South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

TECHNOLOGY COMMITTEE MEETING

Committee Members
Council Member Joe Buscaino, Chair
Supervisor Lisa Bartlett
Board Member Gideon Kracov
Council Member Judith Mitchell
Council Member Carlos Rodriguez

April 17, 2020 ♦ 12:00 p.m.

Pursuant to Governor Newsom's Executive Orders N-25-20 (March 12, 2020) and N-29-20, (March 17, 2020), the Technology Committee meeting will only be conducted via video conferencing and by telephone. Please follow the instructions below to join the meeting remotely.

ELECTRONIC PARTICIPATION INFORMATION
(Instructions provided at bottom of the agenda)
Join Zoom Meeting - from PC or Laptop
https://scaqmd.zoom.us/j/113718569

Meeting ID: 113 718 569 (applies to all)

Teleconference Dial In
+1 669 900 6833
One tap mobile
+16699006833,113718569#

Audience will be able to provide public comment through telephone or Zoom connection.

PUBLIC COMMENT WILL STILL BE TAKEN

AGENDA

Members of the public may address this body concerning any agenda item before or during consideration of that item (Gov't. Code Section 54854.3(a)). If you wish to speak, raise your hand on Zoom or press Star 9 if participating by telephone. All agendas for regular meetings are posted at South Coast AQMD Headquarters, 21865 Copley Drive, Diamond Bar, California, at least 72 hours in advance of the regular meeting. Speakers may be limited to three (3) minutes each.

CALL TO ORDER

ACTION ITEMS – Items 1-2:

1. Amend Award and Execute Contract for Stationary Fuel Cells — Lisa Mirisola, Program Supervisor
(Motion Requested)
In January 2018, the Board approved an RFP to solicit stationary and mobile source projects that will result in emission reductions of NOx, VOC, and PM. Subsequently, in January 2019, Bloom Energy Inc. was awarded $3 million for fuel cells integrated with energy storage on the College of the Canyons campus. Bloom recently requested a change in scope of the project that reduces the award amount but does not impact the emission reduction benefits. This action is to amend the award, the scope of the project and execute a contract with Bloom Energy Inc. in a total amount not to exceed $2,934,052 from the EO Mitigation Fund (27).

2. Amend Contract for Tier 4 Passenger Locomotives *(Motion Requested)* — Mei Wang, Program Supervisor
In 2014, under the "Year 16" Carl Moyer Program solicitation, the Southern California Regional Rail Authority (SCRRA) submitted a proposal requesting $58.85 million to cofund the deployment of 20 new Tier 4 locomotives. In September 2015, the Board awarded $22.85 million to SCRRA from the Carl Moyer Program AB 923 Fund (80), with a commitment to consider the remaining $36 million over four phases. The Board previously approved $27 million of the $36 million in three installments in December 2016, December 2017 and February 2019. This action is to amend SCRRA's contract, adding the remaining $9 million from the Carl Moyer Program AB 923 Fund (80) for a revised contract total of $58.85 million.

INFORMATIONAL ITEM – Item 3:

3. Staff Report on Electric Vehicle Battery Reuse and Recycling — Seungbum Ha, AQ Specialist
(No Motion Required)
Rapid growth in the market for zero emission battery electric vehicles is a significant part of the overall strategy to improve air quality in the South Coast Air Basin. Although reuse of batteries is a desirable option in the near-term, the longer-term challenge of a growing number of batteries present a potential environmental waste issue. Staff will present the current range of approaches to electric-vehicle lithium-ion battery reuse and recycling and highlight potential future pathways.

OTHER MATTERS:

4. Other Business
Any member of the Committee, or its staff, on his or her own initiative or in response to questions posed by the public, may ask a question for clarification, may make a brief announcement or report on his or her own activities, provide a reference to staff regarding factual information, request staff to report back at a subsequent meeting concerning any matter, or may take action to direct staff to place a matter of business on a future agenda. (Gov't. Code Section 54954.2)

5. Public Comment Period
At the end of the regular meeting agenda, an opportunity is provided for the public to speak on any subject within the Committee's authority that is not on the agenda. Speakers may be limited to three (3) minutes each.

6. Next Meeting Date
Friday, May 15, 2020 at 12:00 pm

ADJOURNMENT

Americans with Disabilities Act and Language Accessibility
Disability and language-related accommodations can be requested to allow participation in the Technology Committee meeting. The agenda will be made available, upon request, in appropriate alternative formats to assist persons with a disability (Gov't Code Section 54954.2(a)). In addition, other documents may be requested in alternative formats and languages. Any disability or language-related accommodation must be requested as soon as practicable. Requests will be accommodated unless providing the accommodation would result in a fundamental alteration or undue burden to the District. Please contact Alejandra Vega at 909.396.2264 from 7:30 a.m. to 6:00 p.m., Tuesday through Friday, or send the request to avega@aqmd.gov.

Document Availability
All documents (i) constituting non-exempt public records, (ii) relating to an item on an agenda for a regular meeting, and (iii) having been distributed to at least a majority of the Committee after the agenda is posted, are available prior to the meeting for public review at the South Coast Air Quality Management District, Public Information Center, 21865 Copley Drive, Diamond Bar, CA 91765.

