COOCK SE-MoRE: “Slim laden in de praktijk”

04/06/2026 – Technopolis (Mechelen, Belgium)

“Brandveiligheid van elektrische voertuigen”

Carlo Mol - Task Manager IEA EV TCP:Task49: “EV FIRE SAFETY”

Carlo Mol - Project Manager Energy Technology – VITO/EnergyVille

Brandveiligheid van elektrische voertuigen

Agenda

- IEA EV TCP: Task49: “EV FIRE SAFETY” (2023 – 2027)
- COOCK+ VONK “Kennisloket Batterijen en Brandveiligheid” (in preparation)

IEA HEV TCP: IEA Hybrid and Electric Vehicle Technology Collaboration Programme

International Energy Agency (IEA)

- IEA is an organization of 31 member countries focused on energy issues.
- Founded in 1974, based in Paris.
- IEA works to ensure reliable, affordable and clean energy.
- IEA has four main areas of focus:
  - energy security
  - economic development
  - environmental awareness
  - engagement worldwide.

- IEA has 39 different Technology Collaboration Programs (TCPs) focused on topics across many sectors, including buildings, transport, industry, renewable energy, fossil energy and fusion power
  - one of these is the Hybrid & Electric Vehicle TCP (HEV TCP)

IEAHEV.ORG

IEA HEV TCP: IEA Hybrid and Electric Vehicle Technology Collaboration Programme

Hybrid & Electric Vehicle Technology Collaboration Program (HEV TCP)

- HEV TCP was formed in 1993; today it is a working group of 18 countries working together on electric drive vehicle technologies
- An Executive Committee (ExCo) directs the work of the task forces, plans new initiatives, and disseminates the information produced
- Countries participate in various task forces (working groups) on specific technologies of their choice

HEV TCP Participants

- Executive Committee – 18 member countries

Austria	France	South Korea
Belgium	Germany	Spain
Canada	Ireland	Sweden
China	Italy	Switzerland
Denmark	Netherlands	UK
Finland	Norway	USA

IEAHEV.ORG

IEA ~~H~~EV TCP: IEA ~~Hybrid and~~ Electric Vehicle Technology Collaboration Programme

Current & Recent Work

Electric Cars

- Light EVs
- Batteries
- Fuel Cell Electric Vehicles
- Vehicle/Grid Interface

Beyond Cars

- Electric Trucks
- Hybrid/Electric Ships
- Electric Buses
- Electric Bicycles

Infrastructure

- Electrified Roadways
- Extreme Fast Charging
- Electrification in Ports
- Battery Swapping

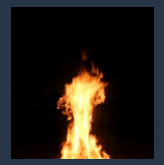
Analysis

- Critical Raw Materials for EVs
- Life Cycle Analysis
- EV Fire Safety
- Battery Second Use

Active Tasks (Working Group)

- Task 1: Information Exchange
- Task 23: Light Electric Vehicle Infrastructure
- Task 38: Marine Application of Hybrid/Electric Systems (eShips)
- Task 43: Vehicle/Grid Integration
- Task 45: Electrified Roadways
- Task 46: Life Cycle Analysis
- Task 47: Electrification in Ports
- Task 48: Battery Swapping
- Task 49: EV Fire Safety
- Task 50: Light Electric Vehicles
- Task 51: Battery Second Use

IEAHEV.ORG



IEA EV TCP Task49 “EV Fire Safety” : Topic & Background (2023 – 2027)

Knowledge exchange on EV fire safety aspects: exchange best practices, share experiences and work towards common guidelines how to deal with specific EV fire safety risks

Task49 is triggered due to many different perceptions of EV fire safety risks

Not that much statistics available yet. Risk assessments based on limited statistics could lead to a too negative perception of EV fire safety risks hampering the roll-out out EV’s and charging infrastructure in e.g. underground parkings

Task49 wants to collect and share information to relevant stakeholders: building and parking owners, fire rescue workers, transport and tow companies, insurance companies, OEMs (vehicles and charging infrastructure), policy makers, regulations, … up to the EV drivers and general public

Sharing experiences between country experts to increase insights in EV fire safety risks and to share best practices in preventing or mitigating EV fire incidents (from technological and regulation perspective).

