



Project Title:

QUalifying and Implementing a user-centric designed and **EfficienT electric vehicle**

Project Acronym: QUIET

GA: **769826**

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Publishable Executive Summary

The dissemination and publication activities in WP6 aim for various stakeholders including EV-experts, vehicle OEMs, EU and member states, public authorities and the general public.

The publication of the technical QUIET results took place by means of papers in peer-reviewed journals and conference proceedings as well as in specialised magazines and scientific journals. Highlights of the project were presented on the project website and announced in periodical e-Newsletters.

This document summarises all documents which the QUIET consortium had put into practice and published by paying always full attention to reach all relevant target groups (as defined in D6.1: Dissemination and communication strategy) in an appropriate and simply accessible format.

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Abbreviations and Nomenclature

Symbol or Shortname	Description
EC	European Commission
РО	Project Officer
РС	Project Coordinator
GA	General Assembly
WP	Work Package
DL	Dissemination Level
RTD	Research and Technology Development

Table 1: List of Abbreviations and Nomenclature





1. Introduction

The objective of this deliverable is to summarise and provide details on all Dissemination, Communication and Exploitation activities undertaken and implemented by the QUIET consortium during the duration of the QUIET project. The deliverable is a follow-up on actions planned and defined in the deliverable D6.1 "Dissemination and Communication Strategy". This includes listing of press releases, scientific conferences, relevant industry or scientific events or exhibitions, e.g. including workshops and face-to-face discussion.

The QUIET dissemination and communication strategy aimed to strengthen the visibility and awareness to key stakeholders and to cultivate the communication of project goals and efforts to a broader public as well as to the scientific communities. The communication strategy included besides the presence at relevant industry and scientific events, workshops and face to face discussions (unfortunately, due to the COVID pandemic, face to face discussions have been converted to online sessions since beginning of 2020), the publication of scientific conference papers and presentations as well as journal papers and promotional documents highlighted on the project website (e.g. flyer, periodical e-Newsletters, video-trailer).

QUIET fully embrace the open access publication policy of Horizon 2020 by providing online access to all published documents that are free of charge to end-users.

This deliverable summarises all documents which the QUIET consortium had put into practice and published.

2. Summary of Published Documents

Dissemination and communication activities of all partners were the focus of T6.1 (communication and dissemination) of WP6 (Exploitation and dissemination) to ensure that dissemination materials like printed and electronic media are published continuously and reliably during the entire project duration. The communication and dissemination of the QUIET results followed the communication and dissemination strategy (D6.1) which determined target groups, as well as communication tools, in order to spread the QUIET message and results in an effective way, i.e. in a suitable and easily accessible format.

A significant portion of dissemination and communication activities were covered through scientific and technical presentations on international conferences, workshops and commercial events, as well as through publications in peer-reviewed journals. General presentations on the project mission, objectives, achievements and impact were performed via interviews, public project presentations through exhibition booths, organization of QUIET workshops, creation of newsletters, leaflets, posters, etc.

The present deliverable D6.4 under the coordination of UOZ is strongly associated with T6.1 and provides a summary of all published documents structured according to their appearance and described in the next chapters.

- Offline Communication and Dissemination,
- Online Communication and Dissemination, and
- Interactive Dissemination and Communication.

The summary of dissemination and communication targets provided in Table 2 shows that the number of published papers, presentations and workshops exceeds the planned metric. The website and mentions in press are the underperforming areas.

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Channel / Type	Targets	Metrics	Metrics achieved
Project website / online	Everyone	<pre># visitors > 100 /month # subscribers > 500</pre>	<pre># visitors < 100 /month # subscribers < 500</pre>
Blog & Social Media / online	End-user, R&D community, industry	# blog posts > 5 /month	Video, newsletters, flyer
Private conversations / interactive	R&D community, policy makers/advisors, industry	# conversations > 10	# conversations > 10
Scientific publications / interactive	R&D community	# papers > 8	6 conference papers 10 journal papers
Conferences / interactive	R&D community, policy makers/advisors, industry	# presentations > 15 Audience > 1.000	# presentations: 18 Audience > 1000
Trade shows (1) / interactive	End-users, industry, public	<pre># interacting visitors # mentions in press > 3</pre>	6 exhibitions # mentions in press: 3
Press releases (2) / online	End-users, industry, public	# releases > 6	2 by UOZ, 1 by AIT
Public workshops / interactive	R&D community, policy makers/advisors, industry	2 workshops	4 workshops

Table 2: Summary of dissemination and communication targets

3. Offline Communication and Dissemination

The offline communication and dissemination that will be used to visualize QUIET consists of the project logo, the logo for the demonstrator car and the flyer/leaflet.

3.1. The QUIET Project Logo

Figure 1 shows the official QUIET project logo. This logo has been approved by the GA during the Kick-off meeting of QUIET and was documented also in the deliverable D7.1 "Quality plan, Contracts and Reports". The use of the official project logo is required as corporate identity on external and internal publications; hence the QUIET Project Logo has been designed according to the following criteria:

- Readable up to the smallest size
- Scalable to any size required
- Memorable that impacts and does not forget. The logo transmits the image of the essential of our product.



Figure 1: QUIET Project Logo.





3.2. Logos for the demonstrator car

In Figure 2 the realized QUIET demonstrator car decoration is depicted. The originally blue sheet metal parts of the car were wrapped with white cover film, the black vehicle closures are the new manufactured lightweight composite engine hood, the rear lid as well as the front and rear side doors.

The car decoration includes the ensemble of all partner logos, the logo of the European Commission as well as the QUIET logo.



Figure 2: QUIET Car Decoration.

3.3. The QUIET flyer

Project brochures such as a flyer will aim for a uniform appearance with a high recognition value and are referred on the project website, which provide comprehensive information source kept up to date on a regular basis. The intention of the project brochures is to keep interested groups informed. They will be delivered/posted at virtual (due to COVID 19-pandemic) conferences, local and global fairs. The QUIET flyer contains the main characteristics of the project, such as its motivation, objectives, the principal message, results and partners. It has been designed to transmit ideas graphically. Figure 3 depicts a sample of the QUIET flyer which can be downloaded from the QUIET website (<u>link</u>).







Figure 3: Sample of the QUIET flyer.





4. Online Communication and Dissemination

4.1. Public Website

The QUIET website serves as a platform for communication of project news and upcoming events and will contain following information:

- Project scope and targets
- Public events related to the project targets
- Contact information for the public
- Public reports, scientific journals, papers and posters
 - o all published QUIET documents are free of charge to end-users and can be obtained here (<u>link</u>)
- E-newsletters to subscribe
- Eye minded related media (e.g. promotional video, flyer, posters)
 - the QUIET flyer can be downloaded from the QUIET website (<u>link</u>)

The QUIET website and its contents are live documents, this is the web link to the main page (Home): <u>https://www.quiet-project.eu/</u>

In Figure 4 and Figure 5 the main page (Home) and the dissemination page of the QUIET website are depicted, respectively.







Objectives

QUIFT alms at developing an improved and energy efficient electric vehicle with increased driving range under real-world driving conditions. This is achieved by expliciting line synergies of a rechnology portfolio in the areas of:

- user centric design with enhanced passenger comfort and safety
- lightweight materials with enhanced thermal insulation properties
- and optimised vehicle energy management

Goals

The developed technologies will be integrated and qualified in a Honda E-segment electric vehicle validator. Among these, a novel refrigerant for robaling, combined with an energy-saving heat pump operation for heating, advanced line mell storages based on phase drampe materials, preventions for infranet radiative heating, and materials for enfranced thermal insulation of the cation will be investigated. Further focus is put on lightweight glazing for windows, as well as light metals like aluminium or magnesium for soat components. Optimized energy management strategies, will further onhance the thormal performance of the vehicle.

