Rare Earth Free e-Drives Featuring Low Cost Manufacturing

ReFreeDrive

Collaborative Project
Grant Agreement Number 770143

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Abstract:

This Project Communication Plan, carried out early in the project, anticipates the main support actions envisoned for the dissemination and exploitation activities, as well as the project Key Messages and Communication Target Stakeholders:

- Communication goals and target audience
- Tools and channels
- Events and face to face communications, meeting with relevant people and organizations
- Interfacing with other projects related e-Drives.
- Stakeholder Platform Events
- Social Media Management

The specific dissemination activities and their monitoring will using this same starting point and update later on the necessary adaptions in the three deliverables of the Plan for the Dissemination of Results (D9.5, D9.6 and D9.7) respectively.

REVISION TABLE		
Document version	**Date**	***Modified sections - Details***
V1.0	20.02.2018	Draft Outline
V1.1	12.03.2018	Final Draft
V2.0	20.03.2018	Review comments by Serge Noels (ECI) and Blanca Araujo (CIDAUT)
V2.1	23.03.2018	Final review of report, shared with consortium
V2.2	12.04.2018	New Deleiverable format applied and comments from PO taken into account

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Abbreviations

ANFAC = Asociación Española de Fabricantes de Automóviles y Camiones

CCFA = Comité des Constructeurs Français d'Automobiles

EC = European Commission

ECI = European Copper Institute

EU = European Union

FEBIAC = Fédération belgo-luxembourgeoise de l'Automobile et du Cycle

GA = Grant Agreement (of the ReFreeDrive H2020 project #770143)

IPR = Intellectual property rights

KOM = Kick-off meeting of the ReFreeDrive project (Oct 2017 in Brussels)

OEM = Original Equipment Manufacturer (*here: Car Maker*)

PPT = Microsoft PowerPoint Format

SMMT = Society of Motor Manufacturers and Traders

UAQ = University of l' Áquila, Italy

VDA = Verband der Automobilindustrie

1 Executive Summary

The present report provides an overview on the planned activities, tools and elements to be used in the communication of ReFreeDrive project outcomes to the envisioned audience.

The overall objectives of the entire WP9 are according to the ReFreeDrive GA:

- To increase the awareness of the scientific research community towards the new free or Rare Earth traction technologies
- To increase the awareness of the industrial sectors involved in the project of the potential of the project results
- To ensure and effective communication is carried out continuously during the project to pave the way for the future products commercialization

Whereas the first two goals are the later outcome of all communication and dissemination activities over the course of the entire project, the present communication plan precisely plans this continuous and effective multi-channel approach for the later one.

As outlined in the GA, the project Communication Plan should be carried out early in the project by ECI and will include all the support actions envisaged to support the dissemination and exploitation activities, as well as the project Key Messages and Communication Target Stakeholders.

Specifically mentioned are following elements:

- **Events and face to face communications**, meeting with relevant people and organizations.
- Clustering and **liaising with other relevant RDI projects** and also other initiatives at European context related to e-Drives.
- **Stakeholder Platform Events**: stakeholder events will be organized to support exploitation and dissemination in new e-Drive technologies, targeting different end users along the mobility value chain, including low power range stakeholders (15kW) and other types of vehicles that could benefit in the future from these technologies.
- **Social Media Management**: ECI will plan, as part of the communication plan, an effective media management strategy to make use of social networks like LinkedIn and Twitter to promote the project visibility.
- Regular updates of the project progress in the **project website**. The website, created by CID will be used by ECI as another means of communication.

The main goals of these activities are to:

- Create awareness and share results to ensure visibility
- Promote project activities
- Network with other H2020 projects
- Increase competitiveness of concerned industry in EU and sell project results

- Inform EU policy makers

We can make use of skills and experiences among the consortium partners to achieve these goals, allocated sufficient resources to fulfil the tasks and have also a designated communication manager in place.

Most of the channels and tools have been defined, although not all finally decided:

- Possible conferences, our own stakeholder events and other meetings
- Tools like our own ReFreeDrive website, dissemination kit material, leaflet and poster
- Social media channel access

A major emphasis will be in successfully interacting with the other GV04 projects, hence we consider applying jointly for the EC Common Dissemination Booster and creating common platforms on social media as well as organizing common events.

The degree of fulfilment of the Communication Plan as described in the present deliverable D9.3 is complete and there have been no deviations in content or time from the deliverable objectives set out in the ReFreeDrive GA.

The follow-up and monitoring for the specific dissemination activities are going hand in hand with this outline and using the same starting point. While the present Communication Plan outlines audiences and channels and their management, the outcome of the dissemination will be later reported in the three releases and individual reports on the Plan for the Dissemination of Results, led by UAQ in D9.5, D9.6 and D9.7 respectively.

2 Communication Goals

The main goal at this early stage in the ReFreeDrive project is to develop key words and key messages, identify the different stakeholder groups to be adressed in the further dissemination activities and to define (preliminary) channels how to effectively reach out to these stakeholders over the course of the project.

The communication strategy should overall:

- Raise awareness over advantages of European Collaboration
- Create awareness and share results to ensure visibility and provide opportunities to receive feedback
- Network with other H2020 projects
- Promote project activities
- Increase competitiveness of concerned industry in EU and sell project results
- Inform EU policy makers about the benefits and outcomes of this project supporting the take-off of electrical vehicles in the EU
- Create awareness on how the EC funded programmes foster Europe's industrial capabilities

3 Targeted Audience

To identify members and entry points at different stakeholder groups of our intended target audience we will make use of the resources and networks of all consortium partners. The stakeholder groups comprise, but are not limited to:

- EU and national policy makers
- Automotive OEMs
- Also smaller E-vehicle manufacturers (e.g. start-ups like StreetScooter in Germany, companies like IFEVS, Tazzari and Estrima in Italy, Microcar-Ligier and Lumeneo in France or Comarth in Spain)
- Other identified potential Customers
- Automotive Supply Chain
- Other motor sectors (Railway, Marine)
- European Manufacturing Platforms and Associations, including all those related to e-mobility (ECI is a member of the Platform for E-mobility)
- Scientific and academic community
- Engagement with EU policies

- Society in General
- Others will be added depending on the project outcomes and risks

4 Resources for the Communication

The main activities of communication and dissemination tasks are bundled and organized in a dedicated work package WP9 with a total time budget of about 24 person-months (= 4,3% of the total time spent of the project), allocated to all consortium partners to make sure everyone can contribute and participate in selective activities.

