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Silicon Alloying Anodes for High Energy **D**ensity Batteries comprising Lithium **R**ich Cathodes and Safe **I**onic Liquid based Electrolytes for Enhanced High **V**oltage Performance

Grant Agreement Number 814464

Deliverable Report

D8.2 / D38 Project Website

Consortium



Deliverable Administration					
Deliverable	D8.2 / D38 Project Website				
Work package	WP 8 – Dissemination, Exploitation and Communication				
Due date	M4 – 31 Apr 2019				
Lead beneficiary	UL				
Type of deliverable*	R	DEM	DEC	OTHER	ORDP
			✓		
Dissemination Level*	PU		CO		CI
	✓				
Authors	All partners				
Reviewed by	Kevin Ryan [UL]; Hugh Geaney [UL]; Edel Kavanagh-O'Carroll [UL]				
Approved by	Kevin Ryan [UL]			Date	29 Apr 2019
DoW	<p><i>Task 8.2: Communication & public engagement (UL, All Partners – M1-M49)</i></p> <p>This task will inform and communicate the activities and results of the project to target audiences including the EV industry and the broader power industry, using platforms such as EGVI, EARPA and ERTRAC and those organised by AABC. Policy makers, industry clusters, regulatory bodies, other relevant stakeholders and the public will also be targeted. Marketing and promotion activities will begin from the outset of the project and will continue throughout. These activities will be defined within the dissemination plan (D8.3) and will aim to raise awareness of the project and maximise its impact. This task will set up and maintain the Si-DRIVE website used as: 1) a web-based information resource for different target-groups and 2) the integrated use of new media (e.g. Blog and Infographics). Press notes will be released at least once per year, highlighting consortium breakthroughs with the aim of achieving not only national, but also international media coverage, using the project website, social media channels (LinkedIn, Facebook, etc.) and on radio/ television. Newsletters will be produced every 18 months and circulated to targeted Si-DRIVE stakeholders. One of the main dissemination tools will be the project website (D8.2), which will contain sections with targeted information suitable for technical readers and the public. The public section of the website will contain an overall description of the project (objectives, structure, consortium, methodology, etc.), the public deliverables, as well as an agenda with events, papers and articles carried out by the partners of the project. Consortium partners will also create a restricted area on the website for access and storage of technical information. The website will be updated during the whole duration of the project</p>				
Document history of changes					
Date	Authors			Description	
26 Mar 2019	All partners			V1	
09 Apr 2019	Kevin Ryan [UL]; Hugh Geaney [UL]; Edel Kavanagh-O'Carroll [UL]			V2	
29 Apr 2019	Kevin Ryan [UL]; Hugh Geaney [UL]; Edel Kavanagh-O'Carroll [UL]			Final	

*	R	Document, report (excluding the periodic and final reports)
	DEM	Demonstrator, pilot, prototype, plan designs

DEC	Websites, patents filing, press & media actions, videos, etc
OTHER	OTHER: Software, technical diagram, etc
ORDP	Open Research Data Pilot
PU	Public, fully open, e.g. web
CO	Confidential, restricted under conditions set out in Model Grant Agreement
CI	Classified, information as referred to in Commission Decision 2001/844/EC

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Executive Summary

This report presents the Si-DRIVE website structure and its content. This website will be used to facilitate a high position web presence for the project, in addition to the Si-DRIVE Twitter account. The website contributes to the overall visibility of the Si-DRIVE project, facilitating its communication to key stakeholders in the EV industry, the academic and scientific community, and public audiences.

The website is divided into seven sections (Homepage; About; Partners, Publications; News; Contact; and Login). There are subsections for each partner. The website was constructed in this way to provide easy-to-understand information regarding the project, which is both general and in-depth enough for the reader to ascertain the current status of the project, and what work is planned for the future. This is an integral to its function.

The Si-DRIVE website provides an important and direct link between those who visit the website, and the project coordinator via the Contact Us function. A designated members-only area also facilitates communication within the consortium, which is then translated to the public where possible.

Social media, as well as website presence is an important driver and powerful tool in promotion of content. Si-DRIVE will utilise these tools to achieve visibility, and promote its brand image to stakeholders.

Acronyms and Abbreviations

AABC	Advanced Automotive Battery Conference
EARPA	European Automotive Research Partners Association
EGVI	European Green Vehicles Initiative
ERTRAC	European Road Transport Research Advisory Council
EV	Electric Vehicle
SEO	Search Engine Optimisation

Glossary

AABC	AABC has organised the preeminent events covering vehicle electrification, where chief battery technologists from leading automotive OEMs, and key members of the supply chain, discuss the latest technology trends in the rapidly expanding market of advanced vehicles and the batteries that will power them. Each year, AABC brings together a global audience of battery technologists and their key suppliers. ¹
EARPA	Founded in 2002, EARPA is the association of automotive R&D organisations. It brings together the most prominent independent R&D providers in the automotive sector throughout Europe. ²
EGVI	The European Green Vehicles Initiative is a contractual Public Private Partnership (cPPP) dedicated to delivering green vehicles and mobility system solutions of the future which match the major societal, environmental and economic challenges. ³
ERTRAC	ERTRAC is the European technology platform which brings together road transport stakeholders to develop a common vision for road transport research in Europe. ⁴
EV	Electric Vehicle
SEO	SEO is the process of getting traffic from the “free,” “organic,” “editorial” or “natural” search results on search engines. ⁵

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¹ <https://www.advancedautobat.com/>

² <https://www.earpa.eu/earpa/home>

³ <https://egvi.eu/who-we-are/the-european-green-vehicles-initiative-egvi-cppp/>

⁴ <https://www.ertrac.org/>

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1.0 Introduction

The aim of the Si-DRIVE project is to create higher performance batteries for electric vehicles. The website is intended to be the primary method for communicating activities within the project to external audiences.

The aim of this deliverable report is to establish the Si-DRIVE website, which includes both public and private (i.e., consortium/project partner access only) sections. This report details how the Si-DRIVE website has been created to provide public information with regard to the project, the tools used in its development and the different pages contained therein.

The Si-DRIVE website will be the main interface of the project towards target groups and stakeholders. The purpose of the website will be general promotion of project/notification of activities to potential users across Europe and internationally. Specifically, it will communicate to project partners, the scientific community, public audiences, as well as other key stakeholders such as industry and national/international policy makers.

The goals of the website are:

- Provide a source of information for the scientific community, and public (using plain language);
- Communicate press articles and upcoming events;
- Dissemination of publications;
- Link to social media;
- Implement a public and private (members-only) section; and
- Generate interest in potential end users.

1.1 Target Audience

The target audience/users will be:

- General public audience;
- Educational/scientific communities;
- Project consortium members;
- Industrial and commercial actors; and
- National/international policy makers.

2.0 Website Construction

2.1 Web address

<http://www.sidrive2020.eu>

A web domain with the .eu extension was chosen by the consortium as it is representative of the European Union, and will thus emphasise the European identity of the project website. 2020 was included to signify the importance of Si-DRIVE as a Horizon 2020 project.

2.2 Management Tool



Figure 1. Wordpress logo

The website was created using Wordpress (<http://www.wordpress.org>), an open-source content management software (figure 1). This is used to create and manage content for websites. WordPress is used by 33.5% of all created websites, with a market share of 60.4%⁶, as of April 2019 (Figure 2). Use of plugins and template systems ensure it is highly flexible to the user, a reason why it was chosen.

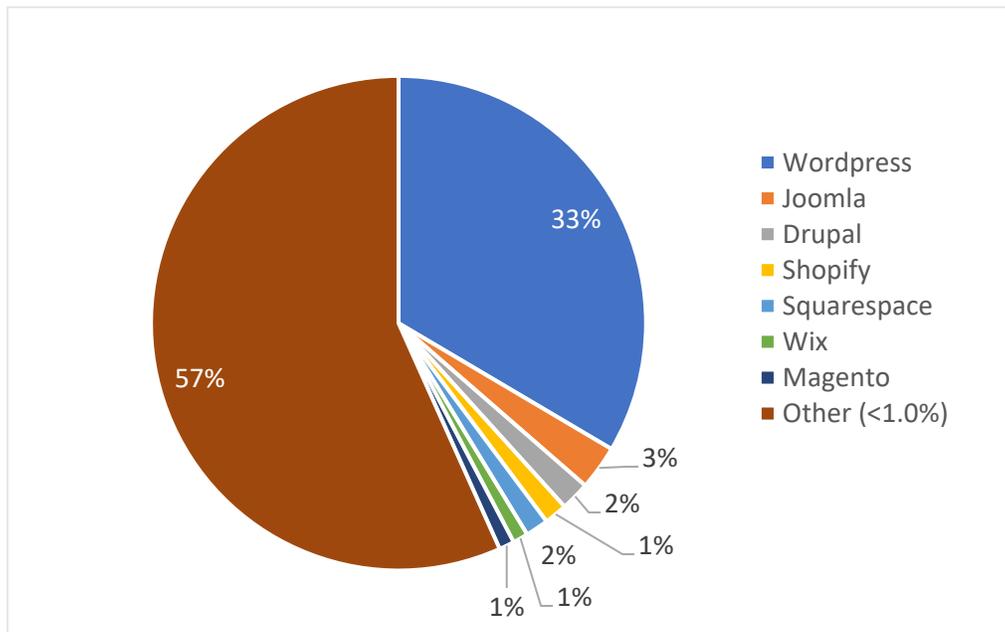


Figure 2. CMS type usage (of websites using a CMS)⁶

2.3 Search Engine Optimisation

Search engine optimisation (SEO) will improve the visibility of the Si-DRIVE website online.

