



# VIPERLAB

FULLY CONNECTED VIRTUAL AND PHYSICAL  
PEROVSKITE PHOTOVOLTAICS LAB

**D5.1**

**VIPERLAB WEBSITE UP AND RUNNING**

**DELIVERABLE  
REPORT**

Version: 1

Date: 08.11.2021

## DISCLAIMER

'Fully connected virtual and physical perovskite photovoltaics lab' VIPERLAB is a Collaborative Project funded by the European Commission under Horizon 2020. Contract: 101006715, Start date of Contract: 01/06/2021; Duration: 42 months.

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FULLY CONNECTED VIRTUAL AND PHYSICAL  
PEROVSKITE PHOTOVOLTAICS LAB

## DELIVERABLE REPORT

### D5.1 VIPERLAB WEBSITE UP AND RUNNING

#### Project References

|                            |  |
|----------------------------|--|
| Project Acronym            | VIPERLAB   |
| Project Title              | Fully connected <b>virtual</b> and physical <b>perovskite</b> photovoltaics <b>lab</b> |
| Project Coordinator        | Helmholtz-Zentrum Berlin   |
| Project Start and Duration | 1st June 2021, 42 months   |

#### Deliverable References

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## DEFINITIONS & ABBREVIATIONS

**C&D:** Communication and Dissemination

**D:** Deliverable

**External Participant:** Any person that participates in VIPERLAB activities not belonging to partners of the Consortium.

**GA:** Grant Agreement

**GATE:** General Access Tool for HZB User Facility. The portal used by VIPERLAB Infrastructures users to submit proposals

**GDPR:** General Data Protection Regulation 2016/679 (GDPR). The European normative that has taken effect on 25 May 2018.

**JRA:** Joint Research Activity

**KEP:** Knowledge Exchange Platform

**M:** project month

**NA:** Networking activity

**Personal data:** According to Art. 4.1 of GDPR, means any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person.

**Processing:** According to Art 4.2 of GDPR, means any operation or set of operations which is performed on personal data or on sets of personal data, whether or not by automated means, such as collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction.

**PWS:** Project Web site

**RTD:** Research and Technology Development

**TA:** Transnational access to Physical infrastructures

**VA:** Access to Virtual Infrastructures

**VAPo:** The electronic platform VAPo (Virtual Access Portal). It unifies the access to all Virtual Access Infrastructures of VIPERLAB and creates a single point of access for the users.

**VIPERLAB member:** any person that participates in VIPERLAB activities and belongs to partners of the Consortium

**WEB user:** is whoever browses the websites and accesses the information content contained therein

**WP:** Work-Package



## EXECUTIVE SUMMARY

One of main goal and objectives of VIPERLAB project is to bring its research and results to the attention of as many relevant and different target audiences as possible, to stimulate European academic and industrial researchers to work together on the research and development of the next generation of solar cell technology to accelerate the perovskite PV technology development in Europe.

Therefore, the first and very important key action of *WP05 Communication, Dissemination, Exchange and Training* has been to establish a coherent communication and dissemination strategic framework for VIPERLAB project with the following objectives:

1. *to raise awareness about the project and its potential,*
2. *to share the generated knowledge,*
3. *to disseminate the project results,*
4. *to engage with relevant stakeholders to create favourable conditions during the course of the project and for wider uptake towards its end.*

The deliverable “D5.2 Communication and Dissemination plan” has already reported our strategy and proposed channels and procedures to raise public awareness and to give visibility to the project.

This Deliverable D5.1 in turn concerns the development and the management of Project web site (PWS) one of the most relevant communication and dissemination channels offered by VIPERLAB project to get the objectives indicated above.

The VIPERLAB PWS isn't the only web platform proposed by the project. In accordance with the project brand guidelines, VIPERLAB PWS is an user-friendly web platform mainly targeted to the impacting visual communication by promoting the project itself and the actions/tasks undertaken from the project. It provides targeted information to multiple and wide audiences formed by infrastructures' users, academia and scientific communities, industry, stakeholders, audiences at large, media, citizens about the project and its relevance, about the consortium as a whole and any relevant details concerning each partner including the availability of top-ranked Research Infrastructures to free access for the scientist from academia and industry. The VIPERLAB PWS also informs about the content and the finality of VIPERLAB proposed Joint Research and Networking Activities, about the skills and expertise offered by our involved scientists/experts, and last but not least, about the progress beyond the scientific and technical achievements reached by our project and our infrastructures' users.

For these reasons, VIPERLAB PWS also serves as a very efficient landing/take off platform toward all the others more specialized platforms offered by the project (KEP, VAPo, GATE, etc), which allow web users to get involved in the highly specialized technical/scientific content of these platforms.





## 1 PROJECT WEB SITE development

Public awareness and dissemination are key priorities in the European research projects funded under the Horizon 2020's programme, and VIPERLAB project will aim to bring the research and its results to the attention of as many relevant and different target audiences as possible by developing effective communication and dissemination strategies, tools and procedures

The VIPERLAB PWS serves as the main gateway to resources and information to a wide range of web users including infrastructures' users, academia and scientific communities, industry, stakeholders, audiences at large, media, citizens, as well as, the project partners.

It acts as a public repository system since most of the communication tactics will aim to drive traffic to the project web site for its very efficient communication impact, but it will also serve as the landing/take off platform assuring a very efficient management of any other more specialized technical/scientific information offered to the web users by all others platforms of the project (KEP, VAPo, GATE, etc).

### 1.1 VIPERLAB PWS main goal and objectives

The main goal and objectives of VIPERLAB PWS are to:

- Inform and raise awareness about VIPERLAB consortium, project and its objectives to create wide-spread visibility of the project scope of work and goals.
- Spread information on technological breakthroughs, methods and results for educating and stimulating further research or exchange knowledge.
- Disseminate project information and data on industrial applicability and exploitability of the results to the market stakeholders and industry.
- Establish two-way communication with relevant market stakeholders to create favourable conditions for wider uptake towards the end of the project.

### 1.2 VIPERLAB PWS targeted groups

The VIPERLAB PWS targets to different web users as classified by D5.2 Communication and dissemination plan:

- **Key players:** members of organizations which have a high interest in PV and at the same time have a high potential influence on the project. These players will be engaged closely to build a relationship that can be used during and after the project. Three subgroup of key players are defined:



- **Industry (Large as well as Small-and-medium enterprises):** members of companies driving or able to incorporate innovations in the perovskite Photovoltaics (first scope), in the general Photovoltaics sector (second scope), as well as in the Renewable energy sector<sup>1</sup> (third scope). Companies in the mentioned sectors could ignite cooperation between European academic and industrial researchers to work together on the research and development of the next generation of solar cell technology, which will accelerate the perovskite PV technology development in Europe.
  - **Research & Development:** Academic and scientists in Universities and Research and Technology Organisations.
  - **Policy:** National and EU-level policy makers, regional and national governments, EU authorities, professional associations, clusters, public organisations, networking organisations in related sectors, standardization bodies;
- **Subjects/Defenders:** organizations which have a high interest in PV, but which do not have a high influence on the VIPERLAB project. These organizations can be regularly informed by the VIPERLAB PWS and other communication and dissemination channels, in order to keep their interest. Potentially, these organizations could become key players once their role becomes of higher importance to the partners of VIPERLAB, and for this reason dedicated web pages will be offered them, too.
  - **Context setters** (referees): players which have a high influence on the project context, but a fairly low interest in VIPERLAB as the product itself.
  - **Crowd:** stakeholders with low interest and low power at moment who could be of interest for VIPERLAB in perspective. For these stakeholders the web site with the newsletters will be the main channel to inform them.

As the Project web site has been mainly designed and organized to efficiently reach any web users across different categories of interest indicated above, it also leaves the opportunity to those who browse the web site to dig deep into the topics of their interest through the other specialized platforms offered by the project (KEP, VAPo, Data Repository, VIPERLAB Meta-Database, The Perovskite Database, etc).