The Communication Plan here present outlines the ongoing framework and will be adjusted over the course of the entire project as appropriate to guarantee a continous and effective communication strategy.

We have designated an ECI representative as resposible ”Communication Manager”, Mr Fernando Nuño, experienced in supporting EU projects incl H2020, to ensure that communication actions and possible participation as well as content preparation is organized well in advance and consortium partners aware of their expected inputs.

The ECI consortium team members have a long track-record of managing communication campaigns (e.g. trough ECI’s Leonardo Energy platform which has over 30.000 subscribers worldwide) and can make use of an established network of media contacts.

4.1 Technological expertise and technological means available

The development of the logo was outsourced by MDL to a professional design partner, Hunter-Bevan Studio Ltd (see: https://hunterbevan.co.uk/).

For all other tools, publication formats, etc we can make use of the skills and experiences accross all consortium partners, hence as two examples, Cidaut has developed the ReFReeDrive website and UAQ tean will create the poster and the leaflet.

We plan to apply together with other GV04 projects for the EC Common Dissemination Booster which offers, among other support, training in communication activities and key advise by communication experts.

5 Channels of the Communication

The communication strategy will use different channels and media to ensure a large visibility and create awareness among the target audience.

5.1 Website

The "ReFreeDrive" Website is operative under: www.refreedrive.eu

since end of December 2017, managed by Cidaut, and will be constantly updated with project results, events, etc

The following picture [figure 1] shows the graphical layout of the current status of the ReFreeDrive website:

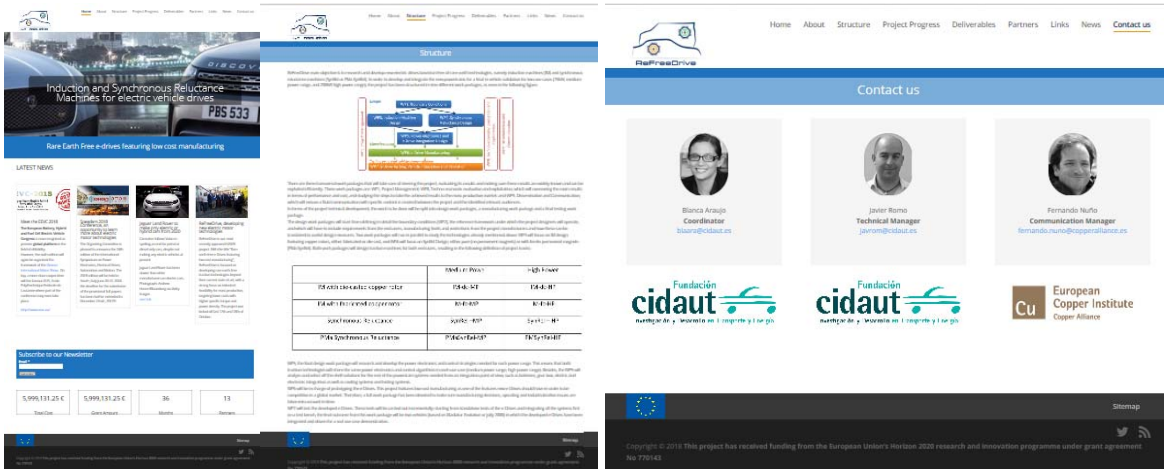


Figure 1: Main content pages of the ReFreeDrive website, status March 2018

The ReFreeDrive website has currently following sections:

- Home
- About
- Structure (of the project)
- Project Progress
- Deliverables
- Partners
- Links
- News
- Contacts

For the detailed structure of the website, see: www.refreedrive.eu/sitemap (see Appendix A1).

There is also a registration form directly on the ReFreeDrive website for subscription to our dedicated newsletter to gather contact details and prepare the first sent-out in the upcoming months.

5.2 Conferences and other events

This preliminary list [table 1] of scientific conferences and events was put together with input from all consortium partners and will be used for continuous update and planning of attendance over the course of the ReFreeDrive project. Many are regular events, hence even if deadline for presenting or submission of papers in 2018 has already expired, we may consider them in the upcoming years.