The website was set up to include the following, which will improve its visibility to search engines such as Google, Bing and Yahoo, for example:

- High-end webpage optimisation for high page ranking by optimising all posts/pages for SEO.
- Focus keywords (top 10 focused keywords integrated with page SEO).
- Title / Description meta tags - set custom page titles, meta descriptions, meta keywords, meta robots and social meta using defined format tags for Homepage, Posts, Pages, Categories, Tags, Custom Taxonomies, Archives, Authors, Search, 404 Pages and Pagination.
- Google Webmasters setup and sitemap generation - the sitemap is generated and uploaded to Google Webmasters.

⁶ 'Usage of content management systems' https://w3techs.com/technologies/overview/content_management/all [retrieved: 08 April 2019]

- Google Analytics and full documented reports.
- Speed optimisations, tests and reports - Image compression and caching to speed up the website to increase loading times.

3.0 Website Structure

The website has a navigation bar that spans the top of the webpage. The following headers can be found (Table 1, A-G):

- Homepage
- About
- Partners
- Publications
- News
- Contact
- Login

Table 1. Preliminary layout of website

A					
Home page					
B	C	D	E	F	G
About	Partners	Publications	News	Contact	Login
	Link to individual partner pages				Link to document management system

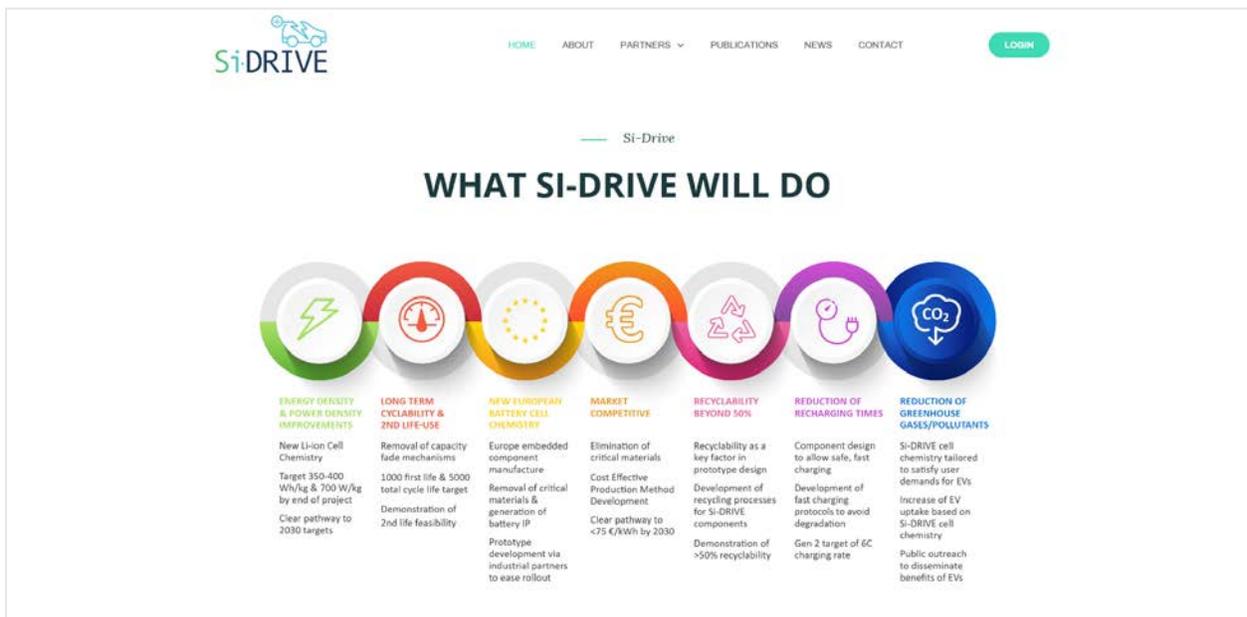
Images of the entire website structure can be found in Appendix 1.

3.1 Home Page

Visitors to the Si-DRIVE website are welcomed to the homepage with an animated homepage slider, which will evolve throughout the project (figure 3A). Scrolling down the page, there is an image of the individual areas of impact the Si-DRIVE project will have and a corresponding short description (figure 3B).



A



B

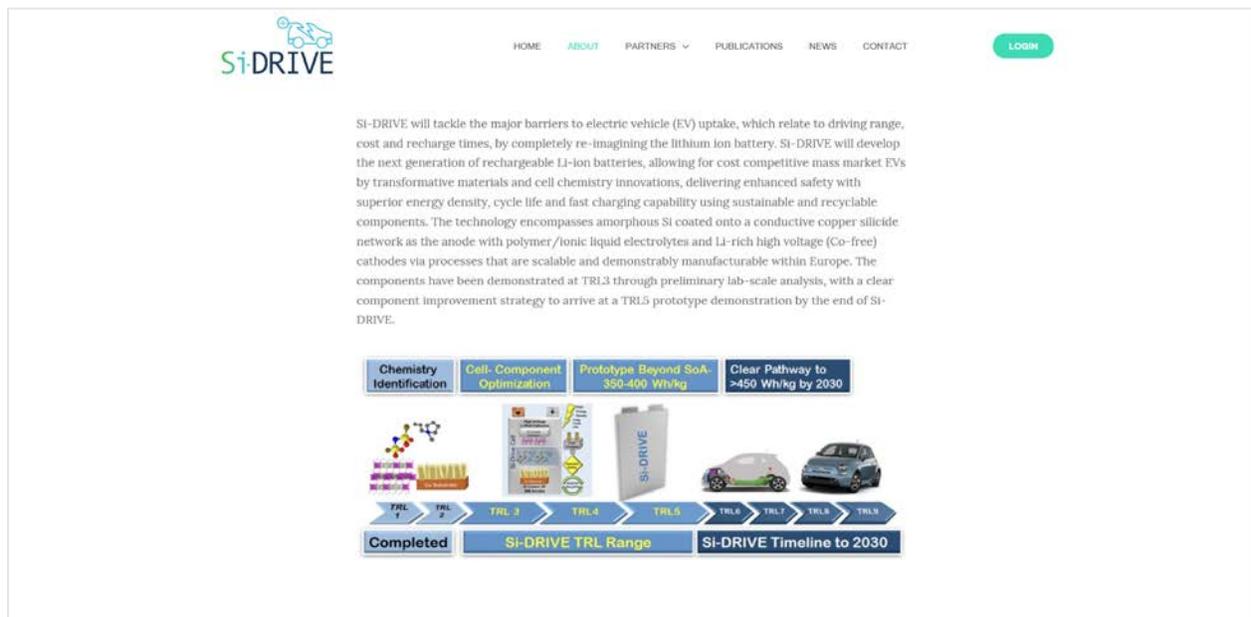
Figure 3. Si-DRIVE website homepage: A – welcome to Si-DRIVE; B – What Si-DRIVE will do

3.2 About Si-DRIVE

This page gives visitors the opportunity to learn what the Si-DRIVE project is about via text, and also through images created to tell the story of Si-DRIVE (figure 4).



