

refuse rethink reduce  
re-use repair refurbish



remanufacture  
repurpose recycle  
recover respect

**CIRCULAR WIND HUB:  
IT'S ALL ABOUT RESPECT**

Knowledge Hub – Setting out a path

# Knowledge Hub meeting, June 25<sup>th</sup> 2021

Thank you for being a part of the first meeting of the Knowledge Hub! In this recap document, you can find the topics discussed and the input provided. Your contributions will be part of The Circular Wind Hub program that aims to accelerate the transition towards a fully circular wind industry.

Please let us know if you have any additional comments, suggestions, or questions!

## Goal of the Knowledge Hub

The main objective of the Knowledge Hub is to collaboratively determine, to make an inventory of, and create the knowledge needed, in the development towards a circular wind industry. The Knowledge Hub hosts participants from different backgrounds in the industry to enhance knowledge collaboration through the value chain. Questions and themes may be shared by participants and by other Hubs. At the end of 2021, a way forward for standards, common understanding of circularity challenges, and new developments in design through knowledge consortia or research projects could be reached.

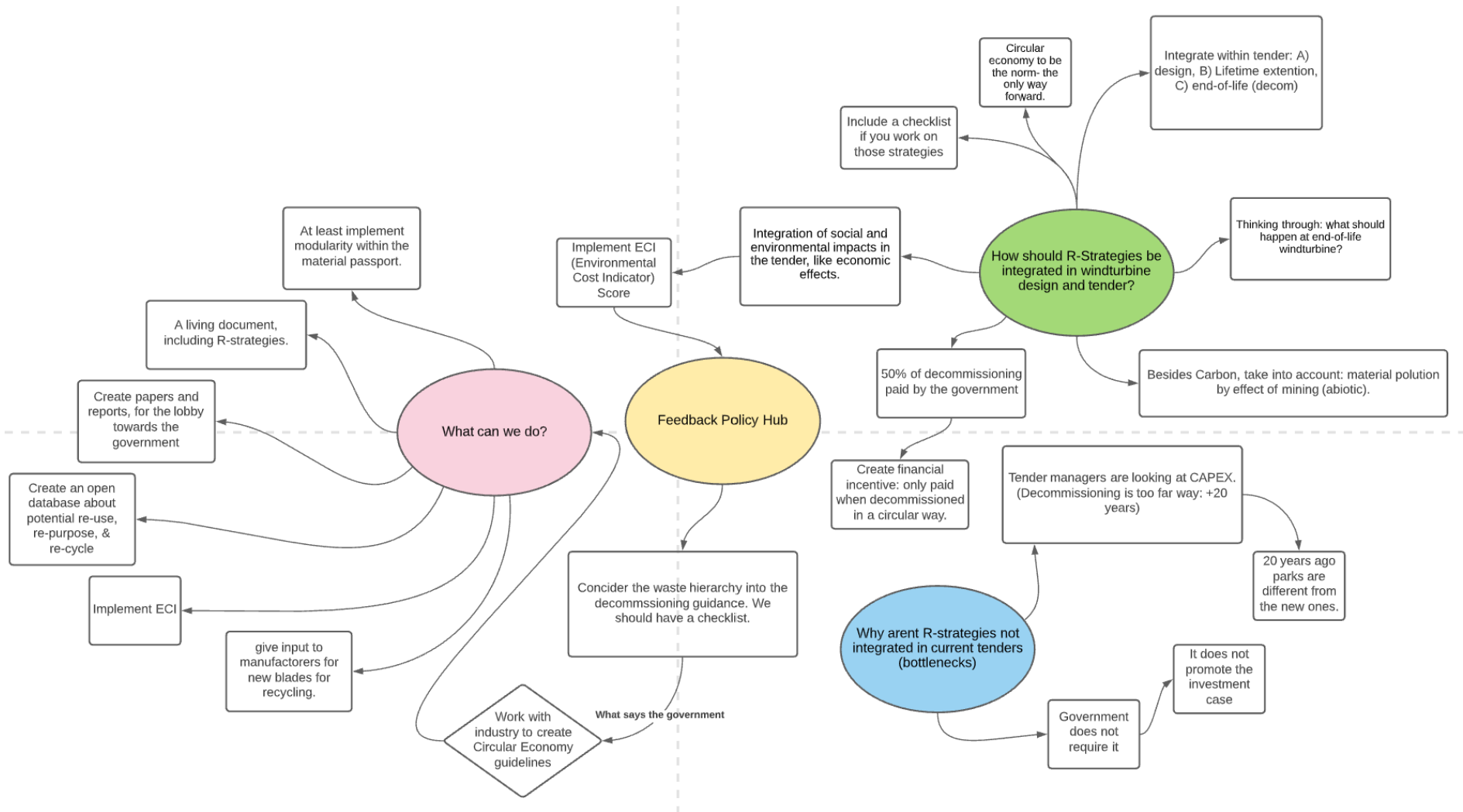
To achieve the objectives, tight and constructive collaboration between parties of the industry is expected. Only in this manner widely supported results, across the industry and European-wide, will be reached. The findings of the other hubs, the Policy Hub and Industrial Hub, will be closely intertwined with the Knowledge Hub. Together, this will create a pathway to a Circular Wind Industry by 2050, by focussing on short- and mid-term action points.

