E-VOLVE
EV FOR LIFE, VALUE, EFFICIENCY

E-VOLVE Cluster
ECOMOBILITY 2023

Eric Armengaud, AIG

www.evolvecluster.eu

Funded by
the European Union

"We bring together various EU funded projects that research on innovations in **electric vehicle transportation**. The vision of this virtual cluster is to realize and monitor synergies between all members and to execute **joint dissemination, exploitation and standardisation activities**."

E-VOLVE Cluster

CONCEPT

The E-VOLVE virtual cluster focuses on developing groups of components that, working all together in synergy, can **meet the future requirements** in:

- energy efficiency,
- fast charging and
- increased driving range.

Working Groups

COMMUNICATION & DISSEMINATION

Joint communication and dissemination activities with the aim to increase the outreach of individual project's activities and the cluster activities in general.

SCIENTIFIC BOARD

Creating synergies and increasing impact towards common (scientific) publications, targeting selected relevant conferences and publications.

INDUSTRIALISATION & EXPLOITATION

Supporting this process via industrialisation / access to vehicle demonstrators, and for exploitation / business tools such as value proposition canvas.

CLUSTER MEMBERS

COMPLETED PROJECTS

E-VOLVE created synergies from six Green Vehicles H2020 Projects on the topic LC-GV-01-2018 and grew over time!

sys2WHEEL
co2 free city logistics
GA No. 824244

Achiles
GA No. 824311

SELFIE
GA No. 824290

fitgen
GA No. 824335

EVOLVER
GA No. 824295

EVC1000
GA No. 824250

ACTIVE PROJECTS

Continuity was ensured by running projects and new projects from Horizon Europe joining the cluster.

HIGHSCAPE

HiPE
High Performance Power Electronics Integrations

powerdrive

multi Moby

RHODAS

SCAPE
POWERING E-MOBILITY

EM-TECH

MAXIMA

ERTRAC Mapping

	Research Need for Powertrains	HiPE	HighScap	RHODa	SCAPE	EM-TEC	Multi-Mo	Powerdrive
Method.	Modelling and simulation	X	X	X	X	X	X	X
	Connectivity and data management						X	
	Recycling, Materials for New Powertrains			X		X		
	Availability / Sustainability of resources	x	x	x	X	X		
BEV	Advanced Components, Materials and Processes	X	X	X	X	X	X	X
	Connected and AI-based systems		X			X	X	X
	System approach, vehicle integration	X	X				X	X
	Safety test procedures and technologies						X	
	Charging technologies (bidirectional, comfort-charging, robotic)		X				X	X
	Battery Swapping technologies							
	Data acquisition and AI supported development							
	Implementation of eco-design principles			X	X	X		
Appl. domain	Light electric vehicle				x		X	
	Passenger cars	X	X		X	X	X	X
	Light commercial vehicles				x	x	X	X
	Heavy-duty			X	x			X

RHODAS

RHODaS

REINVENTING HIGH-PERFORMANCE POWER CONVERTERS FOR HEAVY-DUTY ELECTRIC TRANSPORT

FACT SHEET

- HORIZON-CL5-2021-D5-01
- Coordinated by Technical University of Catalonia
- EU Contribution 5.95 M€
- 9 partners
- 6 countries

- Grant Agreement: 101056896

- Main Targets
  - Improve efficiency and performance of power converters while increasing affordability of power-trains for heavy-duty EVs;
  - Reduce size and weight of the power converters;
  - Integrate the power electronics and thermal management system in a modular and compact integrated motor drive;
  - Apply digital technologies and sensors for advanced on-line monitoring and prediction techniques using Big Data Analysis and Artificial Intelligence;
  - Integrate ecodesign, material criticality and circularity considerations into the RHOdaS powertrain solution;
  - Promote collaborative research and interaction between academia and industry throughout the entire supply chain.