INSTRUCTIONS FOR ELECTRONIC PARTICIPATION

Instructions for Participating in a Virtual Meeting as an Attendee
As an attendee, you will have the opportunity to virtually raise your hand and provide public comment.

Before joining the call, please silence your other communication devices such as your cell or desk phone. This will prevent any feedback or interruptions during the meeting.

Please note: During the meeting, all participants will be placed on Mute by the host. You will not be able to mute or unmute your lines manually.

After each agenda item, the Chairman will announce public comment.

A countdown timer will be displayed on the screen for each public comment. If interpretation is needed, more time will be allotted.

Once you raise your hand to provide public comment, your name will be added to the speaker list. Your name will be called when it is your turn to comment. The host will then unmute your line.

Directions for Video ZOOM on a DESKTOP/LAPTOP:

- If you would like to make a public comment, please click on the "**Participants**" button on the bottom of the screen.
- A list of participants will appear on the right side of the screen. At the bottom of the list, please click on the grey "**Raise Hand**" button.
- This will signal to the host that you would like to provide a public comment and you will be added to the list.

Directions for Video Zoom on a SMARTPHONE:

- If you would like to make a public comment, please click on the "**Participants**" button on the bottom of your screen.
- A new screen will pop up with the list of participants. Look for the "**Raise Hand**" button on the screen and click the button.
- This will signal to the host that you would like to provide a public comment and you will be added to the list.

Directions for TELEPHONE line only:

- If you would like to make public comment, please **dial *9** on your keypad to signal that you would like to comment.

Back to Agenda

Go to SLIDES

DRAFT

Technology Committee Agenda #1

BOARD MEETING DATE: May 1, 2020 AGENDA NO.

PROPOSAL: Amend Award and Execute Contract for Stationary Fuel Cells

SYNOPSIS: In January 2018, the Board approved an RFP to solicit stationary and mobile source projects that will result in emission reductions of NOx, VOC, and PM. Subsequently, in January 2019, Bloom Energy Inc. was awarded $3 million for fuel cells integrated with energy storage on the College of the Canyons campus. Bloom recently requested a change in scope of the project that reduces the award amount but does not impact the emission reduction benefits. This action is to amend the award, the scope of the project and execute a contract with Bloom Energy Inc. in a total amount not to exceed $2,934,052 from the EO Mitigation Fund (27).

COMMITTEE: Technology, April 17, 2020; Recommended for Approval

RECOMMENDED ACTION:
Authorize the Chairman to execute a contract with Bloom Energy Inc. with a revised scope for Fuel Cells Integrated with Energy Storage on the College of the Canyons Campus project in a total amount not to exceed $2,934,052 from the EO Mitigation Fund (27).

Wayne Nastri
Executive Officer

MMM:NB:JI:LM

Background

In January 2018, the Board approved the release of RFP #P2018-06 to solicit proposals for emission reduction projects in accordance with the control strategy in the 2016 AQMP. In January 2019, twenty-six proposals were approved for a total amount of $47,385,792, including an award in accordance with 2016 AQMP CMB-01 - Transition to Zero and Near-zero Emission Technologies for Stationary Sources to Bloom Energy, Inc. (Bloom) in an amount of $3 million for installation of a 1.5 MW fuel cell with a 500 kW Battery Energy Storage System (BESS) at College of the Canyons, replacing an existing cogeneration system.

During project development, Southern California Edison (SCE) notified Bloom that the

interconnection tariff to allow multiple technologies to connect behind the same meter has not been implemented on schedule, and therefore the BESS is not allowed to interconnect to SCE's electrical system. Bloom decided that the BESS had to be removed from the installation plan and is requesting a revised scope of work for this project. The revised project will not impact the overall emission reductions, which are primarily the result of removing the combustion combined heat and power (CHP) system.

Proposal
Bloom proposes to remove the BESS from the project to address SCE's tariff and net-metering requirements. The changes to the project have a negligible impact on the overall emissions, with no impacts for NOx reductions that were quantified in the initial proposal, as summarized in the table below:

	Tons NOx Reduced over 15 Years	Tons SO_2 Reduced over 15 Years
Original Proposal	2,700	3.7
Proposed Revised Project	2,700	2.4

The proposed revisions result in reduced installation costs. Staff is proposing to reduce the incentive award from $3,000,000 to $2,934,052 to maintain the original cofunding percentage included in the proposal.

Benefits to South Coast AQMD
Upon successful deployment, this modified project has the potential to provide the same long-term emission reduction benefits for NOx as the originally awarded project.

Resource Impacts
The revised cost for the recommended project will be provided from the EO Mitigation Fund (27) and will not exceed $2,934,052.