A

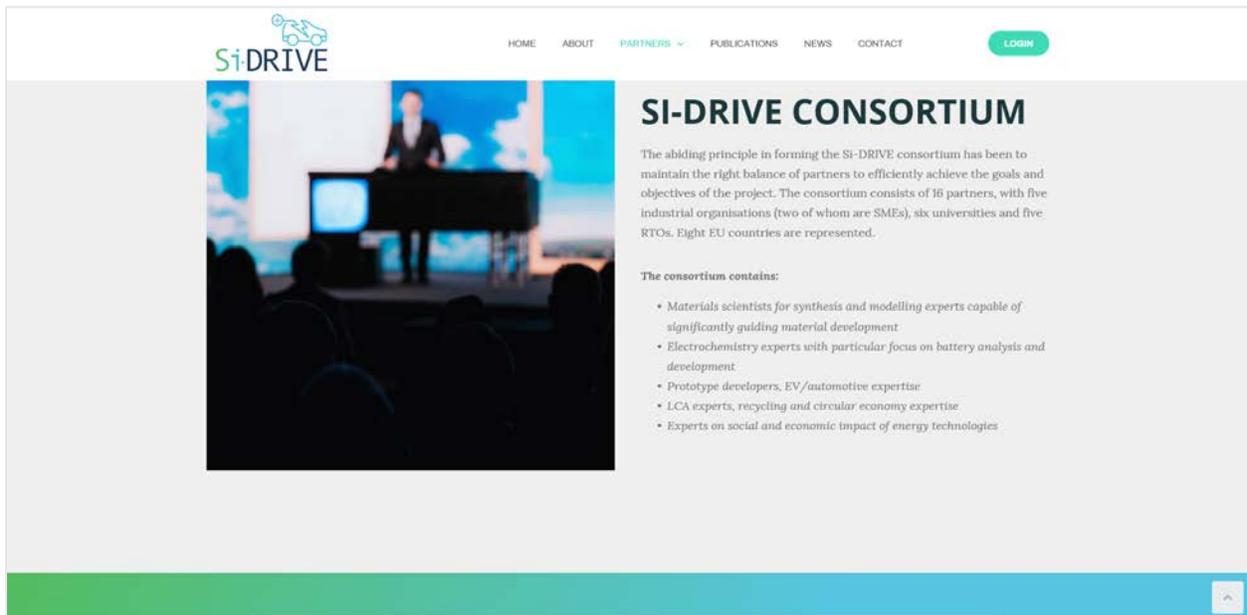


B

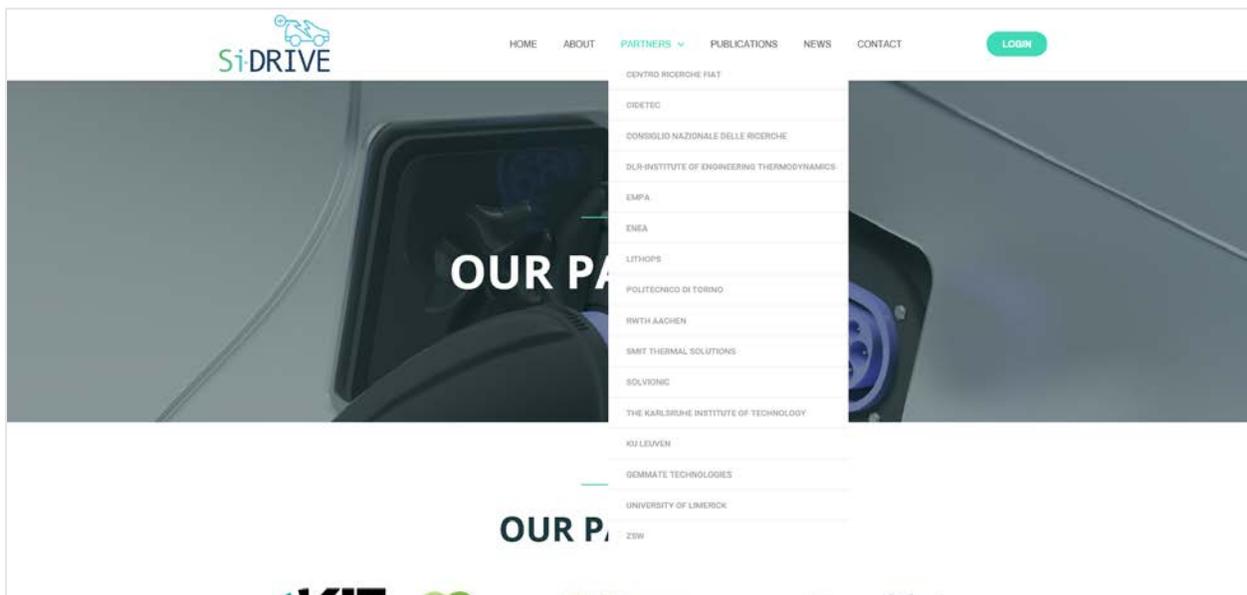
Figure 4. About Si-DRIVE: A – image; B – descriptive text

3.3 Partners

The project consortium partners are summarised on the partner landing page (figure 5A). Each individual partner is then detailed on a separate page, accessible by clicking on the relevant partner logo, or from the dropdown menu (figure 5B).



A



B

Figure 5. Partner pages: A – landing page (University of Limerick); B – Partner drop down menu

3.4 Publications

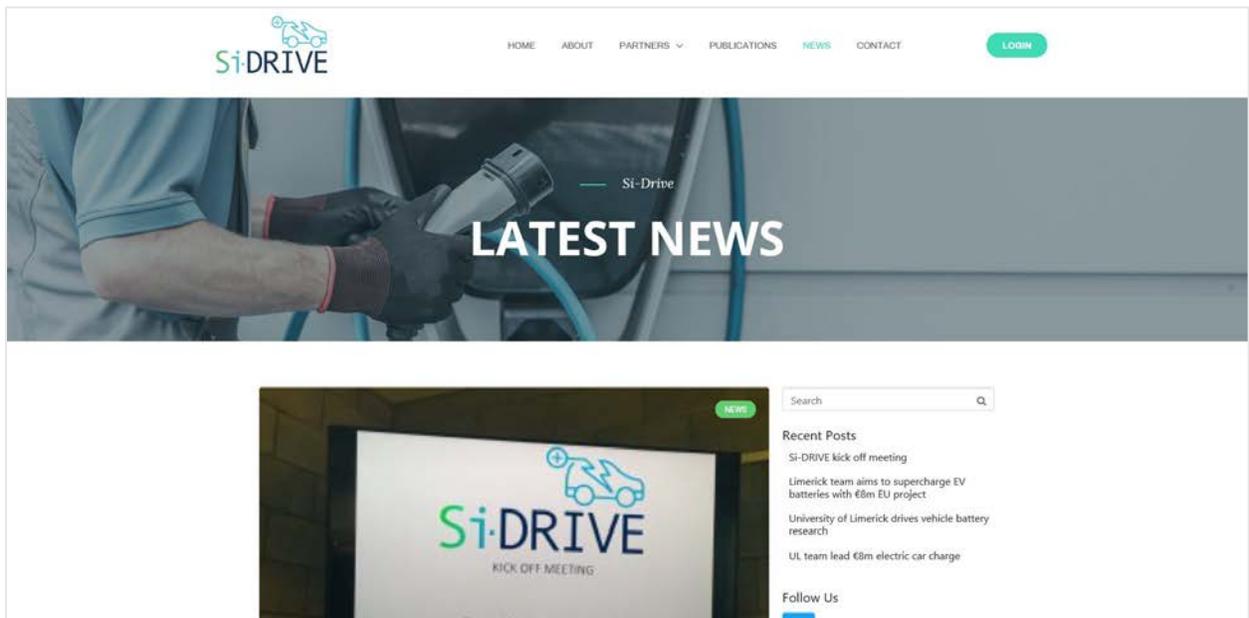
This page will display publications (including links to publications on other sites), or to download a pdf of the publication (figure 6).



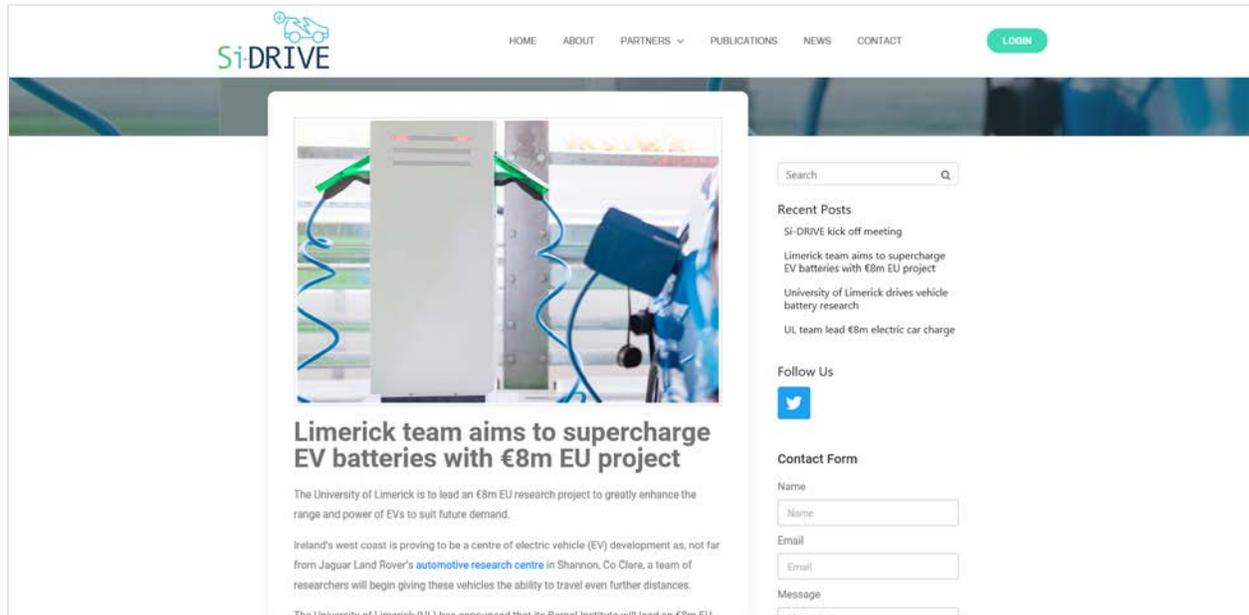
Figure 6. Publications page

3.5 News

This page contains a dynamic news/blog section including news articles and highpoints of the project, including participation at conferences, and details of publications relating to Si-DRIVE results. Visitors can select from recent posts (figure 7A), which will bring them to a dedicated individual news post page (figure 7B).



