CRESYM

Annual Report 2025

19/01/2026

CRESYM – Annual Report 2025

Foreword of the President

Having now passed its three-year milestone, 2025 marks a moment of consolidation and acceleration for our Association. The foundations laid since our launch are now translating into tangible impact: broader membership, a stronger international presence, and a maturing portfolio of research, tools and collaborative initiatives. What began as an emerging ecosystem is now a recognised, structured and productive alliance serving the energy transition.

In 2025, the Association welcomed 17 new members, expanding its network to 39 organisations active in 13 countries and consolidating its international reach. Our model of collaborative innovation continued to attract both industrial and academic partners, with 9 additional organisations joining as observers and actively contributing to our technical and strategic discussions.

A highlight of the year was our cresROADS seminar held in Brussels, which gathered more than 80 people, twice as much than in 2024, reflecting the growing interest and engagement of our community. Building on this success, we look forward to welcoming members and partners to the next cresROADS seminar in Barcelona in 2026.

Since its birth in 2023, CRESYM launched 15 R&I projects funded by its members. With the perspective of bringing our results up to TRL 8 within 3-4 years to make them available to the industry and leveraging with the 2026-2027 Horizon Europe programme, the 30 participants at our Association's winter seminar decided about an additional action portfolio of 12 projects, for 4.6 M€ over 2026-2028.

In 2025, our staffing levels remained stable, while our footprint expanded with a new presence in Belgium alongside France, Greece, the Netherlands and Spain. This consolidation phase sets the stage for strong growth, with a significant reinforcement of the team planned for 2026 to support CRESYM's growing ambitions and activities.

Training activities accelerated as well. Following the successful launch in 2024, CRESYM delivered three acclaimed additional sessions of the Power System Dynamics course in 2025. The Association continued to strengthen its training offer by developing a new training course on Power System Oscillations, delivered for the first time in December. Our visibility also increased through active participation in major scientific and industry events, notably the LFE Summit in September.

Looking ahead, 2026 will see the launch of new, ambitious initiatives, deepening our technical expertise, expanding our partner network, and continuing to build shared tools and knowledge for a secure, efficient, and sustainable energy system. Together, we will keep turning research excellence into real-world impact.

1. Introduction

This Annual Report provides an overview of CRESYM's action for its third year, from January to December 2025.

The report highlights in successive sections the Association's mission, the evolution in its membership, its R&I projects, its networking & training activities, its organisation to sustain R&I results and finally corporate matters.

All acronyms are defined in Appendix 1.

2. CRESYM in a nutshell

2.1. What is CRESYM?

CRESYM (Collaborative Research for Energy System Modelling) is a **non-profit** association, gathering **industry players** & **research organisations** and aiming at undertaking **research actions** and ultimately solving the coming challenges for the future, fast-evolving European energy system.

2.2. CRESYM's ambition

CRESYM aims to **unite** all need-owners and solution-developers and **catalyse** the development of energy system modelling and simulation **opensource**, non-viral bricks required by the energy transition worldwide.

2.3. CRESYM's mission

CRESYM fosters collaborative R&I actions to deliver opensource energy system simulation tools on low-TRL R&I issues of general interest (the '**Projects**").

CRESYM maintains useful technological building blocks available for all researchers & engineers (the "**Assets**"). As of 2024, COLib (the Collaborative Opensource Library of power system component models) and CReDIT (Common Results, Data, Information and Tools) are live.

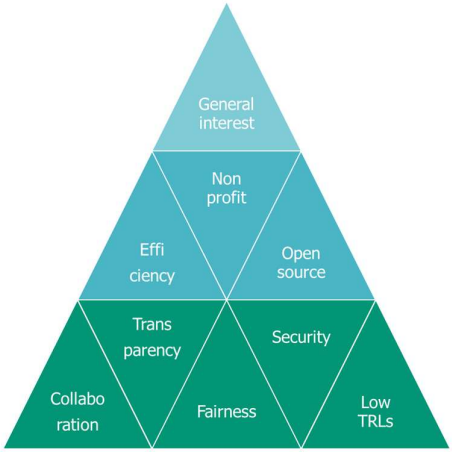
CRESYM manages thematic doctoral networks, be they supported by the EU Horizon Europe program or self-funded by CRESYM, to augment the value of our R&I actions for researchers and to foster serendipity (the "**DoNets**").

2.4. CRESYM's values

CRESYM is **non-profit** and acts **transparently** for the **general interest**, addressing new and/or complex, **low TRL**, technical challenges.

CRESYM reconciles **security** and IPRs when developing **opensource** deliverables. Opensource, non-viral licences are key to ease the dissemination among operators, manufacturers and vendors in a fair, neutral manner.

CRESYM organises **collaborative**, **efficient** R&I works, with practical intermediary outputs. CRESYM builds up on, as well as comforts, supports and promotes other existing opensource initiatives.



CRESYM is committed to protecting **privacy** and promoting **diversity & gender equality**.

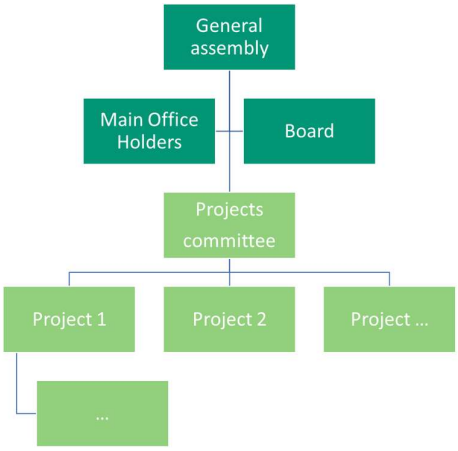
2.5. CRESYM's governance

On behalf of its General Assembly, CRESYM is run by a Board of Directors. The Board appoints a General Manager to manage daily operation.

In 2024, Prof. Antonello Monti and Prof. Peter Palensky were re-elected as President and Vice President respectively for two-year mandates.

With the support of CRESYM's Scientific Advisor, CRESYM's **Project Committee** is in charge of the general organisation of R&I projects: the identification of new topics, the supervision of every project agreement drafting, and the overall consistency of the R&I work program, ensuring that all critical issues are addressed – by CRESYM or other organisations –, efficiently and with **no overlapping** of efforts.

Every project is independent from another and is managed by its participants autonomously, though obeying to one same agreement structure as all others launched by the Association.



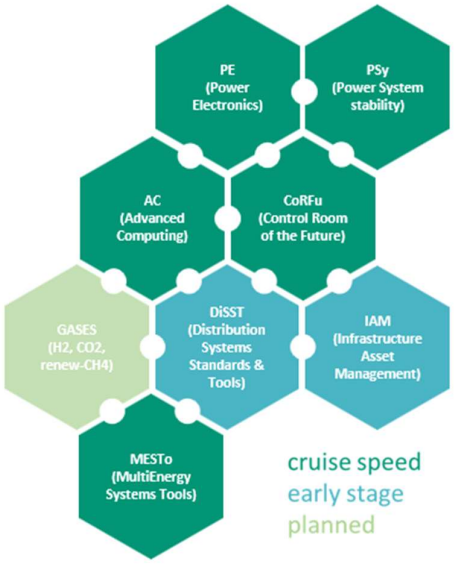
2.6. CRESYM's organisation

CRESYM's collaborative model ensures that members actively contribute to shaping research priorities and solutions. Our **focus groups** operate as structured communities where industry and academic experts jointly identify challenges and opportunities, guiding the Association's strategic and operational decisions. In practice:

- Every member staff can elect one or more groups to attend;
- Every focus group debates **pain statements** of industry parties;
- Every focus group debates specific **research opportunities**;
- Every focus group is represented at Project Committee and Board levels.