**Circularity:** An economic system of closed loops in which raw materials, components and products lose as little value as possible, renewable energy sources are used and systems thinking is at the core (source: Het Groene Brein)

**Material passport:** A document consisting of all the materials that are included in a product or construction. The core idea behind the concept is that a material passport will contribute to a more "circular economy", in which materials are being recovered, recycled and/or re-used in an open traded material market.

**Life Cycle Assessment (LCA):** A methodology for assessing environmental impacts associated with all the stages of the life cycle of a commercial product, process, or service. It involves a thorough inventory of the energy and materials that are required across the industry value chain of the product, process or service, and calculates the corresponding emissions to the environment.

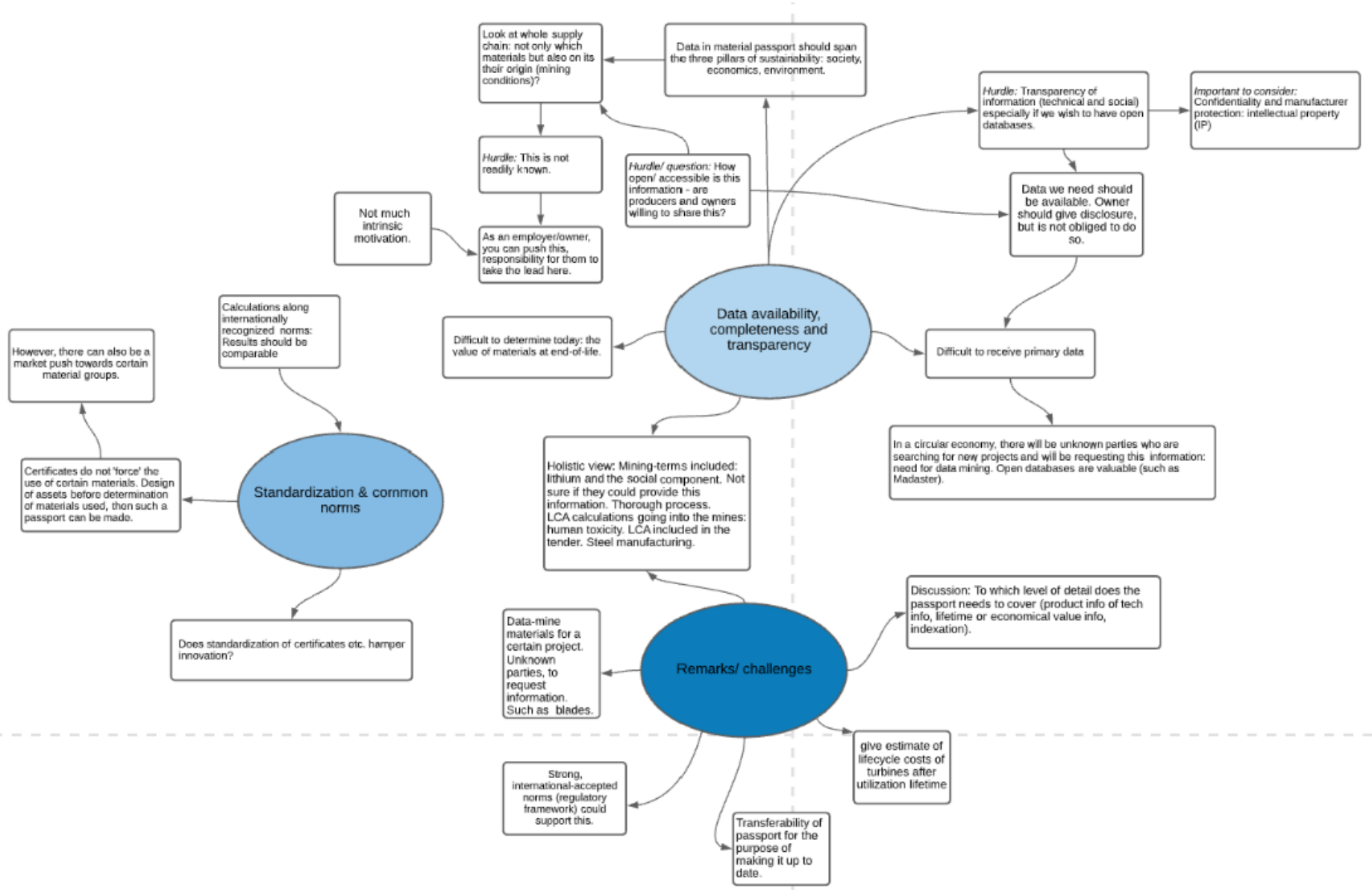
# Recap break-out session, R-strategies within design and tenders



Additional comments, questions and ideas brought forward during the meeting have been presented according to the different subjects discussed:

