions
 - Cost effective and reasonable framework of requirements for management, handling, transportation
 - Improved labeling with vehicle specific data, e.g., YMM and battery chemistry
 - Identify viable and stable funding source to support requirements
 - State general fund not a reliable source of funding
 - Revise overburdensome requirements which disincentivize recycling and have unintended consequence of directing more vehicles and batteries to unlicensed automobile dismantlers
 - Continue to address the issue of unlicensed dismantlers—SB 366 to extend the unlicensed dismantlers taskforce
- Unlicensed dismantler
 - Operates as a dismantler without license from DMV
 - Estimated that up to 40% of 1.2 ELVs in CA are unaccounted for and processed by unlicensed dismantlers
 - 20-30% cost advantage per vehicle for unlicensed dismantlers
 - Number of licensed dismantlers in CA has dropped from 1,600 in 2000 to 900 today

Questions

- PG: Are you saying there are 3X more unlicensed firms? And do you report whether vehicles are hybrid vs. battery electric?
- TN: We report the VIN and that can be used to find the make and model. It's estimated that 40% of vehicles go into black market, the point here is that there is an increase in unlicensed activity.
- PG: What is the federal agency you report to?
- GM: Department of Justice
- TC: That's a significant reduction in terms of facilities. Is there a reason you could point to? Business climate, tough industry?
- TN: There are some folks who have just gotten out of the business. Being in the business, some challenges continue to be with compliance and these are good operators so in a lot of cases it's better for them to roll up their sleeves and move on if it's not the best use for their facility. And the unlicensed

- dismantlers make it difficult to compete. We are going against them when we have to purchase cars; they can spend more at auctions because they don't have the same overhead.
- TC: Are there any regulating mechanisms in place that don't allow for unregulated parties to buy cars at auto auctions?
 - TN: No, they're able to go to auctions, put signs up, and go to tow vendors. They struggle to get city and county abatement cars but other than that they have the same access that we do.
 - MO: Sandy Blalock included a link to the agency dismantlers report to in the chat: https://vehiclehistory.bja.ojp.gov/nmvtis_auto
 - GN: I have a question about the requirements. I see you have a hazardous material permit of some sort, do you have to renew those or do you get an exemption?
 - TN: I'd have to get back to you on specifics, but we are certified to handle hazardous materials.
 - GN: So you could handle LIBs without additional requirement. Do you find the core charge model to be helpful in managing lead-acid batteries? Or is just the ease of shipping and handling that makes it easier?
 - TN: Mostly ease of shipping and handling, documentation. The core charge fluctuates based on the price of lead.
 - CG: Could you explain for the group at large what a core charge is?
 - TN: Yes, it's typically where if a retailer were to sell a battery, they would add a charge on top of that to incentivize someone to bring the battery back.
 - DB: It's good for this group to keep in mind that it's imperative we don't accidentally incentivize unlicensed dismantling. You mentioned excitement about recycling. Are you starting to see a positive value and demand for recycling? Do you purchase them at auctions because you are seeing positive value?
 - TN: Yes, initially they were a nuisance but there is enough demand for example for Nissan leaf batteries to repurpose that we are seeing more interest. Older batteries have a fair amount of cobalt and nickel and they are developing processes to extract high rates of metal with little waste. I don't know how closely you guys are following the news on this but there are recyclers announcing facilities; Lithion, Retrieval, Redwood Materials, etc. It's really the cost of shipping the batteries to the recyclers that's the issue.
 - TF: I am shocked at how brazenly people are able to buy batteries at the same sources you are going to. This sounds very visible. Are a lot of these guys operating out of permitted locations?
 - TN: They go into light industrial areas and just bring carts through where they can lease for a low price. A lot of times they do it for export which is also a