The Project Committee role was adapted accordingly:

- The Project Committee debates the opportunity to launch new focus groups.
- The Project Committee also consolidates the proposals stemming from the focus groups, and sketches the common budget money allocation options among them.



3. Membership & partnerships

3.1. 8 founding fathers in 2022, 12 members end 2023, 22 end 2024, 39 end 2025

CRESYM was founded in 2022 by four research institutions – RWTH Aachen (DE), TU Delft (NL), Uni. Ljubljana (SI), Fraunhofer (DE) – and four industrial players, namely four European Transmission System Operators for electricity – ELES (SI), RTE (FR), swissgrid (CH), TenneT bv (NL).

Four new members joined the Association in 2023, ten in 2024 and seventeen others in 2025:

- Strategic Members: Amprion (DE), SSEN-T (UK), Tennet GmbH (DE) ;
- Industrial Members: Admie (GR), Artelys (FR), EDF R&D (FR), eRoots Analytics (ES), OPAL-RT (CA), SPEN (UK), Toshiba GmbH (DE);
- Research Institution Members: CIRCE (ES), EC Lille (FR), ETH Zürich (CH), Polytechnique Montreal (CA), SuperGrid Institute (FR), TU Eindhoven (NL), U. Duisburg-Essen (DE).

The Association now counts representatives of every segment of the energy sector: grid operators, OEMs, consultants, market players, etc.

3.2. After 6 in 2024, 9 organisations became observers in 2025

CRESYM created in 2024 an "**observer**" status.

For the mere signature of the Association's Non-Disclosure Agreement, every Observer can join the internal conversations together with other Observers and Members. Confidentiality is ensured for all.

Joining a project however requires in practice an organisation to become a member.

After 6 in 2024, **9 organisations** became Observers in 2025 to foster their quick participations to expert debates: GridDigit (HU), Center for Net Zero (UK), Phasecraft (UK), IRT-SystemX (FR), Mines PSL (FR), Envelio (DE), Elia Group (BE, DE), R&D Nester (PT); Dowel (FR) also signed our NDA to support the drafting of action proposals to answer European calls for projects.

CRESYM 39 members end 2025

3.3. CRESYM value for its members

CRESYM is all about **leveraging**, aiming to make R&I happen on energy systems.

A typical industrial member spends 100-400 k€/yr in CRESYM on the projects of its choice and thanks to the **fund pooling**, gets for every euro spent a value of about **4 to 1**. Additional leverage comes from the common pot funding (~0.7 M€ over 2023-2025… plus 2.7 M€, 4 times as much, over 2026-2030?), the complementation with publicly funded R&I, and the complementary positioning of the members (low vs high TRLs, expertise, etc.).

Research Institutions can balance their membership fees (5 k€/yr) by receiving typically between 75 and 200 k€ of funded R&I in member-funded projects. Additional leverage comes from privileged interaction with the industry and additional valuation of otherwise developed assets.

Low fees make every member fully in control about their actual financial involvement.

Beyond the financial leverage, CRESYM also basically offers to its members a **neutral platform** where they are all equal (with no primus inter pares); where **diverse** types of organisations can partner up beyond their usual peers, **crosscutting** all segments of the energy sector from vendors to end industrial users, be they regulated businesses or in competition.

By construction, CRESYM is an **agile** toolkit, effectively **facilitating** the **swift organisation of projects**. Its specific setup especially pre-solves confidentiality, governance, IP sharing, procurement, accounting and invoicing issues, so that project launch within the Association is reduced to a mere discussion between engineers and scientists, alleviating the burden on legal and accounting departments. Among the 18 ongoing projects since 2023, 4 were launched in less than a month!

Beyond projects, members also take advantage of the networking opportunities, especially for researchers, a praised training offer and the Association's ability to sustain R&I projects legacies.

As a result, the Association grew again significantly in 2025 (39 members vs 22 in 2024), and talks are opened with about ten organisations in Europe and beyond.

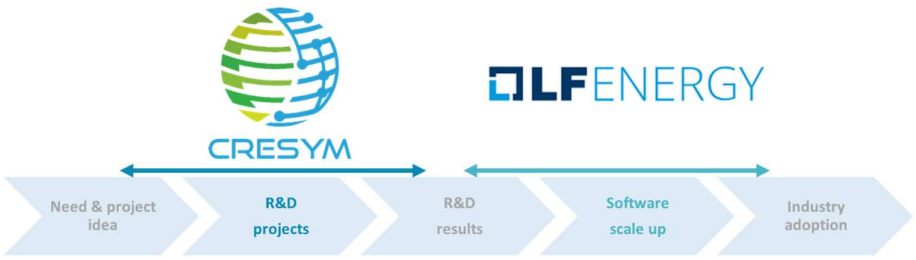
New members would however only join if they can take immediate advantage of the Association, also if joining a project at the same time; and provided that the Association's balance (50% research institutions/50% industrial partners) is ensured.

3.4. Partnerships

In 2025, CRESYM consolidated its partnership with the Linux Foundation for Energy (**LFE**).

Both LFE and CRESYM focus on the digitalisation of the energy sector and promote open-source philosophy and methodologies to achieve it; and both have to date two founding fathers and many more member organisations in common. The two organisations complete each other, as CRESYM's business is to foster, organise and implement collaborations on research works at lower TRL level; while LFE provides a framework for otherwise set-up collaborations to develop their action at higher TRL level, according to the best development standards.

CRESYM and LFE now coordinate efforts monthly. 2026 should see the launch of new projects: the push to LFE's PowSyBl (power system data management) with **DC-BL**; the chaining of LFE PowSyBl and LFE Dynawo (power system dynamic simulation package) to LFE GridFM (foundation models for power systems) through **Path2Gfm**; **D-GITT** the grid description chapter of LFE Opensynth; and **AI.grids**, the European pillar of LFE GridFM.



CRESYM coordinates its action with the Global Power System Transformation Partnership (**GPST**) community, on Control Room of the Future matters and again with the integration of COLib with GPST's pillar 5 data & tool portal in 2025.

Contact is made with **ISON** (the Independent System Operator Network).

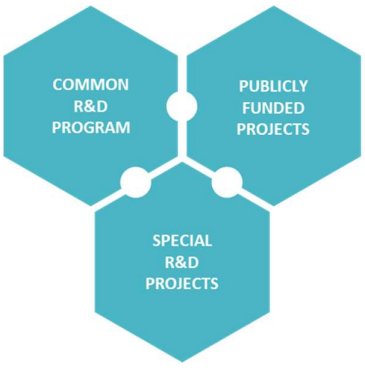
CRESYM also explored collaboration options with the **Cross-Industry Innovators** and the **TSO Alliance** and offered administrative support for innovation scouting.

4. R&I projects

4.1. A light but effective organisation to launch R&I actions

CRESYM's first objective it to catalyse research on disregarded energy system modelling and simulation issues and hence to launch research projects.

A project can be out of three kinds:



- Common project: sponsored by its industrial participants, as well as CRESYM, provided that the General Assembly agrees to it.
- Special project: 100% funded by the project's participants.
- External project: answering a call for project by one (or more) European or national agency(ies) and sponsored by such third party(ies).

