



3rd ELN Conference
STOCKHOLM JUNE 8-9
2023

Executive Summary

The overall goal of the European Lightweighting Network (ELN) is to contribute to the European Green Deal with lightweight technology as an enabler as input to policy decision on a strategical level. ELN Conferences are arranged yearly to promote sustainable multidisciplinary lightweighting innovation in many industrial sectors simultaneously in Europe.

On 8–9 June 2023, 78 participants from 10 European countries gathered in Stockholm, Sweden to participate in the 3rd ELN Conference. They were all invited because they have a national mandate from their respective countries to discuss common lightweight development in Europe. Sweden hosted the conference upon invitations by the governments of Germany and Austria. The conference was organised by SIP LIGHTer – the Swedish Strategic Innovation Program for Lightweight and RISE – Research Institutes of Sweden.

Three specific goals were achieved at the 3rd ELN Conference:

- The key components of a European lightweight strategy are now described, anchored, and further developed (see next page) with an updated activity plan.
- ELN is expanded. Now eight countries participate in the working group: *Germany, Austria, Sweden, Belgium, Spain, Luxembourg, Slovakia, and Poland.*
- Host countries for the two upcoming ELN conferences are appointed. ELN 2024 is held in Belgium. Spain will host ELN 2025.

Next on the agenda is the opening of joint national and international funding possibilities. The effort to develop the research roadmap is still on-going, as well as discussions to establish a lightweighting hub in Brussels.

We are grateful for the valuable support from our collaborators in the organizing committee, and from all participants in the Stockholm meeting, and hope to meet you at the 4th meeting during the spring 2024, in Belgium!

Cecilia Ramberg,



Boel Wadman,



With support from

VINNOVA
Sweden's Innovation Agency

 **Swedish
Energy Agency**

FORMAS 

**Strategic
innovation
programmes**

ELN EUROPEAN
LIGHTWEIGHTING
NETWORK

1. Goals of the European Lightweighting Network (ELN)

Lightweighting as a cross-sectoral technology including but not limited to materials, design and production, contributes significantly to the European Green Deal. To be leader in this key technology, of relevance for many industrial sectors such as energy, mobility, and infrastructure, calls for close collaboration between all European stakeholders, strong networks and constant R&D efforts.

The European Lightweighting Network (ELN) is an initiative by public authorities from Germany, Austria, Spain, Slovakia, Belgium, Poland and Sweden aiming at the development of a common view on the European lightweight potential. The framework and activities focus on exploiting lightweight technologies supporting the Green Deal Goals.

The lightweighting community has already benefited significantly from the initiated activities and the open collaborations, for example by a new funding call and widened exchange between PhD networks. To keep the momentum and gain a critical mass on the European level the ELN needs additional partners willing to shape a strong partnership.

ELN SUPPORTS THE GREEN DEAL BY:

ESTABLISHING A HUB

Establishing a Lightweight hub in Brussels.

DEVELOPING A STRATEGY

Developing a European lightweighting strategy.

CO-CREATING A RESEARCH AGENDA

Co-creating a joint Research Agenda: “Lightweight for a Sustainable Future, a common vision for European and national activities”.

FUNDING PROJECTS IN LIGHTWEIGHT TECHNOLOGIES

Establishing joint calls to fund bi- or multilateral projects in lightweight technologies.

ARRANGING DELEGATION VISITS

Arranging delegation visits connecting research institutions and industrial partners between the partner countries.

MEASURING ECONOMIC IMPACT

Measuring the economic impact of lightweighting on the employment, innovation, and GNP through a Lightweighting Satellite Accounting standard.

ORGANISING ELN MEETINGS

Germany 2020: hosted by the German Ministry for Economic Affairs and Climate Action (BMWK)

Austria 2021: hosted by the Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK)

Sweden 2023: hosted by LIGHTer (The Swedish national program for Lightweight technologies) and RISE (Research institutes of Sweden)

Belgium 2024: the 4th ELN Conference will be hosted in Belgium



2. Focus and working methods at the 3rd ELN Conference

We gathered in Stockholm for the 3rd ELN Conference with the goal of establishing a shared European Lightweighting strategy. The conference revolved around the topics of how lightweight contributes to sustainable growth across different sectors.

Lightweighting has most obvious effects wherever masses are moving, such as within the automotive, aerospace or maritime industries - often seen as pioneers in lightweighting. However, the resource efficiency within lightweighting is harvested across many other industrial sectors as well.