A



B

Figure 7. Si-DRIVE news page: A – landing page; B – news article

3.6 Contact

Visitors to the page can contact us using the form shown in figure 8. Visitors can also contact us via email (*sidrive@ul.ie*), or via twitter (*@sidrive2020*).

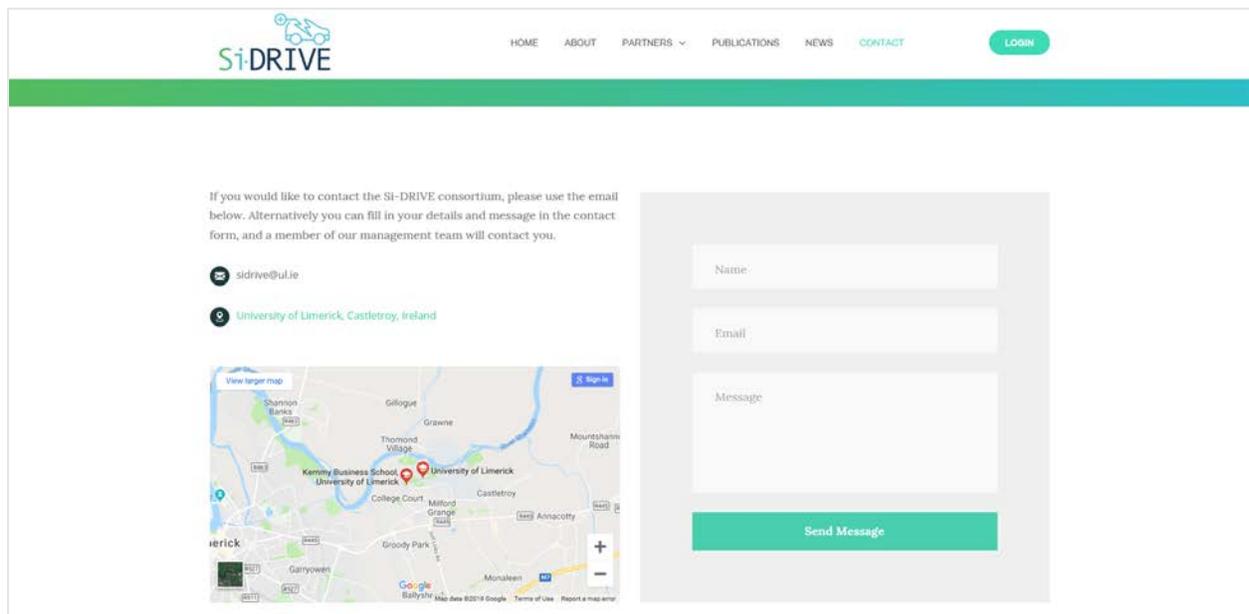


Figure 8. Si-DRIVE contact page

3.7 Login

The aim was to implement a private (members-only) section. This will contain a database for the project consortium members to upload files such as articles, presentations, results documents, images etc. Members will have individual login access with a unique username and password.

This area implemented on a secure internal University of Limerick platform.

Upon clicking the members login, members will be prompted to enter their unique user id and passwords (figure 9). Members will then reach the Si-DRIVE members area page (figure 10).

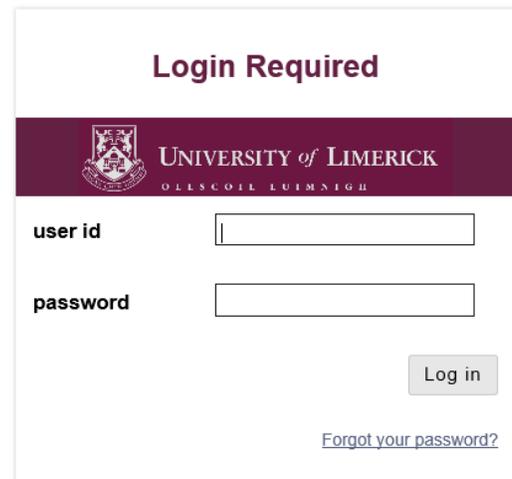
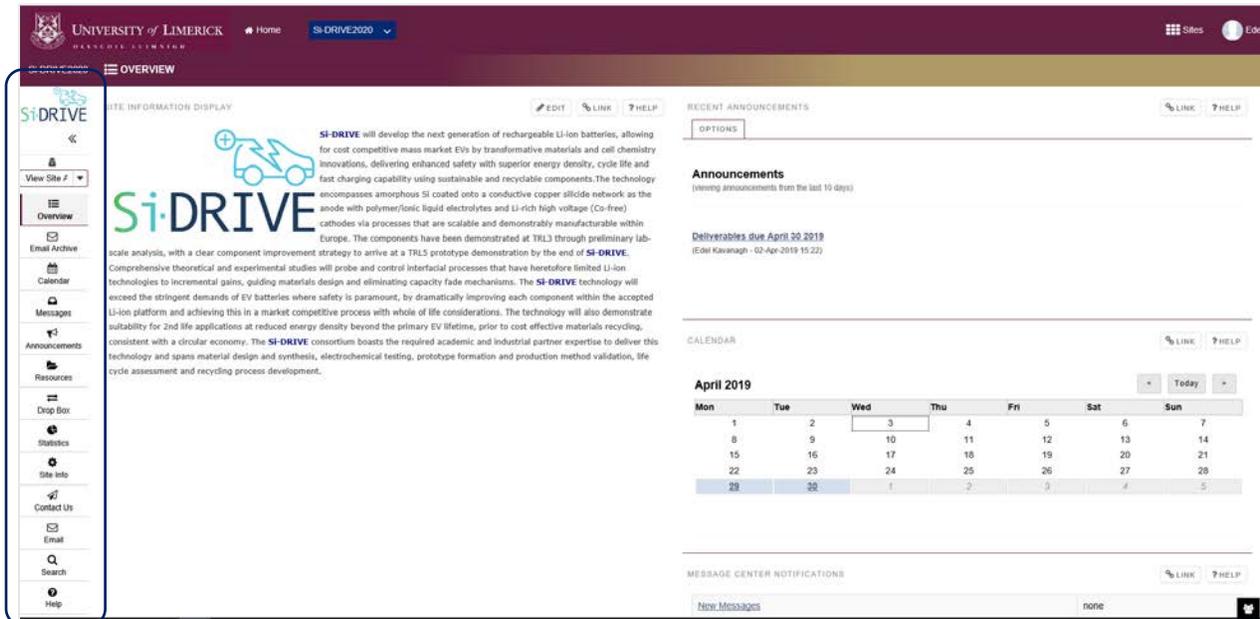


Figure 9. Members login screen



A

Figure 10. Si-DRIVE members area: A – navigation bar

3.7.1 Features

There is a navigation bar (figure 10A) within the members area, which contains the features of the system, and can be selected as required. The features include:

- **Calendar**
The calendar shows events such as deliverables report deadlines for the project.
- **Messages**
The coordinator and partners can communicate regarding Si-DRIVE project via email.
- **Announcements**

Announcements relating to deliverable reports will be shown here, or any other types of announcements relevant to the project.

- **Resources**
This is the Si-DRIVE document management system. The resources folder contains all documents related to the Si-DRIVE project including the grant agreement, consortium agreement, templates, logos, etc.
- **Dropbox**
This is where individuals can store files that only they and the project coordinator can see. These cannot be seen by any other members of the site.
- **Email**
The coordinator and partners can communicate regarding Si-DRIVE project via email.

3.7.1 Document Management System

The database described above acts as the document management system, and is an integral part of the Si-DRIVE project website. This gives a safe and secure area for partners to find confidential documents relating to the project. Figure 11 shows a list of the respective folders within the document management system. New folders can be added as needed, and currently available folders can be updated as required.