Task49 “EV Fire Safety”

Task49 Member Countries

- 18 Member countries:
  - Belgium (Task Manager)
  - Austria
  - Canada
  - China
  - Denmark
  - France
  - Germany
  - Ireland
  - Italy
  - Norway
  - South Korea
  - Spain
  - Sweden
  - Switzerland
  - *The Netherlands*
  - UK
  - USA
  - European Commission

Task49 “EV Fire Safety” : Tasks

Task1: Collection of information

- Desktop research, interviews, conferences, …

Task2: Stakeholders database

- Building up database of task49 working group (first point of contact & key members) & interested stakeholders in member countries

Task3: Collaboration IEA EV Fire Safety Initiatives

- Collaboration with other IEA EV TCP Tasks on their specific expertise e.g. on vehicle side (LEV, marine, ..), on batteries or charging infrastructure (extreme fast charging, battery swapping, …)

Task4: Workshops

- Organize 5 online workshops on selected topics, prioritization in agreement with member countries

Task5: Dissemination

- Task49 chapter in IEA TCP HEV annual reports, newsletters, conferences, …

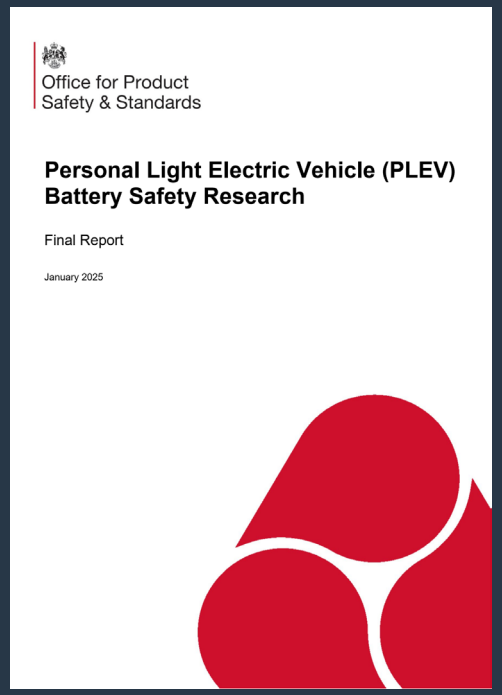
Task6: Task management

- 6-monthly meetings with FPOC of member countries (status update, planning, …)

Task49 “EV Fire Safety” : Task1 : Collection of Information

Task1: Collection of information: desktop research, conferences, ….:

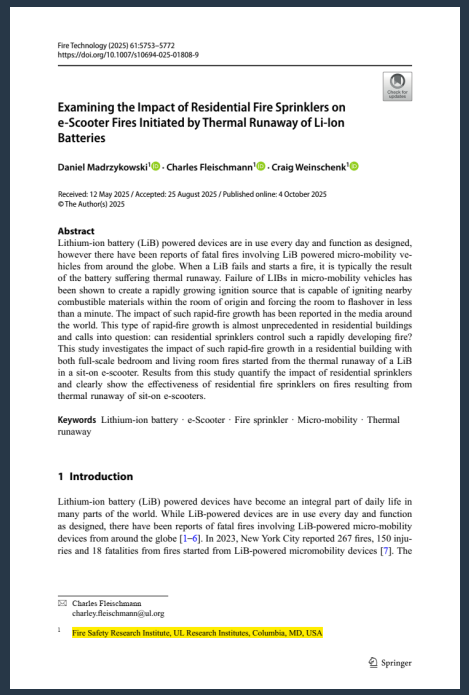
- Examples: Light Electric Vehicles


Office for Product Safety & Standards

Personal Light Electric Vehicle (PLEV) Battery Safety Research

Final Report

January 2025


Fire Technology (2025) 61:5753–5772
https://doi.org/10.1007/s10694-025-01808-9

Examining the Impact of Residential Fire Sprinklers on e-Scooter Fires Initiated by Thermal Runaway of Li-Ion Batteries

Daniel Madrzykowski[1] · Charles Fleischmann[1] · Craig Weinschenk[1]

Received: 12 May 2025 / Accepted: 25 August 2025 / Published online: 4 October 2025
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Abstract
Lithium-ion battery (LiB) powered devices are in use every day and function as designed, however there have been reports of fatal fires involving LiB powered micro-mobility vehicles from around the globe. When a LiB fails and starts a fire, it is typically the result of the battery suffering thermal runaway. Failure of LIBs in micro-mobility vehicles has been shown to create a rapidly growing ignition source that is capable of igniting nearby combustible materials within the room of origin and forcing the room to flashover in less than a minute. The impact of such rapid-fire growth has been reported in the media around the world. This type of rapid-fire growth is almost unprecedented in residential buildings and calls into question: can residential sprinklers control such a rapidly developing fire? This study investigates the impact of such rapid-fire growth in a residential building with both full-scale bedroom and living room fires started from the thermal runaway of a LiB in a sit-on e-scooter. Results from this study quantify the impact of residential sprinklers and clearly show the effectiveness of residential fire sprinklers on fires resulting from thermal runaway of sit-on e-scooters.