Table 1: List of conferences and other events

name	website	location	date(s)	focus	regular event ?	comments
Advanced E-Motors	e-motor-conference.iqpc.de	Berlin, DE	13-15 Feb 2018	E-motor design , new materials for cost efficient e-drive systems, enhance heat transfer, testing methods	2018 -2019? 2020?	Commercial conference organized by IQPC
Safety & Electric Mobility Expo,	www.semexpo.it	Rome, IT	13-15 Apr 2018	A meeting point for the public, market players, media, institutions, associations with the world of electrical mobility (the same days of the of the Rome formula E grand Prix)	2018 – next n/a	UAQ will exhibit posters and presentation about the ReFreeDrive project
EEVC	www.eevc.eu	Geneva, CH	18 Mar 2018	European Battery, Hybrid and Fuel Cell Electric Vehicle Congress	2018 -2019? 2020?	
Transport Research Arena	www.traconference.eu	Vienna, AT	16-19 Apr 2018	European Research and Technology Conference on Transport and Mobility	2018 - 2019? - 2020?	
PEMD	https://events.theiet.org/pemd/	Liverpool, UK	17-19 April 2018	Power electronics, drives and machines	2018, 2020	MDL has paper and expo booth
EV Tech Expo Europe	www.evtechexpo.eu	Hannover, DE	15-17 May 2018	Electric & Hybrid Vehicle Technology	2018 - 2019? - 2020?	Consider for networking
WMM	http://tu-freiberg.de/fakult5/imf/institut/veranstaltungen/wmm-2018	Dresden, DE	12-14 Jun 2018	International Conference on Magnetism and Metallurgy	2018 – next n/a	
Speedam	http://www.speedam.org/	Amalfi Coast (IT)	20-22 June 2018	International Symposium on Power Electronics, Electrical Drives, Automation and Motion	2018 – 2020 (biannual)	UAQ with IFPEN submitted a paper
ITEC	https://itec-conf.com/	Long Beach, USA	13-15 June 2018	Components, systems, power electronics for transportation	2018 - 2019 - 2020	MDL will have tutorial and expo booth
CWIEME	www.coilwindingexpo.com	Berlin, DE	19-21 Jun 2018	Winding systems & supplies, motor components & accessories	2019?	MDL will have tutorial and expo booth
Coiltech WMC	www.quickfairs.net	Pordenone, IT	24 -25 Sep 2018	Includes topics on E-Mobility Drivetrain and Systems	2018 - 2019 - 2020	Managed by UAQ. Possibility to host Project related conference sessions and exhibit prototypes

ICEM	www.icem.cc/2018/	Alexandroupoli, GR	**3-6 Sep 2018**	**International conference on Electrical Machines**	**2018 – 2020 (biannual)**	
ECCE	http://www.ieee-ecce.org/2018/	Portland, USA	**23-27 Sept 2018**	**Industry and academics event on energy conversion systens**	**2018 - 2019 - 2020**	MDL submitted papers
Aachener Kolloquim	www.aachener-kolloquium.de	Aachen, DE	**8-10 Oct 2018**	**Automobile and Engine Technology in Europe, Test track to drive prototypes**	**2018 - 2019 - 2020**	Consider 2019 attendance together with GV04 projects
ESARS- ITEC	www.esars-itec.org	Nottingham, UK	**7-9 Nov 2018**	**Electrical Systems for Aircraft, Railway, Ship Propulsion and Road Vehicles**	**2018 – 2020 (biannual)**	hot topic will be Greener Electrified Transportation
Motor Summit International	www.motorsummit.ch	Zurich, CH	**14-15 Nov 2018**	**highly efficient motor systems, international standards and min national requirements**	**2018 - 2019 - 2020**	UAQ ususally attending
SPS IPC Drives	www.mesago.de/de/SPS/	Nürnberg, DE	**27-29 Nov 2018**	**exhibition for electric automation technology**	**2018 - 2019? - 2020?**	Consider for networkcreate linksing
IEMDC	www.ieee-pels.org/conferences	San Diego, USA	**11-15 May 2019**	**IEEE International Electric Machines & Drives Conference**	**2019 – 2021 (biannual)**	
EGVIA - ERTRAC #H2020RTR	https://egvi.eu/calendar/122/46/EGVIA-ERTRAC-1st-European-Conference-Results-from-Road-Transport-research-in-H2020-projects	Brussels ?	**tbd**	**results of selected H2020 funded projects on road transport related areas (Green Vehicles, Road, Mobility for Growth: Urban Mobility, Logistics, Intelligent Transport Systems**	**2018?**	Should be co-other GV04 projects organized with the
EVS30	http://www.messe-stuttgart.de/en/evs30/	Stuttgart ?	**tbd**	**Electric Vehicle symposium, Battery, Charging, E-Powertrain, Market demand**	**YEARLY EVENT** 2018 location has not been chosen yet	Usually features a stand for EU projects
We might also consider attending the more "gen public" motor shows, if possible to join a small space at JLR booth						
Mondial	**www.mondial-paris.com**	**Paris, FR**	**4-14 Oct 2018**		**2018 – 2020 (biannual)**	Join JLR booth?
IAA	**www.iaa.de**	**Frankfurt, DE**	**Sep 2019**		**2019 – 2021 (biannual)**	Join JLR booth?

The outcomes of all participations will then be detailed in the individual reports on the Plan for the Dissemination of Results, led by UAQ in D9.5, D9.6 and D9.7 respectively.

5.3 Stakeholder platform events

We will organize in the course of the ReFreeDrive project ***three dedicated stakeholder events*** to support exploitation and dissemination in new e-Drive technologies, targeting different end users along the mobility value chain, including low power range stakeholders (15kW) and other types of vehicles that could benefit in the future from these technologies (e.g. two and three wheelers and industrial vehicles).

- Ideally combined with conferences and other existing events

- First ReFreeDRive workshop will be already at Coiltech, Pordenone/IT, in Sep 2018, potentially together with other GV04 projects

5.4 Other meetings

In addition to official events, we will also explore the opportunities to network with stakeholder groups through informal meetings, etc:

- ECI European Motor Workshop, March 13th, 2018 Rome, Italy

  (see: http://www.pole-medee.com/2017/12/european-motor-workshop-2018/)

- Face-to-face meetings with industry groups, associations (e.g. national car manufacturer or importers like VDA in Germany, FEBIAC in Belgium, RAI in Netherlands, CCFA in France, ANFAC in Spain or SMMT in the UK), policy makers, etc

5.5 Scientific papers and other publications

This preliminary list of possible conferences to submit a paper and journals for publications was put together with input from all consortium partners and will be used by UAQ in the Dissemination Plan for continuous update and planning of dissemination of project results.

a) The following list [table 2] "Submission at conferences" shows the main international conferences where papers could be presented