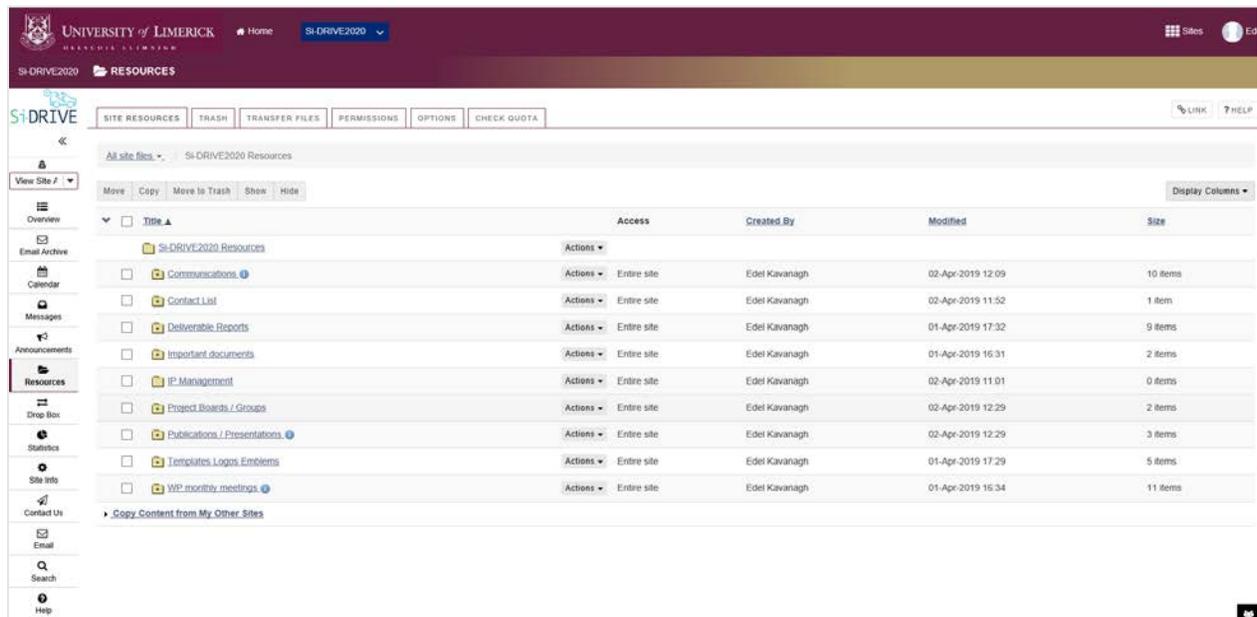


Figure 11. Si-DRIVE Document Management System

4.0 Social Media

4.1 Twitter

A Twitter page for the Si-DRIVE project has been set up (@sidrive2020) for posting short messages (figure 12). In instances where the information to be share is too long, a link will be posted, which will lead to the News section of the website. During scheduled events (for example, consortium meetings, or workshops), the coordinator and partners alike are encouraged to be active on twitter posts, thereby effectively communicating what is happening in the Si-DRIVE project in real time.



Figure 12. Si-DRIVE twitter page

4.2 LinkedIn

A LinkedIn page has been set up for the project (figure 13). Use of this profile will be limited as this will be more readily used as a vehicle for exploitation of results, given LinkedIn identifies with a commercial business or industry orientated audience.

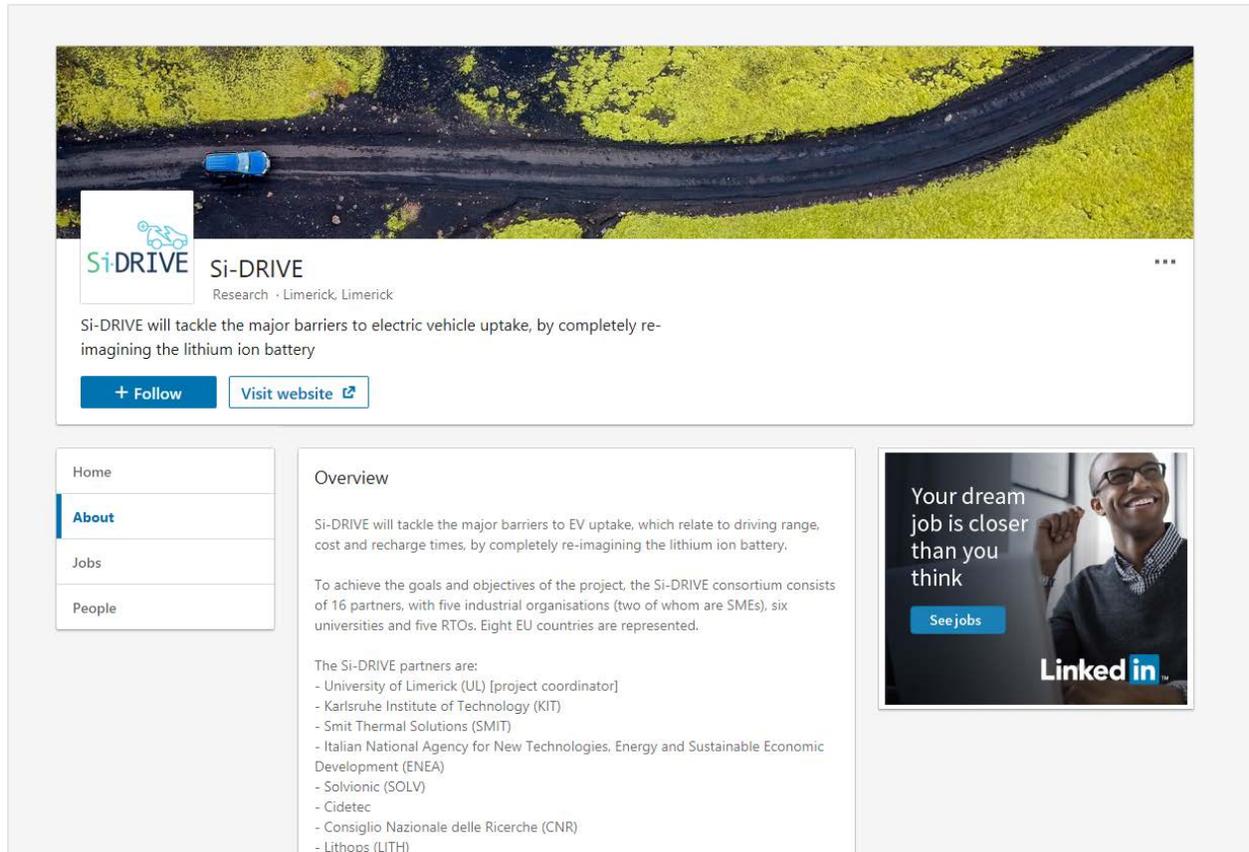


Figure 13. Si-DRIVE LinkedIn profile

5.0 Impact

To maximise the impact of the Si-DRIVE website and social media, specific and relevant audiences have been identified, which will be directly impacted from their implementation (table 2).

Table 2. Si-DRIVE communication activities

	Objective	Target audience	Impact
Project website			
The main interface of the project towards the target groups and stakeholders. A public and private (members only) section will be implemented.	General promotion of project/ notification of activities to potential users across Europe and internationally.	Twenty average external users per month in year 1, rising to 200 average users per month by the end of the project.	Provide information to general public, provide information to the educational/ scientific communities and generate interest in potential end users.
Social media			
Promotion via LinkedIn/Facebook/Twitter/blogs to raise awareness of activities/ share	e-news, which adds new material on a monthly basis.	40-50 average followers per month in year 1, rising to 400 average	Generated following of individuals from target sectors across Europe.

	Objective	Target audience	Impact
results.		followers per month by the end of the project.	
Promotional news activity			
Sectoral newsletters, local, regional and national newspapers.	To raise the awareness of Si-DRIVE amongst a broad audience.	Each country in the consortium will generate three activities during the lifetime of the project.	This activity will spark curiosity of interested parties to seek more detailed information from sources such as the project website and scientific and technical publications. Engagement of new end users, provision of feedback from community stakeholders or the formation of new technology partnerships.

6.0 Conclusions

This deliverable report presented the Si-DRIVE website, the document management system and social media presence. These have been successfully constructed and released to the partners and the wider scientific community.

The overarching goal of the website is to inform both the public and scientific audiences of the accomplishments as well as the general status of the Si-DRIVE project. This will be achieved by effective communication using the website. Information posted on the Si-DRIVE website will also be promoted via the Si-DRIVE twitter page.

Both the website and social media pages are available to the coordinator and consortium members to share and communicate during presentations at national and international conferences/congresses/workshops and across their own organisation website and social media.

6.1 Next Steps

As the Si-DRIVE project evolves, the website will be updated and adapted accordingly.

Envisaged future improvements will include:

- A page featuring links to other relevant projects and publications will be added.

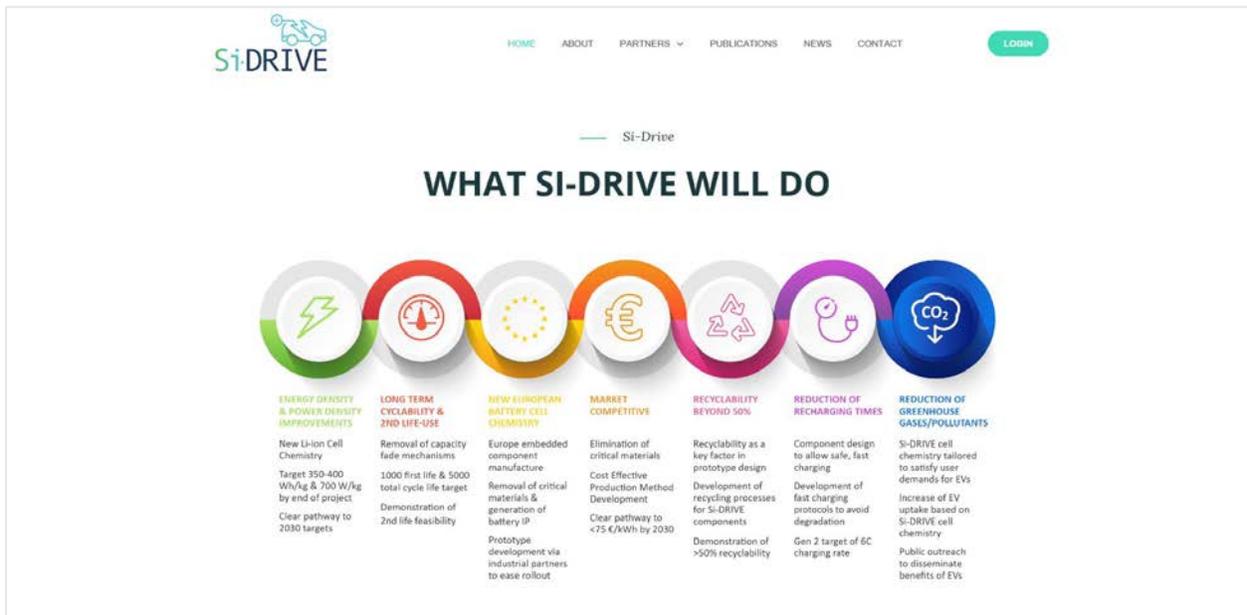
Publications:

- A repository of presentations/publications that is accessible to visitors, and allows PDF download where possible.
- A table of deliverables where public deliverables will become available to download in PDF format, as they are reported.
- A repository for the project's findings and results will be accessible from the Si-DRIVE website. Access to these documents can be made public, or limited to partners, depending on the nature of the results.