EM-Tech

INNOVATIVE E-MOTOR TECHNOLOGIES COVERING E-AXLES AND E-CORNERS VEHICLE ARCHITECTURES FOR HIGH-EFFICIENT AND SUSTAINABLE E-MOBILITY

EM-TECH

FACT SHEET

- HORIZON-CL5-2022-D5-01
- Coordinated by AVL List GmbH
- EU Contribution 3.83 M€
- 12 partners
- 5 countries

- Grant Agreement: 101096083

- Main Objectives
  - Radial flux in-wheel motor
  - On-board axial flux motor
  - Digital twinning
  - Circularity solutions for IWM and AFM
  - Advanced cooling and control strategies

HiPE

HiPE

HIGH PERFORMANCE POWER ELECTRONICS INTEGRATION

FACT SHEET

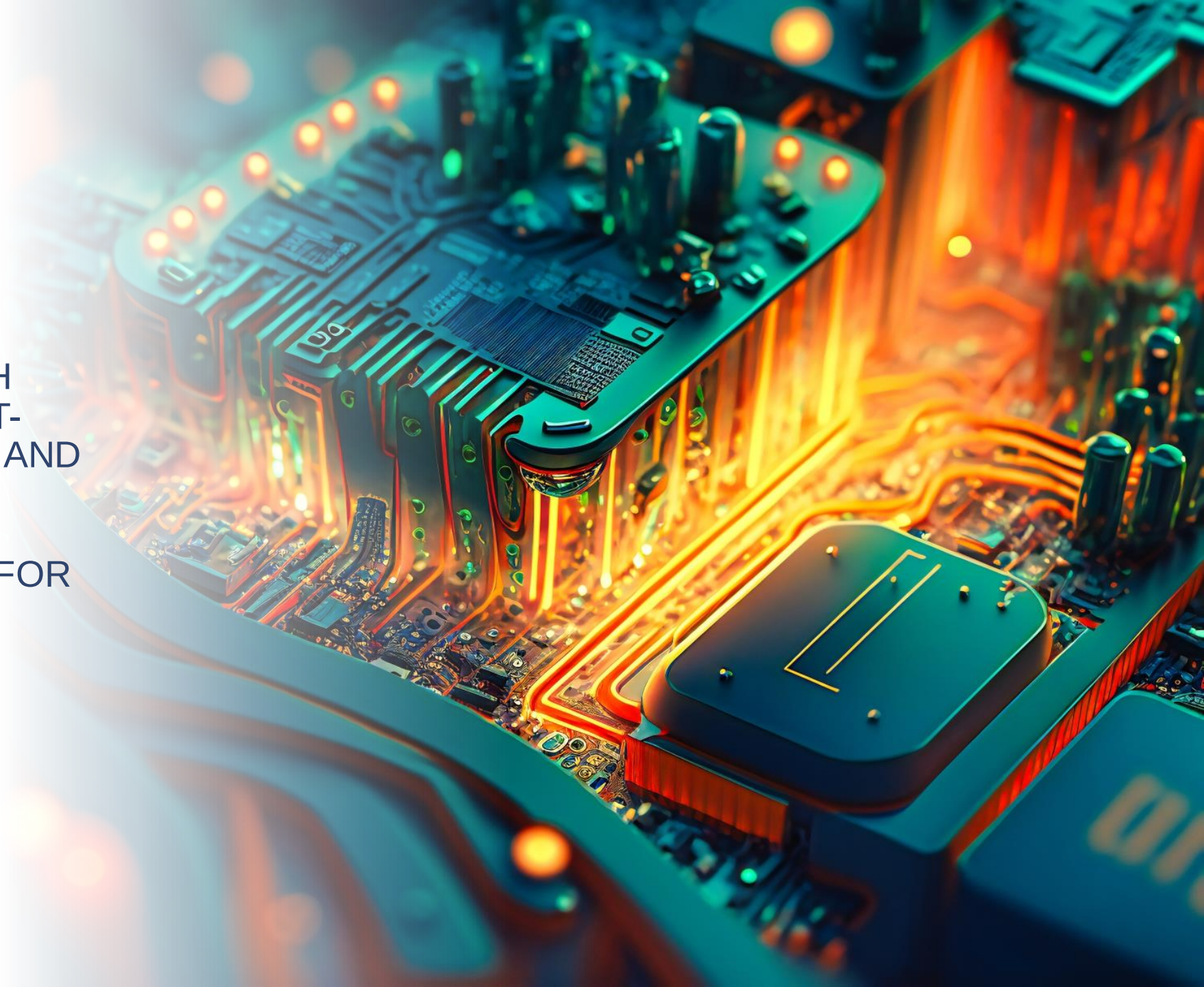
- HORIZON-CL5-2021-D5-01
- Coordinated by Virtual Vehicle Research GmbH
- EU Contribution 5.48 M€
- 13 partners
- 7 countries