Therefore, the [conference programme](#) revolved around the showcasing of examples from more industries where lightweighting shows great promise from an environmental, economic, and social sustainability perspective. These included the following sectors: **energy, construction, and mobility**. Each sector had its own keynote presentation, followed by a panel discussion and time for audience Q&A.

Conference delegates from 10 European nations, were placed in groups of 6 to 8 people per round table.

At the end of both days, there was a 30 minute time slot for group discussions followed by a summary presented by a representative from each group. Ideas were documented at the table and a summary of the notes are presented in this summary.

More than 70 participants from the following areas contributed to keynote presentations and group discussions: Industry, Research, SME, Ministry, Lightweighting Network, and Public Authority.

Two guiding questions were discussed during the interactive sessions:

1. What are the overarching conclusions from the industry presentations?
2. Which lightweighting efforts would you consider are most promising on our way to a sustainable society with competitive industries?



3. Summary of programme

The 3rd ELN Conference established the importance of lightweighting in a wider perspective, including design and production as well as the climate, social and competitive aspects.

- Three industrial sectors gave examples on how innovations in lightweight can promote sustainability and reduce materials and energy consumption.
- The economic contribution of lightweight is important, as exemplified in Austria, and several countries are interested in making similar calculations.
- The representation from several governments, funding agencies and the European Commission was valuable for setting the scene, and for discussing future actions.
- The ELN Network is growing and will continue its policy activities in collaboration with national centres promoting lightweight in even more countries, where we are under discussion with the Netherlands, Slovakia and Poland at the moment.
- Next on the agenda is the opening of national and international funding possibilities for projects that produce savings in material and weight. The effort to deliver a research roadmap is still on-going, as well as discussions to establish a lightweighting hub in Brussels.



4. Overarching conclusions from the industry presentations

After the three industrial presentations from three different industrial sectors and three different European countries, there were group discussions followed by a summary presented by a representative from each group.

Ideas were documented at the table (see Appendix 1) and a short summary is presented below.

- We need political initiatives and policy makers to drive and promote the change for more sustainable lightweight technologies in the industry and in research.
- We need to develop a common lightweighting framework including funding, regulations, rules, standards, etc. to allow for lightweight design and materials more quickly.
- It is important to develop measures to scale up innovations all the way to industrial solutions.
- Key strategies are to work in chains of industry, research organisations and authorities.
- Investments and risk assessment are important.
- We need to work together to enforce the communication and education on lightweighting in general and towards the sectors where lightweight technologies are less visible.
- It is important to include circular value chains.
- The full potential of lightweighting solutions is visible when the production costs are lowered, and serial production is possible, and we have traceability in the supply chain to enable circularity.
- New types of business models could create new demands for lightweight technologies.
- The importance of cross sectoral innovation is the way forward for lightweighting technologies.
- Multifunctional materials are an important area for lightweight technologies.
- Lightweighting should be accompanied with LCA to prove its sustainability and there should be a support system for SMEs on producing affordable LCAs.
- CO₂ reduction is only one of the benefits, in the future we should consider other benefits coming from lightweight.
- Lightweight as an enabler for hydrogen storage is important.

5. Most promising efforts in lightweighting

At the end of the 3rd ELN Conference all participants were engaged in group discussions. The discussions were documented (see Appendix 1) by a representative from each group. A short summary is presented below.

- We need to both add more members to ELN and to cooperate closely with ELA and ELCA.
- Communication is crucial both to speed up the industrial implementation and to raise the level of education on lightweighting solutions.
- Make Leichtbau Atlas European.
- There is a need to fund research and information programs at EU level including lightweight solutions as a top header. EUREKA is good but needs to be improved by better synchronization between countries.
- It is important to develop harmonized and consistent education and training programmes in lightweight technologies.
- Many mega trends are important such as circularity, digitalization, traceability, digital product pass for products based on lightweighting.
- Circularity in all phases changes the model to “recycle-replace-reuse” to take advantage of the improved functionality of lightweight products. We need to show how lightweight gives value on a LCA perspective and help SMEs on LCA-work by for instance open LCA standards for lightweight.
- Additive manufacturing, bionics and multifunctional materials can produce weight reduced components.



6. Summary of presentation

6.1 Opening keynotes

“The importance of co-operation between nations, industries and researchers to attain the overall mission of a sustainable society. The role of lightweighting.”

Keynote Speakers



Ann Lidgard

Department manager for Internationalization, VINNOVA, the Swedish Innovation Agency



Susanne Szech-Koundouros

Deputy Director-General, Raw Materials Policy, Resource Efficiency,



Alexander Pogány

Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, Austria

Summary

Anne Lidgard opened the conference by mentioning the importance of collaboration around lightweight for sustainability, and thus why Vinnova is funding the program LIGHTer during 12 years. LIGHTer is one of the 17 Innovation programs that will be followed by Impact Innovation programs, to be launched from 2024.