Also for this reason the setup of the web site has taken more time than planned to be finalized, to assure that all other platform could be efficiently integrated in the main project web site. Among them, the knowledge Exchange Platforms (KEP) has been developed in parallel to the PWS and it is already running in almost complete version since October 15<sup>th</sup> (planned dead line November 30<sup>th</sup>).

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<sup>1</sup> Such as wind, geothermal and bioenergy.



Both platforms operate each integrated to the other by engaging the web users in a two-way exchange flow: They gain information and at same time they supply information about where they are focussing their interest.

VIPERLAB PWS more than any other project web platform aims also to inform:

- **General public and media:** citizens, EU communities, general public, regional and national media, *sector-related* media outlets, *high-profile* journals.

For this reason the PWS will be also the main source, together with the project social/professional channels (Linkedin, ResearchGate, Twitter, Facebook), to keep informed wider audiences about the relevance of the project and its technical/scientific achievements for the progress of perovskite PV technology in Europe and worldwide.

As opposite, the KEP is a dynamic data base. It aims to efficiently disseminate the project results also for the most specialized web users because they can fulfil their needs to search, filter, and collect the required information by themselves by dynamically defining the quantity/quality of the information. For this reasons it also serves as the repository of project data, files, and personal information (as example for the contact request) and for any other intranet needs of the project to share information for internal communication.

For the duration of the project, the consortium will aim to generate at least 15,000 page-views of the VIPERLAB PWS with 5,000 different web users. In addition, minimum of 20% of the web users landing on the website would come from referral a social source.

### 1.3 VIPERLAB PWS Team

By considering the relevance requested to Project PWS for a very efficient Communication and dissemination strategy, ENEA has involved in these activities its own Communication and Dissemination Unit. ENEA with 2,700 employees for the most part researchers and technicians, is the second public research organization in Italy, and the first if the evaluation is limited to the energy / environmental issues. Their C&D Unit (ENEA-REL-PROM) has experienced professionals in communication and dissemination, in creation of web sites and improvement of quality/quantity of web traffic and search engine results, development of communication tools, and strategies to further improve quality and impact in communication and dissemination.

Clearly, the support by ENEA-REL-PROM will be exclusively based on a technical and strategic nature, by leaving the preparation of the content to the project members, but this choice however offers a strength point for the project as a whole because this unit will operate as an integral part of the project, and therefore as a partner.

The ENEA C&D team will strive for the success of the project activities regardless of the obligations deriving from a contract. And it can be involved in a much easier and more



flexible way than an external agency that always requires, among other things, the formalization of a supply contract before operating. In fact, this choice was also suggested by the initial difficulties encountered in the clear definition of some contents related to the use of different communication platforms, some that have not yet been finalized, sometimes even with the date of achievement at a distance of several months from the beginning of the project. This made it very difficult to formulate a contract with an external agency with risks including unforeseen costs during the execution of the project, due to the changing needs in communication and dissemination and in the tools used for this, first of all the website.

The provision of specialized services by an external communication agency will also be considered in case ENEA would need support for some specific activity.

#### 1.4 VIPERLAB PWS design and realization

- The first step realized by ENEA-REL-PROM has been the evaluation of the website content in term of dedicated web pages. Several draft of the project web site main and submenu skeleton was proposed by stimulating project partners to offer also their thoughts and opinions for a successful communication for the platform
- The second step in parallel to the definition of the logo and the visual identity has been the definition of different colour and font that should be utilized for the web site pages frame
- The third step has been a scouting activity carried out to evaluate within other websites of the projects oriented to the management of research infrastructures could offer the best practice for VIPERLAB to create its own website with its specific original characteristics. A list of 30 projects has been evaluated as reported in Annex III.

#### 1.5 Collection of the information for the organizations and personal data

In Annex 2 are included some examples of templates utilized to collect information about organizations and involved key persons: The following information has been collected: for all members

- Main contact point(s) for each partner with the role in the organization and in the project.  
Email address and link to external professional profile
- Organization data, web site and professional /social networks
- Description of the organization
- Main role and task assigned in the project
- Profiles of the key persons involved in the project
- Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work

We have also got the declaration for the data publication in reference to the GDPR commitments. This activity also took longer than planned, which was another negative impact in completing the deliverable on time.



| WHO SUBMIT THIS FORM???   |  |
|---|--|
| Name  | <input type="text"/>   |
| Surname   | <input type="text"/>   |
| Organization  | <input type="text"/>   |
| Role  | <input type="text"/>   |
| <p><b>Declaration</b><br/>           By submitting this filled in form by email I confirm that I have got the authorization from my organization to publish Logo, photos and any indicated information above in VIPERLAB Project web site, VIPERLAB-KEP, VIPERLAN-VAPO web platforms . I have also got the authorization from the involved people above that their name/surname/role/email can be published in the same Web platform used by VIPERLAN Project</p> |  |
| Place/ date   | <input type="text"/>   |
| Signature   | (it is enough for us just a printed pdf file attached to the word file sent by email to <a href="mailto:webmaster@viperlab.eu">webmaster@viperlab.eu</a> from the person indicated above |

#### Email

*Very important! Be aware that VIPERLAB web platforms will not share directly the email addresses of the contact point(s). A "contact form" will be proposed to the applicant, where he/she will indicate some useful data for the statistic (name/surname/role/organization/type of organization/country) and the message twill be forwarded to recipient by email. The platform will not record the message to avoid duplicated repository of email and*

**Figure 1.1 Declaration for the GDPR included in each template utilized for personal data collection**

## 1.6 Collection of the contributions from the partners for the web site pages content

Based on the description of the specific JRA/NA and TA/VA activities, we have proposed to the WP and task leaders to elaborate the description of each activity, trying to emphasize in concise and effective way:

- Why the topic is relevant for the perovskite PV Research and Technology Development (RTD) and in general?
- What are the key points to be addressed in this activity?
- How the activities are organized by VIPERLAB in that specific area?
- What new and better than before are we proposing?
- How and why our work will produce a progress beyond the state of art in that area?
- What opportunities are we offering to the scientific community working with perovskite (and not only) to do better and more efficiently PV RTD?

We have invited all the authors to transfer message in a very clear and effective way, targeting a very wide range of web users (scientists, stakeholders, companies, citizens, etc.) without losing the scientific relevance.



## 1.7 NAVIGATION on the pages of VIPERLAB PWS

The following web pages are proposed

|                                    |   |
|------------------------------------|---|
| <b>1 About us</b>                  |   |
| WP1/all                            | 1 Goal and objective                            |
| WP1/All                            | 2 Consortium                                    |
| WP2/All                            | 3 Physical Infrastructures                      |
| WP3/All                            | 4 Virtual Infrastructures                       |
| WP5                                | 5 Key persons                                   |
| All                                | 6 External Partners (experts and organizations) |
| <b>2 Infrastructures</b>           |   |
| WP2/All                            | 1 Procedures                                    |
| WP5                                | 2 Infrastructure catalogue                      |
| WP2/WP3/all                        | 3 GATE Viperlab Access                          |
| WP3                                | 4 Virtual Access point                          |
| <b>3 Joint Research Activities</b> |   |
| WP8                                | 1 Advanced device processing                    |
| WP7                                | 2 Materials and device Characterization         |
| WP9                                | 3 Testing and Standardization                   |
| WP10                               | 4 Environmental, Social, and economic impact    |
| <b>4 Networking Activities</b>     |   |
| WP5                                | Knowledge Exchange Platform                     |
| WP4                                | Harmonization & standardization                 |
| WP5                                | Personnel Exchange & Career                     |
| <b>5 Training</b>                  |   |
| WP5                                | Training courses                                |
| WP5                                | Summer schools                                  |
| WP5                                | Webinars  |
| <b>6 Output</b>                    |   |
| WP5/all                            | 1 Publication                                   |
| WP5/all                            | 2 Technical document                            |
| WP3/WP5                            | 3 Databases                                     |
| All                                | 4 Public Deliverables                           |
| <b>7 News &amp; Events</b>         |   |
| WP5/all                            | 1 Scientific Outreach                           |
| WP5/all                            | 2 Workshop & Conferences                        |
| WP5/all                            | 3 External Events                               |
| WP5/all                            | 4 News  |
| WP5/all                            | 5 Newsletter                                    |



## 1.8 Web Content Accessibility: Guidelines

The website has been created by ENEA by following the guidelines of the AGID - the Italian Agency for Digital Italy for Public Administrations based on the DIRECTIVE (EU) 2016/2102 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL - of 26 October 2016 - on the accessibility of the websites and mobile applications of public sector bodies (europa.eu) . And by following the Web Content Accessibility Guidelines (WCAG) developed through the W3C process in cooperation with individuals and organizations around the world, with a goal of providing a single shared standard for web content accessibility that meets the needs of individuals, organizations, and governments internationally.