Table 2: List of conferences and other events

event	website	location	Submission date	focus	comments
Speedam 2018	http://www.speedam.org/	Amalfi, IT	4 Dec 2017	International Symposium on Power Electronics, Electrical Drives	UAQ is proposing a paper to Speedam 2018 generally focused on the Design and Optimization of SyncRel Motors
ICEM 2018	www.icem.cc/2018/	Alexandroupoli, GR	4 Feb 2018	International Conference on Electrical Machines	UAQ and MDL submitted a paper on "Experimental Comparison Between Induction and Synchronous Reluctance Motor"
Esars 2018	www.esars-itec.org	Nottingham, UK	May 2018	International Conference on Electrical Systems for Aircraft, Railway, Ship Propulsion and Road Vehicles	Specific Topics Available in T4 and T5
PEMD	https://events.theiet.org/pemd/	Liverpool, UK	30 Mar 2018	Power electronics, drives and machines	MDL has paper and expo booth
ECCE	**http://www.ieee-ecce.org/2018/**	Portland, USA	25 Jan 2018	Industry and academics event on energy conversion systens	MDL submitted papers
ICEMS	http://www.icems2018.com/main/ci_overview.htm	Jeju, Korea	28 Feb 2018	Electrical Machines and Systems	IFPEN will submit a paper

b) *Papers for journals: The following list [table 3] provides an overview on scientific journals for possible publications of project results:*

Table 3: List of journals for publication

journal	website	Submission dates	focus	comments	Cost for open access
IEEE Transaction on Vehicular technology	http://ieeexplore.ieee.org/browse/periodicals/title/		Electrical and electronics technology in vehicles and vehicular systems.		$1,950. (*)
International Journal of Electric and Hybrid Vehicles	http://www.inderscience.com/jhome.php?jcode=IJEHV		provides a high quality, fully refereed international forum in the field of electric and hybrid automotive systems.		£2,000 (*)
World Electric Vehicle Journal	https://www.evs24.org/wevajournal/		The World Electric Vehicle Journal is the first peer-reviewed international scientific journal that covers all studies related to battery, hybrid and fuel cell electric vehicles comprehensively.		free
Charged: Electric Vehicle Magazine	https://chargedevs.com/			Most suitable for communication	TBV, requested information
IEEE Transactions on Transportation Electrification	http://ieeexplore.ieee.org/browse/periodicals/title/		sub-systems, systems, standards, and grid interface technologies related to power and energy conversion, propulsion, and actuation for all types of electrified vehicles		$1,950. (*)
IEEE Transactions on Industrial Electronics	http://ieeexplore.ieee.org/browse/periodicals/title/		Applications of electronics, controls and communications, instrumentation and computational intelligence for the enhancement of industrial and manufacturing systems and processes including power electronics and drives.		$1,950. (*)
IEEE Transaction on Industry application	http://ieeexplore.ieee.org/browse/periodicals/title/		Advancement of the theory and practice of electrical and electronic engineering in the development, design, manufacture, and application of electrical systems, apparatus, devices, and controls.		$1,950. (*)
(*) possible to share preprint version for non commercial use (i.e. on the project website or public communities)					
IET Electrical System in Trasportation	http://digital-library.theiet.org/content/journals/iet-est		Electrical power systems in modern transport applications including generation, storage, distribution and utilisation. All sectors of transportation. System and sub-system aspects of electrical energy including system architectures and integration, energy management, control and protection.		$1,950.

5.6 Newsletters and Press Releases

On 27th November 2017, Cidaut released a first announcement on the start of the ReFreeDrive project in their newsletter (see: http://www.cidaut.es/newsletter/refreedrive-developing-new-electric-motor-technologies). Cidaut envisions to publish approximately twice a year more general news related to the ReFreeDrive project in their newsletter sent to about 1.000 subscribers.

We furthermore plan to issue several times per year (approximately every 4 months) our own ReFreeDrive newsletter to subscribers from our website form or coming through other channels (e.g ReFreeDrive event participants, social media announcements, etc).

5.7 Webinars

Through ECI's platform Leonardo Energy, we can manage the complete webinar cycle: invitation, registrations, reminders, real-time web-session, recording and hosting of materials (presentation and recording file). The webinar platform is open for all consortium partners to present relevant and public content of the ReFreeDrive project results. (see: http://www.leonardo-energy.org/post/1262)

5.8 Social Media

In order to promote the visibility of the ReFreeDrive project and its milestones and results, we will use the relevant social networks to approach key stakeholder groups:

- LinkedIn groups

  We consider creating either our own or a joint ReFreeDrive profile with at least one other GV04 project to post news on existing group discussion platforms related to electrical vehicles, electric motor technologies, etc.

  In addition, consortium partners will use their existing LinkedIn profiles to promote the project activities within existing LinkedIn groups on electrical motors, electrical vehicles, e-mobility, etc.

- Twitter account

  We consider creating either our own or a joint Twitter account together with at least one other GV04 project, in order to share efforts, create more awareness and guarantee a continuous flow of tweets into the community.

We plan to actively use social media channels after the first year of the project to have enough content, starting by approximately September 2018.

6 Dissemination Kit and other tools available for communication

6.1 Logo

Several options for a project logo have been circulated and discussed at the KOM. The final version here below [figure 2] has been approved by all consortium partners.