Susanne Szech-Koundouros gave a holistic view on how the German government strives to decouple growth from resource consumption, and how lightweighting can save both materials and energy as well as citizen health. She also introduced a new, large funding program on materials and energy efficiency to be launched this summer, where also international and bilateral collaboration possibilities are included, and where higher TRL activities can be financed for organizations with sites in Germany.

Alexander Pogány rounded off with activities already launched within the European Lightweighting Network (ELN) to accelerate the European collaboration within lightweighting, He also emphasized the importance of technologies to further lightweighting, advanced production and processes such as Additive Manufacturing.

6.2 Strategic Outlook

"The European Lightweighting Network and Lightweighting as an enabler for the Green Deal."

Speaker



Cecilia Ramberg

Director of LIGHTer, Sweden

Summary

Cecilia Ramberg gave a Strategic Outlook, explaining how ELN has been working with international policy development and collaboration during the last three years, and how lightweighting within many sectors can enable the Green Deal.

[Download the presentation here.](#)

6.3 Keynote Energy Industry

"The role of lightweight in the transition towards a fossil-free energy system: Lightweight construction and advanced materials supporting new energy solutions – a case study."

Keynote Speakers



Magdalena Sandström

Department manager
for Internationalization,
VINNOVA, the Swedish
Innovation Agency



Bernt Erik Westre

Deputy Director-General,
Raw Materials Policy,
Resource Efficiency,

Panel members

Dirk Fischer

Senior Sales and Project Manager,
Argo-Anleg GmbH, Germany

Amaya Igartua

Doctor in Sciences (Chemistry),
Coordinator of Materials
Initiatives (EUMAT, AMI),
TEKNIKER, Spain

Summary

Magdalena Sandström and Bernt Erik Westre explained how they produce fossil-free energy with turbines that 'fly' underwater with the tidal streams, and demand much lower materials, time and energy input than ordinary wind- or wave energy installations.

In the panel discussion following the keynote, Dirk Fischer and Amaya Igartua discussed how regulations affect the described innovation, where, for example, a demo must fulfil equally high environmental demands as a full scale installation, with regards to ensuring no changes of wildlife or natural streams.

Finally, the discussion focused on how 'safe and sustainable by design' influences new materials, and how we need to invest in Europe to keep our inventions here.

[Download the presentation here.](#)

6.4 Keynote Construction Industry

"The role of lightweight for promoting sustainable construction and infrastructure. The transformation of the construction industry – examples on lightweighting, renewable materials and business models promoting circularity."

Keynote Speaker



Gunnar Merz

CEO of Composites United,
Germany

Panel members

Pierre Duysinx

Professor, University of Liège, Belgium

Ulf Håkansson

Technical Manager at Skanska, Sweden

Summary

Gunnar Merz gave thrilling examples on how new construction design and materials can reduce the environmental impact by lightweighting, for example carbon fibre bars demanding less foundations.

In the subsequent construction industry panel discussion reflected on both topologic design and how the 'bad guys' of the construction industry (steel and concrete) can become supporters by the above mentioned methods and with fossil-free steel.

The panel also raised the challenge of the fragmented construction sector and the need for new conditions for contracts, as today's situation does not give single contractors enough incentives to build lighter, if not resulting in lower cost.

[Download the presentation here.](#)

6.5 Keynote Mobility Industry

"The role of lightweight for a competitive and fossil-free mobility sector in Europe: Getting mature technologies from R&T into customer products – the quest for further weight saving in aeronautics."

Keynote Speaker



Peter Glaser

Vice president of
Engineering, Research
& Technology, FACC
Operations GmbH, Austria

Panel members

Stefan Christiernin

Head of Strategic Knowledge and Research, Volvo
Cars, Sweden

Stefanie Brickwede

Managing Director – Mobility goes Additive e.V.
& Head of AM – DB Fahrzeuginstandhaltung GmbH,
Germany

Claude Maack

Managing Director of GRADEL Group, Luxembourg

Summary

Peter Glaser raised climate challenge even higher: until all energy is green, there will only be a fossil transfer to another actor if you use your part of the green energy, so the job of the mobility industry is now to save energy. He also reflected on where lightweighting has a competitive advantage large enough for higher costs. For aerospace, the business model is based on lightness.