The objective of QUET Is to reduce the energy needed for cooling and heating the cabin of an electric vehicle under different driving conditions, by at least 30 % compared to the Honda baseline 2017, Additionally, a weight reduction of about 20 % of vehicle comparents (e.g. doors, windshields, seals, heating and an conditioning) is also addressed. These efforts will finally lead to at least 25 % driving range line case under both hot (+40 °C) and cold (-10 °C) weather contlitions.

Newsletter

Stay Turied to QUIET: Email*

I wanted ATT a disclaimer and nota contact on solicy which day applies to the solic

Subscribe for QUIET Newslette

Coordinator Contact

Origen Strift

Figure 4: Sample of the QUIET website (Home).











4.2. Promotional Video

A promotional video about QUIET was developed in month 40/41 by the partner HRE-G. The video trailer is aligned for the broad public and aimed to be shared through social media channels like YouTube but is also suitable to be used for scientific conferences or fair booths. The already completed video is soon available on the QUIET website and will be announced via the E-Newsletter to all QUIET subscribers.



Figure 6: Samples of the QUIET video.





4.3. E-Newsletter

QUIET is issuing newsletters, to disseminate and announce activities planned by the project consortium e.g. newsletters were used to announce Special Issues (cp. Figure 7) or events like the Two-Session-Clustering Online Workshop of QUIET & DOMUS (cp. Figure 8).

Dear QUIET subscriber,

On behalf of the open access journal

Energies

(ISSN 1996-1073, IF 2.707 according to WoS JCR, https://www.mdpi.com/journal/energies/stats),

We are pleased to announce a Special Issue entitled

Energy Efficient Cooling and Heating Systems for Improved Passenger Thermal Comfort in Electric Vehicles

Prof. Joško Deur, Ph.D. from the University of Zagreb (QUIET project partner) and Dr. Dragan Šimić from AIT Austrian Institute of Technology GmbH (QUIET project coordinator) are serving as Guest Editors for this issue.

We would like to sincerely invite you, as a renowned expert in the field, to contribute a comprehensive review/article which closely relates to your current research topic, as an invited paper to our special issue. Please kindly note that all invited papers will be subject of full peer-review process.

The deadline for full manuscript submission is 25 August 2020. However, accepted papers will be published continuously in the journal (as soon as accepted) and will be listed together on the special issue website.

For more information on this Special Issue and submission guidelines, please visit the following web page: <u>https://www.mdpi.com/journal/energies/special_issues/energy_efficient_electric_vehicles</u>

Further important details are:

- Energies is fully open access.
- Manuscripts are peer-reviewed, and a first decision provided to authors is approximately 16.7 days after the submission.
- An Article Processing Charge (APC) of CHF 1800 currently applies to all accepted papers.
- You may be entitled to a discount if you have previously received a discount code or if your institute is participating in the MDPI Institutional Open Access Program (IOAP), for more information see: <u>http://www.mdpi.com/about/ioap</u>.
- To submit your manuscript to the journal special issue, please click here: <u>https://susy.mdpi.com/user/manuscripts/upload/abe9d5e917cbe6efb8b775e5d73fe9d0?form%5Bjournal_id%5D=7&form%5Bspecial_issue_id%5D=41733</u>

Before submitting the manuscript, we recommend you to send us first the paper title, authors' list and affiliations, and abstract.

We are looking forward to hearing from you.

With kind regards,		
Prof. Joško Deur	<u>E-Mail</u>	<u>Website</u>
Dr. Dragan Šimić	<u>E-Mail</u>	<u>Website</u>
Guest Editors, Energie	es	

To cancel click here, to edit your subscription click here.

Figure 7: Screenshot of the Newsletter to announce QUIET's Special Issue entitled "Energy Efficient Cooling and Heating Systems for Improved Passenger Thermal Comfort in Electric Vehicles".





Two-Session-Clustering Workshop of QUIET & DOMUS (Online – TEAMS)

On 17th of February 2021 and 3rd of March 2021, the Horizon 2020 project <u>DOMUS</u> will hold a two-session Clustering Workshop together with the Horizon 2020 project <u>QUIET</u>. The clustering workshop has been set up as both projects aim to optimize energy efficiency and thus to increase the range of electric vehicles via innovative user-centric design. New cabin components, systems and control strategies will be developed and demonstrated in an A and B segment car.

Both projects will present their progress and will highlight the similarities and differences in their approach during the workshop.

The Clustering workshop has been divided into two sessions:

Session 1 (on the 17th of February)

During this session, the different methodologies applied by both projects in order to fulfil the same objectives will be discussed and analyzed.

Session 2 (on the 3rd of March)

During this session, breakthrough technologies at component level will be discussed. Additionally, there will be discussions with invited speakers from the H2020 projects BIOMOTIVE and FITGEN about alternative solutions at component level related to EVs.

Interested? Please find the official invitation to the workshop and the agenda (last four pages) here. You can register for one or both sessions via the link in the invitation or by clicking here.

 Please note you will need to register to the workshop to receive the official confirmation as well as the Teams link(s) for the session(s). The official confirmation will be sent via an Outlook Calendar invitation.



To cancel click here, to edit your subscription click here.

Figure 8: Screenshot of the Newsletter to announce the webinar "Two-Session-Clustering Workshop of QUIET & DOMUS".

4.4. Press releases

Country	Title	Year	Quarter
Croatia	Project QUIET featured by Prof. Deur (UOZ) in HRT's (Croatian national broadcasting company) magazine "U svijetu EU fondova".	2019	Q2
Croatia	Project QUIET featured by Ivan CVOK (UOZ) in 3rd Zagreb PhD Café organised by Croatian Science Foundation	2020	Q2
Austria	Höhere Reichweite von Elektroautos im Sommer und Winter	2021	Q2





5. Interactive Communication and Dissemination

Project partners coming from universities or research institutes will publish their research results in scientific journals. The results will be published not only in journals and international congresses/conferences that belong to distinct disciplines of the partners' expertise, but also in multidisciplinary and interdisciplinary ones covering the entire expertise of the partners. Presentations at international conferences and congresses represent a key part of QUIET's communication strategy, as they can greatly contribute to establishing a network of new contacts and directly transferring and interactively discussing QUIET concepts and solutions within the international community.

5.1. Scientific Papers and Posters

Scientific Papers

Contributions in professional journals as well as scientific journals highlight specific expertise and development results in the context of the QUIET project. The target is to publish at least 8 scientific papers, and the Consortium achieved 6 conference papers and 9 scientific journal articles (See Subsection 5.2). The publication and presentation activities related to conference appearances are given in Table 3.

Title	First author	Conference	Date	Link
Energy Consumption, Driving Range and Cabin Temperature Performances at Different Ambient Conditions in Support to the Design of a User Centric Efficient Electric Vehicle: the QUIET project	PAFFUMI (JRC)	SDEWES 2019	Q3 2019	https://www.dubrovnik 2019.sdewes.org/
Control Trajectory Optimisation and Optimised Control Strategy for an Electric Vehicle HVAC System	CVOK (UOZ)	SDEWES 2019	Q3 2019	https://www.dubrovnik 2019.sdewes.org/
Control-oriented Modelling of Vapour- Compression Cycle Including Model-order Reduction and Analysis Tools	RATKOVIĆ (UOZ)	SDEWES 2019	Q3 2019	https://www.dubrovnik 2019.sdewes.org/
Model-based design of an HVAC control strategy	DVORAK (AIT)	SDEWES 2019	Q3 2019	https://www.dubrovnik 2019.sdewes.org/

Table 3: Conference and exhibition related proceedings





Improvement potentials for user-centrically designed efficient electric vehicles - The QUIET Project	KAPELLER (AIT)	TRA2020	Q4 2019	https://traconference.eu
Optimization of Control Parameters of Vehicle Air-Conditioning System for Maximum Efficiency	CVOK (UOZ)	SAE WCX 2020	Q4 2019	https://www.sae.org/w cx

Posters

Besides conferences, the QUIET consortium presented 4 project-related posters (Table 4), which are shown in Figure 9, Figure 10, Figure 11 and Figure 12.