- concern. We can put all the blockchain we want in the batteries but if they're exported they are lost and they probably will not be shipped up to DOT standards.
- TF: Yes there are safety and environmental hazards, who will pay for that liability? So there was a task force that was charged with looking at enforcement, but right now would you say those resources are lacking?
 - TN: Yes, we are working with Senator Umberg to get resources extended. We feel it is in our best interest and interests of this committee to show our support for this bill.
 - TF: So do you think this is an enforcement issue? If there were more people enforcing this issue it would be less of a problem?
 - TN: Yes
 - GK: Getting back to cost of shipping, can you describe what those shipping costs are? Is it a matter of the carrier coming to your door and the fact that it's a hazardous material?
 - TN: Yes, you have to use a certified Class 9 waste hauler. When you're shipping a damaged battery they have to be in a container to protect it from impact and have the material to go along with that. Batteries range from 20lbs to 1000 lbs that don't sit on a standard pallet so you have to have custom-made wood crates. If you're not getting them from the OEM the crate and packing material to ensure they're safe
 - GK: So it's the packaging and preparation. Lead batteries are subject to generous exceptions from hazardous materials transportation shipping. The issue we have is the fire risk. We are working on a solution to lower those costs but it's a heavy lift for DOT.
 - TN: I am mainly talking about exceptions for undamaged batteries. I can transport the battery within the vehicle easily, but when they're taken out of the battery now it's class 9. So is there a way we can say these batteries are safe, they're palletized, and get an exception?
 - GK: Yes it comes back to the fire risk and there are incidents that come back to bite us when we approach DOT. There may be alignment with the Biden's administration's priorities to support battery recycling.
 - MO: Thanks, this was a really great presentation, I think we are all floored by the numbers about unlicensed dismantling. We are going to take a break and come back at 1:15.
 - MO: Welcome back everyone. As an introduction, we have separated out into three subcommittees to identify, discuss, and analyze barriers, opportunities and policy recommendations to meet the goal of AB2832. At this time we are going to hear a brief presentation from the chairs of the subcommittees. This is a type of progress reports. Chairs will answer clarifying questions and then we will go to a larger discussion. First up is GK who is chair of the logistics

subcommittee.

5. Logistics subcommittee presentation-- George Kerchner

GK: I am the chair and this is an update on the issues we have been covering over the last three months. These are complex so please bear with me.

- Barriers: The presentation today was great at discussing transportation issues.
 - Cost and complexity of haz mat transportation
 - Burdensome state regulations
 - Difficulty of capturing out of warranty batteries
 - No defined responsibility or EPR
 - Unlicensed dismantlers
 - Knowledge and infrastructure gap
- Opportunities: Tremendous amount for the state of California.
 - Establishing collection and recycling program to reduce costs
 - Increase recycling rates
 - Support reuse or repurposing
 - Skilled job creation
 - Increased safety
- We started out doing a policy brainstorm.
 - First purpose is defining a responsibility, and this can be reached by EPR or an upfront fee
 - Incentivize battery return through core charge
 - Enable access of information about the battery condition through universal diagnostics
 - Avoid grey market by improving enforcement of existing laws and a certification program
 - And to address the knowledge gaps funding should be made available to provide clear OSHA guidelines, storage, and shipping.
- Extended producer responsibility: one way is the upfront fee collected when the EV is sold. We had a great presentation from Call2Recycle and the PaintCare program. One approach is an upfront fee or environmental handling fee.
 - Positive: This is used in Canada for portable batteries. This avoids the need to subsidize at end of life. There are a lot of positives for this.
 - Negatives: The negatives include an added upfront cost to the EV.

This is a big negative. It may not encourage second life program.

- EPR without upfront fee. This means that the OEM absorbs the costs.
 - Positive: This is also much simpler than an upfront fee.
 - Negatives: Placing all the burden on the OEM and disincentivizes reuse and repurposing.
- Core exchange program: This is similar to what is happening today with the lead-acid battery.
 - Positive: This does not add upfront cost at time of purchase
 - Negative: Only addresses batteries that are returned before the vehicle end of life and assumes a positive value of battery at the end-of-life.
- The party handling the battery is responsible for sending it to the proper facility. This is basically what is happening right now.
 - Positive: Does not add upfront cost, it doesn't add additional actors and supports a used parts market.
 - Negative: Safety and hazard risks, the issue of a lot of unlicensed facilities, enforcement challenges, does not address transportation issues, and it does not incentivize proper disposal.
- Proper diagnosing the condition of the battery and having access to the state of health data.
 - Positive: Enabling informed decision about the end-of-life route. This allows maximum use of the battery and more locations to diagnose.
 - Negative: IP issues and that it could result in unlicensed people to work with the batteries.