Keywords Lithium-ion battery · e-Scooter · Fire sprinkler · Micro-mobility · Thermal runaway

1 Introduction

Lithium-ion battery (LiB) powered devices have become an integral part of daily life in many parts of the world. While LiB-powered devices are in use every day and function as designed, there have been reports of fatal fires involving LiB-powered micro-mobility devices from around the globe [1–6]. In 2023, New York City reported 267 fires, 150 injuries and 18 fatalities from fires started from LiB-powered micromobility devices [7]. The

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Springer


Fire Technology (2025) 61:2865–2887
https://doi.org/10.1007/s10694-025-01707-z

Quantifying the Fire Hazard from Li-Ion Battery Fires Caused by Thermal Runaway in E-scooters

Charles Fleischmann[1] · Craig Weinschenk[1] · Daniel Madrzykowski[1] · Alexandra Schraiber[2] · Benjamin Gaudet[2]

Received: 26 September 2024 / Accepted: 11 January 2025 / Published online: 1 March 2025
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Abstract
Over the last 20 or so years, lithium-ion battery (LiB) powered devices have infiltrated our day to day lives through the devices that rely on them for energy storage including phones, cordless tools, toys, wristwatches, and vehicles. With the meteoric rise in popularity of LiBs in society, failures due to misuse, mishandling, or a poor understanding of necessary safety features may be expected. This study quantifies the fire hazard of a seated E-scooter with a LiB in thermal runaway during overcharging. Heat release rate (HRR) was measured for LiB battery in isolation and subsequently installed in an E-scooter to determine the battery’s contribution compared to the complete device. Two scenarios were evaluated to assess the hazard an E-scooter may pose in a residential scale building: an overcharging E-scooter in a closed bedroom and an overcharging E-scooter in a common living-kitchen area. The results of this study clearly demonstrates the extreme hazard posed by an overcharging E-scooter to the occupants.

Keywords E-scooter · Lithium ion battery · Flashover · Unsprinklered · Compartment fire

1 Introduction

Modern society relies on lithium-ion battery (LiB) powered devices for communication, construction, entertainment, large-scale energy storage systems, wrist watches, and transportation among many other technologies in daily life. Globally, most of the developed world’s populations already use LiB powered devices routinely with little thought given to the serious consequence displayed by a LiB suffering thermal runaway.

When a technology or product is on a rapid development trajectory and is being widely adopted in society, failures due to misuse, mishandling, or a poor understanding of safety design requirements may be expected. Over the past decades, there have been numerous incidents where batteries in cellphones and laptops have overheated to the point of catching fire. The most noteworthy case was the Samsung Galaxy Note 7 where the battery

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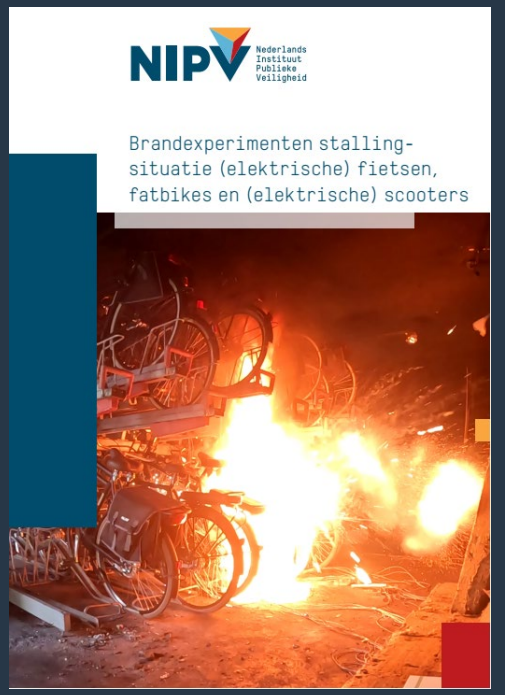