## 1.9 Project Web Site Mock-up

Since Sept. 30<sup>th</sup>,2021, the received data has been uploaded in a web site mock-up. This offered a great opportunity before its final publication to propose improvements to the proposed web pages and for the final validation of personnel that had uploaded data in the VIPERLAB PWS. This web site doesn't work anymore after that VIPERLAB PWS has been published

<http://viperlab-dev.ddns.net/index.php/> .

## 2 VIPERLAB PWS: description

The project's web site needs to simultaneously support different type of possible visitors, ensuring each one can fulfil his/her needs to collect the required information, easily explore the available content, and be engaged. The following areas of the PWS are individuated:

- **Home:** general information about the project and main menu to access to specific parts of website. Home-Focus: a description of the context in which the project evolves with information about the R&D infrastructures 'description related to VIPERLAB technology and the development worldwide.
- **Project partners:** project related information such as Key facts, Objectives, Partners and the project background summarizing participations in other project related to VIPERLAB s and their results, on which VIPERLAB builds and whose work VIPERLAB aims to carry on.
- **Infrastructures:** with information about how to access to each of them and the available catalogue of offered infrastructures





- **Joint Research activities:** summarized and organized by Work Package. Specific sub-pages have been created under each activity, and they will be reviewed as soon as the activities will require new content and results to be communicated and disseminated.
- **Networking activities :** mainly focused on test procedures and -protocols are essential to successfully bring a new technology into the market, and how to improve personnel exchange to share best practice
- **Project Results:** different sections and their sub-pages contain useful resources and links as well as materials related to the public part of the project (logo, leaflets and public standard PowerPoint presentation, public deliverables and milestones, etc.). These sections will be constantly updated to display latest published documents, deliverables and more useful links.
- **News&Events:** list of project news and events related to the project activity. Specific sub-pages will be created for each event as soon as the consortium starts preparing them, and they will be fed with specific event-related information (workshop, summer school, training, proceedings, etc.); A **six-monthly basis** newsletter will complete the pages.
- **Contact us:** a contact form to ask information about the project linked to the coordinator email and PWS management

In the following pages each section will be described.

## 2.1 VIPERLAB PWS home page

The first page of the project website has been implemented as a continuous vertically sectioned page which provides more information as the user moves down.

The element that distinguishes this home page is the harmony of colours integrated with each other and aligned with the logo, and overall the carousel of images that the page proposes to highlight as much as possible the infrastructures proposed by the project. The photos flow by showing captivating and meaningful images of the VIPERLAB infrastructures to attract the web user to investigate further. Each photo contains a brief description of the infrastructure and any copyright rights for the photo if any.

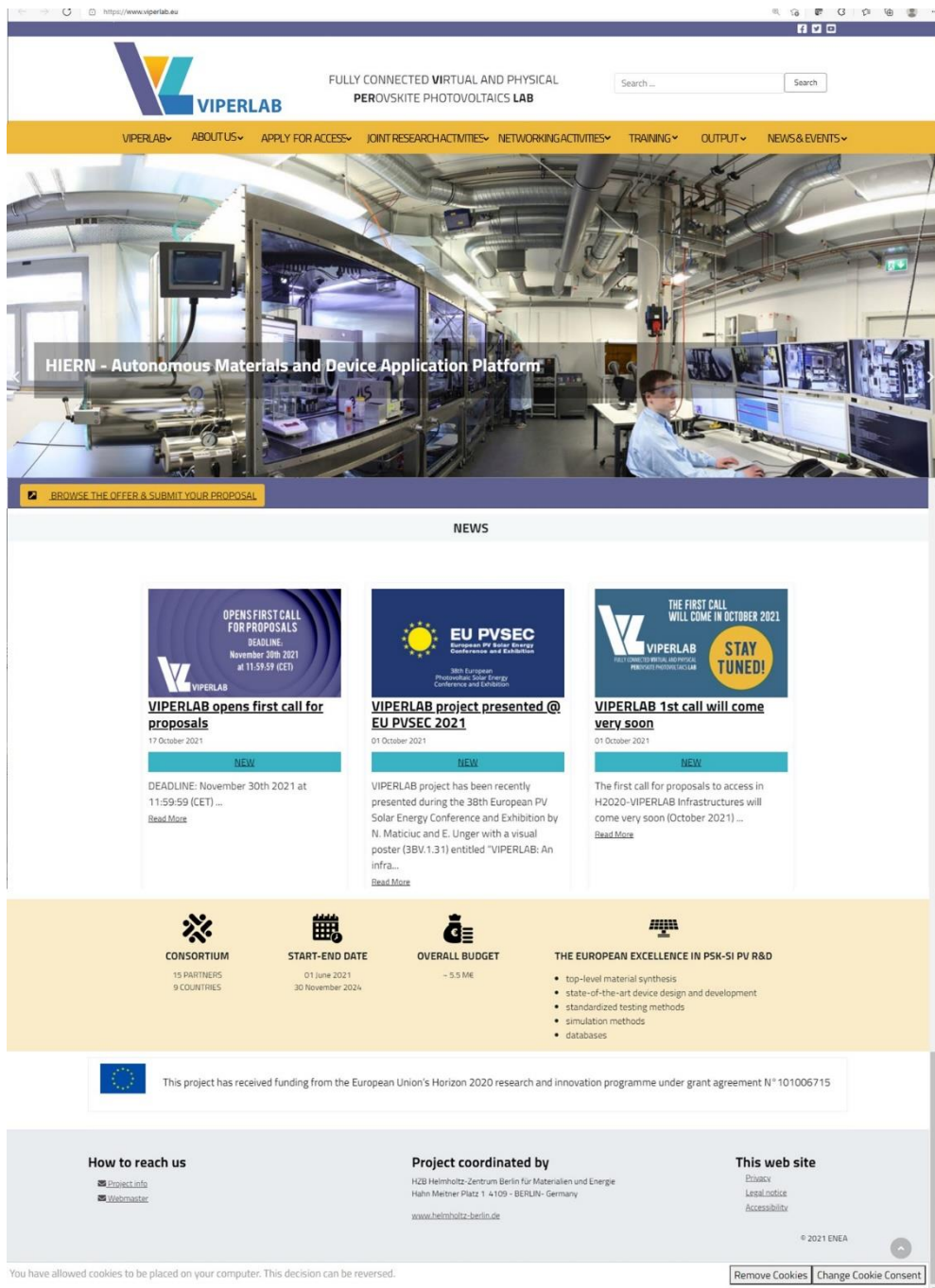
In a very visible position, at the bottom left of the carousel, there is a button that immediately leads the web user to scroll through the infrastructure offer and submit a project to access.