6. Recycling subcommittee-- Mohammed Omer

- MO: Like the other two subcommittees we went over the barriers, opportunities, as well as policy ideas and recommendations.
- A side note: The US and DOT at the federal level have done great webinars. There is a State Senate bill SB244 for training and handling the disposal of the batteries. It would be put together by DTSC and CalRecycle, with a battery fire training program run by CalFire.
- Barriers: all of these are separate subcommittees, but they have similar barriers
 - Regulations: there is difficulty permitting. The department has spread up their process, but facilities have not yet gone through the process. In addition, there is potentially unclear and outdated/ inconvenient regulations
 - Economics: The first is who is responsible for end-of-life costs and the need for consolidation. The economics of material recovery and cathode chemistries, this is kind of the economic case for recycling; is it

economical? We are seeing a shift to lower cobalt batteries which changes the recoverable value.

- Industry development in the US: We don't have a full supply chain in the US. If there is no supply chain, this question of a circular economy is not tested. It is a murky area of seeing into the future.
- Lack of information and data: There are different cathode chemistries that may change from year to year and there isn't much labeling. And of course, this has to do with IP. Another is the lack of design for recycling and standardization. The OEMs are designing for performance and range but perhaps not the end-of-life. Finally, the uncertain performance of recovered materials. It is unclear if these can be put back into the battery supply chain.
- Opportunities:
 - The reduced environmental and social impact: this includes the conservation of resources and reducing the environmental and social impact. Finally, the conservation of landfill capacity and reduced reliance on hazardous waste landfills.
 - Economic opportunities that include job creation, which can support families and economic growth. The introduction of supply risk and reliance on imported materials and the lower cost of batteries.
 - The recycling industry growth: So, the creation of a recycling economy within the US and the manufacturing ecosystem is currently a barrier.
- The policy brainstorm.
 - The goal that I will go over the most is supporting recycling facility development within California because it won't have as much overlap with the other subcommittees. This includes a guaranteed timeline and budget, an economic incentive package, and not allowing rule changes except at permitting.
 - Defining a responsible party: the current owner and EPR
 - Creating a fund to cover the recycling costs with money gathered at the car registration.
 - Ensure quality recycling
 - Incentivize battery recycling
- Streamline the permitting process at DTSC with a guaranteed timeline and budget for both parties:
 - Positive: fixes the immediate problem by providing transparency, this may lead to more facilities in state and reduced GHGs from transportation, and reduced illegal operations.
 - Negatives: the details are unclear,

- Economic incentive package:
 - Positive: can make business competitive by helping with upfront costs
 - Negative: doesn't fix the process or economics, there may be overcapacity through over incentivization. An example for this is e-waste facilities, the business may not be competitive in the long run, and public cynicism.
- Recycling fee gathered through registration costs
 - Positive: Includes EVs purchased outside CA, avoids upfront costs and shared burden across all EV owners, route to funding EoL
 - Negative: registration fees may be too high, does not address what the funds are for
- Extended producer responsibility
 - Positive: incentivized design for recycling, clearly defines responsibility, OEMs will not have to pay oversight cost to CA, and addresses challenge of party at EoL
 - Negative: potential increase of EV, OEMs don't have the tools to deal with the EVs, uncertain EV location at EoL, OEMs may not be able to meet requirement
- Core charge
- Labelling requirement

Questions:

- AL: Why would the core charge only be part of the market?
- MO: Let me get back to you
- Jessica Dunn: The core charge only covers part of the market because it would only apply to the batteries being replaced. If a battery is replaced the purchaser would have to pay a core charge for the new battery and then would get the money (core) back at EV end-of-life. The batteries that are replaced are a very small percentage of the total batteries and EVs on the market.