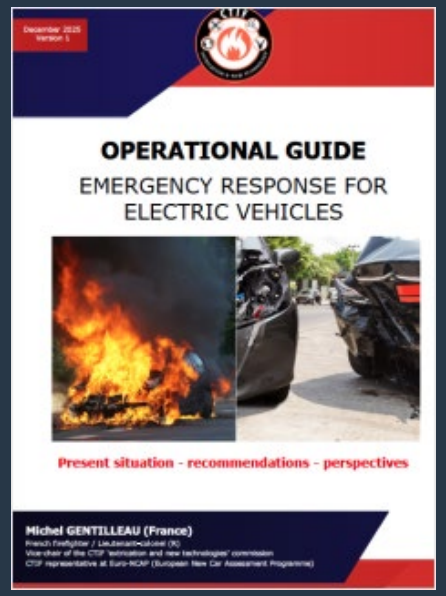
Task49 “EV Fire Safety” : Task3 : Collaboration “EV Fire Safety” initiatives

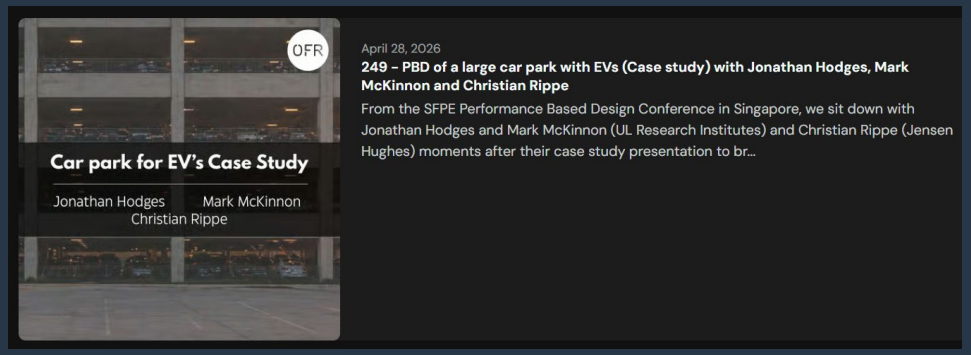
- IEA EV TCP Tasks: linked to electric vehicles, batteries and charging infrastructure (info on EV Fire Safety ?)
  - Task 45. Electrified roadways, e-Roads (Patrik Akerman)
  - Task 47. Decarbonization of ground goods transport in ports (P.T. Jones)
  - Task 01. Information sharing (annual report, websites, newsletters) (D. Beeton/C. Colquhoun)
  - Task 23. Light electric vehicle parking and charging infrastructure (Hannes Neupert)
  - Task 38. Maritime applications (e-Ships) (Jon Are Suul)
  - Task 43. Vehicle/grid integration (Josh Eichman)
  - Task 46. LCA of trucks, buses, and two-wheelers (Gerfried Jungmeier)
  - Task 48. Battery swapping (Xiao Lin)
  - Task 49. EV fire safety (Carlo Mol)
  - Task 50. Light EVs (Mascha Brost / Stephan Schmid)
  - Task 51. EV battery re-use (Ock Taeck Lim)
  - Task 52. EVs and circularity (Gerfried Jungmeier)
  - Task 53. Interoperability of bidirectional charging (Marco Piffaretti)
  - Task 54. Recycled materials for electric vehicles (Yiyun Qiao, Xue WANG)

Task49 “EV Fire Safety” : Task3 : Collaboration “EV Fire Safety” initiatives

Cooperation with other initiatives on EV Fire Safety: Examples:

- EC STF TF6 Fire Safety on Parking Regulation
- International Fire Service Association (CTIF)
- Fire Information Exchange Platform (FIEP)
- Society of Fire Protection Engineers (SFPE)
- …





- Other sources of information: Fire Science Show: https://www.firescienceshow.com/

Task49 “EV Fire Safety”: Task4 : Workshops

Recordings and presentations are available online:

- General information available on IEA EV TCP website: https://evtcp.org/task/task-49/
- Task49 contact details: carlo.mol@vito.be

Workshops:

IEA EV TCP Task49 - Workshop "Impact of electric vehicles on parking regulation" (20240717)

- Recording: IEA EV TCP Task49 - Workshop "Impact of electric vehicles on parking regulation"
- Presentations: IEA EV TCP Task49 - Workshop "Impact of electric vehicles on parking regulation"