Table 4: Summary of project related posters

Title	First author	Event, location	Date	Description
The QUIET Project	CVOK (UOZ)	Project day, Fac. of Mech. Eng. and Nav. Arch. ,Zagreb, Croatia	Q4 2019	Presentation of UOZ's efforts on the QUIET project (on Croatian)
Development of CFRP – hybrid foam composites for improved light-weight design of electric vehicles	BAUMEISTER (IFAM)	Cellmat (online) conference, Erlangen, Germany	Q3 2020	IFAM and ECON present light-door concept, with emphasis on crash beams
Improvement potentials for user-centrically designed electric vehicles: The QUIET Project	KAPELLER (AIT)	TRA2020, Helsinki, Finland	Q2 2020	AIT's presentation of energy savings potential for EV in the QUIET project
QUalifying and Implementing a user- centric designed and EfficienT electric vehicle	PAFFUMI (JRC)	Ispra, Italy	from 2019	Permanent poster in JRC Ispra VELA Lab explaining the main targets of the projects and testing results.

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Fakultet strojarstva i brodogradnje Sažetak projekta Projekt QLIET usmjeren je na razvijanje energetski učinkovitog električnog vozila s povećanim dometom u stvarnim uvjetima vožnje uključujući ekstremno tople (+40 °C)1 hladne (-10 °C) okolišne uvjete. Razvijene tehnologije bili će integrirane i validirane na Hordinom električnom vozilu B segmenta. One uključuju novi rashtadni medij prinjenjen u novom sustavu koji osim hlađenja omogućava i grijanje u režimu toplinske dizalice, napredne spremnise toplne temeljene na fazno promjenjivim materijalima, tanke grijaće prevlake za grijanje infraervenim zračenjem, lake materijale za stakla, sjedala, te ostale komponente vozila s poboljšanom toplinskom izolacijom. Zadatak fakultetskog projektnog tima Temeljni zadatak faku tetskog projektnog tima je razvoj optimalnog sustava upravljanja tokovima energije električnog vozila kako bi se ostvarila maksmalna poboljšanja onergetsko učinkovitosti električnog vozila i postigle optimalne karakteristike grijanja i hladenja putričkog prostora vozila, uzimajući u obzir redundantne aktuatore i ograničenja sustava. Razvijani sustav upravljanja biti će implementirar u inteligentni upravljački sustav vozila koji uključuje novo intuitivno korisničko sučelje s mogućnošću uzimanja u obzir različitih potreba korisnika. Više-fizikalni simulacijski Upravljanja-orijentirano Optimiranje trajektorija modeli modeliranje Primjenom dinamičkog programiranje obliva se referentno mjenilo (penchmark) i uvid u optimalno Razvijeni HVAC omogućava hlođenje (A/C) i grijanje u režimu dizalice topline (HP) uz dodatne grijače prevlake u Razvoj alata i modela orijentiranih sintezi upravljanja, te provođenju (HP) uz dodatne grijaće prevlake kabini, te sadrži više od 10 aktuatora. ponašanje sustava. optimiranja iljna funkcija Simulacijski modell 5 3. 144 ALC: WILLIAM (isparučéni) od. strane 1 . projektnih. partnera) u unutar C. Martin Martin 216 implementirani Dymola i su unutar GT-Suite Contentar okruženja. Zz Za potrebe upravljačke razvoja 1000 nodela nizeg reda na providi se icentimerono modela nizeg reda na vise-fizikalnih strategije identifikacija the state a. Refer C., Cole, J., March, Carra, Martin Strandar, Narada J., Sarar Shep, and Cardinal Sciences (Solid Science) and provide the strategy of the strategy Početnk: 1. listopad 2017 Aktivnosti projektnog tima Kraj: 30. rujan 2020 Razvoj sustava upravljanja Implementacija sustava Optimiranje parametara i validacija upravljanja Sinteza nadredenog optimalnog Više-kriterijsko optimiranje parametara upravljačke strategije s ciljem sustava Validacija dedatno ugađanja upravijanja grijanjem hlađenjem za različite režime rada parametara upravljačkog sustava na upravijatve su negje s cijem poslizanja zadovoljavajućeg kompromisa između potrošnje energije (učinkovitosli) i termetne ugode. (AVC, HP, itd.) koji koordinira radi detalinim, više-fizikalnim simulacijskim redundantnih aktuatora, te ainteza modelima s ciljem povećanja dometa, podredenih regulacijskih krugova. te konačno implementacija upravljačke strategije u demonstratorsko električno . vozilo B-klase 1. mar 1000 1000 1000 14 4 dia la Contraction of the local states of the local s 12.10 10.00 HONDA Upunkt RUBILIERM IFAM

Figure 9: Poster created by Ivan CVOK (UOZ), presenting the QUIET project as part of the Project day Event organised within the 100-years celebration of the Faculty of Mechanical Engineering and Naval Architecture, 28. November 2019, Zagreb.

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ATT eCon









FRAUNHOFER INSTITUTE FOR MANUFACTURING TECHNOLOGY AND ADVANCED MATERIALS IFAM

Development of CFRP - hybrid foam composites for improved light-weight design of electric vehicles

Joachim Baumeister, Jörg Weise, Tamas Turcsan Cellmat 2020, Erlangen, Germany

Abstract

Abstract The series are acless them have back back incluine to depresent on the back have years. However, second due regret framework or due control on the inclusion product any consistent of the series of consistent on the series of consistent of the series of consistent of the series of the series of the series of the series of the consistent of the series of the series of the series of the series of the consistent of the series of the reduct of the series of th

Motivation

Series multily offers a nich correctal the automatical multily, but at the next second the the skew development, of electro indulity is the finite offers registed the vertice a corporate of the vertice a corporate of the vertice a to refure the weight of the vertice automatic, the can be automatic, the can be automatic, but can be automatic.





Figure 10: eCon and IFAM joint effort poster about light door concept (with emphasis on the crash beams) presented (online) at the Cellmat conference, 7-9 of October 2020.





TRA2020 – Rethinking transport

Towards clean and inclusive mobility + Helsinki 27-30 April 2020

Improvement potentials for user-centrically designed electric vehicles: The QUIET Project

Paper ID: 583 Hansjörg Kapeller, Dominik Dvorak, Dragan Simic AIT Austrian Institute of Technology GmbH, Austria

Simulation approach

were the benchmark for determining

targeted efficiency improvements of the

a virtual analysis of the potential of the proposed innovations was performed by means

vehicle

maria a

Q

£5.

The baseline measurements of a Honda Fit EV

optimization potentials and for quantifying the

To find improvement potentials of the vehicle,

of an entire 10 yehicle model and a Propane-

based (R290) HVAC model (both implemented

in Dymola / Modelica, using components from

1

2

the Modelica Standard Library and TIL Suite).



Introduction

In order to achieve higher market shares, electric vehicles must deliver better performance by overcoming the limited driving range due to the still limited capacity of the battery systems

To enhance the driving range, synergies in the areas of optimized vehicle energy management, lightweight materials (Incl. better thermal insulation) and user-centric design (inc passenger comfort and safety! have to be exploited.

Motivation

- · Reducing the energy required for the thermal management system for all weather conditions
- · Developing novel, innovative components and ghtweight materials
- Increasing thermal passenger comfort



Methodology of the QUIET project

Simulation models are the basis for analysing the synergetic effects of different subsystems, and to estimate the entire EV's energy consumption.