Topics	Input participants
<i>Data ownership</i>	Important point: data ownership. Data is essential for product and material passports.
<i>Data sharing</i>	<i>Question:</i> What about legal and business agreements that can enable data sharing along the lifecycle of a product?
	<i>Question:</i> What could be the benefits to wind OEMs and operators to share data?
	<i>Question:</i> How could OEMs be incentivized to share data (Through government when selling)?
<i>Other remarks and questions</i>	Unknown whether OEMs blades have information on materials used in its products from 20 years ago
	<i>Question:</i> What about data authenticity and validation at each node of the value chain? How authentic this data is? How is data validated?
	<i>Question:</i> If considering the R-strategies as obligatory, then we also must work on market development. Who is going to re-use the part and the materials?
	DEX is not generally considered and often assumptions are made rather than thinking through what actually might happen in a certain location.
	With regards to Industry Guidance, perhaps we consider WindEurope's decommissioning guidance?
	The extended producer responsibility needs to be clarified as well (with the policy hub), because now it is not clear who is responsible for EoL (OEMs, developers/ operators).

# Recap break-out session, material passports and certificates



Comments, questions and ideas brought forward during the meeting have been presented according to the different subjects discussed:

Topics	Input participants
<i>Standardization and common norms</i>	Calculations of LCA and EPD along internationally recognized norms: Results should be comparable.
	<i>Question:</i> Does standardization of certificates etc. hamper innovation? First design your assets, then looking at what materials are inside it and then you create a passport. The certificates do not "force" one to use certain materials only. However, there can also be a market push towards certain material groups.
	Keep an open discussion. Using different manners to measure different products, might be good.
<i>Data availability</i>	<i>Hurdle:</i> Transparency of information (technical and social) especially if we wish to have open databases. <i>Important to consider:</i> Confidentiality and manufacturer protection: Intellectual property (IP).
	Data needs must be available. Difficult to receive primary data.
	Give estimate of lifecycle costs of wind turbine after the initial lifetime. Possible scenarios for re-utilization or re-application. In a circular economy, unknown parties will be searching for new projects and will be request this information: Need for data mining. Valuable are open databases (such as Madaster).
	<i>Hurdle</i> Openness of this system.
	Strong accepted norm internationally, mechanism and methods used with regulatory framework.
	To implement environmental material passport. Based on international standards to compare and to have credibility.
	Difficulty of data accessibility from companies: Data we need should be available. Owner should give disclosure but is not obliged to do so.
	Sometimes it is impossible to get insight in information on raw materials.
	Data-mine materials for a certain project. Unknown parties to request information such as on blades.
<i>Data completeness and transparency</i>	Data in material passport should span the three pillars of sustainability: society, economics & environment.
	Taking into account the whole supply chain: not only which materials but also their origin, such as mining conditions (social analysis). <i>Hurdle/ question:</i> How open/ accessible is this information - are producers and owners willing to share this?
	Monetise not only direct economic impacts but also environmental and social impacts. <i>Hurdle:</i> Not readily known.

	<p>As an employer/owner, you can push this, responsibility for them to take the lead here.  Not many companies take this step themselves.  If more and more owners demand such data in their tenders, they can push the sharing of information.  Strong, international-accepted norms (regulatory framework) could support this.</p>
<i>Social-economic and intellectual property included</i>	<p>The material passport should have all components involved in product lifecycle thinking approach. as much as information: Social and economic aspect hard to include as well as taking into account intellectual property.</p>
	<p>Mining-terms included: lithium and the social component.  A more holistic view. Not sure if they could provide this information. A thorough process but important.</p>
	<p>LCA calculations going into the mines: human toxicity.  LCA included in the tender. Steel manufacturing. In employer side you can put it into the market. Not much intrinsic motivation. As owner and employer you can push this.</p>
<i>Other remarks</i>	<p><i>Question:</i> How do you value something like future technology?</p>
	<p>To which level of detail does the passport needs to cover (product info of tech info)?  Lifetime or economical value indexation. That discussion is still not finished...</p>
	<p>give estimate of lifecycle costs of turbines after utilization lifetime.</p>
	<p>Transferability of passport to make it up to date.</p>

## Conclusions

The conclusions are the main aspects forwarded to the other Hubs for further elaboration and discussion to make the necessary steps towards circularity.

### **Integrating R-strategies in tender criteria**

- Integrate a waste hierarchy within the decom plan (in your tender).
- Integrate Environmental Cost Indicators (ECI) for circularity within tenders or design.

### **Integrating material passports in tender criteria**

- LCAs, EPDs and material passports conducted according to international standards (such as ISO, ECI) for comparison.  
To Policy Hub: How can this be approached and realized?
- Data in material passports needs to contain the three pillars of sustainability (social, ecological and economic).
- LCA should be included in the tender. Concerns on intrinsic motivation to share primary data.
- A regulatory framework is needed to provide companies with a 'leg to stand on' regarding the demand of certain data and performance of their suppliers.
- Data of mined materials is often not known by manufacturers, because they use components and parts that are manufactured by suppliers and their sub-suppliers. Therefore, its realistic to start a material passport at component level. In time, this can be extended with material values (is a material passport on component level feasible)?

**Next meeting: August, 27th 2021**