2nd European Lightweighting Network Meeting

World Café; 24th September 2021

Executive Summary

There is a need to make lightweighting contributions and benefits for the society, citizens and stakeholder more tangible. Key is to identify the most relevant target groups, which allows addressing each group with tailormade information.

European Member States and the European Commission are crucial stakeholders for aligning RDI and co-operation activities along a common European Lightweighting Strategy. This strategy builds on national and regional strengths and focus points. The strategy vocals a common vision, thus becoming the condensation nucleus of a mutual lightweighting roadmap. In a first step contact points for lightweighting at the EC and the participating MS shall be established.

The maximum use of digitalisation (e. g. simulation) and the focus on market needs are key to exploit the lightweighting potential to its fullest. Cross-disciplinary co-operation with industrial participation is an additional indispensable facilitator.

The economic significance of lightweighting needs to be made clearly visible. One very promising path to pursue is the use of existing statistical data in form of the Statistical Classification of Economic Activities in the European Community (NACE Codes) for evaluating the impact of lightweighting on the economies and labor markets. A concrete proposal for such an evaluation methodology is available on the European Lightweighting Network (ELN) website: 2021_ELN_Kleissner.pdf

In question of funding the existing instruments on European and national level are adequate, however, an adaptation towards smaller consortia, a better alignment between national call topics and a more flexible integration of non-national partners should be looked into.

A first group of participants willing to contribute to activities in the discussed areas of visibility, technologies , stakeholder needs and funding has been set up.

The Research Institutes of Sweden (RiSe) will host the 3rd European Lightweighting Network meeting in 2022. Germany, Austria and Sweden being the pioneers, along with all the EU countries that have and will join the ELN platform, will continue to work together on further deepening the ELN process.

Content

2nd European Lightweighting Network Meeting 1
World Café; 24th September 2021 1
Executive Summary 1
Goals of the ELN Meeting 2
World Café – Participants contribute to ELN goals 3
Guiding Questions and their relevance according to the workshop participants 3
Results 4
Key Findings Question 1: How could a better visibility of the lightweighting and its potential be achieved? 4
Key Findings Question 2: What are the most promising technology options for the successful development of technologies for weight and resource reduction? 6
Key Findings Question 3: What are the needs of industry and research institutions from public authorities? 9
Key Findings Question 6: Which joint European R&D-funding on European, regional and MS-bilateral level is needed and which existing instruments suit best for its implementation. 11
Relevant Topics not covered during the discussion 13
Relevance of the guiding questions 13
Annex 14
ELN Mindmap of the four discussed guiding Questions 14
Guiding Questions and background information: 15

Goals of the ELN Meeting

Formulating ideas to promote lightweighting and strengthen co-operation between the different stakeholders

- *analyzing opportunities for joint European R&D-funding and the instruments needed to implement this endeavour*
- *discussing technology options for the successful development of technologies for weight and resource reduction*
- *identifying industry and research institution need from public authorities*

- *defining the most promising activities and activity leaders responsible to bring these efforts forward until the next European Lightweighting Network meeting*

World Café – Participants contribute to ELN goals

The working method helped to break down sectorial thinking, i.e. representatives of different institutions and technology directions contribute their views to answering guiding questions. Overall 33 participants from the following seven different areas contributed to the workshop results: Industry (4), Research (5), SME (1), Ministry (7), Lightweighting Network (11), Funding Institution (3), Civil Society (2). The quality of the World Café depends strongly on the preparation and involvement of the guests/hosts.

Working Method: In the World Café (random) small groups discuss guiding questions. The group size is 4-6 people per table. The group has 20-25 minutes to get to know each other, exchange ideas, share their knowledge, work out solutions, develop ideas and document the important points of discussion (paper at the table, flip chart with person responsible for documentation). After the set time, all small groups disperse and meet for new rounds of discussion at other tables on a different (given) question. The host remains at the table and introduces to the guiding question, sharpens it in case of ambiguity, pays attention to the discussion time of the guests and secures results. The host uses the results from the previous group as an impulse to initiate the discussion. At the end of the World Café, the results are presented and shared.