Figure 11: AITs poster about the QUIET project prepared for TRA2020 conference (cancelled due to COVID-19).

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Results and discussion

The validation showed that the models can reproduce the real operating behaviour of the vehicle. Furthermore, the correlation of expected enhancements to possible improvement potentials for the reference EV was elaborated by carrying out variation simulations

The improvement potential by using poly carbonate instead of glass windows indicated, that the cabin temperature could be reduced by approximately 0.5 K compared to the base line car, when using the same air conditioning power of the baseline vehicle.

Under the assumption of a weight reduction of the vehicle of about 75 kg the simulation results show that reducing the cooling energy by 45 % lin hot weather conditions: +40 °C) would lead to a driving range increase of about 10 % (baseline driving range is 137 kml. Reducing the heating energy by 40 % (in cold weather conditions: 10 °C) would lead to a driving range increase of about 27 % (baseline driving range is 68 km).











QUalifying and Implementing a user-centric designed and EfficienT electric vehicle



Exploiting the synergies of a technology portfolio in the areas of user centric design with enhanced passenger comfort and safety, lightweight materials, enhanced thermal insulation properties, and optimised vehicle energy management. These efforts will finally lead to a minimum of 25% driving range increase under both hot (+40 °C) and cold (-10 °C) weather conditions.



High energy consumption of auxiliary components and modules

- · Heating and Air Conditioning systems
- Up to 50% reduction of driving range in cold weather conditions

Coordinator Contact: dragan.simic@ait.ac.at

Figure 12: Permanent poster in JRC Ispra VELA Lab explaining the main targets of the project and testing results.





5.2. Journal publications

Contributions in professional journals as well as scientific journals highlight specific expertise and results developed by the QUIET project consortium. Alongside 6 conference papers, the Consortium produced 10 journal publications. The dissemination activities dealing with the publication of project-related research activities in major journals are provided in Table 5. The publication focus was on open-access journals in accordance's to Horizon2020 goals to enable public access to project results and generated knowledge.

Table 5:	Summary	of journal	publications
----------	---------	------------	--------------

Title	First author	Journal	Date	Peer reviewed	Link
Cabin Conditioning for Electric Vehicles	DRAGE (AVL)	ATZ worldwide	Q1 2019	YES	www.avl.com/- /individual-hvac-climate- control
QUIET project – Qualifying and implementing a user-centric designed and efficient electric vehicle	ŠIMIĆ (AIT)	EEI European Energy Innovation Magazine	Q2 2019	NO	http://www.europeanener gyinnovation.eu/OnlinePu blication/Summer2019/in dex.html#p=53
Composite lightweight redesign of EV closures in the QUIET Horizon 2020 project	TURCSÁN (ECON)	ENGINSOFT Newsletter	Q2 2020	NO	www.enginsoft.com/asset s/pdf/newsletter/newslette r2020_1.pdf
Control Trajectory Optimisation and Optimal Control of an Electric Vehicle HVAC System for Favourable Efficiency and Thermal Comfort	CVOK (UOZ)	Optimization & Engineering Springer	Q2 2020	YES	<u>https://link.springer.com/a</u> <u>rticle/10.1007/s11081-</u> <u>020-09515-w</u>

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Optimisation of Control Input Allocation Maps for Electric Vehicle Heat Pump-based Cabin Heating Systems	CVOK (UOZ)	Energies MDPI	Q2 2020	YES	https://www.mdpi.com/19 96-1073/13/19/5131/pdf
A Novel Methodology for Evaluating the Impact of Energy Efficiency Measures on the Cabin Thermal Comfort of Electric Vehicles	BASCIOTTI (AIT)	Energies MDPI	Q2 2020	YES	https://www.mdpi.com/19 96-1073/13/15/3872/pdf
Demand-Based Control Design for Efficient Heat Pump Operation of Electric Vehicles	DVORAK (AIT)	Energies MDPI	Q3 2020	YES	https://www.mdpi.com/19 96-1073/13/20/5440/pdf
PCM-Based Energy Storage System with High Power Output Using Open Porous Aluminum Foams	BAUMEISTER (IFAM)	Energies MDPI	Q3 2020	YES	https://www.mdpi.com/19 96-1073/13/23/6198/pdf
Improvement and Investigation of the Requirements for Electric Vehicles by the use of HVAC Modeling	KAPELLER (AIT)	HighTech and Innovation Journal	Q4 2020	YES	https://hightechjournal.or g/index.php/HIJ/article/vi ew/91/pdf

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Multi-objective Optimisation- based Design of an Electric Vehicle Cabin Heating Control System for Improved Thermal Comfort and Driving Range	CVOK (UOZ)	Energies MDPI	Q1 2021	YES	https://www.mdpi.com/19 96-1073/14/4/1203/pdf
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QUIET Special Issue in Journal Energies

In order to present the results of their research to a broader scientific community and interact with other researchers working within the same field of research, the QUIET partners initiated a Special Issue titled "Energy Efficient Cooling and Heating Systems for Improved Passenger Thermal Comfort in Electric Vehicles".

The Special Issue was organised and hosted by Energies MDPI, an open-access peer-reviewed journal. It was a part of the "Electric Vehicles" section, and a call-to-paper flyer/invitation was sent (see Figure 13). The guest editors (see Figure 14) for the Special Issue were Prof. Joško DEUR (UOZ) and Dr. Dragan ŠIMIĆ (AIT). The Issue includes a total of eight published papers, five of which were from the QUIET consortium. The published articles are given in the publication summary in the previous chapter, in Table 5.







Energy Efficient Cooling and Heating Systems for Improved Passenger Thermal Comfort in Electric Vehicles

Message from the Guest Editors

Giest Editors

Prof. Jobko Deur University of Express, Private of Adornatical Engineering and Activation Technics and Express Groups (original deurofish In

Dr. Dragan Simit

A T Aukolan Institute of Tachnology Gmbru, Centontor Jow Eritizion Transport, Competence Unit Electric (Mike Tachnologies, Inevia, Austria

Boacting for managempt submissions closed (19 January 2023)

Oragon Simical all as at

in this Special ease, the challenge of enhancing the EV. driving range while maintaining high passenger thermal comfort is to be addressed by capitalizing on either individual or synergetic use of various technologies in the areas of new concepts of the HVAC system and related subsystems and combonent technologies lincuiding advanced heat pump concepts, infrared heating, consideration of novel refrigerants, thermal energy storage devices, etc.), user-centric designed HVAC systems with enhanced passenger thermal comfort, optimized vehicle energy management/control, lightweight materials with improved thermal insulation properties, and similar. The dottimized vehicle energy and thermal management, implemented in an intelligent vehicle control unit, is aimed at cestuling maximized energy efficiency and enhanced the mal comfort, while accounting for various users' needs specified through a proper human-machine interface in an Interactive way.





energies

an Open Access Journal by MDPL

Editor-in-Chief

Prof. Dr. Enrico Sciubba Room 32. Cepartment of Mechanical and Hercenroe Engineering, University of Roma Septeman Via 5) (Investorie) 15. 03249 Roma, tally Message from the Editor-in-Chief

Facegoes is an international, open access journal in energy ingreeeing and research. The journal publishes original papers review atticles, technical notes, and letters. Authors an encouraged to submit manuscripts which bridge the gaps between research, development and implementation. The journal provides a forum for information on research, importation, and conservation in the areas of energy conversion and conservation of the optimal use of energy resources, optimization of energy processes, midgation of environmental pollutants, and sustainable energy systems.

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CitoScore (2019 Scopus data): 3-8, ranked 19/101 (02) in "Control and Optimization". 52/216 (02) in "Energy Engineering and "ower Technology", 206/570 (02) in "Electrical and Electronic Engineering". 33/99 (02) in "Fuel Technology", 9/23 (02) in "Energy (miscellaneous)", and 72/179 (02) in "Renewable Energy, Sustainability and the Environment".