In the subsequent panel discussion on mobility, Stefan Christiernin, Stefanie Brickwede, and Claude Maack followed up with discussions on volume and methods to save by using less materials by additive manufacturing or by casting the car floor in one piece.

A challenge for SMEs with innovative materials and processes is the timing; in a large OEM, several departments must convene to use a new material, especially if it has a higher initial cost than the heavier alternative. For Volvo Cars, there is an economic value set on saved CO2 that can be realised by lightweighting

[Download the presentation here.](#)

6.6 Economic Importance

"Economic impact of lightweighting."

Speaker



Anna Kleissner
CEO, Econmove GmbH,
Austria

Summary

Anna Kleissner described her work with the Lightweight Satellite Account to assess the Economic Impact of Lightweighting, using different trade codes and statistics.

[Download the presentation here.](#)

6.7 Lightweight contributions to the European Green Deal

"Advanced materials for the Green Deal."

Speaker



Javier Sanfelix
Policy Officer, DG Research
and Innovation
& Industrial Transformation,
European Commission,
Spain

Summary

Javier Sanfelix described how the "Green Deal" relates to lightweighting and the coordinated Advanced Materials Initiative 2030.

He welcomes ELN as a strong policy network that can coordinate the voice of stakeholders, having similar objectives and methods can accelerate the transformation to sustainability.

[Download the presentation here.](#)

6.8 Presentation & Q&A Session

"International R&D collaboration activities already initiated within ELN and future suggestions."

Speakers



Lena Killander

Programme manager, Industrial Technologies, Vinnova, Sweden



Werner Loscheider

Federal Ministry for Economic Affairs and Climate Action, Germany



Alexander Pogány

Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, Austria



Javier Sanfelix

Policy Officer, DG Research and Innovation & Industrial Transformation, European Commission, Spain

Summary

Werner Loscheider organises a yearly high-level lightweighting summit to highlight the lightweighting potential to address the need for action. He established a best practice example for matchmaking the Lightweighting Atlas, which serves as blueprint for the ELN Lightweighting Atlas initiative.

Alexander Pogány highlighted the ELN Eureka Lightweighting initiative as unique transnational funding instrument for RDI projects. After the first call in 2023 with 10 partners the 2024 call is expected to attract further countries. Austria offers in addition to bilateral projects up to 20% of the national funding to international partners.

Lena Killander described how she works as national expert for Cluster 4. The proposal of Horizon Europe Work Programme for 2025/2026 are discussed now, and will be presented in September, with an open stakeholder event in October.

The Q&A Session also raised demands for open test beds for innovative SMEs.

6.9 ELN Roadmap

“Roadmap and milestones ahead for the European Lightweighting Network.”



Boel Wadman

Research & Business Developer, Focus Area Leader in Manufacturing, RISE, Sweden



Werner Loscheider

Federal Ministry for Economic Affairs and Climate Action, Germany



Alexander Pogány

Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, Austria



Carine Petit

Attachée qualifiée – R&I Expert – Horizon Europe Service public de Wallonie, Économie Emploi Recherche, Belgium



Amaya Igartua

Doctor in Sciences (Chemistry), Coordinator of Materials Initiatives (EUMAT, AMI), TEKNIKER, Spain

Summary

Boel Wadman, Werner Loscheider, Alexander Pogány, Amaya Igartua and Carine Petit made a survey on the activities ELN is planning to perform on short and long term.

For short term cooperation the establishment of an Lightweighting hub in Brussels, the adaptation of the German Lightweighting Atlas for international partners and the support of the AMI2030 initiative have been identified.

Long term cooperation is clearly needed for the Development of an European lightweighting strategy and a Strategic Research and Innovation Agenda with accompanying funding initiatives like the current Eureka one. The attraction of additional partners is key for accelerating the momentum for lightweighting applications. One promising instrument is the establishment of an European Lightweighting Satellite Account. The analysis of the discussion results will offer additional input to be integrated in the upcoming and ongoing ELN activities.

[Download the presentation here.](#)

Appendix 1

Results from group discussions day one

Key findings question one: What key learnings did you identify from the cases presented that are relevant regardless of industry?

- ELN is key for shaping lightweighting framework (regulations, funding etc.).
- Everybody wants lightweight, but no one wants to pay the cost.
- In Europe we don't want to be the first ones when trying new things, we are more conservative.
- Perfect inventions are created in Europe but not scaled up, the rest of the world take those inventions (e.g. monorail). Fear to invest and risk money - a cultural problem.
- A funding program in Europe for lightweight technologies where Lightweight is in the title (strong title).
- How do we take excellence in research to implementation? -Speed.
- One issue we see in Europe is that we are losing a lot of IP to the rest of the world due to lack of funding on higher TRLs. So, we need to find a solution/funding opportunities to fund higher TRLs.