IEA EV TCP Task49 - Workshop "EV Fire Statistics" (20250324)

- Recording: IEA EV TCP Task49 - Workshop "EV Fire Statistics"
- Presentations: IEA EV TCP Task49 - Workshop "EV Fire Statistics"

IEA EV TCP Task49 - Workshop "EV Fire Emergency Response Procedures Guidelines" (20251002)

- Recording: IEA EV TCP Task49 - Workshop "EV Fire Emergency Response Procedures Guidelines"
- Presentations: IEA EV TCP Task49 - Workshop "EV Fire Emergency Response Procedures Guidelines“

IEA EV TCP Task49 - Workshop "Fire Safety of Light Electric Vehicles" (20260428)

- Recording: IEA EV TCP Task49 - Workshop "Fire Safety of Light Electric Vehicles"
- Presentations: IEA EV TCP Task49 - Workshop "Fire Safety of Light Electric Vehicles"

IEA EV TCP: Task49 “EV Fire Safety”

Agenda Workshop 4: “Fire Safety of Light Electric Vehicles” (20260428)

Introduction

This workshop will explore key fire safety challenges related to light electric vehicles such as e-steps, e-bikes, e-fatbikes, and e-scooters.

Experts will present on topics including European regulations, real-world fire risks, and recent experimental research. The program also covers fire safety in public transport and indoor bike parking facilities. In addition, practical solutions for safe charging and storage of lithium-ion batteries will be discussed. The workshop is aimed at policymakers, industry professionals, and researchers interested in improving safety and trust in electric mobility.

Agenda

Introduction to Task49 “EV Fire Safety” scope and future workshops

Carlo Mol - Task Manager IEA EV TCP - Task49 “EV Fire Safety” (10’)

Technical laws and regulations linked to battery fire safety of light electric vehicles

Annick Roetynck - LEVA-EU (20’)

Railcar Passenger Safety During Electric E-mobility Vehicle Fires - Experiments and Recommendations

Adam Barowy - UL Research Institutes - Fire Safety Research Institute (FSRI) (30’)

From fire experiments to fire safety measures of bike parkings

Ruud van Liempd - NIPV (30’)

Safe charging and storage of li-ion batteries of e-bikes in cabinets

Renee Pillen & Alexander Smets - Loxxer (15’)

Task49 “EV Fire Safety” : Task5 : Dissemination

- EV Belgium Event - Veilig Laden en de VME: Risico's Voorkomen, Veiligheid Garanderen (11/02/2026 in Brussels – BE)

EV Belgium
3,507 followers
18h • Edited •

🔥 **Hot topic alert**! Yesterday our members joined their expertise with that of external experts for a workshop on **fire safety** in underground parkings.

🧯 A very fruitful and inspiring discussion, with fresh ideas brought to the table and a necessary alignment of perspectives between fire safety experts and the charging sector.

🧩 As a federation, we are happy to play a facilitating role with the many stakeholders involved: charge point installers, CPOs, firefighters, fire safety experts, syndics, and users. **To be continued**!

And safely @Time&Spaces

Bart Vanbever Carlo Mol
Hans N. Tom Vandeweghe
Philippe Vangeel Romain Denayer Karsten Marhold

Task49 “EV Fire Safety” : Task5 : Dissemination

- Mobilitätskonferenz 2026 – Side Event: BEV Fire Safety: Erfolgreicher Brandschutz für die Mobilitätswende (20/04/2026 – Vienna Austria)
- Keynote: Hannes Kern

Mobilitätskonferenz 2026

Multimodal unterwegs—sicher, smart, nachhaltig

Montag, 20. April 2026, 10:00 - 12:00 Side-Event

BEV Fire Safety: Erfolgreicher Brandschutz für die Mobilitätswende

Im Zuge der Mobilitätswende wächst der Anteil an Elektrofahrzeugen stetig an. Elektrofahrzeuge brennen statistisch gesehen seltener als konventionell angetriebene Fahrzeuge, stellen aber neue Anforderungen an Brandschutz, Infrastruktur und Einsatzkräfte. Die Session beleuchtet aktuelle Forschungsprojekte, internationale Kooperationen und praktische Herausforderungen im Umgang mit BEV-Bränden. Ziel ist es, Herausforderungen und Lösungsansätze zu diskutieren und den Austausch zwischen Forschung, Verwaltung und Praxis zu stärken.