Contact Us

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Special Issue Editors

Prof. Joško Deur Website

Guest Editor

University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia Interests: engine modeling and control; modeling of automatic transmissions and active differentials; tire modeling; vehicle dynamics state estimation and control

Specialsue

Dr. Dragan Šimić Website

Guest Editor

AIT Austrian Institute of Technology GmbH, Center for Low-Emission Transport, Competence Unit Electric Drive Technologies, Vienna, Austria

Interests: EV and HEV modelling and simulation; energy efficiency; thermal management; energy management; e-mobility; HVAC systems for automotive applications







5.3. Exhibitions

Project partners attended 6 exhibitions summarized in Table 6, at which they presented the QUIET project.

Table	6:	Summary	of exhibitions
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Event	Presenter/Moderator	Description	Location	Date
TRA2018	ŠIMIĆ (AIT)	QUIET project highlighted at TRA2018 European Commision's exhibition stand	Vienna, Austria	Q2 2018
IAA 2019 – New Mobility World	SCHMAELZLE (OBR)	QUIET compressor (R290) highlighted at IAA 2019 on OBR exhibition stand	Frankfurt, Germany	Q3 2019
35 th Int. CAE Conference and Exhibition	KIGLICS (ECON)	QUIET project highlighted at CAE 2019 on ECON exhibition stand	Vicenza, Italy	Q4 2019
FSB 100 Project Day	CVOK (UOZ)	QUIET project highlighted with a poster during the Project Day Event organized within 100-years celebration of Faculty of Mech. Eng. and Naval Arch.	Zagreb, Croatia	Q4 2019
Permanent QUIET Project poster in JRC Ispra VELA Lab	PAFFUMI (JRC)	Permanent poster in JRC Ispra VELA Lab explaining the main targets of the projects and testing results as published in the SDEWES 2019 article "Energy Consumption, Driving Range and Cabin Temperature Performances at Different Ambient Conditions in Support to the Design of a User Centric Efficient Electric Vehicle: the QUIET project". Lists of open source articles are also exposed for consultation.	Ispra, Italy	from 2019
TRA2020 (COVID-19: Cancelled)	KAPELLER (AIT)	QUIET project will be highlighted at TRA2020 European Commision's exhibition stand	Helsinki, Finland	Q2 2020

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Figure 15: OBR exhibition booth in IAA 2019 highlighting the novel R290 compressor developed for the QUIET project.

5.4. Lectures

Project partners held QUIET Project-related lectures to wider audience on multiple occasions at different events. Table 7 overviews the lecture events.

Event	Presenter/Moderator	Title	Location	Date
JEC WORLD 2019	TAKÁCS (ECON)	Mechanical Characterization of Composite Structures with Adhesive Joints	Paris, France	Q1 2019
EPMA Functional Materials Seminar 2019	WEISE (IFAM)	Porous Structures for Thermo Management	Bremen, Germany	Q2 2019
XVIII. eCon Konferencia – ANSYS User Meeting	ŠIMIĆ (AIT)	QUalifying and Implementing a user-centric designed and EfficienT electric vehicle - The QUIET Project	Budapest, Hungary	Q2 2019
NAFEMS World Congress 2019	KOVACS (ECON)	QUalifying and Implementing a user-centric designed and EfficienT electric vehicle - The QUIET Project	Quebec, Canada	Q2 2019

Table 7: QUIET Project-related lectures





SDEWES 2019	ZOTTER (AVL)	Integrated technologies for enhanced energy efficiency and comfort	Dubrovnik, Croatia	Q3 2019
SDEWES 2019	ŠIMIĆ (AIT)	Potential analysis – How to increase the maximum driving range of electric vehicles	Dubrovnik, Croatia	Q3 2019
SDEWES 2019	BAUMEISTER (IFAM)	Thermal Management Solutions using Open Porous Metal Structures	Dubrovnik, Croatia	Q3 2019
SDEWES 2019	KIESERITZKY (RUB)	Thermal Storage with High Power Outputs Using Phase Change Materials	Dubrovnik, Croatia	Q3 2019
SDEWES 2019	PAFFUMI (JRC)	Energy Consumption, Driving Range and Cabin Temperature Performances at Different Ambient Conditions in Support to the Design of a User Centric Efficient Electric Vehicle: the QUIET Project	Dubrovnik, Croatia	Q3 2019
SDEWES 2019	KAPELLER (AIT)	Model-based design of an HVAC control strategy	Dubrovnik, Croatia	Q3 2019
SDEWES 2019	RATKOVIĆ (UOZ)	Control-oriented Modelling of Vapour Compression Cycle Including Model-order Reduction and Analysis Tools	Dubrovnik, Croatia	Q3 2019
SDEWES 2019	CVOK (UOZ)	Control Trajectory Optimisation and Optimised Control Strategy for an Electric Vehicle HVAC System and Favourable Thermal Comfort	Dubrovnik, Croatia	Q3 2019
Automotive Aerodynamics & Thermal Management (International Forum 2019)	ŠIMIĆ (AIT)	Qualifying and Implementing a User-Centric Designed and Efficient Electric Vehicle – H2020 Project QUIET	Manchester, United Kingdom	Q4 2019
H2020 RTR	ŠIMIĆ (AIT)	QUIET project highlighted at H2020 RTR19	Brussels, Belgium	Q4 2019
6th CellMAT – International Conference on Cellular Materials	BAUMEISTER (IFAM)	Improvement of the power output of a PCM-based energy storage system using open porous metal foams	Online	Q4 2020





5.5. Workshop and Webinars

Two public workshops were planned and held by the QUIET consortium in order to disseminate project results to professional audience:

- one face to face QUIET workshop was held at SDEWES 2019;
- and one webinar (due to COVID-19) workshop "Two-Session-Clustering Workshop of QUIET & DOMUS" has been carried out. Summary of the workshops is given below.

At two further Workshops the QUIET project was represented by the QUIET project coordinator (PC):

- on November 29th, 2017 the PC participated at the DOMUS Kick-Off Meeting in Barcelona and highlighted the QUIET project there;
- on October 18th, 2019 the PC participated at the IModBatt workshop in San Sebastian and presented the current QUIET project status (at that time) followed by discussions with the audience.

QUIET Workshop at SDEWES 2019 and QUIET Project session

The first face-to-face style of workshop titled "How breakthrough HVAC and other technologies enable enhanced thermal comfort solutions while increasing the driving range" was held on 1st October 2019, as a part of The QUIET Project Session of the SDEWES 2019 Dubrovnik conference. Targeted audience were experts and scientists/researchers attending the SDEWES conference and dealing with, or interested in fields of e-mobility, user-centric and HMI design, vehicle thermal management, lightweight and PCM new materials. To reach out to a wider audience, an invitation handout was forwarded to all conference participants (see Figure 16 and Figure 17).

The workshop used the "World Café" format (see Figure 17), with three distinct groups, each with their own moderator for one of the three discussion topics:

- 1. User centric design & optimised energy management strategies; moderated by Steffen JAHN (HRE)
- 2. Lightweight materials with enhanced thermal insulation properties; moderated by Tamás TURCSÁN (ECON)
- 3. Energy efficient heating and cooling; moderated by Gerald ZOTTER (AVL/QPA)

Attendees were randomly assigned to one of the three discussion groups each participating in a 20 min presentation followed by an open discussion on the topic. Afterwards, the group was shuffled and forwarded to the next topic. The chosen format proved to be successful as it led to discussion (see Figure 18) and engagement both during and after the workshop.