- Grant Agreement: 101056760

- Main Objectives
  - Improve the efficiency of integrated WBG-based power electronics (PE) components and systems
  - Reduce the cost of power electronics components and systems
  - Reduce size and weight of power electronics and electric powertrains
  - Increase reliability and dependability through integrated design and intelligent control
  - Implement WBG-based power electronics meeting automotive quality levels

HighScape

HIGH EFFICIENCY, HIGH POWER DENSITY, COST-EFFECTIVE, SCALABLE AND MODULAR POWER ELECTRONICS AND CONTROL SOLUTIONS FOR ELECTRIC VEHICLES



FACT SHEET

- HORIZON-CL5-2021-D5-01
- Coordinated by AVL List GmbH
- EU Contribution 4.59 M€
- 12 partners
- 7 countries

- Grant Agreement: 101056824

- Main Objectives
  - component integration with the incorporation of the WBG traction inverters within the in-wheel machines
  - novel solutions, including the implementation of re-configurable winding topologies of the drive
  - Major cost reductions
  - Increased dependability and reliability of the power electronics systems

SCAPE
POWERING E-MOBILITY

SCAPE

SWITCHING-CELL-ARRAY-BASED POWER ELECTRONICS CONVERSION FOR FUTURE ELECTRIC VEHICLES

FACT SHEET

- HORIZON-CL5-2021-D5-01
- Coordinated by IREC - Institut de Recerca en Energia de Catalunya
- EU Contribution 5.99 M€
- 9 partners
- 5 countries

- Grant Agreement: 101056781

- Main Objectives
  - propose a standardisable, modular, and scalable approach, based on multilevel technology, for the design of the EV power conversion systems
  - develop highly-compact and integrated building-block implementation
  - propose intelligent modulation and control strategies, online diagnosis, and digital twin for predictive maintenance with machine learning

POWERDRIVE

POWER ELECTRONICS OPTIMISATION FOR NEXT GENERATION ELECTRIC VEHICLE COMPONENTS

FACT SHEET

- HORIZON-CL5-2021-D5-01
- Coordinated by KU Leuven
- EU Contribution 5.99 M€
- 10 partners
- 8 countries

- Grant Agreement: 101056857

- Keywords
  - Power Electronics
  - SiC
  - Integrated Inverters and Chargers
  - Real Driving Profiles

MULTI-MOBY

SAFE, SECURE, HIGH PERFORMING MULTI-PASSANGER AND MULTI-COMMERCIAL USES AFFORDABLE EVS

FACT SHEET

- H2020-LC-GV-2018-2019-2020
- Coordinated by Infineon Technologies Austria AG
- EU Contribution 5.73 M€
- 9 partners
- 7 countries

- Grant Agreement: 101006953

- Main Objectives
  - Develop a vehicle fleet
  - Demonstrate high safety for occupants and vulnerable road users
  - Autonomous-capable vehicles
  - Advanced low voltage powertrains
  - Advanced energy torage and efficient charging at 48V and 100V
  - Zone-partitioned Electrical and Electronic architecture
  - Road testing
  - Rapid implementation and affordability

MAXIMA

MAXIMA

MODULAR AXIAL FLUX MOTOR FOR AUTOMOTIVE

FACT SHEET

- HORIZON-CL5-2022-D5-01
- Coordinated by ENSAM - Ecole nationale superieure d'arts et metiers
- EU Contribution 5.48 M€
- 11 partners
- 6 countries

- Grant Agreement: 101096097

- Main Objectives
  - Design, develop and validate an axial flux electrical machine for automotive application
  - Develop a digital twin of an electrical machine for optimal control
  - Optimize magnetic materials and the manufacturing process flow of an axial flux electrical machine for mass production and limit the critical raw materials use by recycling the permanent magnet
  - Development of an ex-ante and prospective life cycle assessment of an electrical machine
  - Development of prototypes to validate the concept through representative automotive duty cycle