Every project is independent from another and is managed by its participants autonomously, though every common and special project obeys one same agreement structure as all others launched by the Association. Such a standard simplifies the decision-making, limiting it to technical issues and alleviating the burden on legal and accounting departments.

CRESYM is party to such project agreement, in charge of managing the quarterly invoicing and payment procedure and often acting as PMO. Every project reports at least on a quarterly basis.

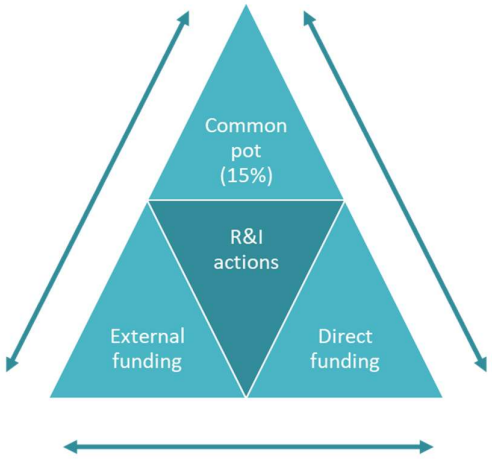
The project **results shall be opensource**, in a non-contaminating manner, either based on Apache 2.0 or Mozilla Public License v2, depending on their nature. Common (resp. special) project results are owned in equal shares by all CRESYM members (resp. by all project participants), except CRESYM. The project participants mandate CRESYM to maintain and make publicly available the results on the web on a long-term basis as "**Assets**". When appropriate, CRESYM trains the researcher teams to improve coding practices and make the algorithm principles or prototypes easier to later industrialise.

Research needs and solution proposals are debated in the related thematic **focus groups** on an ad hoc basis. The Project Committee and CRESYM's scientific advisors coordinate all this action and foster ever more meshing in the organised collaborations.

Our Code of Conduct, and especially our 'Antitrust' guidelines for meetings apply to expert discussions and R&I projects. And software pieces development abides by our 'Good Coding' guidelines.

4.2. Pragmatic financial leverages

Members' **direct funding** of project is key to demonstrate the Association's will and ascertain its **credibility**.



The Association however optimises the use of Members direct funding and external opportunities to maximise the amount of relevant, funded R&I actions and avoid the duplication of efforts.

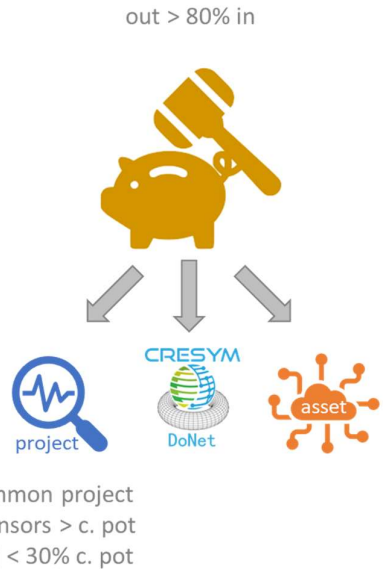
Especially the Association resorts to two leverages for funding, or funding complementation of longer-term, low-TRL actions:

- The "**common pot**" money, especially to develop MVPs or initialise a modular action;
- **Public funding**, when a project ambition exceeds the Association's means to get started.

The **D-CIDE** proposal submitted as HE MSCA end 2024 is a good example of recourse to public funding for an ambitious action that exceeds the Association's financial means. D-CIDE is a 4-year, 5-M€, 15-PhD interdisciplinary doctoral network proposal about "risks for multi-energy systems" calling for European public funding; complementing the privately-funded actions of CRESYM, either already funded (8 PhDs in MuESSLi, ER-PG+, etc.), or upcoming (2 PhDs on batteries in 2025-2026); and supplemented by a side-project (D-CIDE boost), aiming at developing a training & education program to raise critical thinking for a more effective energy transition.

The **common pot** is the other internal leverage of the Association, to catalyse projects and provide flexibility to the Association, complying with the following principles:

- Only common projects (and assets & DoNets) can be funded by the common pot (**community**). All the Association members then share the developed IPRs.
- Direct funding must represent at least 50% of a project's funding; conversely the common pot share is at best 50% of a project (**industrial pull**).
- A single project cannot swallow more than 30% of the common pot income (**diversity**).
- The common pot can serve as cash management tool (**flexibility**).
- Any member can directly fund a project to limit the recourse to the common pot and make it available for other actions (**substitution**).
- At least 80% of the common pot income is spent year on year to fund projects, DoNets or Assets (**liquidity**).



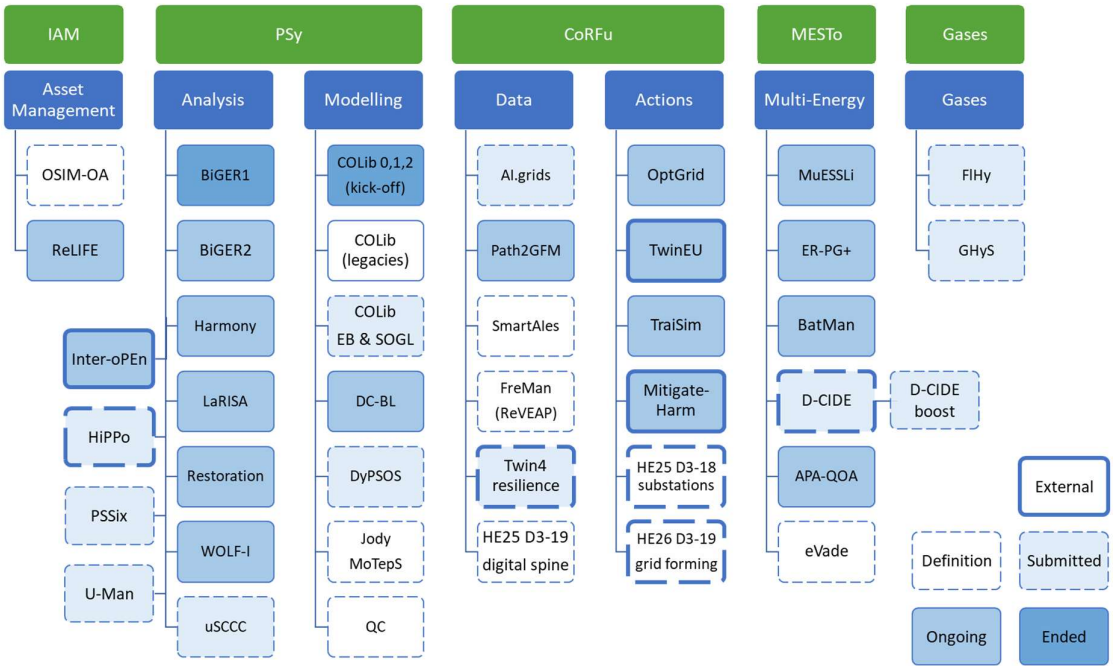
4.3. 22 member-funded projects end 2025, and 10 more on the agenda

In 2025, CRESYM kicked-off four new projects (BiGER2, BatMan, Mitigate-Harm and APA-QOA) and three more (Path2Gfm, DC-BL, TraiSim_2026) are signed for a start on Jan/2nd, 2026. This makes the number of member-funded projects 22 since the Association founding early 2023. Four project proposals were also submitted in 2025 to claim public funding. In addition, four proposals are being compiled for submission to Horizon Europe funding by Spring 2026, and five more by end 2027.