In the lower part there is the "News" area which immediately proposes an abstract, with a captivating photo, which invites the web user to browse for more information.

A similar area will soon be available with the same logic for VIPERLAB events.







The screenshot shows the VIPERLAB website home page. At the top, there is a navigation bar with the VIPERLAB logo and the tagline "FULLY CONNECTED VIRTUAL AND PHYSICAL PEROVSKITE PHOTOVOLTAICS LAB". Below the navigation bar is a large banner image of a laboratory with the text "HIERN - Autonomous Materials and Device Application Platform". A button below the banner says "BROWSE THE OFFER & SUBMIT YOUR PROPOSAL".

The main content area is titled "NEWS" and features three news items:

- VIPERLAB opens first call for proposals** (17 October 2021): DEADLINE: November 30th 2021 at 11:59:59 (CET) ...
- VIPERLAB project presented @ EU PVSEC 2021** (01 October 2021): VIPERLAB project has been recently presented during the 38th European PV Solar Energy Conference and Exhibition by N. Maticic and E. Unger with a visual poster (3BV.1.31) entitled "VIPERLAB: An infra..."
- VIPERLAB 1st call will come very soon** (01 October 2021): THE FIRST CALL WILL COME IN OCTOBER 2021. STAY TUNED! The first call for proposals to access in H2020-VIPERLAB Infrastructures will come very soon (October 2021) ...

Below the news items is a summary section with four columns:

- CONSORTIUM**: 15 PARTNERS, 9 COUNTRIES
- START-END DATE**: 01 June 2021, 30 November 2024
- OVERALL BUDGET**: ~ 5.5 ME
- THE EUROPEAN EXCELLENCE IN PSK-SI PV R&D**:
  - top-level material synthesis
  - state-of-the-art device design and development
  - standardized testing methods
  - simulation methods
  - databases

At the bottom, there is a funding statement: "This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006715".

The footer contains contact information, project coordination details (HZB Helmholtz-Zentrum Berlin für Materialien und Energie), and website links (Privacy, Legal notice, Accessibility). A copyright notice for 2021 ENEA is also present.

**Figure 2.1 Viperlab Project web site home page**

The beige area that now reports the summary data about the *consortium*, *start / end date*, *budget*, and a *summary of the key elements of the project*, will be improved over the next few months, because it will also report in real time, performance indices and statistics regarding the use of infrastructures, contacts with our researchers, number of webinars



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006715

proposed and any other information that highlights the performance and results achieved by the VIPERLAB project.

The grey area reports information about the coordinator, the web site (privacy, legal notice, accessibility) and how to reach us.

Between these two areas there is the acknowledgement for the received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101006715.

The featured news and events are typically in chronological order, but can also include featured news (i.e. older) in order to keep an important blog article in a prominent position. During the evolution of the project, this section will also include videos and pictures to further promote the project.

## 2.2 Goals and objective web page

This page clearly reports on the VIPERLAB Mission *“to facilitate faster and reliable technology evaluation cycles to enable a swift market entry for Perovskite-based PV products and hence a more wide-spread utilization of renewable energy conversion technology”* and it details about the project goal and objectives:

**Access to expertise and infrastructure:** Uniting European top-ranked perovskite PV experts and research infrastructures, both physical and virtual, to enable faster perovskite solar cells and module development and testing on higher technology readiness levels. Facilitating access to perovskite-focused research infrastructures for EU-based material and PV research oriented academia and industry/SMEs.

**Networking and Training Actions:** Connecting and supporting the European perovskite R&D community through physical and virtual infrastructure access, educational resources, fostering collaboration between academics and industry, and targeted networking activities.

**Develop infrastructure and knowledge-base:** Further develop physical and virtual perovskite infrastructures, build an up-to-date database for materials and devices, long-term performance, environmental, and economic impact enabling evidence-based commercial and political decision making.



### 2.3 Consortium web pages

This web area offers information about the whole consortium and each project partner. An Europe map including UK shows where each organization is placed and offers also the opportunity to sort partners by country. In each partners web page is offered information about:

- the organization at glance,
- main role and task in the project,
- offered infrastructures
- key person involved

**RELEVANT INFRASTRUCTURES & TECHNICAL EQUIPMENT AVAILABLE BY VIPERLAB**




**HZB - EMIL – Energy Materials In-situ Laboratory Berlin**



**HZB - HySPRINT – Stability Lab**




**HZB - HySPRINT – Perovskite Database**



**HZB - EMIL – Energy Materials In-situ Laboratory Berlin**

EMIL at BESSY II uniquely combines industry-relevant deposition tools that are in-situ connected to off- and on-synchrotron analysis chambers providing a complementing set of photon-in-electron-out and photon-in-photon-out spectroscopic techniques that make full use of the "two-color" beamline that allows a "depth-dependent" characterization of thin-film layer stack samples using an x-ray photon energy range from the soft (80 eV) to the hard (10,000 eV) x-ray energy regime. EMIL is thus particularly well suited for in-situ, in-situ, and operando characterization of energy conversion materials and structures revealing their chemical and electronic structure (incl. energy level alignment), etc.



[more details](#)


**Infrastructures organization**

- [HZB - Infrastructure](#)
- [BIT - Infrastructure](#)
- [CEA - Infrastructure](#)
- [CENER - Infrastructure](#)
- [CSEM - Infrastructure](#)
- [EPFL - Infrastructure](#)
- [IMEC - Infrastructure](#)
- [FRAUNHOFER - Infrastructure](#)
- [Jülich-HERIN - Infrastructure](#)
- [MINTOV - Infrastructure](#)
- [TNG - Infrastructure](#)
- [ENEA - Infrastructure](#)
- [SU - Infrastructure](#)

Figure 2.2 Infrastructure web area



KEY PERSONS INVOLVED IN VIPERLAB PROJECT



**Dr. Eva UNGER**  
in

Dr. Eva Unger is a Young Investigator Group Leader at Helmholtz-Zentrum Berlin (Germany), affiliated with Humboldt University Berlin, and a Senior Lecturer at the Department of Chemistry at Lund University (Sweden). She received her Ph.D. degree from Uppsala University (Sweden) where she worked on Excitonic Dye Solar Cells. During her postdoctoral research at Stanford University (USA) she started working Perovskite Solar Cell devices as an early adaptor of the technology. Her current research focuses on scalable process development for the manufacturing of larger area Perovskite Solar Cells and the rationalization of material formation mechanisms from solutions to solid-state thin films. In VIPERLAB, her team supports an online perovskite solar cell device database "The Perovskite Database" for interactive data-queries, plots and any type of advanced analysis and AI-based projects.


**Role**

Leader of Young Investigator Group Hybrid Materials Formation and Scaling, HZB

**Role in the project**

Project Coordinator, leader of Task JRA1.1, contact person for VIPERLAB's virtual infrastructure "Perovskite Database"

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**Dr. Natalia MATICIUC**  
in

Natalia Maticiu received her bachelor's (2008) and master's (2010) degrees in physics from the State University of Moldova, after which she obtained a PhD in chemistry and materials technology from Tallinn University of Technology (Estonia) in 2015, where she studied chalcogenide thin films for photovoltaic applications in CdTe and kesterite solar cells. Since 2017, Dr. Maticiu is at Helmholtz-Zentrum Berlin (Germany) focusing on CIGSe absorber surface analysis and implementation of inorganic HTMs in perovskite-CIGSe tandem devices. Since 2021 she is actively involved in coordination of VIPERLAB project.


**Role**

Research scientist in thin film photovoltaics

**Role in the project**

Technical Manager of the Project, WP11 leader and fully involved in the of transnational access organization and management

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**Dr. Bettina WOLTER**

Dr. Bettina Wolter is a member of the user coordination department at Helmholtz-Zentrum Berlin (Germany). She received her Ph.D. degree from Freie Universität Berlin (Germany) and Fritz-Haber-Institut der Max-Planck-Gesellschaft (Germany) on electron spectroscopic studies on transition metal oxides. She is an expert on application of synchrotron radiation and has experience in the field of organic solar cells and organic electronics.