Political:

- We need political initiatives to drive and promote the change for more sustainable lightweight technologies in the industry and in research. Policy makers is crucial to drive the change towards more sustainable industries through lightweighting technologies.
- Rules and regulations should be adapted to allow for lightweight design and materials more quickly. Regulations should force companies to go more sustainable.
- Political initiatives to drive/promote change.
- Key strategies is to work in chains of industry-academia-policy makers.

Calls:

- The access of reaching the funding money is too administrative.

Communication/information/education:

- We need to promote the importance and possibilities with lightweight technologies, especially towards the sectors where lightweight technologies are less visible (right now you see lightweight technologies mostly in transportation and energy sectors but there is much potential in other industries as well).
- The research within the area has lost its attractiveness (losing the number of PhDs).
- It is important to inform that the circularity of materials (including lightweight technologies) are not solved. This is a topic that is missed during the conference.
- We need to inform the networks and beyond about that lightweight technology most often means more sustainable technologies and not only in the use phase.
- Lightweight should be visible and embedded in the educational system and we should educate our educators of the importance of lightweight technologies.

Lightweight technologies:

- One issue with lightweight technologies is to make it more affordable. This is one of the reasons that it is hard to implement into the industry. How can we make it more affordable before it reaches serial production levels?
- Question is how we can solve the issues with supply chain of materials and traceability to ensure sustainability for Europe?
- New types of business models could create new demands for lightweight technologies.
- The importance of cross sectoral innovation is the way forward for lightweighting technologies.
- Multifunctional materials are an important area for lightweight technologies.
- Lightweighting should be accompanied with LCA to prove its sustainability and there should be a support system for SMEs on producing affordable LCAs.

- Lightweight design is nice to have but it must be cost effective.

Topics:

- The group then discussed the Luxembourg's keynote: where e-mobility ,might not need lightweight. However when it comes to CO2 emissions and tax, the focus should not only be on the emissions per se but also saving energy.
- -CO2 reduction is only one of the benefits, in the future we should consider other benefits coming from lightweight.
- To implement lightweight technologies, we need a holistic approach from the very beginning.
- We missed a use case of lightweight for hydrogen storage - its huge but it was missing.

Results from group discussions day two

Key findings question two: What do you identify as the three top priorities from a lightweight perspective in order to reach a sustainable society with competitive industries?

- Help companies to develop new sustainable lightweight products without losing competitiveness at international level.
- Add other EU members to ELN (for instance France). We need a single voice -> One network.
- ELN, ELA, ELCA should speak with one voice.
- One strategic agenda on lightweighting.
- Gather all initiatives as EU embrace.
- Verifying agendas.
- Website share documentation.

Communication:

- Give lightweighting a common EU definition and how it benefits all.
- More communication between Industry – University/institute to do the right kind of research and to shorten the distance and bridge the valley of death.
- to rapid up the implementation
- to provide needed education

- Convince industry the value of lightweighting in the long run.
- Make Leichtbau Atlas European.

Calls:

- EUREKA is good, but needs to be improved.
- Better synchronization between countries.
- “all” European countries should be part.
- More efficient use of research money.
- We feel that in today’s system we spend more time to apply for research funding than we do the research. It is a waste that is not sustainable.
- Sustainability -> higher importance in calls/ evaluation in industry funding schemes.
- Lightweight design should not be a subtopic of different calls but top header of the program.
- Fund some research and information programs in lightweighting at EU level.

Education:

- Clear and consistent education and training program in lightweight technologies.
- Harmonization of lightweight education (include academia).
- Education and educate the educator. – Change the mindset even in mobility(?).
- New studies within lightweighting attract students.

Topics:

- Circularity, digitalization, traceability, digital product pass for products based on lightweighting.
- Circularity in all phases change the model to “recycle-replace-reuse”. Both when companies go to EU domestic markets and EU markets.
- Improve functionality of lightweight products. Strength to weight ratio and durability.
- Enable circularity harmonization in Europe.
- Additive manufacturing can produce weight reduce components.
- Powerful industry partner to push (RISE) TRL within lightweight and sustainable technologies.
- Show that lightweight gives value on a LCA. Give SMEs help on LCA-work.
- LCA standards for lightweight (open for SMEs).
- To use an open collaboration for multi-material.
- Bionic – Inspire lightweight with Nature.