Figure 2: ReFreeDrive Logo, status March 2018

6.2 Project templates and document layout

A common layout for documents, minutes, report/ deliverables and powerpoint presentation has been developed after the KOM to be used in all official communication activities:

a) The following figure [figure 3] shows the Report format in word.doc

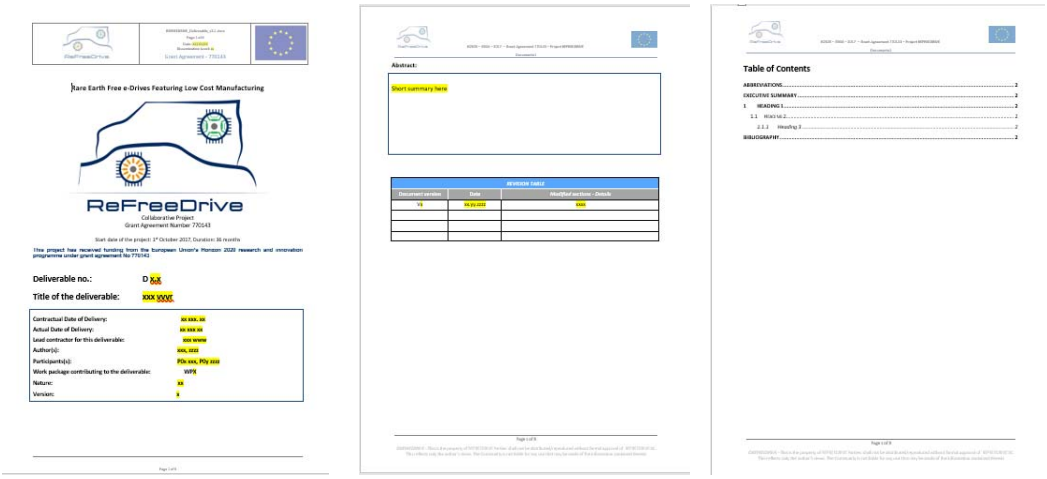


Figure 3: ReFreeDrive Report Format as word.doc status March 2018

b) The following figure [figure 4] shows the Presentation format as Powerpoint

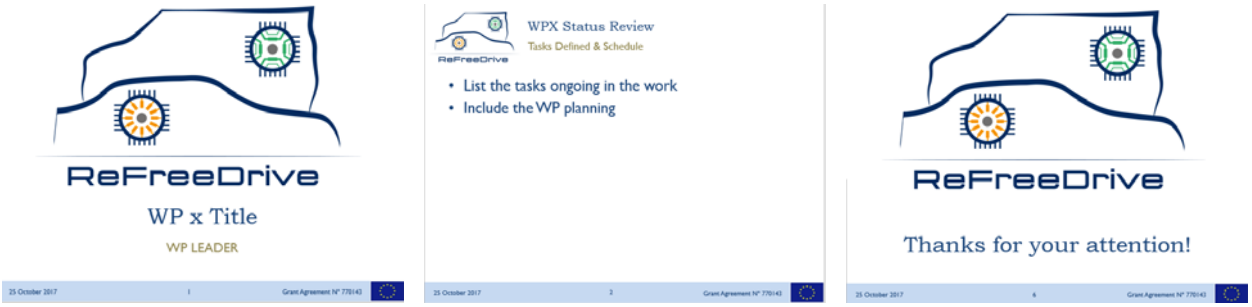


Figure 4: ReFreeDrive Report Format as powepoint ppt, status March 2018

6.3 General overview on ReFreeDrive

A general project overview has been developed by Cidaut, both as PDF paper as well as powerpoint presentation, after the k/o meeting based on general information available and pictures provided by consortium partners (see appendix A2 and A3).

6.4 Poster

The UAQ team will develop a poster presenting the key objectives of the ReFreeDrive project which can be used for conferences, stakeholder meetings and other events.

6.5 Leaflets

Based on a similar design and content as the poster, UAQ will furthermore create a short leaflet (2 to 4 pages). This print template layout will be shared with all ReFreeDrive consortium partners who are then responsible for printing the adequate number of hard copies used for their attendance on events, to share here the costs and avoid shipping.

7 Management of the dissemination and communication

7.1 Interaction with other GV04 projects

In order to increase awareness and use synergies in communication and dissemination activities, the RefreeDrive project will explore different avenues of joint-activities with the other two GV04 projects from the call: ModulED and Drivecom.

To better coordinate these joint activities, we consider applying for the EC Common Dissemination Booster in Spring 2018 when it will be open again.

7.2 Strategy for knowledge management and IP protection

IPR monitoring will be an explicit part in WP8, under task leader Mavel. Monitoring of foreground and IPR issues, the project's IPR strategy, consolidating the interests of all partners, will be updated each year of the project and monitored by Mavel. All partners will identify all knowledge to be protected and Cidaut, who has a department specialized in IPR issues, will assist all partners which protection should be chosen. IPR help desk will be contacted in cases of conflicts as well as to provide advice. The IPR management will also be part of the Plan for the Dissemination of Results, led by UAQ in D9.5, D9.6 and D9.7 respectively.

7.3 Project Public Deliverables

Following table [table 4] shows list with all ReFreeDrive project deliverables. The public reports will be entirely part of the dissemination tasks and actions, whereas for confidential marked deliverables we plan to issue at least a short executive and adapted summary for publications.