Back to Agenda

Agenda Item #1

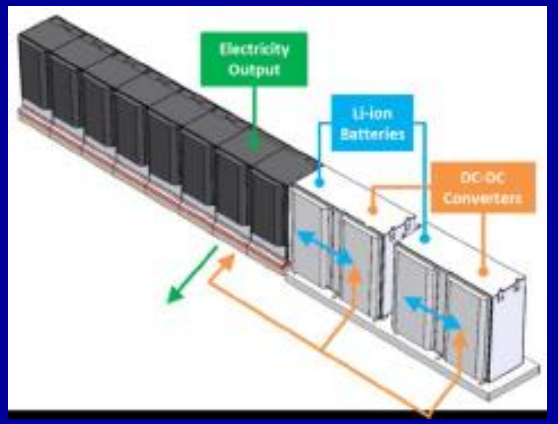
Lisa Mirisola

Amend Award and Execute Contract for Stationary Fuel Cells

Background

- In January 2018, the Board approved RFP 2018-06 to solicit stationary and mobile source projects that will result in emission reductions of NOx, VOC, and PM
- Subsequently, in January 2019, Bloom Energy Inc. was awarded $3 million for fuel cells integrated with energy storage on the College of the Canyons campus
- Due to current utility tariff structure, Bloom is not able to connect both the fuel cell and battery energy storage components for this project

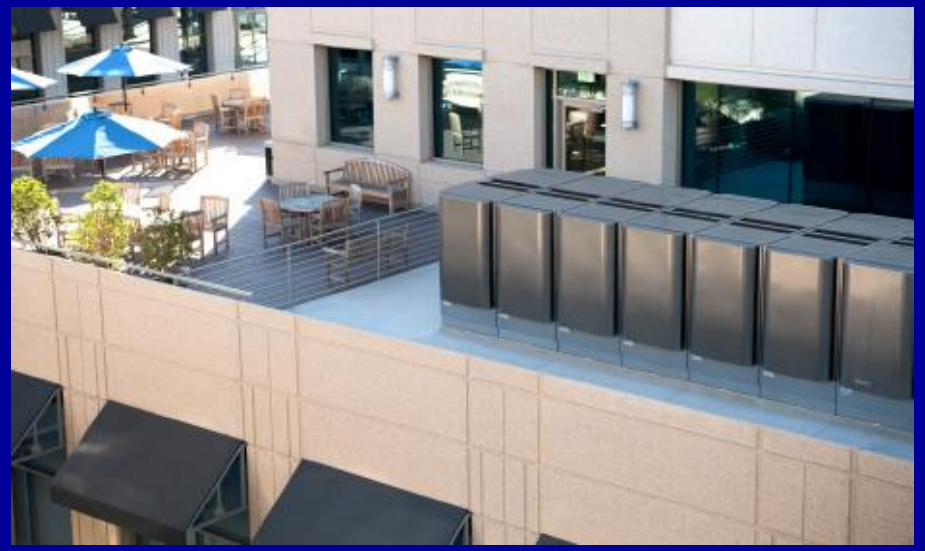
College of the Canyons Campus



Bloom Fuel Cell

Proposal

- Bloom proposes to eliminate battery energy storage
- Changes will not effect NOx emission reductions
- Adjust award from $3 million to $2,934,052 which reflect slightly reduced project costs, maintaining the original cofunding percentage



Proposed Location of Fuel Cell

	Tons NO_x Reduced over 15 Years	Tons SO_2 Reduced over 15 Years
Original Proposal	2,700	3.7
Proposed Revised Project	2,700	2.4

Recommended Action

- Amend the award, the scope of the project and execute a contract with Bloom Energy Inc. in a total amount not to exceed $2,934,052 from the EO Mitigation Fund (27)

Back to Agenda

Go to SLIDES

DRAFT

Technology Committee Agenda #2

BOARD MEETING DATE: May 1, 2020 AGENDA NO.

PROPOSAL: Amend Contract for Tier 4 Passenger Locomotives

SYNOPSIS: In 2014, under the "Year 16" Carl Moyer Program solicitation, the Southern California Regional Rail Authority (SCRRA) submitted a proposal requesting $58.85 million to cofund the deployment of 20 new Tier 4 locomotives. In September 2015, the Board awarded $22.85 million to SCRRA from the Carl Moyer Program AB 923 Fund (80), with a commitment to consider the remaining $36 million over four phases. The Board previously approved $27 million of the $36 million in three installments in December 2016, December 2017 and February 2019. This action is to amend SCRRA's contract, adding the remaining $9 million from the Carl Moyer Program AB 923 Fund (80) for a revised contract total of $58.85 million.

COMMITTEE: Technology, April 17, 2020; Recommended for Approval

RECOMMENDED ACTION:
Authorize the Chairman to amend a contract with SCRRA, adding an additional $9 million from the Carl Moyer Program AB 923 Fund (80) for a revised contract total of $58.85 million.

Wayne Nastri
Executive Officer

MMM:NB:JI:MW

Background

In 2014, under the "Year 16" Carl Moyer Program solicitation, the Southern California Regional Rail Authority (SCRRA) submitted a proposal requesting $58.85 million for the deployment of 20 new Tier 4 passenger locomotives. SCRRA's proposal was evaluated based on the Carl Moyer Program Guidelines, and the funding amount was determined based on the cost-effectiveness limit specified in the Program Guidelines. In September 2015, the Board approved $22.85 million to SCRRA from the Carl Moyer Program AB

923 Fund (80), with a commitment to consider the remaining $36 million over four phases. The Board previously approved $27 million of the $36 million in three installments in December 2016, December 2017 and February 2019.