CLUSTER STATUS

COMMON TRA PUBLICATION

REGULAR NEWSLETTER

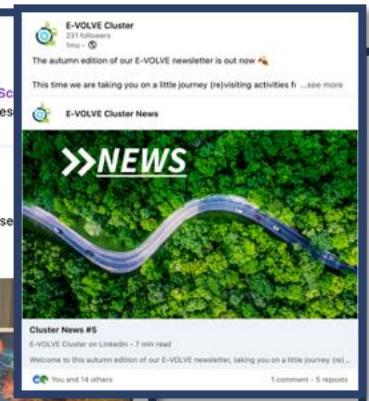
SOCIAL MEDIA

MEMBER ONBOARDING

WEBSITE UPDATE


E-VOLVE
EV FOR LIFE, VALUE, EFFICIENCY
Edit profile
E-VOLVE Cluster
@EVOLVECluster
The purpose of the Cluster is to execute joint dissemination and exploitation activities in the field of "EV for Life, Value and Efficiency". EU funded
Europe
evolvecluster.eu
Joined July 2019
58 Following
92 Followers


E-VOLVE Cluster
231 followers
3mo
2 cluster projects in the spotlight: Have a read on the HighSc
TU Ilmenau Research Night where Marius Heydrich was pres
as well as the EVC1000 Project demonstrator!
HighScape
96 followers
3mo
Looking behind the scenes - How science and daily rese
and how everybody can be part of it!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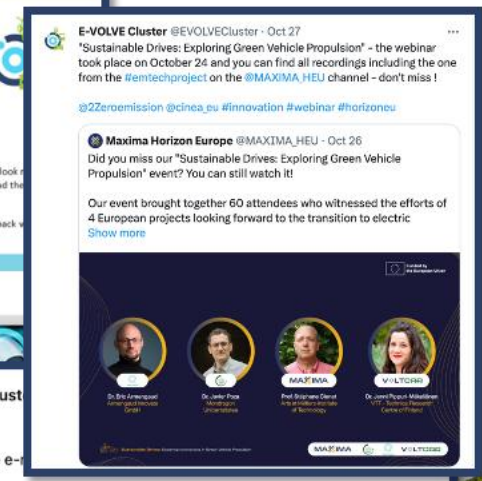
The autumn edition of our E-VOLVE newsletter is out now
This time we are taking you on a little journey (re)visiting activities fi ...see more
E-VOLVE Cluster News
>>NEWS
Cluster News #5
E-VOLVE Cluster on LinkedIn · 7 min read
Welcome to this autumn edition of our E-VOLVE newsletter, taking you on a little journey (re)...
You and 14 others
1 comment · 5 reposts


E-VOLVE
EV FOR LIFE, VALUE, EFFICIENCY
NEWSLETTER 08/23
A warm and sunny welcome to another issue of our E-VOLVE newsletter!
July brought some events that have taken place and some interesting deliverables that let us look
the work that is going on in the projects. Be sure to check all the links to the information and the
to keep up to date.
Also, don't forget to get informed about upcoming events at the end of the newsletter.
Enjoy the rest of this 2023 summer and perhaps a well-deserved vacation. We will come back w
newsletter at the end of September.
EVENTS & NEWS
SELFIE
SELF-sustained and Smart Battery Thermal Management Solution for Battery Electric Vehicles
SELFIE final event
The results of SELFIE were successfully presented at the Final event on 18th July 2023, online, with 40 participants from different countries, industries as well as universities. The event was structured in 4 sessions, including 2 key notes, 11 presentations. All the presentations and video streaming about the Final Event are available here.
SELFIE project video:


E-VOLVE Cluster @EVOLVECluster · Oct 27
"Sustainable Drives: Exploring Green Vehicle Propulsion" - the webinar took place on October 24 and you can find all recordings including the one from the #emtechproject on the @MAXIMA_HEU channel - don't miss !
@2Zeroemission @cinea_eu #innovation #webinar #horizoneu
Maxima Horizon Europe @MAXIMA_HEU · Oct 26
Did you miss our "Sustainable Drives: Exploring Green Vehicle Propulsion" event? You can still watch it!
Our event brought together 60 attendees who witnessed the efforts of 4 European projects looking forward to the transition to electric
Show more
MAXIMA
VOLTCRAFT


E-VOLVE Cluster @EVOLVECluster · Nov 13
Exciting update from the @MobyMulti project!!
#h2020 @cinea_eu #testing #ElectricVehicles
EU H2020 Project Multi-Moby @MobyMulti · Nov 9
It's the final month of the Multi-Moby project. We are now testing the Multi-Moby vehicle on the road. Check out the photos of the fully electric Multi-Moby van driving around a test track!