Table 4: List of project deliverables

WP	Deliverable	Description	Lead Beneficiary	Nature	Dissemination Level	Delivery Date
WP2	D2.1	KPI Key Performance Indicators Document	PRI	Report	Confidential	31.12.2017
WP2	D2.2	ReFreeDrive testing vehicles: Driving Cycle	PRI	Report	Public	31.12.2017
WP9	D9.1	Project Website	CID	Other	Public	31.12.2017
WP2	D2.3	Functional subsystems Full Technical Specifications	PRI	Report	Confidential	28.02.2018
WP9	D9.2	Open Data Management Plan	CID	ORDP: Open Research Date Pilot	Public	31.03.2018
WP9	D9.3	Communication Plan	ECI	Report	Public	31.03.2018
WP3	D3.1	Preliminary IM Design Analysis and Material Selection	MDL	Report	Confidential	20.04.2018
WP1	D1.1	First Progress Report	CID	Report	Public	30.09.2018
WP4	D4.1	SynRel Preliminary analysis	IFPEN	Report	Public	30.09.2018
WP9	D9.4	Plan for the Dissemination of Results, First Release	UAQ	Report	Public	30.09.2018
WP3	D3.2	CR-IM Electromagnetic Design Report for Inner and Outer Rotor	MDL	Report	Confidential	31.10.2018
WP3	D3.3	CR-IM Thermal Design Report for Inner and Outer Rotor	MDL	Report	Confidential	31.03.2019
WP4	D4.2	SynRel Electro Magnetic Design Track 1 / Track 2	UAQ	Report	Confidential	31.03.2019
WP4	D4.3	PM SynRel Electro Magnetic Design Track 1 / Track 2	IFPEN	Report	Confidential	31.03.2019
WP8	D8.3	Plan for the Exploitation of Results, first draft	MAV	Report	Confidential	31.03.2019
WP3	D3.4	CR-IM Full Design (including CAD) for Inner and Outer Rotor Designs	MDL	Report	Confidential	30.06.2019
WP4	D4.4	SynRel Full Design Track 1 / Track 2	UAQ	Report	Confidential	30.06.2019
WP4	D4.5	PM SynRel Full Design Track 1 / Track 2	IFPEN	Report	Confidential	30.06.2019
WP5	D5.1	Application software for IM and SynRel motor control	UAQ	Report	Confidential	30.06.2019
WP5	D5.2	High Power Range Electric Drive Design	IFPEN	Report	Confidential	30.06.2019
WP5	D5.3	Medium Power Range Electric Drive Design	UAQ	Report	Confidential	30.06.2019
WP1	D1.2	Second Progress Report	CID	Report	Public	30.09.2019
WP5	D5.4	Technical High Power Powertrain Integration Description Document	PRI	Report	Public	30.09.2019
WP5	D5.5	Technical Medium Power Powertrain Integration Description Document	PRI	Report	Public	30.09.2019
WP6	D6.7	Pure Synchronous Reluctance Motor for 200kW of operation	MAV	Other	Confidential	30.09.2019
WP6	D6.8	PM Synchronous Reluctance Motor for 200kW of operation	MAV	Other	Confidential	30.09.2019
WP6	D6.9	Power Electronics for the 75kW power setting	R13	Other	Confidential	30.09.2019
WP6	D6.10	Power Electronics for the 200kW power setting	IFPEN	Other	Confidential	30.09.2019
WP9	D9.5	Plan for the Dissemination of Results, Mid Release	UAQ	Report	Public	30.09.2019
WP7	D7.1	Motor testing results	IFPEN	Report	Public	31.12.2019
WP6	D6.1	Induction Machine with Die Casted Copper Rotor for 75kW of operation	TCM	Other	Confidential	29.02.2020
WP6	D6.2	Induction Machine with Fabricated Copper Rotor for 75kW of operation	TCM	Other	Confidential	29.02.2020
WP6	D6.3	Pure Synchronous Reluctance Motor for 75kW of operation	MAV	Other	Confidential	29.02.2020
WP6	D6.4	PM Synchronous Reluctance Motor for 75kW of operation	MAV	Other	Confidential	29.02.2020
WP6	D6.5	Induction Machine with Die Casted Copper Rotor for 200kW of operation	TCM	Other	Confidential	29.02.2020
WP6	D6.6	Induction Machine with Fabricated Copper Rotor for 200kW of operation	TCM	Other	Confidential	29.02.2020
WP7	D7.2	Integrated e-Drive test bench testing results	CID	Report	Public	31.03.2020
WP7	D7.3	In vehicle Technology Validation	PRI	Report	Public	30.06.2020
WP1	D1.3	Third Progress Report	CID	Report	Public	30.09.2020
WP8	D8.1	Techno economic Evaluation	ECI	Report	Confidential	30.09.2020
WP8	D8.2	LCA technologies analyses	CID	Report	Public	30.09.2020
WP8	D8.4	Plan for the Exploitation of Results, final draft	MAV	Report	Confidential	30.09.2020
WP9	D9.6	Plan for the Dissemination of Results, Final Release	UAQ	Report	Public	30.09.2020

8 Evaluation and tracking of the communication

In order to track the effectiveness and reach-out of our different communication activities, we will establish some tracking and monitoring over the course of the project.

8.1 Report about website visit tracking

We will use the embedded ***Google Analytics*** tool on our ReFreeDrive website to track and report the website traffic (number of visitors, their geography, the length of stay, etc)

8.2 Report about feedbacks after each event

A short memo if possible including agenda, audience, etc will be prepared after each event where ReFreeDrive partners will be attending and presenting project results.