SCRRA's locomotive project will deploy a total of 20 new Tier 4 locomotives, including 9 exclusively using SCRRA and Caltrans funds and 11 cost-shared by South Coast AQMD. The 11 cost-shared by South Coast AQMD will replace the existing Tier 0-2 locomotives, and the old locomotive engines will be destroyed to fulfill Carl Moyer Program requirements. The nine new locomotives that will be purchased exclusively with SCRRA and Caltrans funds will replace older locomotives, and the older locomotives will remain in the SCRRA fleet for operation on an as-needed basis. Three of the new locomotives are for fleet expansion.

Funding Distribution

Cost-Share	Number of Locomotives	Funding Amount	Existing Locomotive
South Coast AQMD	11	$58.85M*	Engines destroyed
Caltrans and SCRRA	9	$70.15	6 operate as needed and 3 expansion
Total	20	$129M	

* Total, if this Board action is approved.

Currently, 12 Tier 4 locomotives have been delivered to SCRRA.CARB emissions verification commenced in March 2020 and is expected to be completed by August 2020. South Coast AQMD will only disburse funds after the CARB verification process is complete.

Additionally, last year, SCRRA began actively seeking demonstration projects for zero emission locomotives and anticipates deployment under such projects in the future.

Proposal

This action is to amend a contract with SCRRA, adding the remaining $9 million for a total contract award of $58.85 million from the Carl Moyer Program AB923 Fund (80).

The total project cost is $129 million, which is cost-shared by Caltrans and Metrolink member agencies with 31.9 and 22.5 percent, respectively. The South Coast AQMD funds will only be used to fund 11 replacement locomotives because Carl Moyer funds cannot be comingled with Caltrans funds per the Carl Moyer Program Guidelines. South Coast AQMD's participation is contingent upon the implementation of all 20 locomotives.

Benefits to South Coast AQMD
The replacement of older diesel locomotives with new Tier 4 locomotives will help the South Coast Air Basin (Basin) to meet federal air quality standards. The procurement of Tier 4 locomotives was identified in the 2016 AQMP. In addition, since SCRRA locomotives travel throughout the Basin, the cleaner Tier 4 locomotives will reduce the public's overall exposure to diesel particulate emissions. Based on the location of the rail track, 53 percent of the locomotive operations will be in disproportionately impacted areas, as defined under South Coast AQMD's Carl Moyer Program criteria. Emission reductions of NOx, PM and ROG from each locomotive will be approximately 12.3 tons per year, 0.33 tons per year and 1.0 ton per year, respectively.

Resource Impacts
The additional funding award for SCRRA's locomotive project will not exceed $9 million for a total of $58.85 million from the Carl Moyer Program AB 923 Fund (80). There are sufficient funds in the Carl Moyer Program AB 923 Fund (80) for this contract amendment.

Back to Agenda

Agenda Item #2

Mei Wang

Amend Contract for Tier 4 Passenger Locomotives

Background

- In 2014, under “Year 16” Carl Moyer Program Announcement, SCRRA submitted a proposal to deploy 20 new Tier 4 locomotives
- Total project cost: $129M
- Requested funding from SCAQMD: $58.85M

Project Description

- In 2015, the Board approved $22.85M of the requested $58.85M from the Carl Moyer Program (AB 923), with a commitment to consider the remaining $36M over four phases as funding becomes available
- Cumulative Award of $49.85M to date

Total Project Cost	Requested Funding from SCAQMD	Approved Funding Amount	Board Approval Date
$129 M	$58.85	$22.85M	September 2015
		$9M	December 2016
		$9M	December 2017
		$9M	February 2019
		Total: $49.85M	

Funding Description

- South Coast AQMD cost sharing 11 locomotives
- The remaining 9 locomotives will be purchased exclusively by SCRRA and Caltrans funds

Cost-Share	Number of Locomotive	Funding Amount	Existing Locomotive
SCAQMD	11	$58.85M	Engines destroyed
Caltrans & SCRRA	9	$70.15M	6 operate as needed and 3 expansion
Total	20	$129M	

Project Benefits

- Cost-effectiveness of the locomotives funded by South Coast AQMD: $15,082 per ton
- Emissions reductions per locomotive:

  NOx = 12.3 tons/year
  PM = 0.3 tons/year
  ROG = 1.0 ton/year

- 53% of the locomotive operations will be in EJ areas

Recommended Action

- Amend contract with SCRRA adding $9M, from the Carl Moyer Program AB 923 Fund (80)