**Role**

Implementation and support for the web-based user access tool GATE (VIPERLAB)

**Role in the project**

Leader of WP2

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Antonio Abate is the Head of the Department of Novel Materials and Interfaces for Photovoltaic Solar Cells at HZB in Germany, Associate Professor at University of Naples Federico II in Italy and Visiting Professor at Fuzhou University in China. Before HZB, he worked at the University of Oxford, the University of Cambridge and the Ecole Polytechnique de Lausanne. Prof. Abate's research is focused on novel materials to make stable perovskite solar cells.

**Figure 2.3 key persons web area**



## 2.4 Apply for access

A detailed web page including several subpages is proposed to inform the web user about:

- Select infrastructure & contact infrastructure responsible
- Check proposal submission deadlines
- Check eligibility criteria
- Draft proposal (Scientific Case & Experimental Plan)
- Submit proposal via GATE
- Wait for Approval
- Plan and execute your experiments
- Submit Report
- Request Travel Reimbursement

## 2.5 Infrastructures' catalogue

By a dedicated Infrastructure catalogue the VIPERLAB PWS proposes a set of infrastructures designed for solar cells and PV modules for:

- Top-level material synthesis,
- State-of-the-art device design and development,
- Standardized characterization and testing methods
- simulation methods, and databases


This catalogue guides the web user through the different infrastructures made available by the consortium and possible viable synergies all around the EU perovskite expertise. The web site proposes also the list of cluster equipment & instruments that can be subject of the proposal submission.

Here, the PWS also proposes a link to the KEP platform where the web user can find more information about the infrastructures:

- Detailed description of the infrastructure
- Services currently offered by the infrastructure
- Modality of access under VIPERLAB Project
- Support offered
- Participation in others relevant Research Projects or activities connected to VIPERLAB







FULLY CONNECTED VIRTUAL AND PHYSICAL  
PEROVSKITE PHOTOVOLTAICS LAB

Search ... Search

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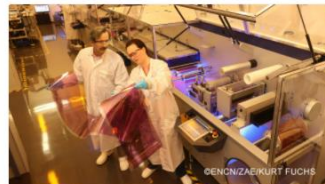
VIPERLAB
ABOUT US ▾
APPLY FOR ACCESS ▾
MEDIA ▾

You are here: Home / Apply for access / Infrastructure catalogue / JÜLICH- HIERN - Infrastructure


**JÜLICH-HI ERN - Amanda**

JÜLICH

- Automated research line for the fully automatic processing and characterization of Perovskite solar cells.
- Production of larger sample sets of identical devices for stability studies
- Accessed through a browser-based web portal that allows for large scale design of experiments and access to the experimental data.


**JÜLICH-HI ERN - R2R-Coating-Line**

JÜLICH

- An highly advanced r2r-coating-line for the upscaling of solution processed semiconductor based solar cells for the upscaling into modules
- Preparation and characterization of thin solution processed films, development of new coating and printing processes and Electrode materials
- Scaling of printed cell layers to industrially relevant sizes (approx. 30 x 30 cm<sup>2</sup>)

**Infrastructures organization**

- [HZB - Infrastructure](#)
- [AIT - Infrastructure](#)
- [CEA - Infrastructure](#)
- [GENER - Infrastructure](#)
- [CSEM - Infrastructure](#)
- [EPFL - Infrastructure](#)
- [IMEC - Infrastructure](#)
- [FRAUNHOFER - Infrastructure](#)
- [JÜLICH- HIERN - Infrastructure](#)
- [UNITOV - Infrastructure](#)
- [TNO - Infrastructure](#)
- [ENEA - Infrastructure](#)
- [SU - Infrastructure](#)

You are here: Home / Apply for access / Infrastructure catalogue / All infrastructures / JÜLICH-HI ERN - Amanda


**JÜLICH-HI ERN - Amanda**

**Infrastructures organization**

- [HZB - Infrastructure](#)
- [AIT - Infrastructure](#)
- [CEA - Infrastructure](#)
- [GENER - Infrastructure](#)
- [CSEM - Infrastructure](#)
- [EPFL - Infrastructure](#)
- [IMEC - Infrastructure](#)
- [FRAUNHOFER - Infrastructure](#)
- [JÜLICH- HIERN - Infrastructure](#)
- [UNITOV - Infrastructure](#)
- [TNO - Infrastructure](#)
- [ENEA - Infrastructure](#)
- [SU - Infrastructure](#)

The VA facility AMANDA is an automated research line for the fully automatic processing and characterization of Perovskite solar cells. The line will be used both for process development and optimization of Perovskite devices, as well as the production of larger sample sets of identical devices for stability studies. As a VA AMANDA is accessed through a browser-based web portal that allows for large scale design of experiments and access to the experimental data.



[more detail](#)

**Figure 2.4 VIPERLAB project web site: infrastructures' area**



## 2.6 Joint Research activities

The following JRA are described in the web site:

- Advanced device processing
- Materials and device Characterization
- Testing and Standardization
- Environmental, Social, and economic impact

The common elements that distinguish the communication regarding JRAs are the following:

- Relevance of the topic for the perovskite PV RTD and in general
- Technical/scientific key points aren't addressed yet and/or they should be addressed better
- How the activities are organized in VIPERLAB project
- What new and better than before is VIPERLAB proposing
- How and why our work will produce a progress beyond the state of art

## 2.7 Networking activities

It's commonly agreed that harmonized test procedures and -protocols are essential to successfully bring a new technology into the market. In this web page it has been highlighted that the harmonization & standardization activities in VIPERLAB shall facilitate and simplify trans-national and virtual access to infrastructures, and improve the comparability of device parameters by harmonizing procedures and test protocols to increase innovation speed of perovskite PV RTD. This web page informs that to successfully achieve these goals, in VIPERLAB, we:

- will develop test procedures and harmonized protocols according to best practices and beyond state-of-the-art knowledge;
- Organize networking events for project partners, industry and other external stakeholders; and publish freely accessible reports and white papers on harmonized test protocols and/ or procedures for the actual and most promising novel perovskite-based PV devices.

## 2.8 News

This section of the website concerns the organization of the main information supplied to the web user about the following categories of news/posts

- **Project updates** (ie the launch of calls, project web site, and KEP launch, etc)
- **Project scientific outcomes** (technical scientific outcomes achieved by the project)
- **Our users' outcomes** (technical scientific outcomes reached by organizations and researchers use our infrastructures)
- **Networking activities** (new procedures available, RR launched, job opportunities collaboration with other networks, etc)



- **News on line** (relevant information concerning outcomes reached by non VIPERLAB members, other relevant information useful for Perovskite PV RTD community)

## 2.9 Events

Participation at different events is crucial for the dissemination and communication activities due to the wide audience and high outreach in terms of spreading the project outcome and results. Furthermore, it ensures high project and consortium visibility, creates potential opportunities for stakeholder engagement and business networking.

The VIPERLAB PWS will propose the most relevant and specialized conferences to disseminate the results and attract the interests of relevant stakeholders.

The platform leaves to KEP the management of the webinars by just promoting the events within its events web pages.

## 3 Contribution to the PWS by the project members

### ENEA

#### Leader of WP5

The expert responsible for the web site on behalf of ENEA and the consortium, is Massimo Izzi, a skilled scientist involved in communication and dissemination activities. He has been also the WP leader for the Communication and the dissemination of H2020 Ampere project.

Francesco Roca, a specialized Scientist involved in several projects as a leader for the communication, dissemination, and training. In VIPERLAB Dr Roca is the Communication and Dissemination manager and he has followed the PWS set up and he will continue to assure that the best strategies will be put on the ground for the most impacting effect of the VIPERLAB PWS.