Guiding Questions and their relevance according to the workshop participants

Four guiding questions have been discussed (Details see Annex) during the World Café.

- ***Question 1: How could a better visibility of the lightweighting and its potential be achieved?***
- ***Question 2: What are the most promising technology options for the successful development of technologies for weight and resource reduction?***
- ***Question 3: What are the needs of industry and research institutions from public authorities?***
- ***Question 6: Which joint European R&D-funding on European, regional and MS-bilateral level is needed and which existing instruments suit best for its implementation.***

Results

Key Findings Question 1: How could a better visibility of the lightweighting and its potential be achieved?

The group discussions during the World Café were lively and active, therefore many different ideas could be generated. In the final round, the six most important ideas have been identified and prioritized with points. These are summarised in the following sections, starting with the idea that gathered the most points.

- **Identify target groups**
  Before any action to promote lightweighting (LW) as such can take place, there must be a clear picture about who should be addressed. LW comprises very diverse technologies, to be found in numerous different industries and applications. Therefore, the identification of target groups is crucial. Some target groups have already been named during the discussion, namely mobility, construction, health, electronics and politics. Hereby, politics (3 points) and mobility (2 points) were highlighted as major target groups during the last round.
- **Define a common vision = Roadmap**
  An important next step to foster visibility, especially to initiate support/funding from the EU, would be the creation of a roadmap which will lie down common goals for all players on an international and transdisciplinary level. To be heard by the European Commission, a clear, simple and understandable message needs to be delivered (and repeated, several times…). The more industries, OEMs, suppliers, networks, NGOs, etc. take part in the process of defining such international common goals for LW, the greater the chances of being heard (and supported). Such a roadmap could be elaborated during the next conference in Sweden.
- **Visibility through sustainability**
  One of the biggest strengths of LW throughout different disciplines is the undeniable potential of contributing to the European SDGs. A higher resource efficiency and CO_2 reduction have been named as two important ecological benefits. Therefore, all communication on LW should highlight the strength of fulfilling/addressing the triple goals economic success, social responsibility and ecological viability, ergo sustainability.
- **Share and promote Best-Practice examples**
  The state-of-the art LW technologies which seem the most promising could be used for story-telling and help to counteract on negative image aspects (like high costs, pollution, …).

- **Highlight the multiple benefits**
  Not only sustainability goals can be pursued by using LW technologies, but in some cases also cost reduction can be achieved. A better understanding of the overall benefits that are possible through LW may help to promote the technology in more different fields.
- **Establish a list of high performance lightweight products**
  Another idea to improve the visibility of LW was the generation of a platform listing all products that would not exist/not have a future without a focus on weight saving, e.g. spacecraft or race boats. Hereby, best practice examples could be included. Also, the additional benefits of these LW products compared to non-LW benchmark products should assessed, made transparent and visible.
- **Lighthouse projects**
  Finally, even though the point did not make it into the ranking, the positive impact of lighthouse projects has been discussed eagerly. Having some well-known OEMs promoting a lighthouse project with a clear focus on LW can also trigger further action and increase the visibility.

Key Findings Question 2: What are the most promising technology options for the successful development of technologies for weight and resource reduction?

Lightweighting (remark: widely understood as “a technology” itself – at least in the public, if known anyhow) is the best technology for weight and emission reduction as well as resource efficiency (remark of one participant).

In the **first round** we developed a table of various lightweighting technologies, giving an overview on basis of four columns – formerly technologies were material and process centered, design (e. g. in additive manufacturing), also due to digitalization, came much more into focus. Nowadays circularity has to be borne in mind right from the beginning of any lightweighting technology product development.