7. **Reuse subcommittee**— Alison Linder

AL: There is a lot of overlap so I will go fast.

- Barriers:
 - The cost of repurposing
 - Allocation of responsibility. Reuse is an extra step of the loop and there is difficulty in knowing who would be responsible, and it came up that OEMs are liability conscious. From a policy standpoint it is useful to think of not only who is responsible but who is responsible at each time point.
 - Lack of information about battery conditioning

- First-life battery design
- Acquisition challenges: the lack of volume but also
- Opportunities:
 - Reduce environmental impacts of large format LIBs such as displacing the mining
 - Create skilled jobs
 - Provide an affordable energy storage solution, expand the energy storage market
 - Encourage transparency and coordination between producers and end-of-life stakeholders
- Policy brainstorm: these are broken into policies that facilitate reuse and those that determine who is responsible
 - Policies that facilitate reuse: universal diagnostic system, battery passport, mechanisms for testing, expand the eligibility for incentive programs. It was pointed out that some CA programs include new batteries but not used.
 - Policies that determine who is responsible: A fee collected at the point of purchase, extended producer responsibility. It might be helpful to include incentive programs for batteries that have a lower state of health. We don't want batteries to be taken back too quickly.
- Universal diagnostic system:
 - Strengths/opportunities: more operations would be able to determine reuse value, ability to flag safety issues, consumers and buyers have information, and decreased testing costs
 - Weaknesses/threats: need to develop a robust UDS, measuring battery condition, opposition from OEMs, challenge of standardization
- Upfront fee collection:
 - Strengths/opportunities moves cost from the public, supports the OEMs, administration burden shared
 - Negative/weaknesses: incentivize recycling and not reuse, opposition from the OEMs, and cost of managing could be high

Questions:

- Jennifer Krill: What is a UDS?
- GN: A universal diagnostic system would provide information to the consumer as to what the state of health is of the battery. This would be for example provide for the ability to plug a device into the battery and have readings on the capacity or voltage of the battery.

8. Discussion of progress— Caroline Godkin

- CG: Thank you to all the presenters and the UC Davis team. I am going to go around and call on people today.
- TA: I thought the presentations were informative. A couple comments about enforcement. I think the biggest issue is that regulations are passed but there isn't money to enforce these. This ends up being the bigger players are misguided with enforcement and the smaller players skate by and don't get the attention they deserve. Regulations without funded enforcement makes things worse. I pulled the report that was referenced from earthworks. I think the comment about getting 55% of metal requirement is achievable, this refers to copper. The other numbers, we need to remember that we are talking about twenty years down the road. So, this gets pushed way down the road and there are material supply issues to solve between now and then. Big believable in the free-market approach but I do support having some funds available for orphaned products. Funded recycling, I think is a mistake.
- DB: It was encouraging to hear that EVs are seen as an opportunity and not a burden. We are trying to encourage EV adoption and I worry that any kind of upfront fee will make it so lower- and middle-income people don't adopt. I know labelling is mentioned and part of ARB proposal, I encourage that.
- MC: I'll bring two points. I was surprised to see that many unlicensed. The new regulations need to have strong enforcement. Given the growth of the EV, I don't think we will be able to just use recycled materials—we will need both recycling and mining.
- TC: I really am echoing the comments about shock in respect to unlicensed dismantlers. There is this infrastructure we are trying to build up and that is a black hole and unsupported area. I do not know how to address that. Enforcement needs to be moved up the priority list. That's all I have.
- TF: I am also shocked about the unlicensed dismantler. I am surprised that they can acquire feedstock. It seems like there needs to be permitting and certification to participate at auctions. This creates a false market and the environmental and safety issues. If they were to create an environmental problem this is a burden to society and the OEM. The north America supply chain is also an area we need to focus. Everyone has great ideas and I think we don't know how it will end up. We need flexibility in the recommendations that we make.
- PG: We started looking at the barriers and opportunities document, is there a plan to discuss.
- MO: Yes, please make in line comments and send to me and the UCD team.
- PG: No one talked about discussing the design aspect. Is there a way we can influence in terms of chemistry or easier design? Jessica challenged us to do some homework and it sounds like the other groups had the same approach. One thought is to design a system with flexibility down the road and we don't want to burden it with an upfront cost. I had the idea of a hybrid approach of taking many of these routes to spread the cost. This could be used for clean-up,