E-VOLVE
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NEWSLETTER 10/23
Welcome to this autumn edition of our E-VOLVE newsletter, taking you on a little journey (re)visiting
projects all over Europe. While we will investigate the past on what has happened
on what will be done, we are finetuning on the
course, we will be taking you on to this journey,
and mark your calendars on the upcoming


VALUE, EFFICIENCY
TER 10/23
edition of our E-VOLVE newsletter, taking you on a little journey (re)visiting
jects all over Europe. While we will investigate the past on what has happened
l as sneak-peak into the future on what will be done, we are finetuning on the
ded value of our cluster itself. Of course, we will be taking you on to this journey,
oy this edition of the newsletter and mark your calendars on the upcoming
CONFERENCE PARTICIPATION
PowerDrive @ICE2023
powerdrive
Power electronics optimization for next generation electric vehicle components
In September, the ICE2023 International Conference on Engines & Vehicles for Sustainable Transport took place in Capri, Italy, and we would like to thank Christof Schernus from FEV, Chairman of EAPAA, for introducing the E-VOLVE Cluster in his keynote speech "European Collaborative Research on Road Transport and the Challenges of Resources". One of the project cluster members, PowerDrive was exhibiting at the conference and presenting the project to the international conference audience.
More Information:
EM-Tech and HighScape @FISITA
FISITA, Barcelona, Spain
Taking place from October 12 to October 14, the FISITA World Congress, FISITA World Mobility Summit, FISITA Intelligent Safety Conference Europe and EuroBrake hosted 2,164 attendees and 103 exhibitors and delivered 393 presentations, 80 technical papers and 12 panel sessions.
EM-TECH
HIGHSCAPE
Thanks to the coordination of University of Surrey, the projects EM-TECH and HighScape have prepared a common publication on "Innovative e-Machine and Power Electronics Solutions for e-Axle and e-Corner Vehicle Powertrains".
The paper has been presented by Eric Armengaud: "Twenty minutes to summarize the advances of two research programs is very challenging. At the same time, it was a great exercise to extract to the core essence of the projects. Many thanks to Roel Verhoog from Valeo as moderator of the session, and to the participants for the valuable discussions!"
The full paper is openly available on Zenodo. Click on this link to get access.
Follow the project EM-Tech:
Follow the project HighScape:
1


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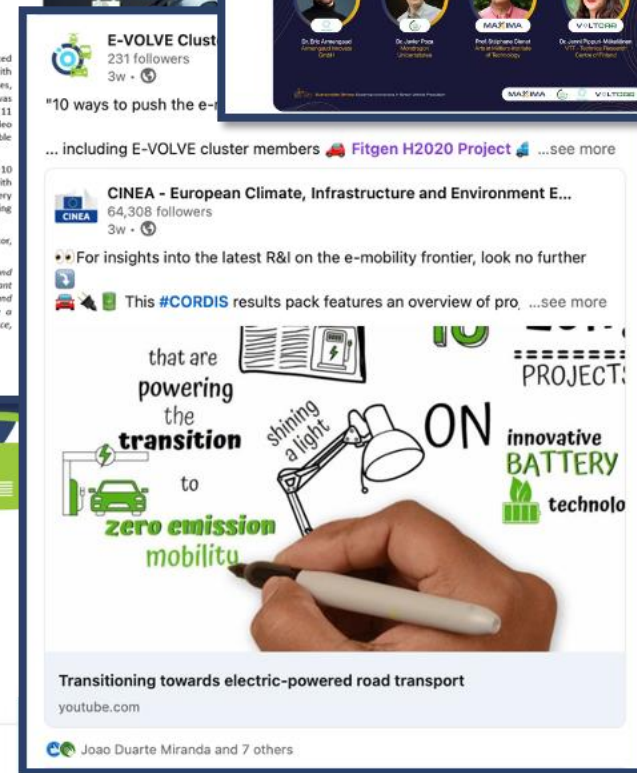
Ready to learn more about the cluster member PowerDriveEU?
With the purpose of transforming road transportation in Europe to z ...see more
PowerDriveEU
240 followers
1mo
The PowerDrive project develops the mobility of tomorrow, today! This is PowerDrive
#HEurope #PowerdriveEU #HorizonEurope #Research #electri ...see more
powerdrive