Thus, **lightweighting comprises 4 areas**:

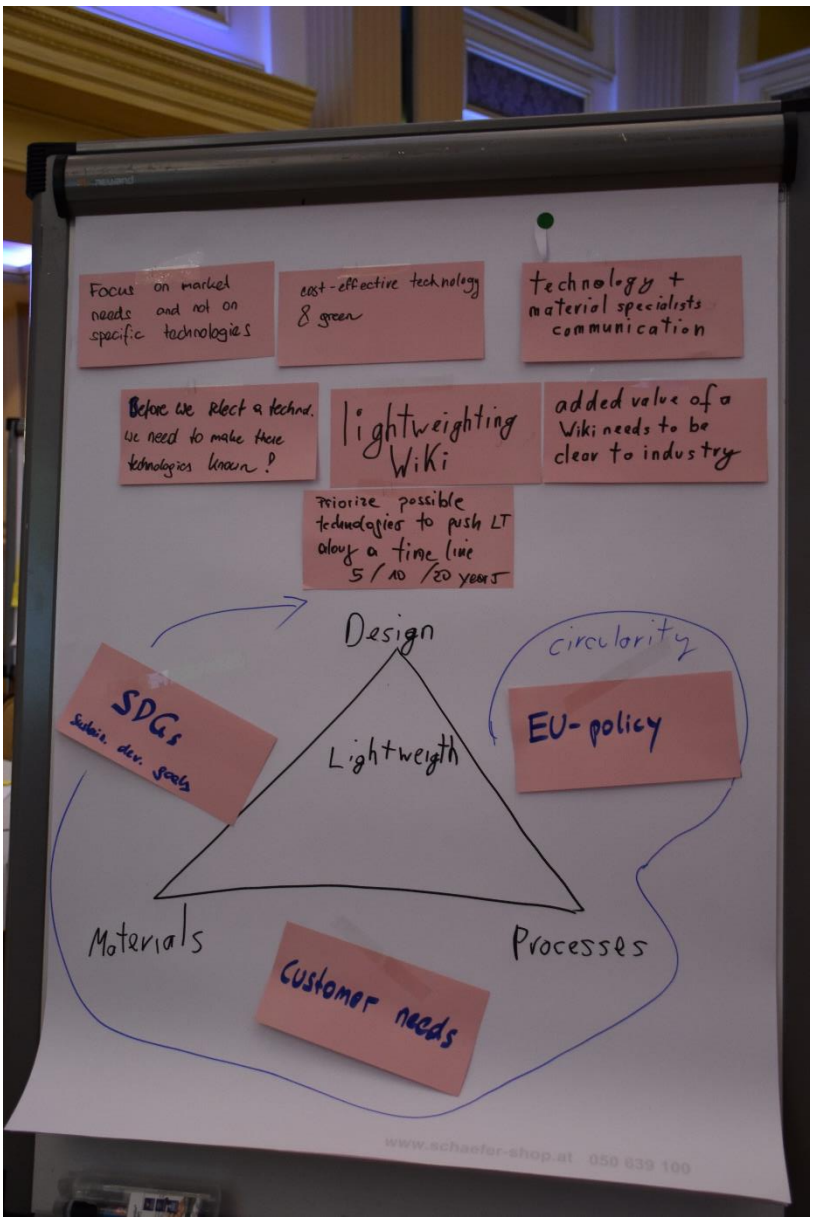
Material	**Process**	**Design**	**Circularity**
Metals	Substrative	Bionic	Modular
Polymers	Additive	Algorithmic	Repair
Composites	Forming	Big data	Reuse
Renewable bio resources	Pressing / stamping	Artificial Intelligence (AI)	Mechanical shreddering
Minerals	Growing		Separation
Nano-materials	Casting		Chemical
	Joining		Size reduction
	Assembling		

In the **second and third round** we focused on the framework, which facilitates the flourishing of lightweighting technologies, like the necessity for cooperation of various groups (and making cooperation possible, so that industry and scientific partners get to know from each other’s work), visibility in public (“what are lightweighting technologies and why are they crucial for climate change actions”), combining simulation with experiments in order to achieve an optimal (individual) solution.