Back to Agenda

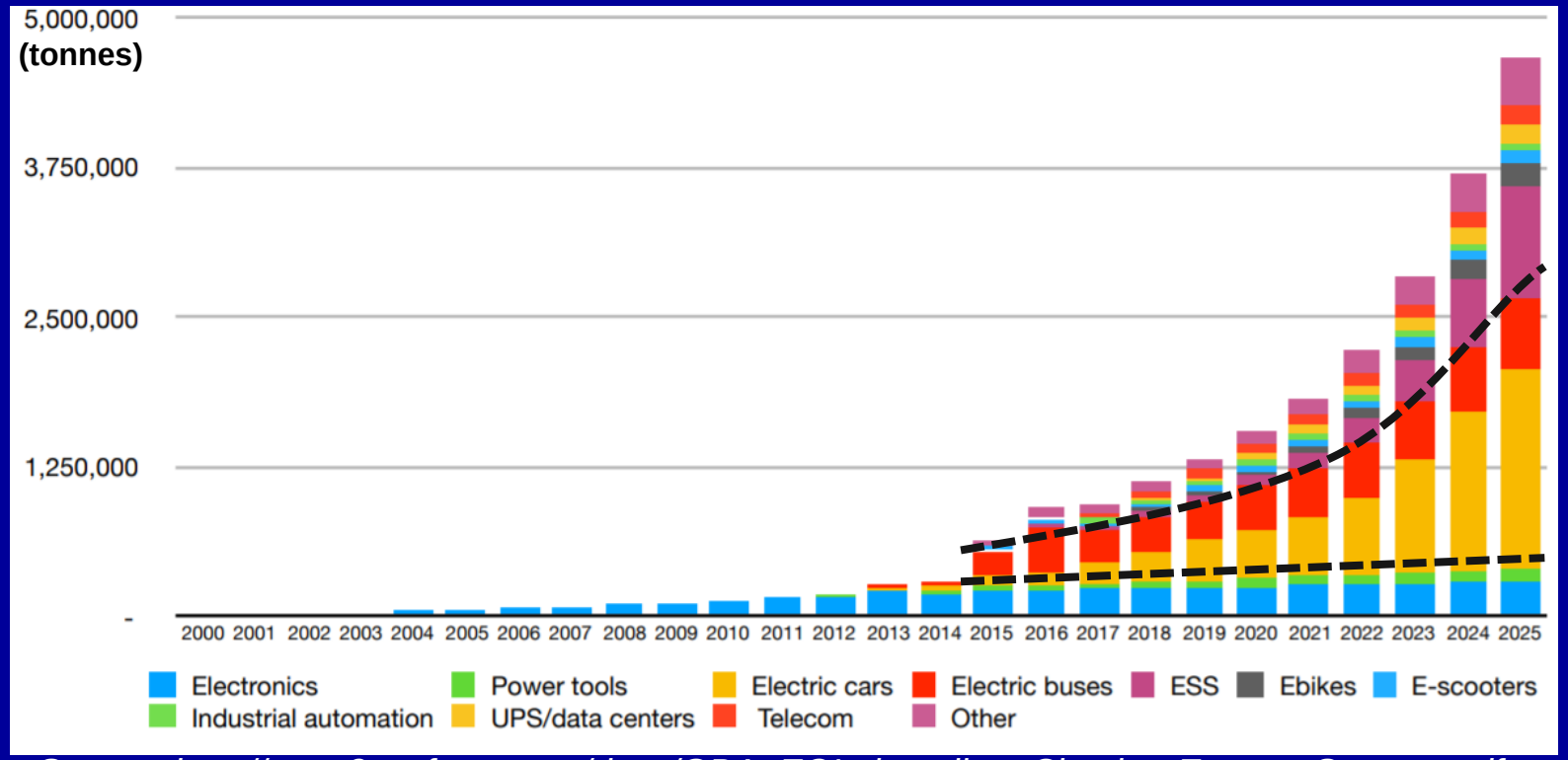
Agenda Item #3

Seungbum Ha

EV Battery Reuse and Recycling

Batteries on the Global Market

- The market for lithium-ion batteries is growing rapidly
- At the end of 2019, the cumulative number of electric cars in the world has exceeded 7.5 million