News:

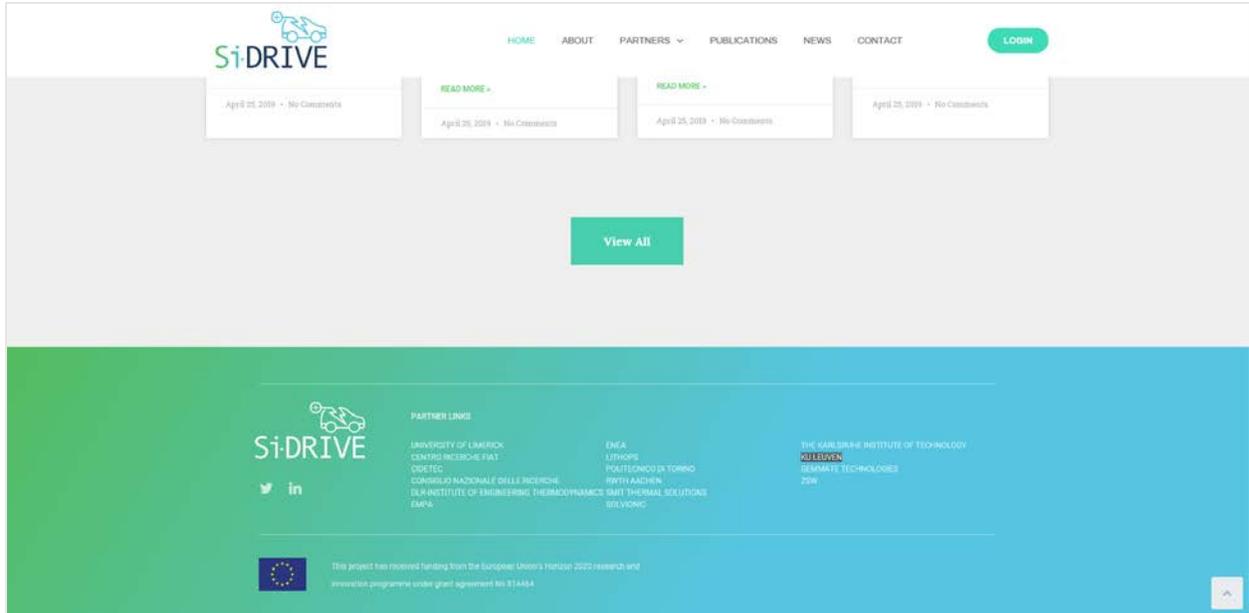
- Academic positions relating to the project at partner institutions will be posted, as needed.
- The website will post opportunities for public and stakeholder participation in the project's events and activities (for example Si-DRIVE workshops).

Appendix - Images of website Homepage



The screenshot shows the 'OUR PARTNERS' section of the Si-Drive website. At the top left is the SiDRIVE logo. The navigation menu includes HOME, ABOUT, PARTNERS (with a dropdown arrow), PUBLICATIONS, NEWS, and CONTACT. A green LOGIN button is in the top right. Below the navigation is a horizontal line with 'Si-Drive' text. The main heading is 'OUR PARTNERS' in large, bold, black letters. Below this, there are five partner logos: Empa (Materials Science and Technology), RWTH AACHEN UNIVERSITY, Deutsches Zentrum für Luft- und Raumfahrt German Aerospace Center, KU LEUVEN, and LITHOPS. There are blue arrows on the left and right sides of the partner logos, indicating a carousel. A small upward arrow is in the bottom right corner.

The screenshot shows the 'LATEST NEWS' section of the Si-Drive website. At the top left is the SiDRIVE logo. The navigation menu includes HOME, ABOUT, PARTNERS (with a dropdown arrow), PUBLICATIONS, NEWS, and CONTACT. A green LOGIN button is in the top right. Below the navigation is a horizontal line with 'Si-Drive' text. The main heading is 'LATEST NEWS' in large, bold, black letters. Below this, there are four news cards, each with a 'NEWS' tag in the top right corner and a small SiDRIVE logo in the bottom left corner of the image area. 1. 'Si-DRIVE kick off meeting': On March 21/22, the Si-DRIVE consortium meet for the first time since the initiation of the project on January 1. Partners travelled from all over. READ MORE + April 28, 2019 • No Comments. 2. 'Limerick team aims to supercharge EV batteries with €8m EU project': The University of Limerick is to lead an €8m EU research project to greatly enhance the range and power of EVs to suit future demand. READ MORE + April 28, 2019 • No Comments. 3. 'University of Limerick drives vehicle battery research': A team from the University of Limerick (UL) is taking on the challenge of making faster-charging, longer-lasting batteries for electric cars. The group, part of the UL. READ MORE + April 28, 2019 • No Comments. 4. 'UL team lead €8m electric car charge': A team at the University of Limerick (UL) is to lead a €8m EU-funded research project to help improve the performance of electric cars. Researchers. READ MORE + April 28, 2019 • No Comments. A small upward arrow is in the bottom right corner.



About



Partners



HOME ABOUT PARTNERS ▾ PUBLICATIONS NEWS CONTACT [LOGIN](#)



UNIVERSITY of LIMERICK
OILESCOIL LIMERICK



UNIVERSITY OF LIMERICK

Project Coordinator

The University of Limerick (UL) with over 13,000 students and 1,300 staff is an energetic and enterprising institution with a proud record of innovation and excellence in education, research and scholarship. Research at UL is renowned for its close alignment to real world problems and the university has an enviable reputation in fundamental research, which can have real impact on society and the economy alike. This strong focus allowed UL to gain a five star rating for innovation and excellence from QS, the International ranking body. UL has a strong international reach and involvement in the European Framework actions from FP2 to FP7, and current involvement in Horizon 2020 has grown UL's international network of collaborators.

The Bernal Institute was launched in November 2016 to promote scientific excellence, and stimulate the Irish and global community in the area of materials research. Battery research is conducted within the Molecular and Nano Materials cluster, which combines expertise in materials synthesis, electrochemistry, state of the art analytical methods and materials modelling.

[More Info](#) →



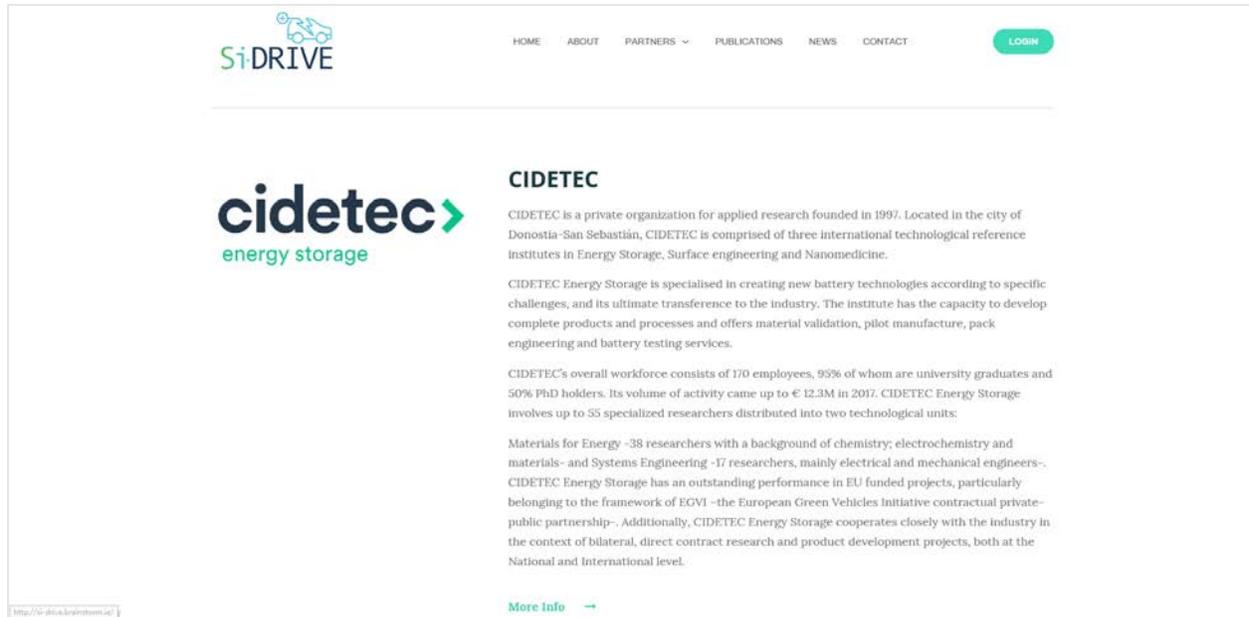
HOME ABOUT PARTNERS ▾ PUBLICATIONS NEWS CONTACT [LOGIN](#)



CENTRO RICERCHE FIAT

Centro Ricerche FIAT (CRF) is an Industrial research organisation having the mission to promote, develop and transfer innovation for providing competitiveness to the FCA group. With a full-time workforce of more than 850 highly trained professionals, CRF fulfils his task by focusing on the development of innovative products, implementation of innovative processes development of new methodologies and training of human resources. To properly cover a very wide technological spectrum, CRF has developed a global network with national and international institutes, private and public research organisations, universities and companies, through the promotion of common research activities, associations, conferences and seminars, and researchers' mobility.