Following aspects were mentioned:

- **“Cross-disciplinary co-operation with industrial participation.”** *This comment was brought in by RiSe, organizer of the 3rd ELN event in April 2022.*
- **Before selecting we need to make technologies known – LIGHTWEIGHTING WIKI** (remark: there is a “Leichtbauatlas” in Germany already available // remark: how can we enhance the visibility of such a wiki? How can we facilitate that the lightweighting community in the EU works on and updates such a WIKI? There is need for accountability – who is responsible for the built up? What resources are needed? Roadmap?)
- **Using the combination of simulation and experiments leading to a better design**
- **Focus on market needs and not on specific technologies (green and cost effective) –** research and development needs to be market driven (the involvement of industry in such processes is key)
- **Applied Technology → Use-Case centered (related) research and development**
- **Technology & materials specialists communication (Remark: facilitation thereof; a platform?)**
- The guiding question: “*What are the most promising technology options for the successful development of technologies for weight and resource reduction?”* was criticized or caused some irritations. However, an aspect was brought in that when there are available technologies on the table **a prioritization IS possible in terms of a roadmap**:

- **Prioritize possible technologies to push lightweighting along a timeline 5 years /10 years /20 years (remark: and also align funding logics to this timeline).**



Finally, in the last round we scratched a sketch on the flip-chart of how the **most crucial aspects of lightweighting could be seen in their environment**:

Key Findings Question 3: What are the needs of industry and research institutions from public authorities?

A general remark has been raised to ensure that the meaning of the expression *Lightweighting* is understood throughout the whole group of stakeholders.

During the workshop the following topics have been addressed and discussed:

- **Strategic Needs**
    - Create a Lightweight Technology Strategy (Bottom Up Group National)
    - Harmonize needs and opinion towards an European Strategic Paper as input to the European Commission or/and to a Future European Technology Platform
    - Make Lightweighting economically visible (e. g. bottom up approach with existing statistical data in form of NACE Codes as pointed out in the keynote of Ms Kreissler)
    - Include a specific “Lightweighting” part in EU & National Strategic Plans in such areas as Resource Efficiency, Energy Consumption, Green Deal
    - Create National and EU Commission Contact Points for Lightweighting to facilitate exchange and cooperation activities

    - Point out the Lightweighting potential toward Green Deal objectives and national objectives linked to it
- **Legislative Impact on Innovation or Non Innovation**
    - Legislative Impact on Innovations should be considered & checked more in detail with stakeholders, as Industry & Science need clear Rules (also on Forecast) e.g. End of Life Directive, CO2 Emission Tax, a.s.o.
- **Visibility & Voicing (Topic Mentoring)**
    - Lightweighting is not involved in gremial work as an important contributing factor
    - Make Lightweighting visible using initiatives on national, transnational (EU, global) level and be present as dedicated topic on global summits like G7/G20 or on national events e.g Forum Alpbach in Austria
    - Lightweighting marketing with facts & figures and success stories
- **Education & Knowledge Transmission**
    - Educate Lightweighting in technical schools, universities, designers & industry
    - Create knowledge transfer enabling tools to boost/accelerate innovation
- **Funding & Support**
    - A dedicated lightweighting funding is already existing
    - Funding schemes to create national & transnational lightweighting open innovation test beds
    - Support SME´s in creating innovation impact support for higher TRL or commercialization (within the competition laws)
    - Hear and invite SME´s in strategic RDI Roadmaps or designing funding programmes and rules/requirements
- **Networking**
    - Create platforms or support/facilitate interaction between Lightweighting regions across Europe
    - Create or support learning journeys to benchmark regions for Lightweighting and R&D hot spots on the variety of Lightweighting taking into account cross technology aspects from wood to steel and plastics

Key Findings Question 6: Which joint European R&D-funding on European, regional and MS-bilateral level is needed and which existing instruments suit best for its implementation.