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PROJECT NUMBER	769626			PROJECT DESCRIPTION
PRIME ALBORIT	QUIET	6	Quiet	QUERT must at developing an improved and energy efficient electric velocite mill increases driving range under real-sourced driving conditions. This is achieved by requiring the sourcegies of
PROJECT NAME	QUalifying and Imple user-centric designed EfficientT electric vehi	menting a and icle	- Cr	Leer centric design with enhanced passenger conflort and safety Lightweight matterials with enhanced themsal incubitor properties
STARI Date	01/10/2017	END DATE	30509/2020	 And optimised vehicle energy initiagement. The developed technologies will be integrated and availabled in a floada b segment electric vehicle.
TOTAL BUDGET (6)	6,998,955.00	EU FINANCIAL CONTRIBUTION (É)	6.998,955.00	solidater. Anning faste, o novel refrigerent for enviring, combined with an energy-owing fast pump operation for heating, advanced thermal surviges based on phone elange more-tals.
ORGANISATION	Project coordinator	Dr. Dragai SIMIC Dragai.some@at.sc.s	¢	provertilans for influence relative factoring, and moteriale for enhanced thermal involution of the ration will be wreeingued. Further factor is put on high/weight glaving for windows, as well as
PROJECT PARTN	ERŚ			light meads the alamman in suggestion for east components. Optimized energy restargument structures will have enhance the formed terformance of the vehicle.
 Houm P. Lea (1) agnulz Det Ventres J. V G. University Franchofer (FAM) (60) AIT Adva Earn Fragment Robitherm Sourne Exgr Robitherm Robitherm 	D Entropy (Densemblar) Eacht (Aussich) reschland Gmith (German trouterbre Gmith (Namar of Zagreb (Crowlar) Institute för Matufaster ternany) aged Thermal Technolog societing Kh (Hungary) Tachnologies Grifth (German macring Gmith (Aussich) und Carme - Finnestan C	agi ay ay ing Teolinologues (nd Ads des Gmbh (Anstria) musuy) ay y) ummessee (Daly)	sucod Maturials	 electric vehicle mader different driving conditions, by 9 lests 30 % compared to the Hondr breeline 2017 Additionally, a weight reduction of about 10 % of vehicle components (e.g. doors, windshields, sens, heating and air conditioning) is also addressed. These efforts will finally let d is a less 25 % driving range increase under buffi for (~0.7c) and cold (~0.7c) weather conditions. RESULTS QUIET will provide a series of headthrough indexdogles flow runties fowering the energy exceepted for facting and avoiding solid reducing the weight of the entres plactic vehicle vehicing platform, resulting in a leater driving range functionally 25 %. Implementing an incorntive air conditioning system based on the refrigerent K190 (program.) that has a conditioning system based on the refrigerent K190
WEBSHE	www.cuset-conject.cu			 The heating of the vehicle can size be done by the an conditioning system working or heat
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Figure 16: Handout (I) of QUIET Workshop – Efficient and user-friendly designed electric vehicles.









QUIET Workshop - Efficient and user-friendly designed electric vehicles "How breakthrough HVAC and other technologies enable enhanced thermal comfort solutions while increasing the driving range" Tuesday, 1st of October 2019, 09:00-12:00

Hotef Valamar Lacroma Dubroynik

Tier	Tégés
09:00-09:15	Welcome and introduction
01-15-10-00	The QUIET project - Overview and gained results
10:00-10:20	Klottke Inesk
10:30-11-30	World Call
11:30-11:45	Stanmary and conclusion
11.45-12.45	Longin loggether

Topics World Cafe

- 1. User centric design & optimised energy management strategies
 - What opportunities can be expected from user centric designed electric vehicles? What apportingings can be expected from user scaling, strangers because same senses is the (possibly) associated increase of passenger constort indispensable to pash acceptance for electric michality? Or issuer centric design even overated? Optimized energy menagement suscepts will enhance the dismust performance of the related. How far should the user be able to influence the energy management strategy
 - algorithm?
- 2. Lightweight materials with enhanced thermal insulation properties
 - Focus in QUIET is also put on lightweight glazing for windows (offering caloneed thermal invalidation of the passenger comparament) and light metals for seat components. Do you think it was paid too little attention for these approaches up to now? Are these promising finture applications?
- Energy efficient heating and cooling Which breakthrough HVAC technologues (e.g. novel refrigerants for cooling, novel return view month is the return of the second secon

Figure 17: Handout (II) of QUIET Workshop – World Café topics.



Figure 18: World Café topic roundtable panels and discussion.





As mentioned above also a QUIET Project Session was organised and held on 1st October 2019 as a part of the SDEWES 2019 conference and was organised after the QUIET Workshop (see Figure 19). The QUIET Project Session included presentations of submitted SDEWES 2019 conference articles (Table 3), followed by presentations/lectures (as reported also in Table 7) prepared by industry consortium partners about their role and work done on the QUIET project (Table 8).

Qualifying & Implementing a User-Centric Designed & Efficient Electric Vehicle – The QUIET Project Session

- SDEWES2019-1054 Model-based design of an HVAC control strategy
- SDEWES2019-1075 Potential analysis How to increase the maximum driving range of electric vehicles
- SDEWES2019-1078 Thermal Management Solutions using Open Porous Metal Structures
- SDEWES2019-1080 Thermal Storage with High Power Outputs Using Phase Change Materials
- SDEWES2019-1036 Energy Consumption, Driving Range and Cabin Temperature Performances at Different Ambient Conditions in Support to the Design of a User Centric Efficient Electric Vehicle: the QUIET Project
- SDEWES2019-1084 Control-oriented Modelling of Vapour Compression Cycle Including Model-order Reduction and Analysis Tools
- SDEWES2019-1086 Control Trajectory Optimisation and Optimised Control Strategy for an Electric Vehicle HVAC System and Favourable Thermal Comfort

Tuesday, October 1

9 ⁰⁰ - 13 ⁰⁰	QUIET Workshop – Efficient and user-friendly designed electric vehicles "How breakthrough HVAC and other technologies enable enhanced thermal comfort solutions while increasing the driving range" (ROOM H) <i>Chair: Prof. Joško Deur Co-chair(s): Dr. Dragan Šimić</i>
13 ⁰⁰ - 17 ⁰⁰	Qualifying & Implementing a User-Centric Designed & Efficient Electric Vehicle – The QUIET Project Session (ROOM H) <i>Chair: Prof. Josko Deur</i> <i>Co-chair(s): Dr. Dragan Šimić</i>

Figure 19: QUIET SDEWES 2019 Dubrovnik Project Session and Schedule for the Workshop, Lectures and Publication Presentation.





Table 8: QUIET Project Session presentations

Presenter	Description
ZOTTER (AVL)	Integrated technologies for enhanced energy efficiency and comfort
ŠIMIĆ (AIT)	Potential analysis – How to increase the maximum driving range of electric vehicles
BAUMEISTER (IFAM)	Thermal Management Solutions using Open Porous Metal Structures
KIESERITZKY (RUB)	Thermal Storage with High Power Outputs Using Phase Change Materials
PAFFUMI (JRC)	Energy Consumption, Driving Range and Cabin Temperature Performances at Different Ambient Conditions in Support to the Design of a User Centric Efficient Electric Vehicle: the QUIET Project
KAPELLER (AIT)	Model-based design of an HVAC control strategy
RATKOVIĆ (UOZ)	Control-oriented Modelling of Vapour Compression Cycle Including Model- order Reduction and Analysis Tools
CVOK (UOZ)	Control Trajectory Optimisation and Optimised Control Strategy for an Electric Vehicle HVAC System and Favourable Thermal Comfort





Two-Session-Clustering Workshop of QUIET & DOMUS

The QUIET and DOMUS are Horizon2020 projects that share an identical objective: improving the energy efficiency of an EV to achieve an increase in driving range of at least 25% under real-world driving conditions. Both projects aim to accomplish the set goal by focusing on user-centric design to optimise energy efficiency, introduce new cabin elements and materials, utilise novel technologies, i.e. phase-change materials and infrared heaters, and employing smart thermal management strategies. To enhance collaboration, exchange knowledge and present different approaches to achieve the same objective, a clustering workshop was proposed. The initial clustering workshop was planned as a part of the Transport Research Arena 2020 (TRA2020) conference. However, the conference was cancelled due to COVID-19 and replaced by a public online two-session-clustering workshop meeting. To reach out to a larger audience, an invitation handout (see Figure 20) referring to a registration form was placed on the QUIET website and forwarded via e-newsletter (see Figure 8), social media announcements (by AIT and DOMUS partner Uniresearch) as well as by email to possibly interested parties.