By March 2025, CRESYM compiled its potential "ambitions 2026-2030", a collection of more than 80 industrial needs sorted out into 7 chapters, from Power System Stability to Applied Mathematics. About 20 have been discussed during the year.

The conversation culminated on Nov/24th with a successful strategic seminar gathering 30 participants. There, ten more projects were scheduled to be signed by June 2026, for a total of 4.2 M€ funded by members over 2026-2027. The focus in on "power system +", i.e. encompassing sector coupling and asset management.

Overall, end 2025, CRESYM deals with about **forty *named* R&I initiatives**, either ongoing actions or would-be projects. They are grouped in **seven topical chapters**. Three of them deal with different facets (analysis, modelling, data) of Power System Stability (PSy) and represent two third of all named initiatives. Every other chapter corresponds to a dedicated focus group.



CRESYM R&I action end 2025 - development

4.4. Power system stability (PSy)

"Power System stability" (PSy) is a large focus group, now divided into three chapters but still mostly focusing on dynamic simulation tools, split into six projects:

- **BiGER**, is about bridging the gap between EMT and RMS modelling, for stability studies and daily operation of fast, active components-dominated power systems. A preliminary action was dedicated to literature review, identification of use cases and the construction of the related test cases. The main project is launched end 2024, sponsored by RTE and Hydro-Quebec.
- **Harmony** is a 4-year project developing a toolkit for easy *harmonic* analyses of (local EMT), to assess multi-terminal HVDC power systems, TSO-DSO interface, controller interoperability and HVDC protection. The three work packages progress in parallel, and as planned. Programmers have been hired to code and join the first developed bricks. With CETP funding, Mitigate-Harm further complements the Harmony toolbox by developing methods and algorithms to identify mitigation measures against instability.
- **LaRISA** stands for Large RES Integration Stability Analysis, focusing first on the development of 1 GW of photovoltaic generation on the Slovenian ground. The project is half through and delivered as expected end of 2024. The methodological issues feed BiGER and Harmony and conversely LaRISA is a trial test for both projects developed solutions.
- **Restoration** explores the potential benefits of BESS within the actuation of power system restoration plans relying on generic and detailed validation models of electrical grids. The various expected models have been developed as planned during the first of the three years of the project duration.
- **WOLF-I** (Wide-area Oscillations of Low Frequency with presence of IBRs) is a PhD work, aiming to gain a deeper understanding of the role of IBRs in the damping of inter-area oscillations and develop methods and tools to design POD controllers for new devices and develop guidelines

for TSOs. The first year compiled the state of the art on both research directions: power system damping controller tuning methods and the impact of IBRs on inter-area oscillations. A conference paper is being submitted. The associated website shares didactic information about inter-area oscillations.

These research projects are completed by the development of **COLib**, a web library of opensource, verified power network component models for power system stability analyses and related test cases. Its proof of concept went live end 2023 and was populated in 2024, with basic component models supplied by e-Roots Analytics, detailed power electronics devices' models from TU Delft, and new models from RTE and Fraunhofer Gesellschaft IEE. Further enrichment of the library is foreseen in 2026: the development of a parameterisation tool (**DyPSOS**) to identify and enhance generic models as alternatives to black-box models, and/or the development of a framework to support and prepare operators towards achieving the dynamic data exchanges foreseen by the System Operation Guidelines (**COLIb-EB**).

4.5. Control Room of the future (CoRFu)

"Control Room of the Future" (CoRFu) is a wide chapter, yet to be further refined. In practice it coordinates CRESYM members' action in four projects:

- The HE-funded **TwinEU** project, which started in January 2024, gathers 77 partners to make the European power system digital twin real.
  NB: CRESYM is only in charge of coordinating some of its members' action in the project (TwinEU as a whole is coordinated by Fraunhofer IIT)
- Building on the expected outcomes of TwinEU, CRESYM launched in parallel **TraiSim**, an AI-based control room operators' Training Simulator. Technical discussions have aligned all partners, the general architecture of the system has been developed, and the proof of concept is being developed. TraiSim is extended for one more year in 2026.
- **OptGrid** is a PhD work at TU Delft about the optimisation of the power grid configuration (topology) in operation procedures to ensure an acceptable level of reliability of the electricity supply using machine learning techniques. A Risk-based MILP model of the TNR problem has been developed this Summer with a first article early 2025 for the IEEE PowerTech conference.
- **DC-BL** develops advanced DC modelling and computation capabilities in the PowSyBl framework of LFE, facilitating the simultaneous computation of hybrid AC and DC sub-grids of the power system.

In 2026, CRESYM plans three more actions, on short-circuit current assessment in presence of IBRs (**uSCCC**), tertiary voltage control of the transmission system and TSO-DSO coordination for reactive power management (**UMan**), and the development and industrialisation of a practical and efficient power system stability index (**PSSIx**) during high penetration of converter-based resources.

4.6. Multi-energy & flexibilities (MESTo)

"Multi-Energy Systems Tools" (MESTo) is focused on the development of Energy System Optimisation Models (ESOMs) and the related techno-economic research.

CRESYM's flagship project in this chapter is **MuESSLi** (Multi Energy System Smart Linking). MuESSLi aims at "smart-linking" simulation tools to perform cross-sector, scalable, simulations of multi-energy

systems and enable the optimal development and operation of a holistic “energy system” (power, heat, transportation, etc.), including electricity and hydrogen as energy carriers.

The MuESSLi project is moving full speed with all five PhDs on track. The literature review phase is almost completed, narrowing the respective scopes. Reviews are now available to all Cresym members. First developments and proof of concepts have been made. 2026 shall lead to further reproducible achievements. The regular pace of meetings within MuESSLi and MESTo is maintained for fruitful collaborations.

ERPG+ is a PhD work conducted at CentraleSupelec, with co-supervision at DTU. **ERPG+** analyses the impact of regulation options on multi-energy systems and power system flexibility provision incentives, starting with electrolysis (a first article has been published).

BatMan focuses on the interactions between BESS and congestions in transmission networks, through their participation in wholesale and balancing markets. BatMan has officially started end 2025 with a first objective to better understand regulations and practices for congestion management in France, Germany and Switzerland.

If awarded, the HE project **GENESHyS** will search for robust strategies for the evolution of the hydrogen value chain in the Antwerp / Rotterdam basin. GENESHyS includes the modelling of possible futures for a global hydrogen market (see §4.8) and is completed in 2025 with **APA-QOA**, a 3-month investigation of Ammonia economics and opportunities of Quasi-Optimal Alternative approaches.

If awarded, the **D-CIDE** proposal – HE MSCA doctoral network of 15 PhD students about risks for future energy systems – will lift MESTo to a whole new level.