8.3 Citations of Papers

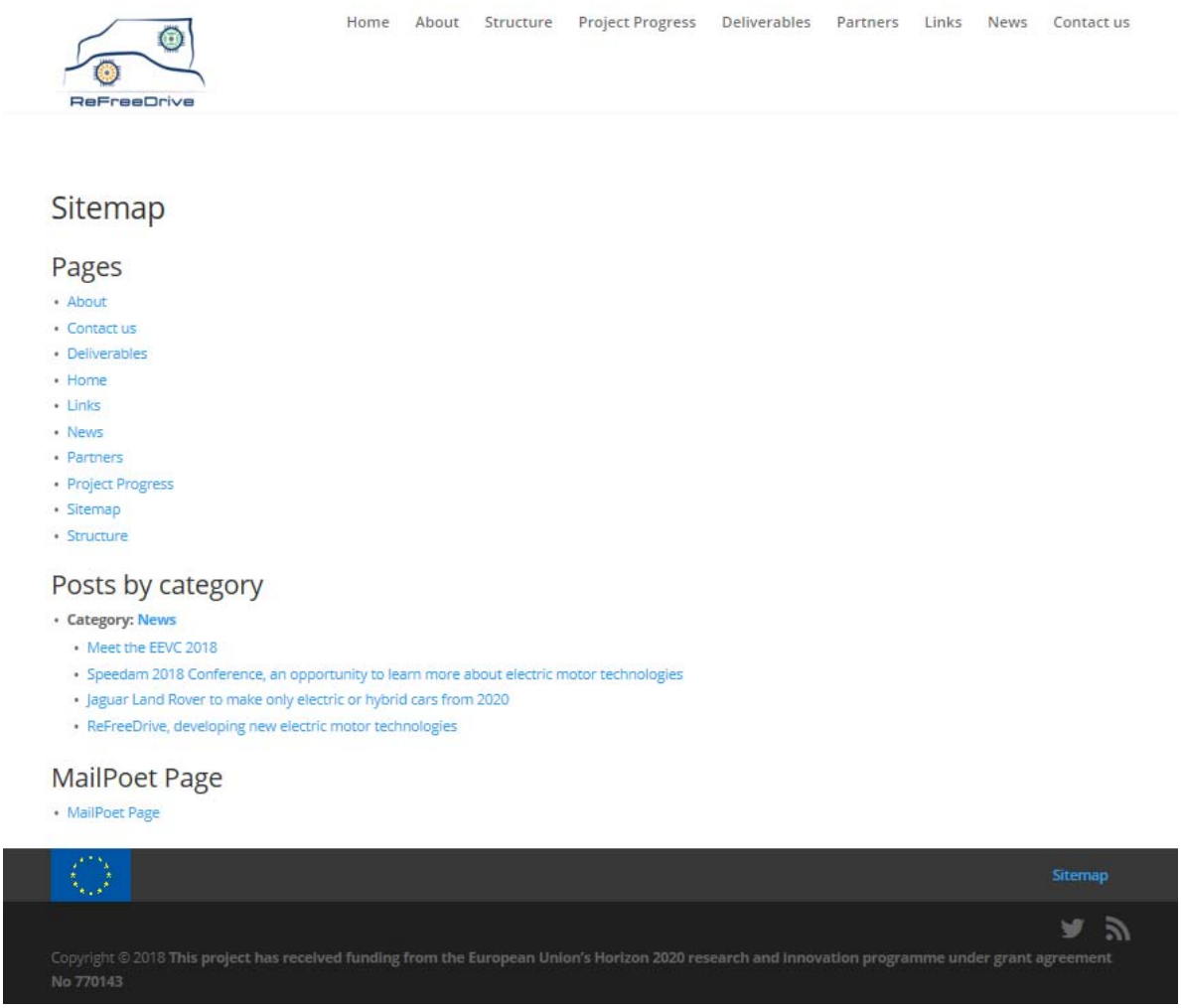
The UAQ team will be in charge to monitor the reach-out of our scientific papers. There are several options at present under consideration to track citations and to compute bibliometrics indicators to rank scientific papers and authors:

- ***Google Scholar*** is automatic and free of charge and searches any type of document online
- ***Scopus*** and ***Web of Science*** are more restricted to papers and journals and are paid services where UAQ has an active subscription

The output of these services are bibliometric data, i.e. number of citations of a specific paper in other papers, thesis, articles, etc and the h-index of the author. We will hence use these citations of the ReFreeDrive papers to get an indication on their impact.

9 Appendix

9.1 A1 - Map of website



9.2 A2 - General overview on ReFreeDrive project – (long version)

ReFreeDrive

Project Overview

CIDAUT

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770143

Project Overview

General Figures

Title: Rare earth free e-Drives featuring low cost manufacturing

Acronym: ReFreeDrive

Grant Agreement No: 770143

Topic: GV-04-2017

Project Total Costs: 5,999,131.25€

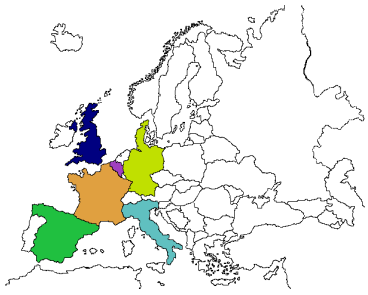
Total EU Contribution: 5,999,131.25€

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770143

Project Overview

Project Partners and Locations

ReFreeDrive Consortium is composed of 13 partners in six European countries



3 **UNITED KINGDOM**
European Copper Institute
Motor Design Limited
Jaguar Land Rover

1 **BELGIUM**
Aurubis

1 **FRANCE**
IFP Energies Nouvelles

6 **ITALY**
Universitá degli studi dell'Aquila
Centro Sviluppo Materiali
Tecnomatic
Mavel
R13 Technology
Privé

1 **GERMANY**
MetallGiesserei
Breuckman

1 **SPAIN**
Fundación Cidaut

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770143

Project Overview

Project Objectives

- The main aim of this project is to develop **rare earth-free traction technologies** beyond their current state-of-art, with a strong focus on industrial feasibility for mass production, targeting lower costs with higher specific torque and power density
  - To explore, optimize and compare motor designs in two rare earth-free motor technologies: **copper rotor induction machines and synchronous reluctance machines**. As a result, four designs will be obtained for each of the two power range settings under study in this project
  - To design, prototype and test four high speed (maximum speed of 45.000 rpm) motors (one for each technology) that increase the specific torque by 30%, and reduce the motor losses by 50%, compared to the project benchmark (Tesla S60 motor)
  - ReFreeDrive electric powertrain to reach a cost reduction foreseen in at least 15%, against solutions with equal performance characteristics
  - To develop the power electronics needed for each power setting, increasing the power density by 50% compared to current system which are been using in the electric vehicles, by means of adoption of wide bandgap semiconductor technology, increasing efficiency and reducing the weight of the cooling system, but also, adopting of advanced gate driver and efficiency optimizer control strategies
  - To validate the motor technologies by obtaining an integrated powertrain, including all the powertrain systems (batteries, gear box, etc.) that will be tested in real driving conditions in the full electric vehicles customized by PRIVÉ (e.g. Iveco Daily, Mercedes Sprinter)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770143