Figure 20: INVITATION: Two-Session-Clustering Workshop QUIET & DOMUS.

The first session was held on the 17th of February and the focus was set on the discussion, analysis and comparison of different methodologies used by the respective partners for reaching the same target. The second session was held on the 3rd of March 2021 with the emphasis on novel and breakthrough technologies at component level. The second session also hosted speakers form Horizon2020 projects BIOMOTIVE and





FITGEN to present their solutions at component level regarding to EVs. The workshop was moderated by QUIET and DOMUS project officer Eric CERNEAZ and was a success (43 registrations and 38 participants were counted, respectively) as it successfully showcased different approaches and ideas, sparked discussion and strengthened the possibility of collaboration in future projects. The summary of discussed topics for both sessions is given in Table 9. All QUIET partner's presentations held at the QUIET & DOMUS clustering workshop are available for download on the QUIET website under the category 'Dissemination', see also https://www.quiet-project.eu/dissemination/.

Session	Title	Presenter
1 & 2	Short introduction of QUIET	ŠIMIĆ (AIT)
1	A virtual user-centric approach to design radically new cabin designs and assess them in terms of optimal energy efficiency use	JAHN (HRE)
1	Thermal management control system to be implemented in a demo car which will maximize energy efficiency	THIERINGER (AVL)
2	Seats that will reduce the weight and energy consumption of the entire electric vehicle	ROITHER (AIT)
2	Advanced thermal storages based on phase change materials (PCM) with high power output using open porous aluminum foams	KIESERITZKY (RUB)
2	Powerfilms for infrared radiative heating	HABENBACHER (ATT)
2	Lightweight materials with enhanced thermal properties	TURCSÁN (ECON)
2	Lightweight Thermoplastic Glazing Techniques for Windows	KAPELLER (AIT)

Table 9: Overview of QUIET partner's presentations held at the QUIET & DOMUS clustering workshop

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QUIET participation at Workshop during Domus Kick-Off Meeting in Barcelona

During the Domus Kick-Off Meeting on November 29th, 2017 in Barcelona the QUIET PC highlighted the QUIET project there. Figure 21 shows a screenshot of the DOMUS Kick-Off agenda.

DCMUS	KICK-OFF MEETING 29 – 30 November 2017
Meeting organiser	IDIADA
Type of meeting	General Assembly
Location	Host: IDIADA Location: Hotel Catalonia Eixample 1864, Roger de Llúria 60, Barcelona

Agenda 29 November 2017			
Item No	Timing	Topic	Chair
01	11:30	Welcome and registration	IDIADA
	12:00	Lunch	IDIADA
02	13:00	Opening General Assembly meeting Introduction of all partners (partner presentation) 1 slide per partner, 2 minutes presentation Introduction to the project 	IDIADA UNR - MW IDIADA -
03	14:00	Management presentation – WP8 Stakeholder group 	UNR - MW
04	14:30	Dissemination, exploitation and Communication – WP7	UNR-MW
	15:00	Coffee	
05	15:15	Introduction EC	
06	15.45	Introduction QUIET project	1.0
05	16.00	Short introduction WP's 10 minutes each	WPL's
06	17:00	Finishing up day 1 and short introduction day 2	
07	17.15	Closure day 1 15 minutes	

Figure 21: DOMUS Kick-Off agenda, time slot for the QUIET project.

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QUIET participation at the IModBatt Workshop in San Sebastian

On October 18th, 2019 the PC participated at the IModBatt workshop in San Sebastian presenting the current QUIET project status followed by discussions with the audience. Figure 22 shows a screenshot of the IModBatt workshop agenda.