For the communication and dissemination activity the ENEA VIPERLAB technical/scientific team is collaborating with the ENEA Communication and promotion unit REL-PROM (lead by Arch Paola Giaquinto). This team has four members skilled in web site development and marketing activity.

### PNO

#### Responsible for dissemination activities

#### Leader of Task NA2.2 Dissemination activities

PNO will lead the implementation of an appropriate dissemination strategy also by using the web site aiming to promote the visibility of VIPERLAB's research infrastructures and exploitation of the Project's results, in order to translate them into market opportunities.





## Communication and dissemination working group

This group (in short C&D WG) will support the effective communication between all partners, and outside the consortium, by proposing dedicated initiative to disseminate the outreach of the project activities, to create interest and raise awareness among the relevant stakeholders and policymakers. The group will help in gathering material for the website and other dissemination channels (outreach, news, events, and launch of the website).

Members of the Communication and Dissemination Working Group are:

- Project Coordinator & Project Manager, HZB
- WP5 leader: Communication and Disseminating manager, ENEA
- NA2.2 -Dissemination activities task leader, PNO
- WP6 leader: Community building and exploitation, IMEC
- Exploitation manager, CENER
- A representative from BI

All WPs and Task leaders are involved in pushing all participants in disseminating and communicate the information and the outreaches of the whole project.

## Remaining partners

- Assist in the preparation of communication and dissemination info content
- Provide regular updates with regards to the respective task they are involved
- Presenting project achievements and results to be disseminated by VIPERLAB PWS.
- Promote by their institutional C&D Channels, VIPERLAB PWS and its proposed information

## 4 Conclusion and further steps

The main purpose of the VIPERLAB PWS is to promote project objectives, messages and activities being used as the main channel for disseminating outcomes and achievements. The website will represent the heart of the VIPERLAB Communication and dissemination strategy around which all other communication tools will be deployed and will refer back to it as the landing/take off area to get more information.

In this document we have presented the VIPERLAB PWS providing a description of its structure, sections and contents. Additionally, we have provided an overview of the components and methodology we have used to design the website. The consortium will continue looking through the whole remaining course of the project for features that could be integrated to it in order to provide an enhanced experience to the web user



## ANNEX 1.

### Best practice in web Communication-dissemination of projects

#### FP7-CHEETAH & CHEETAH-KEP

|                 |   |   |
|-----------------|---|---|
| CHEETAH Project | <a href="http://www.cheetah-project.eu/">http://www.cheetah-project.eu/</a>     | Cost-reduction through material optimisation and Higher EnERgy output of solar pHotovoltaic modules - joining Europe's Research and Development efforts in support of its PV industry |
| CHEETAH-KEP     | <a href="https://www.cheetah-exchange.eu/">https://www.cheetah-exchange.eu/</a> | CHEETAH Knowledge Exchange Platform (KEP)   |

#### List of selected H2020- INFRAiA projects web sites

|    | PROJECT        | Web site  | Project description  |
|----|----------------|---|--|
| 1  | ESTEEM3        | <a href="https://www.esteem3.eu/">https://www.esteem3.eu/</a>                               | ESTEEM3 – Enabling Science and Technology through European Electron Microscopy   |
| 2  | SFERA-III      | <a href="https://sfera3.sollab.eu/">https://sfera3.sollab.eu/</a>                           | Solar Facilities for the European Research Area - Third Phase  |
| 3  | EASI-Genomics  | <a href="https://www.easi-genomics.eu/home">https://www.easi-genomics.eu/home</a>           | European Advanced infraStructure for Innovative Genomics   |
| 4  | ARIADNEplus    | <a href="https://ariadne-infrastructure.eu/">https://ariadne-infrastructure.eu/</a>         | Advanced Research Infrastructure for Archaeological Data Networking in Europe - plus   |
| 5  | EurofleetsPlus | <a href="https://www.eurofleets.eu/">https://www.eurofleets.eu/</a>                         | An alliance of European marine research infrastructure to meet the evolving needs of the research and industrial communities |
| 6  | SOLARNET       | <a href="https://solarnet-project.eu/">https://solarnet-project.eu/</a>                     | SOLARNET Integrating High Resolution Solar Physics   |
| 7  | EMP            | <a href="https://emplatform.eu/">https://emplatform.eu/</a>                                 | European Microkelvin Platform  |
| 8  | EPIC-XS        | <a href="https://epic-xs.eu/">https://epic-xs.eu/</a>                                       | European Proteomics Infrastructure Consortium providing Access   |
| 9  | RADIATE        | <a href="https://www.ionbeamcenters.eu/radiate/">https://www.ionbeamcenters.eu/radiate/</a> | Research And Development with Ion Beams – Advancing Technology in Europe   |
| 10 | IS-ENES3       | <a href="https://is.enes.org/">https://is.enes.org/</a>                                     | Infrastructure for the European Network for Earth System modelling - Phase 3   |



|    |                 |   |   |
|----|-----------------|---|---|
| 11 | STRONG-2020     | <a href="http://www.strong-2020.eu/">http://www.strong-2020.eu/</a>   | The strong interaction at the frontier of knowledge: fundamental research and applications                                  |
| 12 | RISIS 2         | <a href="https://www.risis2.eu/">https://www.risis2.eu/</a>   | European Research Infrastructure for Science, technology and Innovation policy Studies 2                                    |
| 13 | SYNTHEsys PLUS  | <a href="https://www.synthesys.info/">https://www.synthesys.info/</a>   | Synthesis of systematic resources   |
| 14 | SERA            | <a href="http://www.sera-eu.org/en/home/">http://www.sera-eu.org/en/home/</a>                                 | Seismology and Earthquake Engineering Research Infrastructure Alliance for Europe   |
| 15 | INEXT-Discovery | <a href="https://inext-discovery.eu/network/inext-d/home">https://inext-discovery.eu/network/inext-d/home</a> | Structural biology for Translational Research and Discovery   |
| 16 | AQUAEXCEL2020   | <a href="https://www.aquaexcel2020.eu/">https://www.aquaexcel2020.eu/</a>                                     | AQUAculture infrastructures for EXCELlence in European fish research towards 2020   |
| 17 | EU_FT-ICR_MS    | <a href="https://www.eu-fticr-ms.eu/">https://www.eu-fticr-ms.eu/</a>   | European Network of Fourier-Transform Ion-Cyclotron-Resonance Mass Spectrometry Centers                                     |
| 18 | AQUACOSM        | <a href="https://www.aquacosm.eu/">https://www.aquacosm.eu/</a>   | Network of Leading European AQUAtic MesoCOSM Facilities Connecting Mountains to Oceans from the Arctic to the Mediterranean |
| 19 | AHEAD           | <a href="https://www.ahead-project.net/">https://www.ahead-project.net/</a>                                   | Integrated Activities for the High Energy Astrophysics Domain   |
| 20 | SoBigData       | <a href="http://project.sobigdata.eu/">http://project.sobigdata.eu/</a>                                       | SoBigData Research Infrastructure   |
| 21 | SLICES - SC     | <a href="https://slices-sc.eu/">https://slices-sc.eu/</a>   | Scientific Large-scale Infrastructure for Computing/Communication Experimental Studies – Starting Community                 |
| 22 | AIDA-2020       | <a href="https://aida2020.web.cern.ch/aida2020/">https://aida2020.web.cern.ch/aida2020/</a>                   | Advanced European Infrastructures for Detectors at Accelerators   |
| 23 | NFFA-Europe     | <a href="https://www.nffa.eu/">https://www.nffa.eu/</a>   | NANOSCIENCE FOUNDRIES AND FINE ANALYSIS - EUROPE  |
| 24 | LASERLAB-EUROPE | <a href="https://www.laserlab-europe.eu/">https://www.laserlab-europe.eu/</a>                                 | The Integrated Initiative of European Laser Research Infrastructures  |
| 25 | EUMarineRobots  | <a href="https://www.eumarinerobots.eu/">https://www.eumarinerobots.eu/</a>                                   | Marine robotics research infrastructure network   |
| 26 | ACTRIS-2        | <a href="https://www.actris.eu/">https://www.actris.eu/</a>   | Aerosols, Clouds, and Trace gases Research InfraStructure   |
| 27 | CALIPSOplus     | <a href="http://www.calipsoplus.eu/">http://www.calipsoplus.eu/</a>   | Convenient Access to Light Sources Open to Innovation, Science and to the World   |