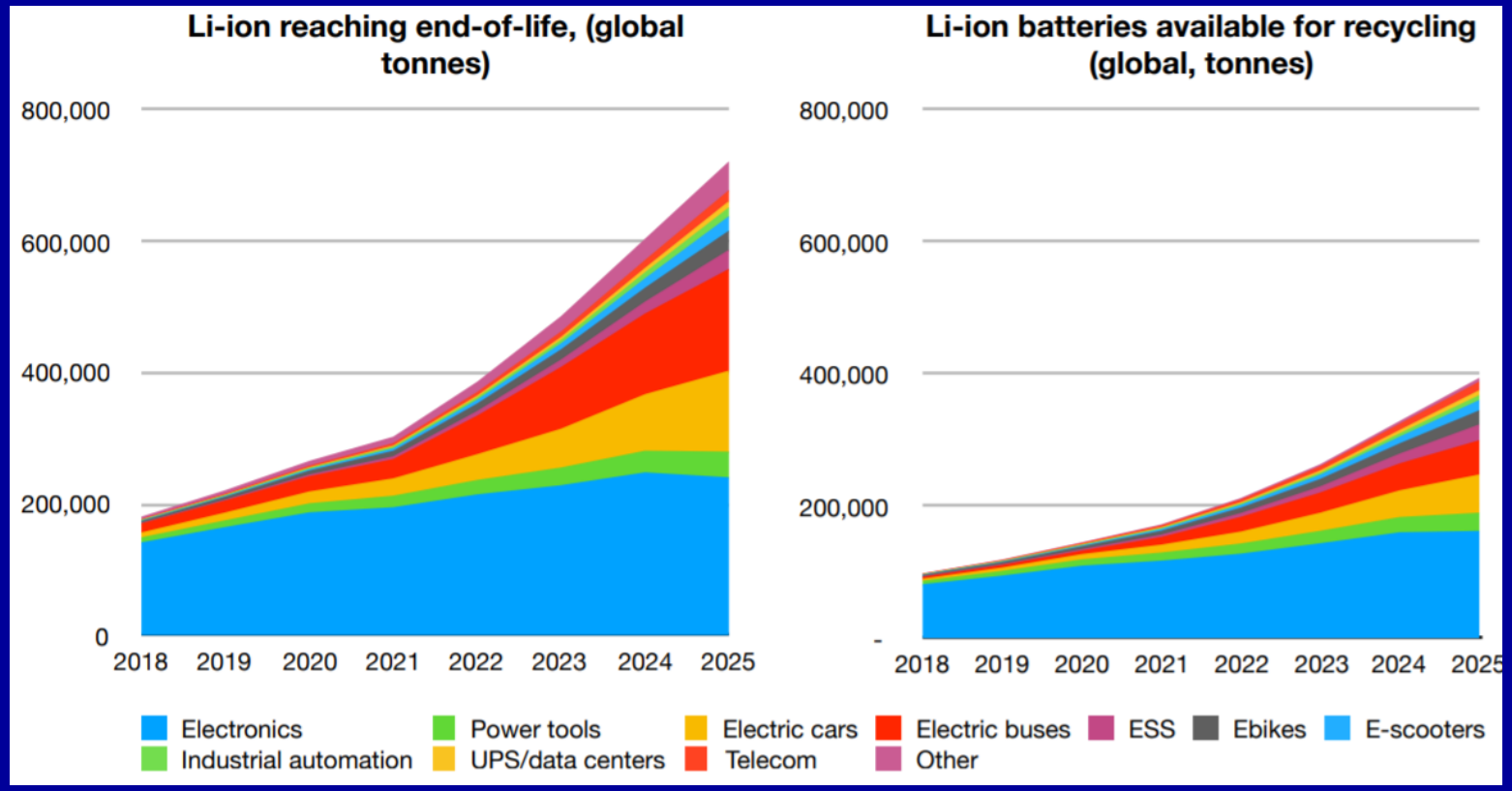


Rapid increase of electric cars

Source: http://www3.weforum.org/docs/GBA_EOL_baseline_Circular_Energy_Storage.pdf