Description Moderators: Luce Feature Statustion of a Cylindrical Cell Battery Module HiFI-ELEMENTS project Subhajeet Rath, TNO Battery Module HiFI-ELEMENTS project 11:10 15' Optimization of scalable realtime modeLs and functional testing for e-drive ConceptS OBELICS project Horst Pfluegl, AVL, OBELICS Coordinator Tomaz Katrasnik, University of Ljubljana 11:30 15' Qualifying and Implementing a user-centric designed and Efficient electric vehicle QUET project Dragan Simic, AIT, QUET Coordinator 11:45 15' Optimised Energy Management and Use OPTEMUS project Inés Muñoz, IDIADA 12:40 15' Design OptiMisation for efficient electric vehicles based on a User-centric approach DOMUS project Inés Muñoz, IDIADA 12:50 70' Panel discussion followed by wrap-up & conclusion Moderators: Luca Feola, (INEA), David Storer (CRF) 13:45 75' Standing up lunch & posters session - IMAGE – Denise Tapler (AVL) - HIFI-ELEMENTS – Christof Schernus (FEV) - EVERLASTING – Philipe Azais (CEA) - ACHILES – Thomas Geury (VUB) - EVOLVE cluster – Christof Schernus (FEV) - EVOLVER – Christof Schernus (FEV) - EVOLVER – Christof Schernus (FEV) - Evorilora Varga (VUB) - CHOOST – David Storer (_	
11:00 15' Core Temperature Estimation for Cylindrical Cell Battery Module HIFI-ELEMENTS project Subhajeet Rath, TNO 11:15 15' Optimization of scalaBle rEaltime modeLs and functional testing for e-drive ConceptS OBELICS project Horst Pfluegl, AVL, OBELICS Coordinator Tomaz Katrasnik, University of Ljubljana 11:30 15' QUalifying and Implementing a user-centric designed and Efficient electric vehicle QUIET project Dragan Simic, AIT, QUIET Coordinator 11:45 15' Optimised Energy Management and Use OPTEMUS project Ibai Ulacia, University of Mondragon 12:00 15' Design OptiMisation for efficient electric vehicles based on a USer-centric approach DOMUS project Inés Muñoz, IDIADA 12:12 20' Buffer-Break Moderators: Luca Feola, (INEA), David Storer (CRF) Participants: Christof Schernus (FEV), Vittorio Ravello (CRF), Thierry Claudel (TVVA), Stefan Gaigg (MIBA) 13:45 75' Standing up lunch & posters session • IMAGE – Denise Tapler (AVL) • HIFI-ELEMENTS – Christof Schernus (FEV) • i-HecOBatt – Altor Makibar (CIDETEC) • OBELICS – Horst Pfluegl (AVL) • EVERLASTING – Philippe Azais (CEA) • ACHILES – Thomas Geury (VUB) • E-VOLVE cluster – Christof Schernus (FEV), • Eva Flora Varga (VUB) • E-VOLVE cluster – Christof Schernus (FEV), • Eva Flora Varga (VUB) • CEVOLVER – Christof Schernus (FEV) • iModBatt – Iosu Cendoya (CIDETEC) • i	VORKSHOP				
11:15 15' Optimization of scalaBle rEaltime modeLs and functional testing for e-drive ConceptS Horst Pfluegl, AVL, OBELICS Coordinator Tomaz Katrasnik, University of Ljubljana 11:30 15' QUalifying and Implementing a user-centric designed and EfficienT electric vehicle QUIET project Dragan Simic, AIT, QUIET Coordinator QUIET project 11:45 15' Optimised Energy Management and Use OPTEMUS project Ibai Ulacia, University of Mondragon OPTEMUS project 12:00 15' Design OptiMisation for efficient electric vehicle goated on a USer-centric approach DOMUS project Inés Muñoz, IDIADA 12:15 20' Buffer-Breok Moderators: Luca Feola, (INEA), David Storer (CRF) 12:35 70' Panel discussion followed by wrap-up & conclusion Moderators: Luca Feola, (INEA), David Storer (CRF) 13:45 75' Standing up lunch & posters session • DOMUS – Inés Muñoz (IDIADA) • IIMAGE – Denise Tapler (AVL) • DOMUS – Inés Muñoz (IDIADA) • IIMAGE – Denise Tapler (AVL) • DOMUS – Inés Muñoz (IDIADA) • IIMAGE – Denise Tapler (AVL) • DOMUS – Inés Muñoz (IDIADA) • IIMAGE – Denise Tapler (AVL) • DOMUS – Inés Muñoz (IDIADA) • IIFIELEMENTS – Christof Schernus	11:00	15'	Core Temperature Estimation for Cylindrical Cell Battery Module HiFi-ELEMENTS project	Subhajeet Rath, TNO	
11:30 15' QUalifying and Implementing a user-centric designed and EfficienT electric vehicle QUIET coordinator Dragan Simic, AIT, QUET Coordinator 11:45 15' Optimised Energy Management and Use OPTEMUS project Ibai Ulacia, University of Mondragon 11:45 15' Design OptiMisation for efficient electric vehicle based on a USer-centric approach DOMUS project Inés Muñoz, IDIADA 12:15 20' Buffer-Break Moderators: Luca Feola, (INEA), David Storer (CRF) 12:15 70' Panel discussion followed by wrap-up & conclusion Moderators: Luca Feola, (INEA), David Storer (CRF) 13:45 75' Standing up lunch & posters session Moderators: Christof Schernus (FEV), Vittorio Ravello (CRF), Thierry Claudel (TVVA), Stefan Gaigg (MIBA) 13:45 75' Standing up lunch & posters session UPSCALE – Enric Aramburu (IDIADA) 14:45 75' Standing up lunch & posters session UPSCALE – Enric Aramburu (IDIADA) 14:17:4 16:14 Ference Altor Makibar (CIDETEC) DOMUS – Inés Muñoz (IDIADA) 14:18:4 75' Standing up Iunch & construct (FEV) OPTEMUS – Ibai Ulacia (MU) 15:45 75' Standing up Iunch & construct (FEV) UPSCALE – Enric Aramburu (IDIADA) 14:19:4 Ference Altor Makibar (CI	11:15	15'	Optimization of scalaBle rEaltime modeLs and functional testing for e-drive ConceptS OBELICS project	Horst Pfluegl, AVL, OBELICS Coordinator Tomaz Katrasnik, University of Ljubljana	
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12:35 70' Panel discussion followed by wrap-up & conclusion Moderators: Luca Feola, (INEA), David Storer (CRF) 13:45 75' Standing up lunch & posters session Participants: Christof Schernus (FEV), Vittorio Ravello (CRF), Thierry Claudel (TYVA), Stefan Gaigg (MIBA) 13:45 75' Standing up lunch & posters session • IMAGE – Denise Tapler (AVL) • DOMUS – Inés Muñoz (IDIADA) • HiFi-ELEMENTS – Christof Schernus (FEV) • UPSCALE – Enric Aramburu (IDIADA) • UPSCALE – Enric Aramburu (IDIADA) • i-HeCoBatt – Aitor Makibar (CIDETEC) • OBELICS – Horst Pfluegl (AVL) • OPTEMUS – Ibai Ulacia (MU) • DEMOBASE – Joseph Martin (IFPEN) • OPTEMUS – Ibai Ulacia (MU) • DEMOBASE – Joseph Martin (IFPEN) • E-VOLVE cluster – Christof Schernus (FEV), Eva Flora Varga (VUB) • GHOST – David Storer (CRF) • iModBatt – Iosu Cendoya (CIDETEC) • CEVOLVER – Christof Schernus (FEV) Specific developments linked to xEVs: • in depth comparison of high energy density cylindrical cells – Hartmut Popp (AIT) • Battery Thermal State Observer development for HiFi-ELEMENTS – Subhajeet Rath (TNO) 30' Optional visit to CIDETEC Energy Storage facilities	12:15	20'	Buffer-Break		
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Battery Thermal State Observer development for HiFi-ELEMENTS – Subhajeet Rath (TNO) 30' Optional visit to CIDETEC Energy Storage facilities	13:45	75'	 Standing up lunch & posters session IMAGE – Denise Tapler (AVL) HiFi-ELEMENTS – Christof Schernus (FEV) i-HeCoBatt – Aitor Makibar (CIDETEC) EVERLASTING – Phiippe Azais (CEA) ACHILES – Thomas Geury (VUB) DEMOBASE – Joseph Martin (IFPEN) E-VOLVE cluster – Christof Schernus (FEV), Eva Flora Varga (VUB) CEVOLVER – Christof Schernus (FEV) Specific developments linked to xEVs: In depth comparison of high energy density cyli 	 DOMUS – Inés Muñoz (IDIADA) UPSCALE – Enric Aramburu (IDIADA) OBELICS – Horst Pfluegl (AVL) ADVICE – Vittorio Ravello (CRF) OPTEMUS – Ibai Ulacia (MU) ORCA – Thomas Geury (VUB) GHOST – David Storer (CRF) iModBatt – Iosu Cendoya (CIDETEC) 	
	15:00	30'	Dattery Inermal State Observer development to Optional visit to CIDETEC Energy Storage facilities	or mini-elements – subhajeet kath (TNO)	

Figure 22: IModBatt workshop agenda, time slot for the QUIET project.





6. Conclusions

This document D6.4 summarises all documents that the QUIET consortium has implemented and published, always taking care to reach all relevant target groups (as defined in D6.1: "Dissemination and Communication Strategy") in an appropriate and easily accessible format.

The dissemination and communication strategy formulated within deliverable D6.1. has been overviewed in this report and provides a summary of all published documents. The achievements in the following categories are:

- offline communication and dissemination: QUIET project logo has been designed; demonstrator vehicle has been decorated accordingly and the designed flyer is available for distribution,
- online communication and dissemination: besides public website, a project video-trailer and enewsletter have been created, and
- interactive dissemination and communication: 2 workshops have been held and on further 2 workshops the QUIET coordinator has been participated; 16 papers published of which 6 are conference papers and 10 are scientific journal papers; 7 lectures.

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7. Acknowledgment

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Project Partners:

The author(s) would like to thank the partners in the project for their valuable comments on previous drafts and for performing the review.

Participant No	Participant short name	Participant organisation name	Country
1 Coordinator	AIT	AIT Austrian Institute of Technology GmbH	Austria
2	HRE-G	Honda R&D Europe (Deutschland) GmbH	Germany
3	AVL	AVL List GmbH	Austria
4	QPD	AVL Thermal and HVAC GmbH	Germany
5	VEN	VENTREX Automotive GmbH	Austria
6	UOZ	University of Zagreb	Croatia
7	IFAM	Fraunhofer Institute for Manufacturing Technologies and Advanced Materials IFAM	Germany
8	ATT	ATT advanced thermal technologies GmbH	Austria
9	ECON	eCon Engineering Kft.	Hungary
10	RUB	Rubitherm Technologies GmbH	Germany
11	STS	SeatTec Sitztechnik GmbH	Germany
12	OBR	Obrist Engineering GmbH	Austria
13	JRC	Joint Research Centre - European Commission	Italy