orphaned modules, or even electric scooters. The idea is that if we spread out the costs through registration it would be spread out, but the OEM could pay 50% of the vehicle registration to cover half of the end-of-life costs. This can be a different fee based on the type of vehicle, two-wheel, hybrid, truck, or passenger vehicle. This fee can be used to address a multitude of costs down the road.

- SH: I was aghast at hearing about the unlicensed dismantlers. I think the distinction between who is responsible and who pays is a hard one. These EVs are out there for 15 to 20 years before EOL. I think the initial customer putting a bottle return fee just doesn't work. That is why I think the core charge is a great idea. We have a huge task in front of us. The OEMs are tasked with moving everyone over to EVs and that means that low-, middle-, and high-class people need to be able to afford an EV. The economics are really challenging. The labelling and battery SOH monitor could probably address the concerns across all the subcommittees.
- JK: I echo a lot of what the previous speakers have said. I am impressed by the alignment between subgroups. The framework was great for leapfrogging and learning. I am shocked about the unlicensed dismantlers as well. A few remarks about the role of mining. For clarity sake, I am not saying we won't need mining for the EV revolution but I think we need to realize that it has impact.
- GK: JK's point that the report of the subcommittee will help with the writing of the report. The fact that the subcommittees overlap with issues allowed for the reinforcement of how complex these issues are and implementing a program that takes into account these issues. Our responsibility is important to convey these difficulties and that any legislation needs to take these into account or it will burden every industry. We have captured these challenges and we can convey this. I don't think anybody knows how this will end, I think our recommendation should be that we establish a program but it allows for the market to grow. I now know where we are going with the report and I feel much better about the direction that we are going.
- NL: I hate being in the middle of the alphabet, I always get stuck after people saying things I thought. I also saw an overlap. One thing that I am not clear is that I have a hard time knowing peoples position and how far we are from a consensus. When we get into the report writing we will have to deal with that. Another thing is that maybe we need to look at a yes and approach where we take a lot of pieces to conquer the problem. My initial approach was thinking manufacturers should have to deal with this but maybe we should combine approaches. Maybe warranties should include taking back all the batteries under ten years, core exchange programs can take some. I think it is a good point that if we want to get to 100% ZEV, we don't want to increase EV costs. I am wondering if maybe we can use a lot of these policies to cover the costs and help fund the batteries that are left if it is a relatively small delta. I like where Perry is going with his approach.
- CG: Yes, I think we need to get to know what each party is thinking. I like the "yes and" approach.