[More Info](#) →



The screenshot shows the CIDETEC page on the SiDRIVE website. The header includes the SiDRIVE logo, a navigation menu (HOME, ABOUT, PARTNERS, PUBLICATIONS, NEWS, CONTACT), and a LOGIN button. The main content area features the CIDETEC logo and the text: "CIDETEC is a private organization for applied research founded in 1997. Located in the city of Donostia-San Sebastián, CIDETEC is comprised of three international technological reference institutes in Energy Storage, Surface engineering and Nanomedicine. CIDETEC Energy Storage is specialised in creating new battery technologies according to specific challenges, and its ultimate transference to the industry. The institute has the capacity to develop complete products and processes and offers material validation, pilot manufacture, pack engineering and battery testing services. CIDETEC's overall workforce consists of 170 employees, 95% of whom are university graduates and 50% PhD holders. Its volume of activity came up to € 12.3M in 2017. CIDETEC Energy Storage involves up to 55 specialized researchers distributed into two technological units: Materials for Energy -38 researchers with a background of chemistry; electrochemistry and materials- and Systems Engineering -17 researchers, mainly electrical and mechanical engineers-. CIDETEC Energy Storage has an outstanding performance in EU funded projects, particularly belonging to the framework of EGV1 -the European Green Vehicles initiative contractual private-public partnership-. Additionally, CIDETEC Energy Storage cooperates closely with the industry in the context of bilateral, direct contract research and product development projects, both at the National and International level." A "More info" link is located at the bottom of the text block.



The screenshot shows the Consiglio Nazionale delle Ricerche (CNR) page on the SiDRIVE website. The header includes the SiDRIVE logo, a navigation menu (HOME, ABOUT, PARTNERS, PUBLICATIONS, NEWS, CONTACT), and a LOGIN button. The main content area features the CNR logo and the text: "Consiglio Nazionale delle Ricerche (CNR, www.cnr.it) is the main Italian public research organization, with more than 8400 employees and 4000 researchers. Its mission is to carry out, promote, spread, transfer and improve research activities in the main sectors of knowledge and to apply them for the scientific, technological, economic and social development of Italy. CNR is distributed all over the country through a network of institutes (more than 100) aiming at promoting a wide diffusion of its competences throughout the national territory and at facilitating contacts and cooperation with local firms and organizations. CNR has a total annual income of 900 M€, more than 40% coming from private investments and from other institutions. It has attracted more than 44 ERC winners and it has the highest number of patents in Italy. CNR run two polar stations, witnessing its opening to international cooperation. Within CNR, a well established expertise in the field of materials science exists, recognized by many projects and patents. In particular, the people involved in the present project have a consolidated experience in the fields of physics, chemistry and electrochemistry of materials pertinent to the research on batteries, both from an experimental and a computational point of view. The researchers collaborate among them since many years and with several groups worldwide and participated in various national and European projects. Contracts and collaborations with public or private entities for activities in the battery area were also obtained. Activities about materials for lithium batteries are going on since almost 20 years in the group and a large scientific outcome has been produced. Since 5 years also the investigation and characterization of ionic liquids became one of their top research activities. They possess equipment, computational software and experience that allow to foresee the successful achievement of the tasks outlined in the research project here presented. Apart from the equipment available in their laboratories, the following facilities have access to advanced facilities of CNR." The text is partially cut off at the bottom.



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Deutsches Zentrum für Luft- und Raumfahrt
German Aerospace Center

DLR - INSTITUTE OF ENGINEERING THERMODYNAMICS

DLR is the national aeronautics and space research center of the Federal Republic of Germany. Its extensive research and development work in aeronautics, space, energy, transport and security is integrated into national and international cooperative ventures. In addition to its own research, as Germany's space agency, DLR has approximately 8000 employees at 16 locations in Germany: Cologne (headquarters), Augsburg, Berlin, Bonn, Braunschweig, Bremen, Goettingen, Hamburg, Juelich, Lampoldshausen, Neustrelitz, Oberpfaffenhofen, Stade, Stuttgart, Trauen, and Weilheim. DLR also has offices in Brussels, Paris, Tokyo and Washington D.C.

The DLR-Institute of Engineering Thermodynamics is active in the fields of renewable energy research and technology development for efficient and low emission energy conversion and utilization with two sections and around 75 persons. The Department of Computational Electrochemistry (CEC) has strong expertise in modelling and simulation of batteries (Lithium-ion, Metal-Sulfur and Metal-air batteries) and fuel cells (SOFC, PEFC and DMFC). 16 researchers are working in the field of batteries, mainly in the field of Lithium Ion, Metal-sulfur and Metal-air batteries. The battery modelling activity of CEC is integrated in the Helmholtz Institute Ulm for Electrochemical Energy Storage, a joint-venture of Karlsruhe Institute of Technology, University of Ulm, Center for Solar Energy and Hydrogen Research Baden-Württemberg, and the German Aerospace Center. The division is modeling physico-chemical processes inside batteries – from the nanoscale to the macroscale making use of rigorous methods from non-equilibrium thermodynamics, electrochemistry, statistical mechanics and numerical mathematics. We model degradation effects in state-of-the-art Lithium batteries and are committed to the optimization and understanding of next-generation batteries with various electrolytes and electrode designs.



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Empa
Materials Science and Technology

EMPA

EMPA is a materials science and technology research institution. It belongs to the ETH domain and as such is an important element in education, science and innovation in Switzerland. Empa conducts cutting-edge materials and technology research, generating interdisciplinary solutions to help overcome major challenges faced by industry, and creates the necessary scientific basis to ensure that our society develops in a sustainable manner.

Within Empa the Technology & Society Laboratory (TSL) creates knowledge that supports industry in developing technologies that are beneficial and acceptable for society. It helps to minimize the risks of new technologies and contributes to sustainability by giving early warnings of critical developments in technology applications. Applied tools and instruments are e.g. Life Cycle Assessment (LCA), Impact Assessment Modelling, Environmental and Human Health Risk Assessment Modelling, or Sustainable Innovation. EMPA is since more than 30 years internationally recognized for its expertise in the development of the LCA methodology and is one of the founding members of the ecoinvent Centre, delivering one of the most important, international databases with life cycle inventory (LCI) data, the ecoinvent database.

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ENE A
Italian National Agency for New Technologies,
Energy and Sustainable Economic Development

ENE A

ENE A is a governmental and scientific/technological organization, which run research activities and provides agency services for supporting public administrations, public and private enterprises, and citizens. ENE A is the second major Italian research organization with more than 2,600 staff employees, mainly researchers and technicians. The ENE A structure is divided into 14 research centres/laboratories and 19 regional offices, and a Liason Office is active in Brussels for relations with Community institutions/programs. ENE A's knowledge base and results are made available to enterprises, particularly small/medium-sized, PA and citizens, through services, processes and products, training activities, information, transfer of know-how. ENE A gets a wide, internationally recognized experience in conducting advanced programs and implementing projects in the fields of research and innovation for the sustainable development and environment safeguard.

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LITHOPS

LITHOPS

Lithops is the first Italian Li-ion technology developer and provider, established in Turin in 2010. Lithops is partner with global leading players and Universities to develop proprietary lithium battery technologies focusing on next generation active materials and assembly processes.

Lithops has installed the first production scale Li-ion pouch cell assembling line in Italy (presently one of few in Europe), covering from active material mixing to cell forming, and has gained almost seven years of experience in designing and assembling electrodes for different applications and using different active materials.

At the end of 2015 Lithops became part of the Seri Group, being incorporated in its subsidiary FIB (owner of the FAAM brand). FAAM has more than 40 years of experience in producing lead-acid batteries for stationary, traction and automotive applications and almost 10 years of experience in assembling Li-ion batteries, having developed its own property control and cooling systems. Seri, through its Seri Plast and Seri Plant, combines more than 20 years of experience in lead recycling turnkey plant and plastic recovery and recycling.