with Brandstätter Bernhard and 18 others
Eric Armengaud and 28 others
4 reposts


E-VOLVE Clust
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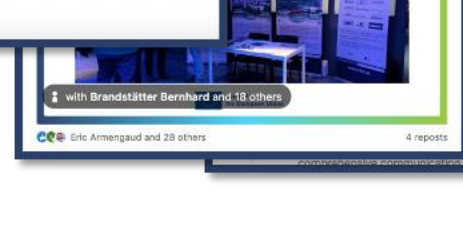
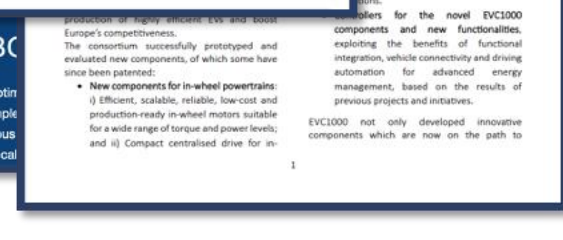
3w
"10 ways to push the e-
... including E-VOLVE cluster members Fitgen H2020 Project ...see more
CINEA - European Climate, Infrastructure and Environment E...
64,308 followers
3w
For insights into the latest R&I on the e-mobility frontier, look no further
This #CORDIS results pack features an overview of pro ...see more
that are powering the transition to zero emission mobility
shining a light
ON
innovative BATTERY technolo
PROJECTS
Transitioning towards electric-powered road transport
youtube.com
Joao Duarte Miranda and 7 others


CATION &
NATION
ntribute to and profit from a


SCIENTIFIC BC
The virtual E-VOLVE (Electric Vehicle Optin
and Efficiency) Cluster is developing, imple
and monitoring synergies between various
Horizon 2020 calls and Horizon Europe cal

NEWS SECTION
wants to honor success stories of two
able outcomes of their research and
ustainable city logistics and improving
e to check out the two project videos
projects. We hope you enjoy this issue!
motor axles, based on Silicon Carbide
ology, targeting superior levels of
onal integration and failsafe operation
called, eWD2. The designs consider
o-magnetic compatibility aspects and
e prognostics and health monitoring
iques of the electronic components.
components for electrified chassis
ol with in-wheel motors: i) Brake-by-
system, consisting of front electro-
ulic brakes and rear electro-
anical brakes for seamless brake
ing, high regeneration capability and
nced anti-lock braking system
rmance; and ii) Electro-magnetic and
o-pneumatic suspension actuators,
ing increased comfort and EV
ncy, e.g. through the optimal control
e ride height depending on the driving
tions.
ollers for the novel EVC1000
components and new functionalities,
exploiting the benefits of functional
integration, vehicle connectivity and driving
automation for advanced energy
management, based on the results of
previous projects and initiatives.
EVC1000 not only developed innovative
components which are now on the path to
production of highly efficient EVs and boost
Europe's competitiveness.
The consortium successfully prototyped and
evaluated new components, of which some have
since been patented:
New components for in-wheel powertrains:
i) Efficient, scalable, reliable, low-cost and
production-ready in-wheel motors suitable
for a wide range of torque and power levels;
and ii) Compact centralised drive for in-
1

CURRENT ACTIVITIES

- Application to Horizon Results Booster
- Common Papers
- Special Sessions
- Horizontal Working Groups
- Website
- Newsletter
- Social Media
- Extending Cluster

WORKING GROUP CONTACTS

COMMUNICATION & DISSEMINATION

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INDUSTRIALISATION & EXPLOITATION

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E-VOLVE
EV FOR LIFE, VALUE, EFFICIENCY

We are looking forward to further projects joining the cluster and fruitful exchange.

Thanks for following our advancements on X (ex Twitter) and LinkedIn as well as on our website.

The research leading to these results have received funding from European Union's Horizon Europe research and innovation programme H2020 (GA No. 824290, 101006953) and Horizon Europe (GA No. 101056760, 101096083, 101056824, 101056896, 101056781 and 101056857). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the funding authority). Neither the European Union nor the funding authority can be held responsible for them.

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