The answers of the changing rounds of participants can be mostly summarised into three categories:

1. International instruments
2. Possible improvements on instruments from the perspective of the funding applicants
3. Common platform, network, visibility for lightweight construction

The following core statements have been elaborated:

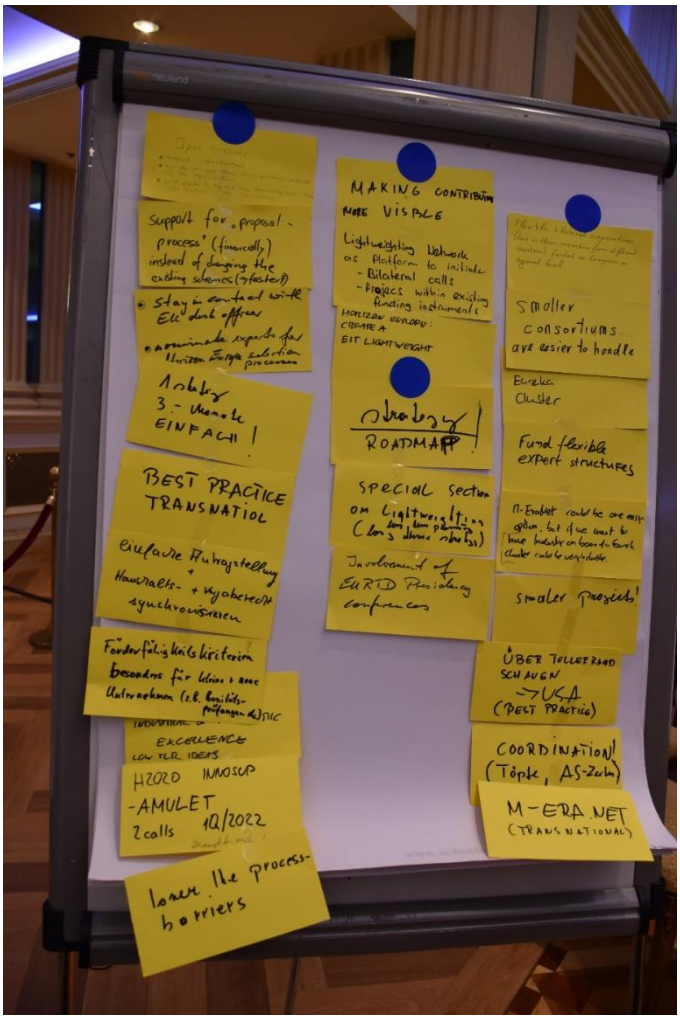
- **International instruments**: no new instruments need to be created, the existing instruments such as ERA-Net/ Eureka Cluster/ Eureka (or other flexible, bi-, multilateral instruments) are suitable (with slight adaptations). Preferred structure: 2-3 member states.

  Suggestions for adaption:

  - Smaller projects, consortia (not too many countries/ participants needed)
  - National funding (money availability, programme life spans, topics) programmes should be more harmonized, which would make collaboration easier
  - Looking to oversea regions for input how to improve, are they doing anything better?
  - Flexible, multilateral cooperation, smaller consortia
  - Build on existing projects and initiatives such as H2020 INNOSUP and the running H2020 project AMULET
- **Possible improvements on instruments:** In summary, it can be said that the desire for cooperation (in funded projects) is reduced by the low probability of success and a lot of effort to prepare proposals. The application process should be simplified (more coordinated between states), or - if this is not possible - assistance from experts should be provided. National funding is easier to access, but lacks the European scope/partner mixture. Possible improvements that were named in the discussion were:
  - Pairing industrial and academic excellence, support fast-movers
  - Open test beds (research infrastructure, pilot plants in order to try out new ideas)
  - Provide best practice (transnational) examples
  - Provide financial support for the proposal process

- Improve the exchange of participating companies and the EC desk officers responsible. Put specific effort in the nomination of experts and advisory panels (in order to learn from a different perspective)
- Ideal setup for project selection: 1 stage, 3 months to decision
- Legislation harmonisation (across states)

- **Common platform:** All the participants agreed about the need of more visibility and on the idea of a common platform in order to represent the voice of the community (e. g. towards the European Commission and national states). The participants had in mind that it will not be an easy way and will need some time. The essence of the discussion is the possible **creation of a common strategy and roadmap** (long term planning).
  - Involvement of EC such as DG RTD in the ELN process, e. g. hosting conferences and aligning the process to European objectives
  - The platform should initiate bilateral calls, projects within existing funding instruments
  - Creation of an European Technology Platform (ETIP) *Lightweight* or an ETIP