|    |           |   |   |
|----|-----------|---|---|
| 28 | EUSMI     | <a href="https://eusmi-h2020.eu/">https://eusmi-h2020.eu/</a>                                 | European infrastructure for spectroscopy, scattering and imaging of soft matter                               |
| 29 | EVAg      | <a href="https://www.european-virus-archive.com/">https://www.european-virus-archive.com/</a> | European Virus Archive goes global  |
| 30 | JERICO-S3 | <a href="https://www.jerico-ri.eu/">https://www.jerico-ri.eu/</a>                             | Joint European Research Infrastructure of Coastal Observatories: Science, Service, Sustainability - JERICO-S3 |

### Examples of Web sites designed, realized and managed by ENEA

|    | Project       | Web site  | Description  |
|----|---------------|---|--|
| 1  | ENEA web site | <a href="https://www.enea.it/it">https://www.enea.it/it</a><br><a href="https://www.enea.it/en">https://www.enea.it/en</a>      | ENEA web site  |
| 2  | ENEA KEP      | <a href="https://www.kep.enea.it/">https://www.kep.enea.it/</a>   | ENEA Knowledge Exchange programme for SMEs   |
| 3  | ENEA EAI      | <a href="https://www.eai.enea.it/">https://www.eai.enea.it/</a>   | ENEA Energia Ambiente ed Innovazione magazine  |
| 4  | AMPERE        | <a href="https://www.ampere-h2020.eu/partners.html">https://www.ampere-h2020.eu/partners.html</a>                               | Automated photovoltaic cell and Module industrial Production to regain and secure European Renewable Energy Market |
| 5  | EIT RawM      | <a href="https://www.eitrawmaterials-rcsi.eu/">https://www.eitrawmaterials-rcsi.eu/</a>   | EIT RawMaterials Hub - Regional Center Southern Italy  |
| 6  | MILEDI        | <a href="https://www.miledi-h2020.eu/">https://www.miledi-h2020.eu/</a>   | Micro Quantum Dot-Light Emitting Diode and Organic Light Emitting Diode Direct Patterning (MILEDI)                 |
| 7  | RISEN         | <a href="https://www.risen-h2020.eu/consortium.html">https://www.risen-h2020.eu/consortium.html</a>                             | Real-time on-site forensic trace qualification   |
| 8  | METROFOOD     | <a href="https://www.metrofood.eu/preparatory-phase/partners.html">https://www.metrofood.eu/preparatory-phase/partners.html</a> | Infrastructure for Promotion Metrology In Food And Nutrition   |
| 9  | ENEA SSPT     | <a href="https://sostenibilita.enea.it/e">https://sostenibilita.enea.it/e</a>   | ENEA Department for Sustainability   |
| 10 | RISEUP        | <a href="https://riseup-project.eu/">https://riseup-project.eu/</a>   | Regeneration of Injured Spinal Cord By Electro Pulsed Bio-Hybrid Approach  |



# ANNEX 2. Template utilized to collect information about each VIPERLAB Consortium member



VIPERLAB PROJECT WEB SITE  
VIPERLAB KNOWLEDGE EXCHANGE PLATFORM  
REPOSITORY OF DATA.

### ORGANIZATION DESCRIPTION

| #1 - HZB                          | VIPERLAB main contact point(s) |
|-----------------------------------|--------------------------------|
| Name                              |                                |
| Surname                           |                                |
| Role in the organization          |                                |
| Role in the project if any        |                                |
| Email                             |                                |
| External link to his/her profile* |                                |

We mean an updated link to the web site of your organization or [LinkedIn](#), [ORCID](#), [Research Gate](#), [Ea](#), select only one, [the best can reach under professional networking](#)

| 1 - HZB                 |   |
|-------------------------|---|
| Organization short name | HZB   |
| Organization legal name | Helmholtz-Zentrum Berlin für Materialien und Energie GmbH   |
| Country                 | Germany   |
| Website                 | <a href="https://www.helmholtz-berlin.de">https://www.helmholtz-berlin.de</a>   |
| LinkedIn                | <a href="https://www.linkedin.com/company/helmholtz-zentrum-berlin">https://www.linkedin.com/company/helmholtz-zentrum-berlin</a> |
| Twitter                 | <a href="https://twitter.com/HZB.de">https://twitter.com/HZB.de</a>   |
| Facebook                | <a href="https://www.facebook.com/HZB.de/about">https://www.facebook.com/HZB.de/about</a>   |




**Description of the legal entity**  
Helmholtz-Zentrum Berlin für Materialien und Energie GmbH (HZB) is a legally independent member of the Helmholtz Association of German Research Centres (HGF), financed by the Federal Government (90%) and the State of Berlin (10%), and has an annual budget of approx. 150 million € with ca. 1,100 employees. HZB operates BESSY II, which is a third-generation synchrotron radiation source that produces extremely bright X-ray light, and offers access and user support to ca. 3,000 user visits per year.


In the focus of HZB's energy materials research are materials for energy conversion (solar cells) and storage (solar fuels, electrochemical storage), as well as quantum materials (spintronics) that could be of relevance in novel, energy-efficient information technologies. Catalysis materials are also being developed at HZB, for example for artificial photosynthesis and processes for CO<sub>2</sub> conversion. Research on energy materials is closely connected with the operation and development of the BESSY II photon source and dedicated unique infrastructures like EMIL, HySPRINT, or the Berlin Joint EPR Lab. The research and development approach focus on thin-film technologies. HZB's Competence Centre Thin-Film- and Nanotechnology for Photovoltaics Berlin (EViComb) develops photovoltaic technologies and products jointly with industry. It has made significant contributions to the field of photovoltaic module technologies and related production processes and has now extended its contribution to neighbouring fields such as Building Integrated Photovoltaics (BIPV).

**Main role and tasks in the project**

- Project coordination (Lead WP 1): HZB shall provide the administrative and scientific coordination of the project ensuring that the objectives and milestones of the project are efficiently and effectively met, on time and within budget. Additionally, HZB will promote efficient communication flows within the consortium guaranteeing that each partner is well informed of the project progress, understands its role and contractual obligations in the project, and is aware of the requests and information from the EC.
- HZB will lead WP2-TA1 contributing with its expertise in the management of the proposals through the unique point (GATE) and providing access to VIPERLAB's research infrastructures. HZB will publicize the calls and elaborate the standardized routine of evaluation for user's proposal for transnational and virtual access. xxxxx
- HZB will contribute to the following WPs: in WP3-JRA1, by enabling access to its [HySPrint](#) - Perovskite Database and [contibuting](#) to the development of guidelines for virtual access through the [VABA](#) (Virtual Access Point).
- HZB will actively support the Joint Research Activities in VIPERLAB: In WP7 by leading task JRA1.1 where the perovskite database will be [set up](#) and will correlate device architectures, material properties, and fabrication protocols to device properties and summarize this information in [data studies](#). In WP9-JRA3, by leading task JRA3.4 on advance spectroscopic characterization of device degradation where protocols for testing procedures will be developed. Additionally, will contribute to tasks JRA3.2 and JRA3.3 with its expertise in aging protocols and encapsulation methods. In WP10-JRA4, by supporting task JRA4.2 and JRA4.4 where environmental and social impact will be assessed.