Today, Seri Group has 800 employees, € 180m turnover, its Industrial division is listed in Milano stock market under KR Energy. Thanks to the combined experiences, the Group aims to develop the first Italian Li-ion battery vertical supply chain, from raw materials to second life battery reuse. By the end of 2018, Lithops and FAAM plan to establish the first lithium-ion cell and battery production plant (under our battery brand FAAM) in Teverola (close to Napoli) with an initial capacity of 200 MWh, targeting military, industrial and storage applications. Lithops core competences are related to study and development of low environmental impact materials.



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POLITECNICO DI TORINO

Politecnico di Torino (www.polito.it) was founded in 1906 and has its roots in the Technical School for Engineers created in 1859. It is internationally ranked among the most important universities in Europe for engineering and architecture studies, with 33,000 students (out of which 15% are international students coming from over 100 different countries). Politecnico is a center of excellence for education and research in engineering, architecture, design and planning and it works in close cooperation with the socio-economic system. It is a comprehensive Research University where education and research complement each other and create synergies in order to address the needs of the economic system, of the local community and, above all, of its students. In November 2013, Politecnico was awarded by the EC with the label "HR Excellence in Research", recognizing its commitment in offering to researchers coming from all over the world a positive and challenging environment. Politecnico is part of many public-private international inter-university networks (CESAER, CLUSTER, E.C.I.U, EUA, CMU). Politecnico can count on a great experience both in scientific projects and administrative management with more than 230 FP7 projects (66M€). In this regard, it is currently involved in 142 Horizon 2020 funded research and innovation projects (about 50M€).

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RWTH AACHEN

The Excellence Initiative of the German federal and state governments provided a huge boost to the targeted development of RWTH Aachen by providing € 180 million of funding in the first approval phase. The institutional strategy on which the successful Excellence Initiative application was based has, in the meantime, been expanded to form a long-term strategy to strengthen all the areas of the University and enhance their profiles. In the process it has gained great momentum, which can be seen, among other things, in the extensive building activities.

Visible evidence of this is the RWTH Aachen Campus that is being developed in close cooperation with industry and which is to form one of the largest research parks in Europe. Students and employees of RWTH Aachen will benefit equally from these developments and are expressly invited to get involved in shaping the individual initiatives.

IME, the Institute for Process Metallurgy and Metal Recycling, has its expertise in the field of process metallurgy and metal recycling, and therefore incorporates a large number of metals and extends to the full broadness of engineering subjects based on wet-chemical and high temperature-chemistry. For fifteen years, research in Battery Recycling Technologies has been conducted and have given IME an expertise to cope with different research questions, methodical procedures and aims. Besides, research at IME in the field of battery recycling also considers the environmental impact of the extraction, treatment and processing of critical raw materials for LIB.

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SMIT THERMAL SOLUTIONS

Founded in Nijmegen, the Netherlands in 1936, SMIT Thermal Solutions is a leading supplier of customized thermal equipment and processes.

At Smit, design and manufacture thermal process solutions are developed for high-volume manufacturing. SMIT's core competences are not limited to thermal treatment, but include deposition processes using thermal evaporation, (PE)CVD and ALD for both rigid and flexible substrates, with constant innovation. It employs around 60 people and currently has more than 3000 installations operating, including some 150 in the solar- and battery industry.

Today, focus is on thin film applications, acting as an expert partner to manufacturers aiming for cost-effective mass production. In particular, within this project, the aim of STS is to further optimize this technology for high throughput manufacturing. Our plan is to use the know-how developed within this project to offer added value to existing systems and as a building stone for next generation systems (R2R). A successful development will help market penetration of high capacity batteries.

Additionally, there are many other applications and markets that can as well benefit from this technology development to improve product quality and increase throughput. This will also contribute to increased revenue and can create additional expansion opportunities.

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SOLVIONIC

Solvionic is a SME specialized in the design, synthesis, production and commercialization of Ionic Liquids (ILs) from lab scale to industrial scale. The main market of Solvionic is that of electrochemical devices, and particularly, electrochemical energy storage systems of new generation. Solvionic have a catalogue of around 200 different references, including ILs, metal salts and electrolyte formulations made of the combination of those specific products, but also with common organic solvents (carbonates). Our production facilities and strategy allows fast and reliable scale-up of our products, to commit with industrial needs. Our quality control procedures that were specifically developed for ILs products since 2003 is one of Solvionic key know-how that allows the commercialisation of the highest purity standard of the market. Solvionic is also expert in the research and development of new materials and processes based on the use of ILs. Their main R&D activity is devoted to the development of the next generation electrochemical energy storage systems based on the use of ILs (Next generation Li-ion and other metal-ion batteries, supercapacitors, etc.). Solvionic's production processes result from 15 years of experience and allow us to offer high purity products, which is important to meet the requirements of battery devices. Around 80% of their sales are in the market of Electrochemical Energy Storage Systems and other Electrochemical Devices. Solvionic's product portfolio is composed of ILs, but also electrolyte formulations as well as Lithium and other metal salts for several types of batteries, including next generation Li-ion batteries.

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The screenshot shows the SiDRIVE website interface. At the top left is the SiDRIVE logo. The navigation menu includes HOME, ABOUT, PARTNERS (with a dropdown arrow), PUBLICATIONS, NEWS, CONTACT, and a LOGIN button. The main content area features the KIT logo (Karlsruhe Institute of Technology) on the left. To the right, the heading is "THE KARLSRUHE INSTITUTE OF TECHNOLOGY". The text describes KIT as a leading research and educational institution with a world-class competence, covering a complete range of fundamental research to close-to-industry, applied research, and from small research partnerships to long-term large-scale research projects. It focuses on the development of a complete value chain of the future energy mix. The text also mentions that KIT oversees the Helmholtz Institute of Ulm (HIU), a centre of excellence on fundamental and applied materials research for the next generation electrochemical energy storage technologies. A "More Info" link with a right-pointing arrow is located at the bottom of the text block.

The screenshot shows the SiDRIVE website interface for the KU Leuven page. At the top left is the SiDRIVE logo. The navigation menu includes HOME, ABOUT, PARTNERS (with a dropdown arrow), PUBLICATIONS, NEWS, CONTACT, and a LOGIN button. The main content area features the KU LEUVEN logo in a blue box on the left. To the right, the heading is "KU LEUVEN". The text describes the Katholieke Universiteit Leuven (KU Leuven) as a research university in the Dutch-speaking town of Leuven in Flanders, Belgium. It conducts teaching, research, and services in the sciences, engineering, humanities, medicine, law, and social sciences. The text also mentions that KU Leuven has satellite campuses in Kortrijk, Antwerp, Ghent, Bruges, Ostend, Geel, Diepenbeek, Aalst, Sint-Katelijne-Waver, and in Belgium's capital Brussels. A "More Info" link with a right-pointing arrow is located at the bottom of the text block.



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GEMMATE TECHNOLOGIES

The mission of Gemmate Technologies S.R.L. is of innovating existing products and making new ones from science and technology advances. From early research developments, by developing and mastering key enabling technologies, new potential business are gauged and the due actions to have them started up carried out. From initial laboratories results, Gemmate Technologies conceives and develops implementation plans to manufacture the assessment prototypes, as well as business plans to pave the way for product development and commercialization. This role is played co-working with: i) public and private research organizations and education institutes at the very early stage, ii) technology institutes to carry out the technology and processing scale up, iii) large enterprises for incremental advance development, and small and medium enterprises for breakthrough exploitation. A main goal of Gemmate Technology is to spin out novel product-making companies to extend the holding and its profit.

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ZSW

The ZSW was established in 1988 by the State of Baden-Württemberg, the universities of Stuttgart and Ulm, and private companies. It is a non-profit foundation under the civil code. The ZSW contributes to the development of solar energy, energy conversion, and electrochemical energy storage systems – major components in the sustainable energy supply of the 21st century. It is integrated in a network of university, industrial, and institutional co-operations. The focus of research and development is currently on Lithium-ion batteries, super-capacitors, fuel cells and thin film photovoltaic. The ZSW has about 220 employees (scientists and technicians) with experience in materials science, electrochemistry, physics, electrical and mechanical engineering and technology). The battery research team at ZSW consists of more than 70 researchers covering different research areas. The ZSW has a high level of expertise in both material research for Lithium-ion batteries and system technology for batteries and fuel cells. Additionally, the ZSW has a wide base of equipment and experience in the characterisation of battery materials and components as well as in battery testing and hazard potential evaluation. ZSW has established a pilot-line for technical development of electrode coatings and cell assembling for 18650 and small stacked pouch cells, and, furthermore, runs a research-production line (FPL) for the manufacture of PHEV1 prismatic hard case cells.

By covering the whole value-chain from fundamental material development and Scale-up to the research production of large cells, safety and performance test labs, ZSW has a unique position in the battery research community.

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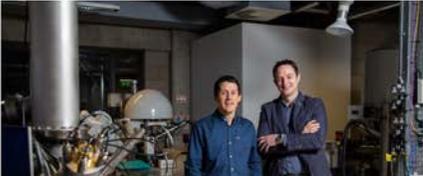
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