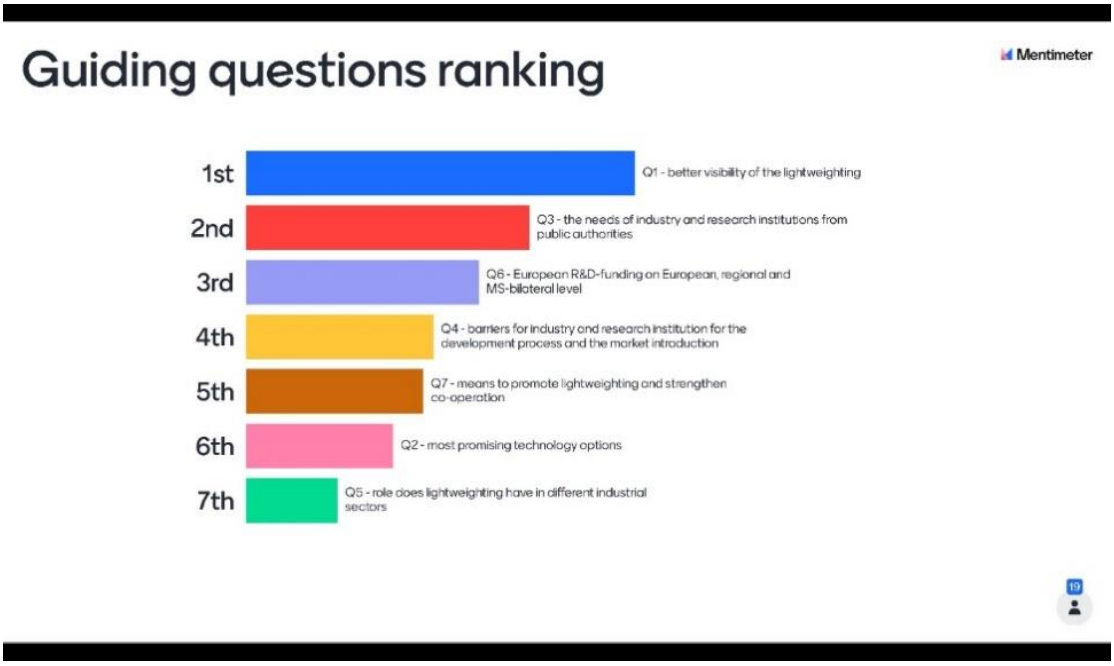
Relevant Topics not covered during the discussion

The participants mentioned the following points, which should be taken into account

- Anticipate NGO communication and think about (technological) downsides of Lightweighting in advance
- Work on a list of contact points on EC and national level to strengthen the ELN network and to facilitate cooperation

Relevance of the guiding questions

The participants ranked all seven guiding questions prepared according to their relevance for the audience. All seven questions are described in the Annex. The Questions Q1, Q2, Q3 and Q6 have been preselected as most relevant by the hosting organisations and where therefore selected for the workshop. The participants, however, assessed the relevance of Q2 significantly lower.