Programm

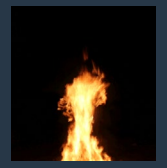
Moderation: DI (FH) Andreas Blust, Abt. III/4, BMIMI

inkl. Ausstellung im Eingangsbereich

Keynote – Elektromobilität und Brandrisiken

DI Dr. Hannes Kern, IRIS—Industrial Risk and Safety Solutions

Die Keynote gibt eine thematische Einführung in die Brandrisikolandschaft der Elektromobilität, stellt die internationale Forschungsinitiative EV TCP Task 49 vor und spannt den inhaltlichen Bogen zu den zentralen Programmschwerpunkten Baulicher Brandschutz/Verkehrsinfrastruktur sowie LEVs und elektrische Nutzfahrzeuge.



Task49 “EV Fire Safety”

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https://evtcp.org/task/task-49/

Thank you for your interest in Task49 “EV Fire Safety”

Interested to follow Task49 workshops?

- Follow LinkedIN Post: https://www.linkedin.com/in/carlo-mol/
- Register for Task49 mailing list via carlo.mol@vito.be

Brandveiligheid van elektrische voertuigen

Agenda

- IEA EV TCP:Task49: “EV FIRE SAFETY” (2023 – 2027)
- COOCK+ VONK “Kennisloket Batterijen en Brandveiligheid” (in preparation)

COOCK+ VONK

Kennisloket Batterijen en Brandveiligheid

In voorbereiding

Carlo Mol (VITO)

vito

Energy Ville

vito.be

COOCK+: Collectief Onderzoek & Ontwikkeling en Collectieve Kennisverspreiding

Meer Info: https://www.vlaio.be/nl/vlaio-netwerk/coock-collectief-oo-en-collectieve-kennisverspreiding/wat-zijn-coock-projecten

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Kennisloket Batterijen en Brandveiligheid (VONK)

Consortium & Planning

- Projecttype: COOCK+ (Collectief O&O en Collectieve Kennisverspreiding) | VLAIO
- Geplande indiening: Juni 2026
- Projectlooptijd: 3 jaar (2027-2029)
- Partnerorganisaties: VITO (coordinator), KU Leuven, AP Hogeschool, Agoria en FireForum (i.s.m FLUX50)
- Contactpersoon: Carlo Mol (VITO) (carlo.mol@vito.be)

Kennisloket Batterijen en Brandveiligheid (VONK)

Scope: Matrix van producten en hun productlevenscysclus

- **Stationaire Batterijen (BESS)**
  - **Residentieel** (< 20 kWh, meestal binnen, gevaar voor inwonenden bij brand)
  - **C&I** (> 20 kWh, commercieel en industrie, binnen en buiten)
  - **Utility-scale** (> …, batterijparken, meestal buiten, gevaar voor omwonenden bij brand)

- **Elektrische voertuigen (EV)**
  - **LEV**: e-steps, e-bikes, e-fatbikes, e-scooters (veel thuisladen)
  - **BEV**: elektrische personenwagens (thuisladen en publieke (ondergrondse) parkings)
  - **HDEV**: elektrische bussen en trucks (laden op depots)

- **Combinatie (BESS + EV)**
  - Door elektrificatie van energiesysteem en transport komen op veel locaties/sites meerdere toepassingen samen: zonnepanelen, stationaire batterijen en elektrische voertuigen.
  - Synergie oplossingen optimaal benutten.

- **Ontwerp**
  - Productdesign, testen, normen, certificatie, …
- **Gebruik**
  - Studie van site (parking, gebouw, …)
  - Installatie - Operationeel
- **Einde Levensduur**
  - Na normaal gebruik: re-use, recyclage
  - Na incident/brand: veilige verwerking, recyclage
- **Transport**
  - Nieuwe batterijen
  - Gebruikte/beschadigde batterijen
- **Opslag**
  - Nieuwe batterijen
  - Gebruikte/beschadigde batterijen

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Kennisloket Batterijen en Brandveiligheid (VONK)

Contactgevens

Indien u meer informatie wenst ivm begeleidingsgroep en/of inhoud proposal, contacteer:

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- Email : carlo.mol@vito.be

COOCK+ VONK

Kennisloket Batterijen en Brandveiligheid

Carlo Mol (VITO)