**Profile of persons primarily responsible for carrying out the proposed activities**

|  |  |
|--|--|
| <br><b>Prof. Dr. Rutger</b>   | <p><b>Scientific degree:</b><br/>MSc in physics at the University of Groningen (1991). PhD in physics at the FOM Institute AMOLF/Vrije Universiteit in Amsterdam (1995).</p> <p><b>Previous position:</b><br/>Staff scientist Akzo, Nobel corporate research (1998-1999). R&amp;D manager at solar cell company Hellanfos EV (Akzo Nobel/Shell Solar)</p> <p><b>Current positions:</b><br/>Founder director of the institute EViComb at HZB (since 2008)<br/>Speaker of the renewable energy division at HZB (since 2017)<br/>Full professor (W3) Photovoltaic Technology at the <a href="#">Hochschule für Technik und Wirtschaft Berlin</a> (since 2012)<br/>Member of the ETIP PV, the European Technology &amp; Innovation Platform Photovoltaics (since 2014), member of the Executive Committee and leader of the working group Integrated Photovoltaics (since 2018).</p> <p><a href="#">Email</a><br/><a href="#">An External link for networking??? (personal web page in the organization) LinkedIn, etc. etc.</a></p> |
| <br><b>Dr. Eva UNGER (F)</b><br>Young Investigator Group Leader: Hybrid Materials Formation and Scaling | <p><b>Scientific degree:</b><br/>Dipl. Chem., Philipps Universität Marburg, Germany (2007)<br/>PhD in Chemistry, Uppsala University, Sweden, (2012)</p> <p><b>Previous positions:</b><br/>Scientist at Lund University (2014-2016)<br/>Scientist at Stanford University (2012-2014)</p> <p><b>Current position:</b><br/>Head of Young Investigator Group Hybrid Materials Formation and Scaling (EE-NYFS) at HZB (since 2017)<br/>Ass. Sen. Lecturer at the Department of Chemistry, Lund University (since 2014)<br/>Associated with Humboldt <a href="#">Umweltakademie</a> Berlin (<a href="#">Umweltakademie</a>, since 2017)</p> <p><a href="#">Email</a><br/><a href="#">An External link for networking??? (personal web page in the organization) LinkedIn, etc. etc.</a></p>  |
| <br><b>Dr. Antonio ABATE (M)</b> ,<br>Head of Young Investigator Group, Helmholtz-Zentrum Berlin        | <p><b>Scientific degree:</b><br/>PhD in Chemistry, Politecnico di Milano (2011) Master's and of Materials Engineering, University of Naples Federico II (2006) Bachelor's of Materials Science, University of Naples Federico II (2004)</p> <p><b>Previous positions:</b><br/>Team leader, University of Fribourg, <a href="#">Adolfo Merello</a> Institute (2016-2017);<br/>Post-Doctoral Marie Curie Research Fellow, EPFL (2014-2016);<br/>Post-Doctoral Research Scientist, University of Cambridge (2013-2014);<br/>Post-Doctoral Research Scientist, University of Oxford (2011-2013)</p> <p><b>Current position:</b><br/>Assistant Professor University of Naples Federico II (since 2018);<br/>Head of Young Investigator Group, Helmholtz-Zentrum Berlin (since 2017);<br/>Visiting professorship, Fuzhou University (since 2017)</p> <p><a href="#">Email</a></p>  |

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| <br><b>Prof. Dr.-Ing. Marcus BAR (M)</b><br>Head of Dept. "Interface Design" | <p><a href="#">An External link for networking??? (personal web page in the organization) LinkedIn, etc. etc.</a></p> <p><b>Scientific degrees:</b><br/>Dr.-Ing. Electrical Engineering TU Berlin (2004);<br/>Dipl.-Ing. (FH) Environmental Engineering Renewable Energy, University of Applied Sciences (FH) Berlin (1999)</p> <p><b>Previous positions (two selected):</b><br/>Junior professor, <a href="#">Institut für Physik und Chemie</a>, BTU Cottbus (2011-2017);<br/>Research Assistant Professor, Dept. of Chemistry, University of Nevada, Las Vegas, USA (2007-2009).</p> <p><b>Current positions:</b><br/>Head of Department "Interface Design" at HZB (since 2018);<br/>Head of Research Department "X-ray Spectroscopy at Interfaces of Thin Films" at Helmholtz Institute Erlangen-Nürnberg for Renewable Energy (since 2018);<br/>Professor for X-ray Spectroscopy, Friedrich-Alexander <a href="#">Universität Erlangen-Nürnberg</a> (since 2018).</p> <p><a href="#">Email</a><br/><a href="#">An External link for networking??? (personal web page in the organization) LinkedIn, etc. etc.</a></p> <p><b>Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work</b><br/><b>EMIL (Energy Materials In Situ Lab Berlin)</b><br/>EMIL at BESSY II combines industry-relevant deposition tools that are in-system connected to off- and on-synchrotron analysis chambers providing a complementing set of photon-in-electron-out and photon-in-photon-out spectroscopic techniques that make full use of the "two-color" beamline that allows a "depth-dependent" characterization of thin-film layer stack samples using an x-ray photon energy range from the soft (80 eV) to the hard (10,000 eV) x-ray energy regime. EMIL is thus particularly well suited for in-system, in-situ, and operando characterization of energy conversion materials and structures revealing their chemical and electronic structure (incl. energy level alignment), etc. EMIL is expected to be fully operational by 2021.</p> <p><b>HySPRINT-Stability Lab</b><br/>The Helmholtz Innovation Lab <a href="#">HySPRINT</a> provides a unique infrastructure with the purpose to test and age perovskite solar cells (PSC) for the improvement of device stability under realistic ageing conditions at high device numbers allowing high throughput as well as a high level of statistical confidence. The system is designed for long-term measurements and ageing of single junction PSC and monolithic tandem solar cells (e.g. PSK/Silicon and PSK/CIGS) under realistic conditions. Solar cells in power plants are operated at their Maximum Power Point (MPP). It was found that the stability of PSC is strongly dependent on the electric load applied while the ageing test is performed. Thus,</p> |
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only MPP-Tracking will give realistic predictions of cell lifetime. Our High-Throughput Aging-System is equipped with electronics that allow us to MPP-track more than 500 solar cells in parallel. Testing is performed under AM1.5G light with 1-2 suns intensity. The sample environment can be set to nitrogen, other gases or air. The substrate temperature is permanently controlled between 0-85°C. Sequential JV scans can be performed to gain further insights into device behaviour. **Voc**, **Jsc**, and constant voltage ageing is also possible.

The Tandem Ageing-System is equipped with electronics that allow us to track 4 tandem solar cells in parallel. As the performance of monolithic tandem solar cells is strongly dependent on the utilized spectrum, an array of 193 LEDs with two different peak wavelengths was engineered. The 470 nm and 940 nm centre emission wavelengths are absorbed in the top- and bottom cell, respectively. Both intensities can be tuned independently to adjust the desired photocurrents of the subcells. With this, we can artificially induce a mismatch between the subcells in a controlled way. The cells are measured in ambient conditions with a controlled temperature of 25°C.

### HySPRINT – Perovskite Database

Perovskite Database, led by HZB, rely on a team of approx. 100 collaborators world-wide that collectively are extracting all perovskite solar cell device data available in the over 15000 published perovskite papers. The extracted data includes metadata describing the devices, e.g. architecture, stack sequence, and deposition procedures, doping, and key characteristics for every layer in the stack, as well as key metrics for the device performance including for example efficiency and stability. The extracted data is codified and stored in an openly available database. Accompanying this database is a web page and interactive graphics which enable anyone to download, analyse, and learn from the data, as well as interactively slice and dice the data set in any way imaginable.

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