- AL: I will echo the delight that the subcommittees have overlap. I think the yes, and approach is great but I see a lot of them in conflict. I don't know how those will be resolved from a process standpoint. I think that for me a useful next step is to map out the life of the battery from the point of manufacturing to the end of life so we don't miss anything. For example, someone talked about expedited permitting and that is something we don't want to miss and is a great idea. I think it would be helpful to map this out in a logical and linear way. One point of incompleteness for me is the upfront fee and producer responsibility. In many cases I think they work in similar ways. My point of determining who is responsible for what could work there. I know people have made the claim that any kind of fee that would handle end of life concerns could discourage EV sales. I would encourage the committee not think about that. I think they should think about the full life impacts because the cost of EVs are coming down and there is policy support for the decreasing of costs. I don't think we can hide behind that to avoid internalizing end of life costs.
- GN: Great presentations today. For Tom's presentation, I am not sure how to streamline the battery EoL and decreasing the transportation costs. I think we are all on the same page about mining. There is no such thing as a free lunch. Based on the ZEV, by end of 2020 2.3% are EVs. If this is to go to 100% there will be a huge need and demand for EVs. I suggest looking at USGS mineral surveys for more information. The last point is that the UDS and battery identification and composition labeling. I have a hard time seeing this as an IP issue, I think it is a safety issue. If the OEMs aren't willing to take back the products then the information needs to be available to those handling it
- NN: *No comment*
- LR: I am at the risk of saying the same thing as everyone else. I recommend we look at on-site meetings again. It may make sense that we get back together in a face-to-face form. That will make the discussions and activities move along quicker. I am familiar with the pick and pull industry so I wasn't surprised. This is a huge void that needs to be addressed. I am impressed by the Governor's programs and see that they are trying to support the growth of industry. That warms my heart. I think getting some feedback from the other committees was helpful. We struggled on the reuse committee and getting to a point where it is in a document will be difficult.
- LS: I am the new addition to the logistics subcommittee. I am staff council to the California automotive industry (CNCDA). I am very happy to be here and honored to be added. At risk of being repetitive, I just want to echo comments about trying to keep costs down, they are not cheap to make. I know costs will come down in an organic way so that can be adjusted as things go forward. I also want to emphasize the need for enforcement. These are dangerous and there are liability issues with dismantling. I do like that there is a splitting of fees. Yes, OEMs are making these vehicles, but they also will be forced to make these vehicles. From the meetings I have been in everyone has been collaborative and haven't just been trying to force the fees on the manufacturer which I appreciate.

- AS: I agree with the others that emphasized the informative nature of today's presentation. I think it is very impressive by the amount of work of the subcommittees and the time contributed. In regard to synergy, I think it is critical to look at this from upstream and downstream. I think we are still trying to figure out the best option of hybrid EPR, to full EPR, a take-back program. I think we need to be prepared for in a change of chemistry and the value of batteries going down. We see this with e-waste, we need to be prepared to address that negative value that we will likely have. We need to be flexible and look in the long-term. I agree that strong enforcement is needed but we do need resources. In terms of next step, it will be interesting how we will streamline the process and the report. If there aren't things addressed yet we will be able to get to that.
- MS: I want to encourage everyone to look at the barriers and opportunities draft. I know that everyone didn't because the draft has the information about the unlicensed recyclers. So please read that and get it back to us.
- AK: I think it is great to see the cohesion between the three subcommittees. I think there has been a great effort from everybody and I am excited to see where it goes.
- MO: It was interesting to see just how much overlap there was. It is really stark to see just how much we have converged on a few core policy ideas. It will be interesting to see where we stand. I don't think we will have full consensus, well maybe some such as enforcement issues, but the cost distribution will likely have varying opinions. These subcommittees will continue to meet monthly, we meet as a larger body per quarter.
- MO: the next meeting is scheduled for July 13th, 2021 at 9 AM to 2 PM.
- CG: Two comments from Ryan Barr:
 - The issue of enforcement should be considered or there will be a similar issue in the repurposing industry
 - IP is not a good reason to hold off on sharing UDS. UDS should be available for the past and near-term vehicles. This is feasible and can dramatically increase the safety and value of batteries
- Hanjiro Ambrose: I would encourage everyone to check out the recent workshop materials from the Air Resources Board Advanced Clean Cars 2 Program workshop from May 6th. The Advanced Clean Cars 2 proposal, which would apply to 2026 model year and future vehicles, includes provisions for standardized state of health metrics and a battery labelling requirement. <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program>
- Sandy Blalock: The only solution to unlicensed auto recycling is effective enforcement on multiple levels. A huge burden to every state and their resources. Putting additional burdensome regulations on the licensed auto recyclers in California, while removing opportunities to resell vehicle components into a retail market will have disastrous consequences. Good insight Toshi!
- MO: thank you everyone. We introduced our new member, approved meeting,

had two presentations, and had the subcommittees present the progress reports, and Carolyn led us in the discussion of progress and ideas. Thank you.

- CG: Thank you everyone. I am optimistic about the report. Meeting adjourned.