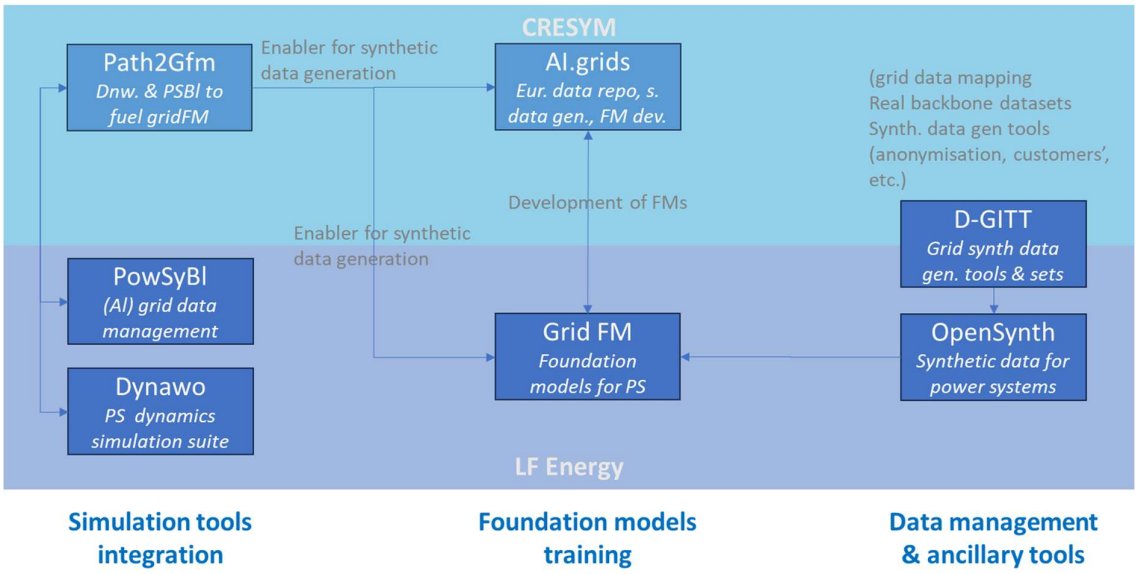
4.7. Applied mathematics (AI4ES+)

CRESYM joined two consortia applying for Horizon Europe funding in 2025 (**HiPPo**, **Twin4Resilience**), and plans to support six more answers to Horizon Europe calls in 2026-2027 to develop AI capabilities for energy players.

Most importantly, CRESYM members agreed end 2025 to have the Association put an emphasis on AI for power systems:

- **Path2Gfm**, signed in December 2025, bridges LFE PowSyBl and Dynawo (power system dynamic simulation package) to LFE’s GridFM (foundation models for power systems) to enable the generation of synthetic data, to teach power system dynamics to foundation models;
- **D-GITT** is the “grid infrastructure description” chapter of LFE Opensynth. The framework has been set up in 2025 with storage capabilities for real grid (“backbone”) datasets and associated synthetic datasets. The organisation shall provide a typology of data depending on their nature (e.g. electrical features, asset management, etc.), their sensitivity (IP, privacy, safety…), their applicability (from DC load flow to EMT simulations), their reliability, etc. D-GITT aims also at listing a series of tools to derive descriptive synthetic data to complement datasets. The setup shall be completed in 2026, and a challenge involving 1, 2 or 3 real grid datasets shall be organised for promotion.
- **AI.grids** shall implement the EU’s AI action plan for the energy sector in 2026-2027, gathering system operators and research institutions, especially the AI factories and TEFs, to become “the European pillar of LFE GridFM”, developing a secure environment for European grid operators to develop, share and test foundation models.

The Quantum focus group started exchanging experience in July 2025 and decided to compile a joint "next-step" project proposal and submit it for public funding in 2026.



AI projects integration

4.8. Publicly funded projects

CRESYM is party to three projects funded by the European Commission's Horizon Europe program, two that started in 2024, one end 2025:

- **Inter-oPEn** is a Horizon Europe MSCA doctoral network about interoperability of HVDC equipment with open models (2.7 M€, 2024-2026, 8 beneficiaries and 13 associated partners, including 3 CRESYM members).
- **TwinEU** is about the development of a digital twin generic platform for the European power system (HORIZON-CL5-2023-D3-01, 20 M€, 2024-2026, 77 partners, including 7 CRESYM members).
- **Mitigate-Harm**, a project funded by the Clean Energy Transition Partnership and developing the 'remedial actions' side of the Harmony project (1.1 M€, 5 partners, including 4 CRESYM members).

CRESYM **leverages** the value of each of these publicly funded projects by supplementing their action. E.g. TraiSim further develops complementary modules to TwinEU. And the doctoral candidates of Inter-oPEn further network with other researchers of the PSy DoNet or can interact with CRESYM members beyond the sole associated partners of the project. In addition, as for in-house projects, CRESYM shall take over both projects' open-source results and ensure their long-term maintenance and public availability, through COLib or CReDIT.

In 2025, CRESYM submitted two proposals to public calls:

- **D-CIDE**, a HE MSCA doctoral network application (5.0 M€) on risks for future energy systems;
- **CODIFyS**, control and operation tools for a RES-based energy system, answering HORIZON-CL5-2025-D3-17 (9.9 M€, 36 partners, including 10 CRESYM members, under the aegis of ENTSO-E and EDSO).

CRESYM also contributed to drafting and submitting three other proposals. In all of them, CRESYM is in charge of the "after-sale" service, i.e. the dissemination and exploitation of the results on behalf of the partners after the project end.

- **Twin4resilience**, Generative AI for energy systems in industry & smart cities, answering HE-INFRA-2025-01-TECH-04 (coordinated by AIT);
- **GENESHyS**, Green, resilient and flexible hydrogen production processes, answering the call HE-CL4-IND.-2025-01-TWIN-TR-32 (coordinated by Air Liquide);
- **HiPPo**, a HE MSCA doctoral network application (4.6 M€) about High Performance Computing (coordinated by AIT).

CRESYM supports its members with, and is part to the drafting of, four more proposals, due by March 2026 (about digitalisation of distribution grids, grid-forming, multi-terminal HVDC).

Discussions around proposals for 2026-2027 Horizon Europe calls for projects have already started, to define a consistent answering strategy to maximise the calls' value and leverage them mutually with the member-funded actions.

5. Training, education & networking

5.1. Training offer

CRESYM develops the possibility to access cutting-edge training offer for its members' staff.

The Association pools its **academic members' offer** and its partnership with **EES-UETP** proved cost-effective for its members in November 2025 ("HVDC 2025" training).

CRESYM consolidated its training offer in 2025, delivering several successful sessions across key technical topics:

- The top-rated course on Power System Dynamics continued to attract 35 participants from 11 different organisations across three sessions throughout the year. Owing to continued demand, an additional session is already planned for January 2026.
- In addition, a new training course on Power System Oscillations was inaugurated in December 2025, attracting 12 participants from 6 different organisations. A second session is scheduled for April 2026 in Brussels, reflecting the growing interest in this topic.
- In December 2025 also, CRESYM delivered the second "Good Practices for Coding" workshop as part of Inter-oPEn's training programme.
- To Inter-oPEn PhD students, CRESYM also lectured about industrial needs and barriers to power electronics implementation.

The training sessions are proposed at cost rate for members. Beyond the taught material, they prove good networking opportunities across member organisations.