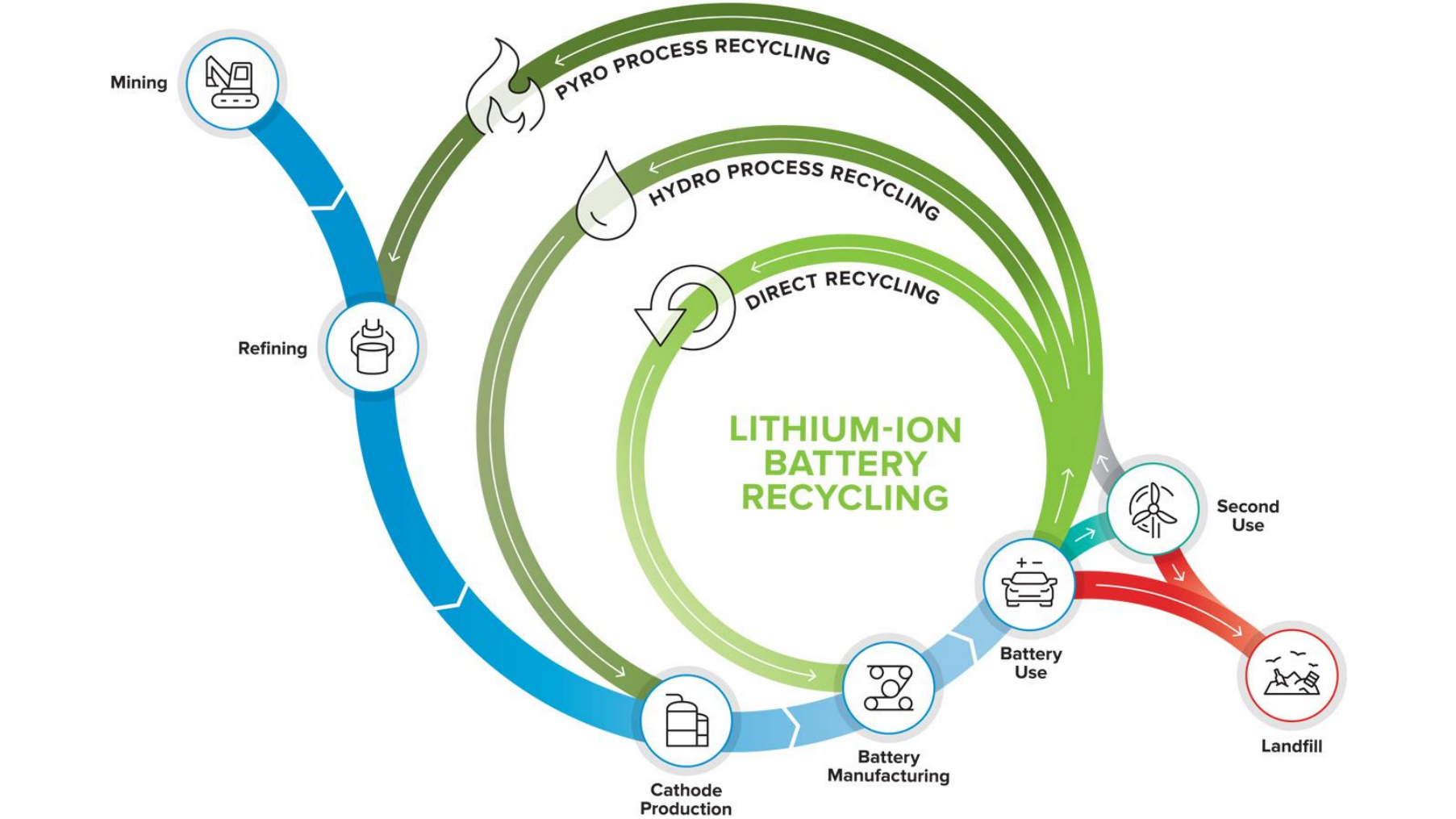
Batteries Reaching End-of-life

Depending on chemistry, size, configuration and purpose, a lithium-ion battery can perform between 500 to over 10,000 cycles of charging and discharging



Source: http://www3.weforum.org/docs/GBA_EOL_baseline_Circular_Energy_Storage.pdf

Second-use Strategy & Recycling



Source: Argonne Recell project

Second-use Strategy from Industries

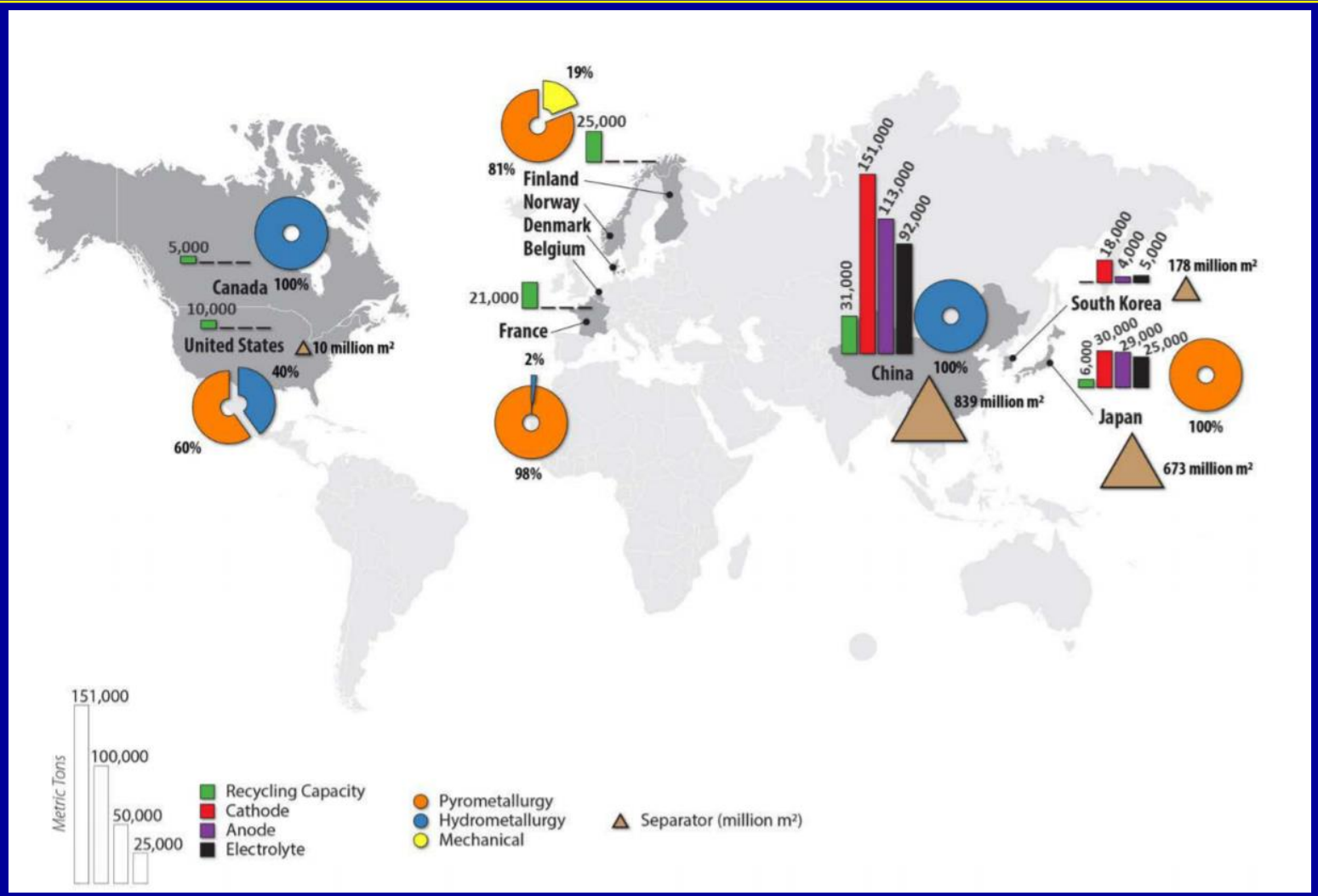
- OEMs have partnered with energy companies, third party vendors and startups using the batteries in their own operations
- In Europe, several vehicle manufacturers have installed used batteries primarily in different kinds of energy storage systems, ranging from small residential systems to larger grid-scale solutions
- In China, new regulations calls for battery and vehicle companies to arrange for both recycling and assessment of second life potential. The largest volume of second life batteries will become available in China