Project Overview

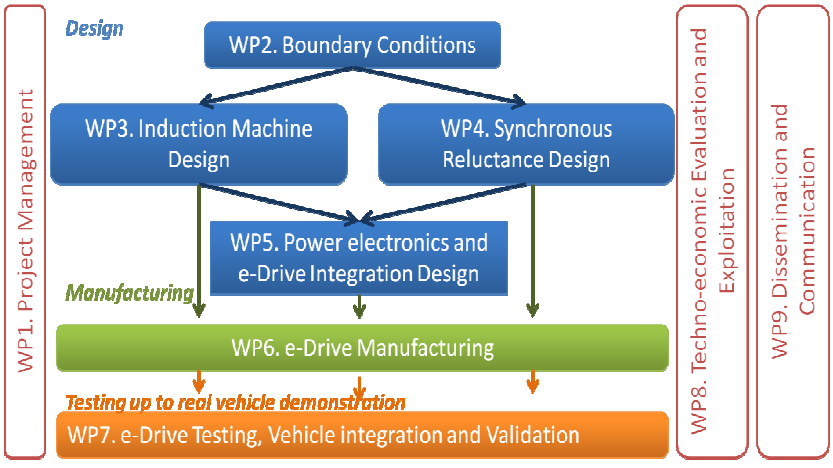
Project Expected Outcomes & Exploitation

- This project will develop new e-Drives for electric vehicles focusing on the design and development of prototypes for the 75kW and 200kW cases, of two different technologies (IM, SR). The electric powertrains to be developed within ReFreeDrive project will cover a broad power range, so as responding to the demand from the current and future market.
- Some of the most relevant results are listed here:
  - Integrated Induction Machine design with fabricated copper rotor and with die cast copper rotor
  - Integrated Synchronous Reluctance Machine design, Permanent magnet assisted and pure synchronous reluctance
  - Cooling system design for low cost high efficiency motors
  - Design of advanced control algorithms for ReFreeDrive motors
  - Design of advanced medium/high density electric drives integrated with the electric motor

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770143

Project Overview

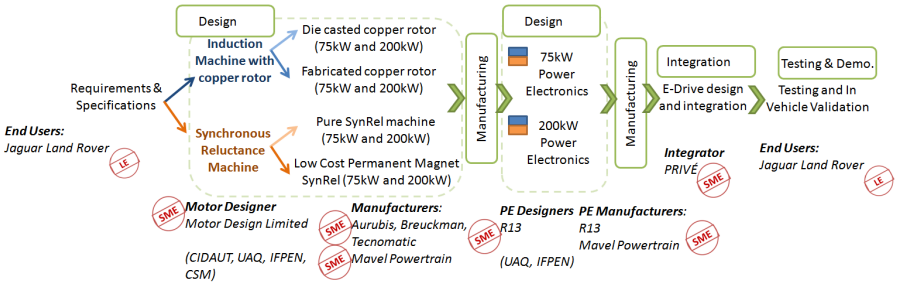
WP Structure



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770143

Project Overview

Pictures

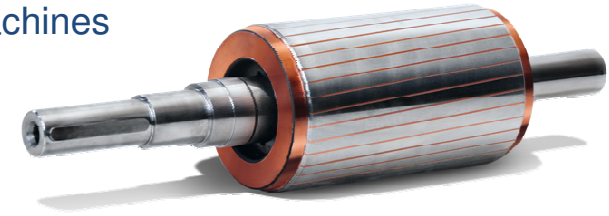


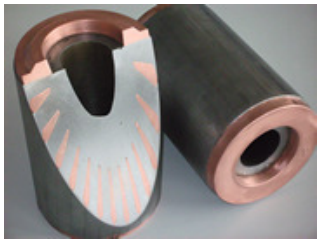
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770143

Project Overview

Pictures

- Induction Machines





This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770143

9.3 A3 - General overview on ReFreeDrive project – (short version)

ReFreeDrive

Project Overview

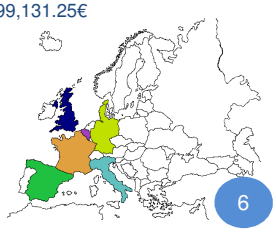
CIDAUT

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770143

Project Overview

General Figures

Title: Rare earth free e-Drives featuring low cost manufacturing
Grant Agreement No: 770143
Topic: GV-04-2017
Project Total Costs: 5,999,131.25€
Total EU Contribution: 5,999,131.25€



3 UNITED KINGDOM
European Copper Institute
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IFP Energies Nouvelles

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Universitá degli studi dell'Aquila
Centro Sviluppo Materiali
Tecnomatic
Mavel
R13 Technology
Privé

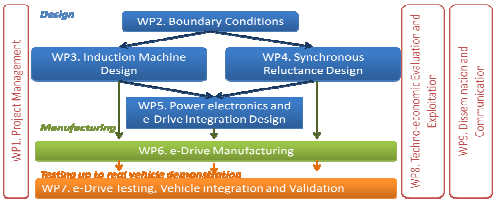
1 GERMANY
MetallGiesserei
Breuckman

1 SPAIN
Fundación Cidaut

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770143

Project Overview

Project Objectives



- The main aim of this project is to develop **rare earth-free traction technologies** beyond their current state-of-art, with a strong focus on industrial feasibility for mass production, targeting lower costs with higher specific torque and power density
  - To explore, optimize and compare motor designs in two rare earth-free motor technologies: **copper rotor induction machines and synchronous reluctance machines**.
  - To design, prototype and test four high speed (maximum speed of 45.000 rpm) motors (one for each technology) that increase the specific torque by 30%, and reduce the motor losses by 50%, compared to the project benchmark (Tesla S60 motor)
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  - To validate the motor technologies by obtaining an integrated powertrain, including all the powertrain systems (batteries, gear box, etc.) that will be tested in real driving conditions in customized full electric Vehicles

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770143