5.2. CRESYM DoNets

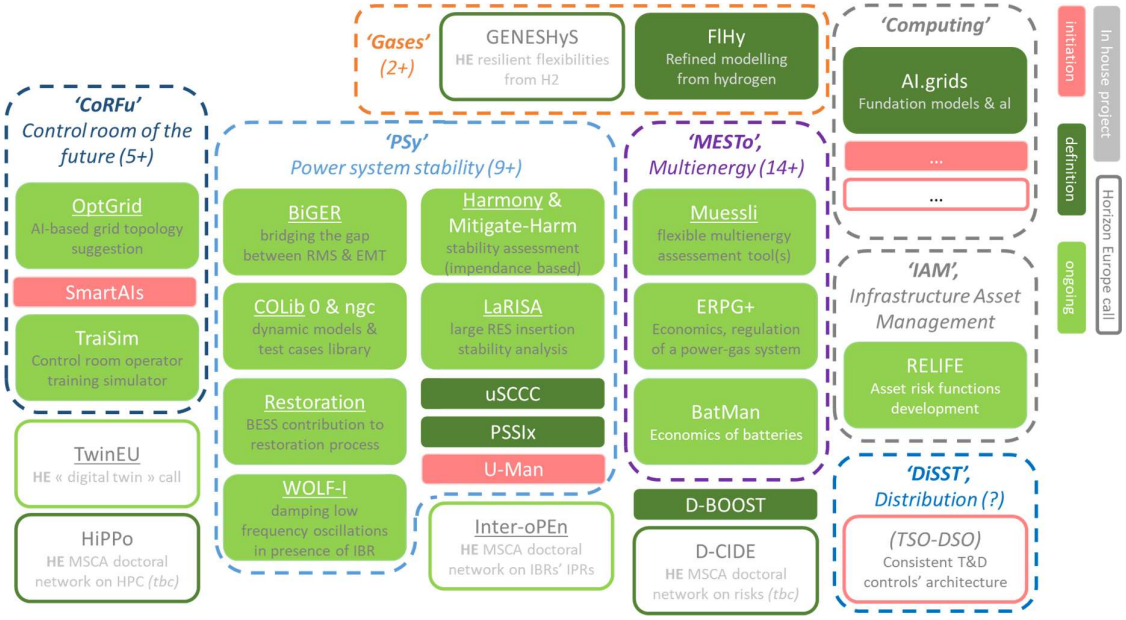
CRESYM's own common and special projects gather more than twenty PhD students or researchers end 2025. They are grouped into three thematic doctoral networks – our so-called **DoNets**: one about power system stability (**PSy**); another about multi-energy matters (**MESTo**); the last about control room of the future matters (**CoRFu**).

As for a HE MSCA, the objective of a DoNet is to provide opportunities for **networking** and emulation, more efficient **dissemination**, **training** and education, and a strong interface to **industry**. A DoNet is as **transverse** as possible (international, transdisciplinary, cross-sector, cross-projects, with multiple partners, both academic and industrial) and shall ease the **recruitment** of highly skilled people by industry. A DoNet is the implementation side of a focus group.

The DoNets also welcome sole doctoral fellows hired independently by our members for other research actions: e.g. the PlaneTerr project (with four PhD students, sponsored by the French agency ADEME, gathering three of CRESYM's members and starting end 2023) is a component of MESTo.

CoRFu also associates members' experts involved in the HE **TwinEU** project, and PSy the PhD students of the **HE MSCA** doctoral network Inter-oPEN. If awarded, the fifteen PhD students of the HE MSCA doctoral network HiPPo will add up to PSy, as would the fifteen of D-CIDE to MESTo.

With **BatMan**, two other PhD students about batteries' economics enlarge the scope of MESTo in 2025.



CRESYM R&I action end 2025 – main blocks

Four focus groups were kicked off in 2025:

- 'Gases' (CO2, H2) submitted the GENESHyS proposal.
- '**IAM**' (Infrastructure Asset Management) met first during cresROADS. It explored synergies with Cross-Industry Innovators (innovation scouting on asset management) in 2025 and will materialise in 2026 with the ReLife project.

- '**DiSST**' (Standards & tools for DSOs) contributed to preparing two proposals to Horizon Europe calls (HE-2025-CL5-05-D3-17 and -18) and developing **uSCCC** and **AI.grids**.
- 'QC' (Quantum computing) was born in June 2025, shared recent explorations from every member and agreed on a joint project proposal, joining various aspects (and different transcriptions and tests for quantum computers). The group aims at public funding in 2026.

With new projects in 2026, further topical, cross-organisation and international **networks of young researchers** will be set up.

Crosscutting to the DoNets, **CresCOM** was launched by our PhD students: it's an informal community bringing together PhD candidates and researchers involved in, or connected to, CRESYM. The initiative aims at creating a CRESYM-wide network that fosters collaboration, knowledge exchange, and mutual support. CresCOM provides a relaxed space that complements local groups at universities and companies, allowing members to share common research challenges and connect with a broader European network of colleagues. CresCOM is open to all aspects of energy system research. Its activities include a dedicated Discord group for informal discussions and monthly online meetings.

6. Assets

6.1. Common opensource IT Assets

CRESYM addresses **low-TRL** R&I matters, that competitors have an interest to solve jointly and would disregard separately. Every project's results are due to be **opensource** and **non-viral**, either based on Apache 2.0 or Mozilla Public License v2, depending on their nature. And CRESYM is meant to **sustain** and make **publicly available** such results on the **long-run**, as common **Assets** of general interest for the scientific community.

Such IT assets would be mostly methodologies, algorithms, prototypes, possibly basic tools for modelling and simulation of energy systems.

Beyond its own projects, CRESYM may also be mandated by any third-party owning a research asset, in order to take care of it on their behalf, alleviating the maintenance burden from the inventing institution, provided that the asset is made available opensource.

Researchers or organisations willing to use any asset must agree with its attached opensource license; and have access to a series of standard **services**, as defined by the related Asset Terms of Reference (**AToR**).

To make this happen, CRESYM runs the **ComOn** project. The project aims to test the Association's ability to welcome third-party invented assets, of different kind (source code, running prototypes, etc.) with a different span of services attached.

Twelve services have been defined in 2024 (from mere promotion to hosting, basic maintenance, and possibly debugging or documentation) and have been subscribed to date by 4 organisations, for 7 Assets.

6.2. CReDIT

CReDIT (Common Results, Data, Information & Tools) shall be the primary **portal** for opensource R&I results on energy systems. It shall host CRESYM's own projects' results, but also gives access to, and interconnects with, existing or past initiatives (e.g. the European Open Science Cloud).

CReDIT intends to complement, for **yet-to-industrialise research results**, what is developed for ready-to-use tools by other initiatives, such as G-PST for power system simulation tools or Openmod for energy system tools.

The concept is developed in the ComOn project, and the CReDIT portal is available and showcases Assets since mid-2024. Resources are yet to be hired in 2026 to bring it to the next level.

6.3. COLib

COLib (Collaborative Opensource Library) is a web library of opensource, verified power network component models for power system stability analyses and related test cases.

It is an example of the various resources CReDIT can contain.

Its proof of concept went live end 2023 and was populated in 2024 with basic component models supplied by e-Roots Analytics, detailed power electronics devices' models from TU Delft, and new models from RTE and Fraunhofer Gesellschaft IEE. In 2025 the tool was revamped with Quarto rather to complement the github webpages basis.

In 2026, the systematic equation-based transcription of models (with **Modelica**) is planned.

COLib shall also be the **shrine** of older R&I project legacies to sustain them on the long-run.

7. Corporate matters & general administration

7.1. Corporate

Five **independent scientific advisers** to the Association have been appointed to challenge and appraise the Association's action, after their charter has been validated by the General Assembly in April 2025.

A first representative for Industrial Members[1] has been appointed in April 2025. Two others shall be appointed in 2026, together with **administrators** elected in 2024 for research institutions. The President and Vice President mandate also come to an end in April 2026.