Second-use Strategy from South Coast AQMD's Partners

- Daimler: The battery packs, along with the vehicles, will be returned to Daimler Trucks North America at the conclusion of the initial fleet testing for evaluation and repurposing

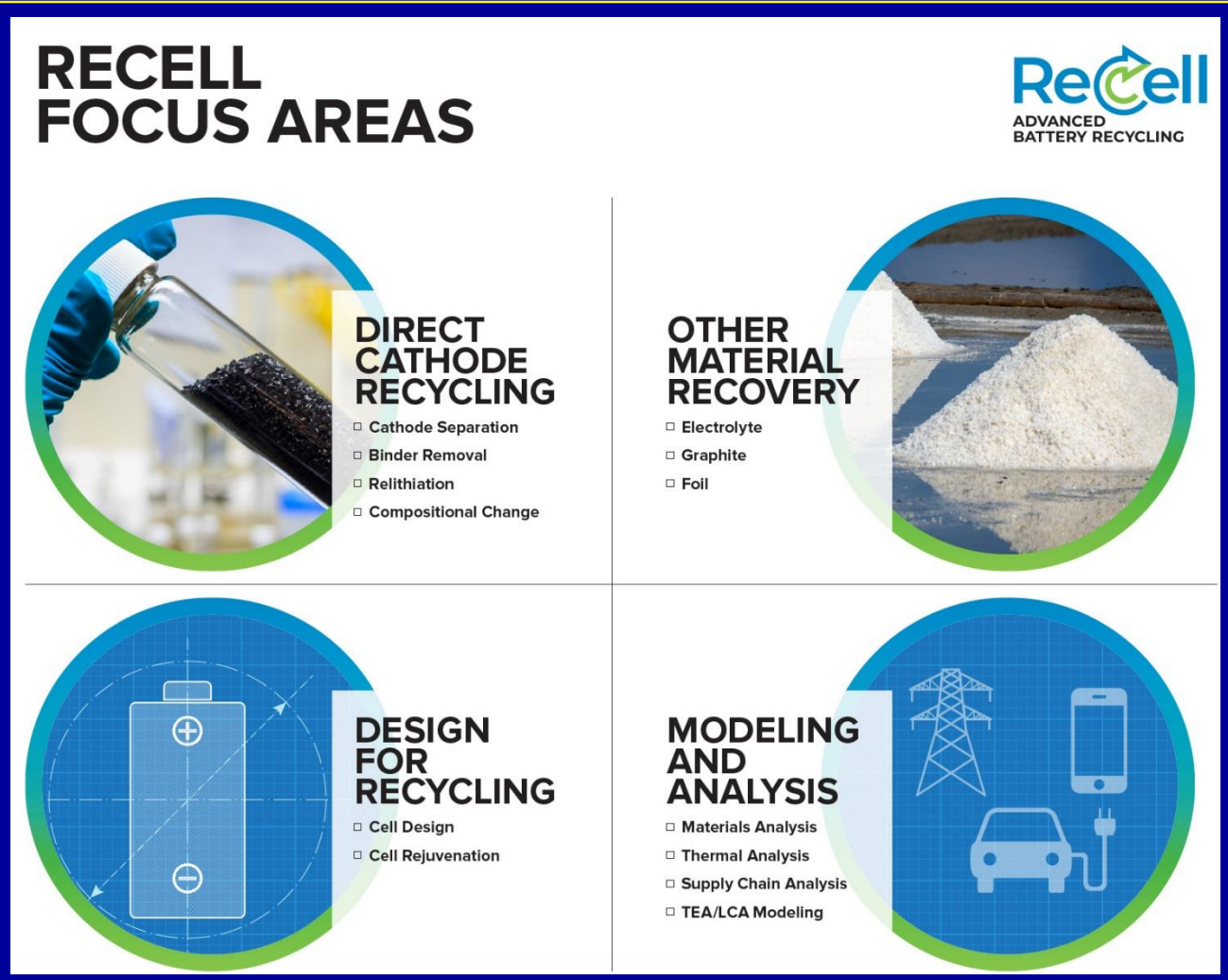
- Volvo: Volvo has a pilot project for a battery's second life in Gothenburg. They will apply the learnings from this activity to start a possible U.S. stationary application for batteries reaching the end-of-life from VOLVO LIGHTS trucks and initial production units

Recycling Capacities



https://www.osti.gov/servlets/purl/1490997

ReCell at Argonne National Laboratory



Source: Argonne Recell project

Summary

- In mid-2018, an estimated 3% of Li-ion batteries were recycled globally. By comparison, traditional lead-acid batteries are recycled at a rate of over 99%
- Battery secondary use is increasing, but recycling is still in the early stages of development
- The Federal government is supporting efforts through the national laboratories working with industry
- Staff will continue to support national efforts and look for local battery recycling demonstration opportunities