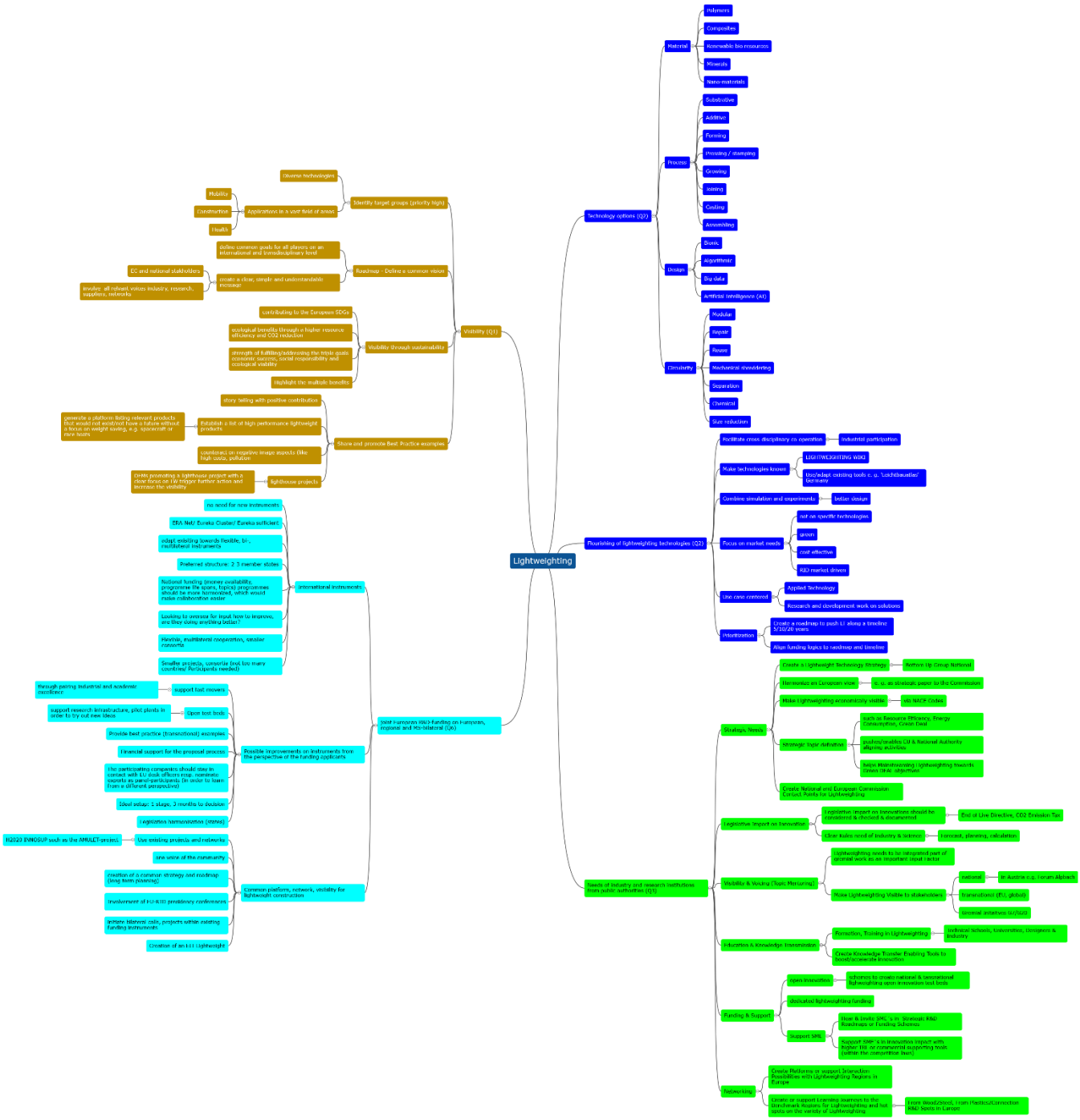


Online documentation of the event:

https://mobilitaetderzukunft.at/en/articles/european-lightweighting-network.php

Annex

ELN Mindmap of the four discussed guiding Questions



Guiding Questions for the ranking exercise:

- Question 1: How could a better visibility of the lightweighting and its potential be achieved?
- Question 2: What are the most promising technology options for the successful development of technologies for weight and resource reduction?
- Question 3: What are the needs of industry and research institutions from public authorities?
- Question 4: What are the barriers for industry and research institution for the development process and the market introduction of lightweighting technologies?
- Question 5: What role does lightweighting have in different industrial sectors? What is your long-term vision?
- Question 6: Which joint European R&D-funding on European, regional and MS-bilateral level is needed and which exisiting instruments suit best for its implementation.
- Question 7: What are the best means to promote lightweighting and strengthen co-operation between the different stakeholders?