7.2. General Management

With a growing number of members, CRESYM had to professionalise its processes.

The Association questioned its principles, strategic goals and organisation after its first 3 years, to enter a **cruise mode**.

The Association inaugurated on Dec/16th its first, and probably annual, Q&A session about internal procedures.

Especially, new ways have been explored to update our **research programme**: a 7-chapter "Ambitions" document compiling all proposals collected from members and challenged at cresROADS, was finalised, reviewed and valued in Spring. Project ideas were then further discussed and refined to be

[1] Four at the time; Strategic Members come on top.

submitted to a first general seminar end November. The seminar decisions shall be turned into new project agreements, starting in Spring or Summer 2026. This process is intended to be repeated yearly.

The business administration became also heavier: CRESYM manages end 2025, on a rolling yearly basis, more than 300 sales invoices and 400 cash moves. A business administration and **office manager** has been hired in October.

The Association's **contractual framework** (i.e. our Project, Service or Supplier Agreement templates) proved robust in 2025 with no required update.

7.3. Finances

In 2025, CRESYM's **turnover** is 2537 k€, including 295 k€ of membership fees.

General budget expenses (staff, offices & IT, corporate…) are 948 k€, of which 766 k€ are earmarked to support R&I activities, 91 k€ covered by the common pot, leaving 90 k€ of net general **expenses**. Covering at least 80% of the general expenses, especially staff through projects or commercial activities is a KPI of the Association. As in 2024, corporate expenses in 2025 are lower than 30% of the membership fees (i.e. the share of the membership fees remaining for the general budget).

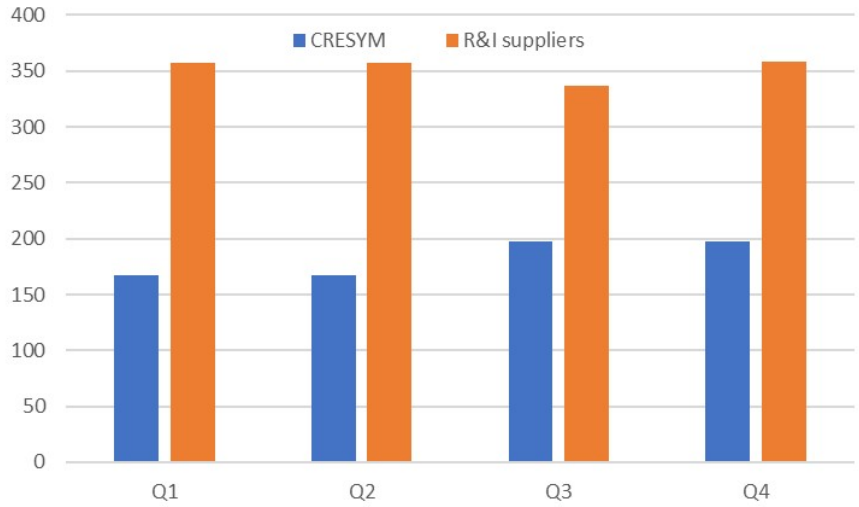
	total budget		R&I projects		common pot		comments	
incomes	**2537**	a	**2189**	s	**502**	a'	a=b+c+d+e+f+g	
membership fees	295	b			207	a'	b'=70%.b	
projects direct funding	1850	c	1850	c			s=c+t+e+u	
common pot contribution	295	d	284	t	295	c'	t=-(p+y)	
ext funding & subsidies	0	e	0	e			a'=b'+c'	
other sales	85	f	55	u				
cash management	12	g						
expenses	**-2375**	h	**-2316**	v	**-313**	d'	h=n+o+o'+p+q	
staff	-785	i					n=i+j+k+l+m	
office & IT	-33	j					v=w+x+o+o'+p+y	
corporate	-21	k					d'=e'+p+y+q	
events & meetings	-25	l						
consultants	-85	m			-11	e'		
general budget	**-948**	n					d'/a' (~100%)	62%
gen b. > projects			-766	w			(w+y)/(i+j) (>80%)	104%
gen b. > project sales			-60	x				
dir. funding > R&I suppliers	-1205	o	-1205	o			(k+l)/(0.3*b) (<100%)	52%
publ. funding > R&I suppliers	0	o'	0	o'				
com. pot > R&I suppliers	-204	p	-204	p	-204	p		
com. pot > public applic.			-80	y	-80	y		
com. pot > assets/donets	-18	q			-18	q		
balance	**161**	r	**-127**	z	**189**	f'	r=a+h, z=s+v, f'=a'+d'	
2024 > 2025 + 2025 > 2026	*144*		*122*		*22*			
balance 2025 stricto sensu	***305***		***-6***		***211***			

2025 Profit & Losses, simplified

The **net balance** in 2025 is 161 k€ (disregarding 199 k€ of anticipated income received in 2025). The **common pot** contributes for 189 k€ to this positive net balance, as only 62% of the common pot income is spent in 2025. The Association failed to meet its KPI of a using its common pot in 2025. CRESYM starts 2026 with about 640 k€ cumulated in its common pot.

The total **project budget** is 2316 k€ (summing up the directly collected funding, external subsidies, the common pot support and 127 k€ of inter-year funding). 1409 k€ are directly hired from research institutions. 395 k€ are seconded personnel from industrial members to research institutions to undertake a PhD work, via CRESYM's budget. 371 k€ are PMO support to projects and focus groups.

140 k€ are spent to prepare applications to public calls for projects or in support to the inter-oPEn MSCA.



2025 CRESYM R&I project expenses (k€/quarter)

7.4. Human resources

CRESYM is still **seven staff**, with one departure and one hiring end 2025.

In October 2025, a business administration & office manager has been hired, one scientific advisor joins one of our members. A consultant also supports part time the focus group on quantum computing. CRESYM still promotes diversity, though our initial perfect gender balance is only a memory now.

In January 2026, a new scientific advisor will join CRESYM to manage the project portfolio. In order to accommodate the Association's growing number of projects, CRESYM is always looking for other **recruits**, ideally MSc with a first experience in the energy sector, to run projects and focus groups or sustain R&I assets live and ready for business.

CRESYM supports also diversified **career paths** for its industrial members' staff, either becoming scientific advisor or undertaking their journey for PhD degree.

7.5. Communication

CRESYM's communication is bound to be limited to its research efforts and related advocacy.

Its **website** advertises its projects and shall develop into a portal for opensource resources on energy system modelling and simulation.

CRESYM publishes a quarterly **newsletter**, with three to four issues per year, and maintains and active presence on LinkedIn. This year marked the launch of our YouTube channel, where we released two new videos to reach and engage a wider audience.

CRESYM consolidated its partnership with LF Energy and advocated its action through side-events at the **LFE** summit in September 2025.

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Appendix 1: glossary & abbreviations

AI	Artificial Intelligence
AI.grids	Synthetic data & power system foundation models for Europe *(common project)*
BatMan	Battery management *(special project)*
BESS	Battery Energy Storage Systems
BiGER	Bridging the Gap between EMT and RMS modelling *(common project)*
CETP	Clean Energy Transition Partnership
CCUS	Carbone Capture, Use & Storage
CODIFyS	Control & Operation tools Deployment to ensure renewable energy sources Integration and power systems Flexibility & Stability *(external project proposal*)
COLib	Collaborative Opensource Library of power system component dynamic models and related test cases *(part of CReDIT)*
Colib-EB	Equation-Based Model Representation of IEC 61970-457 Standard Models & Enhancement of COLib *(common project)*
Colib-SOGL	Dynamic data exchange & simulation to fulfil SO GL obligations *(common project)*
CReDIT	Common Results, Data, Information & Tools – portal to all "common" assets
cresCENDO	CRESYM's Common Education, Networking, Dissemination Opportunities (advocacy events)
CreSem	Creative Seminars *(internal workshop sessions of the Association)*
cresROADS	CRESYM's Research Opportunities And Dissemination Sessions *(public workshops of the Association)*
Common pot	70% of the annual membership fees + additional contribution (15%) from projects sponsors. Available to fund common projects and cross-activities (DoNets, asset management)
Common project	Sponsored by CRESYM as well as other industrial participants, subject to the General Assembly's labelling. IPR's are equally shared by CRESYM members
CRESYM	Collaborative Research on Energy System Modelling
DC-BL	DC load flow functionalities for LFE PowSyBL framework to enable advanced analysis of hybrid AC/DC systems *(common project)*
D-CIDE	Decision making enhanced through Critical thinking and Interdisciplinarity for a Decarbonised, resilient, and competitive European Energy system (HE MSCA doctoral network – *external project proposal*)
D-GITT	Grid synthetic data generation tools and datasets

DiSST	Distribution Systems Standards & Tools *(research chapter)*
DoNet	Doctoral network of CRESYMs, with a strong interface to industry
DSO	Distribution System Operator
DyPSOS	Dynamic Power System OpenSource Framework *(special project)*
EC	European Commission
EDSO	European Distribution System Operators
ENTSO-E	European Network of Transmission System Operators for Electricity
EES-UETP	Electric Energy System – University Entreprise Training Partnership
ER-PG+	Economics & Regulation of integrated Power & Gas systems *(special project)*
ESOM	Energy System Optimisation Model(ling)
EU SL	EU SL – European Social Labor
eVADe	Electric Vehicles & Ancillary services Development *(special project)*
External project	Answering a call for projects and 100% sponsored by the related grant
FTE	Full-time equivalent
G-PST	Global Power System transformation consortium
GENESHyS	Green ENergy ESsentials for HYdrogen Sustainability compliant with asset integrity *(external project proposal)*
Harmony	Open-source power system stability assessment tool *(common project)*
HE	European Commission's Horizon Europe research program
HiPPo	High Performance Computing for Power systems *(HE MSCA doctoral network – external project proposal)*
HPC	High Performance Computing
IAM	Integrated Assessment Model(ling)
IBR	Inverter Based Resources (see PE)
Inter-oPEn	Interoperability of Power Electronic dominated grid by openness *(HE MSCA doctoral network – external project, granted)*
IPR	Intellectual Property Right
ISON	Independent System Operators Network
JoDyMoTePS	Joint Dynamic Modelling & Testing of Power Systems *(special project)*
KPI	Key Performance Indicator
LaRISA	Large RES Integration Stability Analysis *(common project)*
LFE	Linux Foundation for Energy

Mitigate-Harm	Harmonics mitigation *(CETP application – external project proposal complementing Harmony)*
ML	Machine Learning
MSCA	Horizon Europe Marie-Sklodowska-Curie Actions
MUESSLi	MultiEnergy System Smart Linking *(special project)*
MVP	Minimum Viable Product
NGO	Non-Governmental Organisation
OptGrid	Power system topology optimisation *(special project)*
Openmod	Open Energy Modelling Initiative
Path2GridFM	Opensource simulation toolkit for LFE gridFM *(special project)*
PE	Power electronics (see IBRs)
PMO	Project Management Office
POC	Proof of Concept
Project agreement	Standard MLA framework joining willing project participants, all industrial sponsors and/or research institutions, plus CRESYM as serving party
PSSIx	Power System Stability Index *(special project)*
QC	Quantum computing
Restoration	Use of batteries to restore power systems after black-out *(common project)*
R&I	Research & Innovation
Special project	Sponsored 100% by industrial participants. IPR's are equally shared by the project's participants (rather than by all the Association's members)
TEF	Testing & Experimentation Facility (of the Digital Europe Programme)
TSO	Transmission System Operator
TraiSim	AI-based control room operators' Training Simulator *(special project, complementing TwinEU, extended in 2026)*
Twin4Resilience	Generative AI-Powered Digital Twins for Resilient Energy and Smart City Infrastructures in European Research Infrastructures *(external project proposal*)
TwinEU	Power system digital twin *(HORIZON-CL5-2023-D3-01 – external project, granted*)
U-man	Voltage management *(common project)*
uSCC	Updated short-circuit current computations in presence of IBRs *(common project)*
WOLF-I	Wide-area Oscillations of Low Frequency with presence of IBRs *(special project)*

Appendix 2: CRESYM in a nutshell

WHO WE ARE

CRESYM is a **non-profit** association, gathering **industry players** & **research organisations** and aiming at undertaking **research actions** and ultimately solving the coming challenges for the future, fast-evolving European energy system.

After its incorporation in September 2022, CRESYM started operation in January 2023 with 8 founding fathers, launched its first projects in April 2023, started self-funding R&I actions as of July 2023.

End 2025 it is 39 members and 15 observers. For 2026, it plans to organise more than 5M€ member-funded R&I on power systems at large through about 25 actions, leveraging 3 to 4 times as much public R&I with about 10 permanent staff.

OUR AMBITION

CRESYM aims at **uniting** all need-owners and solution-developers to **catalyse** the development of energy system modelling and simulation **opensource**, non-viral bricks in order to meet the energy transition challenges.

OUR VALUES

CRESYM is **non-profit** and acts **transparently** for the **general interest**, addressing new and/or complex, **low TRL**, technical challenges.

CRESYM reconciles **security** and IPRs when developing **opensource** deliverables. Opensource, non-viral licences are key to ease the dissemination among operators, manufacturers and vendors in a fair, neutral manner.

CRESYM organises **collaborative**, **efficient** R&I works, with practical intermediary outputs. CRESYM builds up on, as well as comforts, supports and promotes other existing opensource initiatives.

CRESYM is committed to protecting **privacy** and promoting **diversity & gender equality**.

OUR MISSION

CRESYM fosters collaborative R&I actions to deliver opensource energy system simulation tools on low-TRL R&I issues of general interest (the '**Projects**").

CRESYM shall maintain useful technological building blocks available for all researchers & engineers (the "**Assets**"). In 2024, COLib (the Collaborative Opensource Library of power system component models) and CReDIT (Common Results, Data, Information and Tools) started operation.

CRESYM manages thematic doctoral networks, be they supported by the EU Horizon Europe program or self-funded by CRESYM, to increase the value of our R&I actions for researchers and to foster serendipity (the "**DoNets**").

OUR ORGANISATION

On behalf of its General Assembly, CRESYM is run by a Board of Directors. The Board appoints a General Manager to manage daily operation.

With the support of CRESYM's Scientific Advisors, CRESYM's Project Committee is in charge of the general organisation of R&I Projects: the identification of new topics, the supervision of every project agreement drafting, and the overall consistency of the R&I work program, ensuring that all critical issues are addressed – by CRESYM or other organisations –, efficiently and with no overlapping of efforts.

Every project is independent from another and is managed by its participants autonomously, though obeying to one same agreement structure as all others launched by the Association.

CRESYM is represented by its President, Prof. Antonello Monti, and Vice-President, Prof. Peter Palensky.

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