SDU TAL Conference

Associate Professor Lykke Margot Ricard - Researcher and Head of MSc PDI Programme

& Research Assistant Sofie Bach Hybel (former PDI student)

Innovation and Design Engineering (IDE)

Faculty of Engineering

The course: Sustainable Materials in Product Creation

- The course is a new 10 ECTS course integrating entrepreneurial opportunities in circular economy thinking w. material test lab work for MSc Engineering in Product Development and Innovation
- The course takes a stand at the design community as playing a key and determinant role as up to 80% of a product life cycle sustainability impact is determined at the design stage.

Circular economy models = product and business innovation

- Challenges from companies and learning from frontrunner companies
- Technology notes and product catalogue
- New business & markets drivers
- Transformations & innovation systems

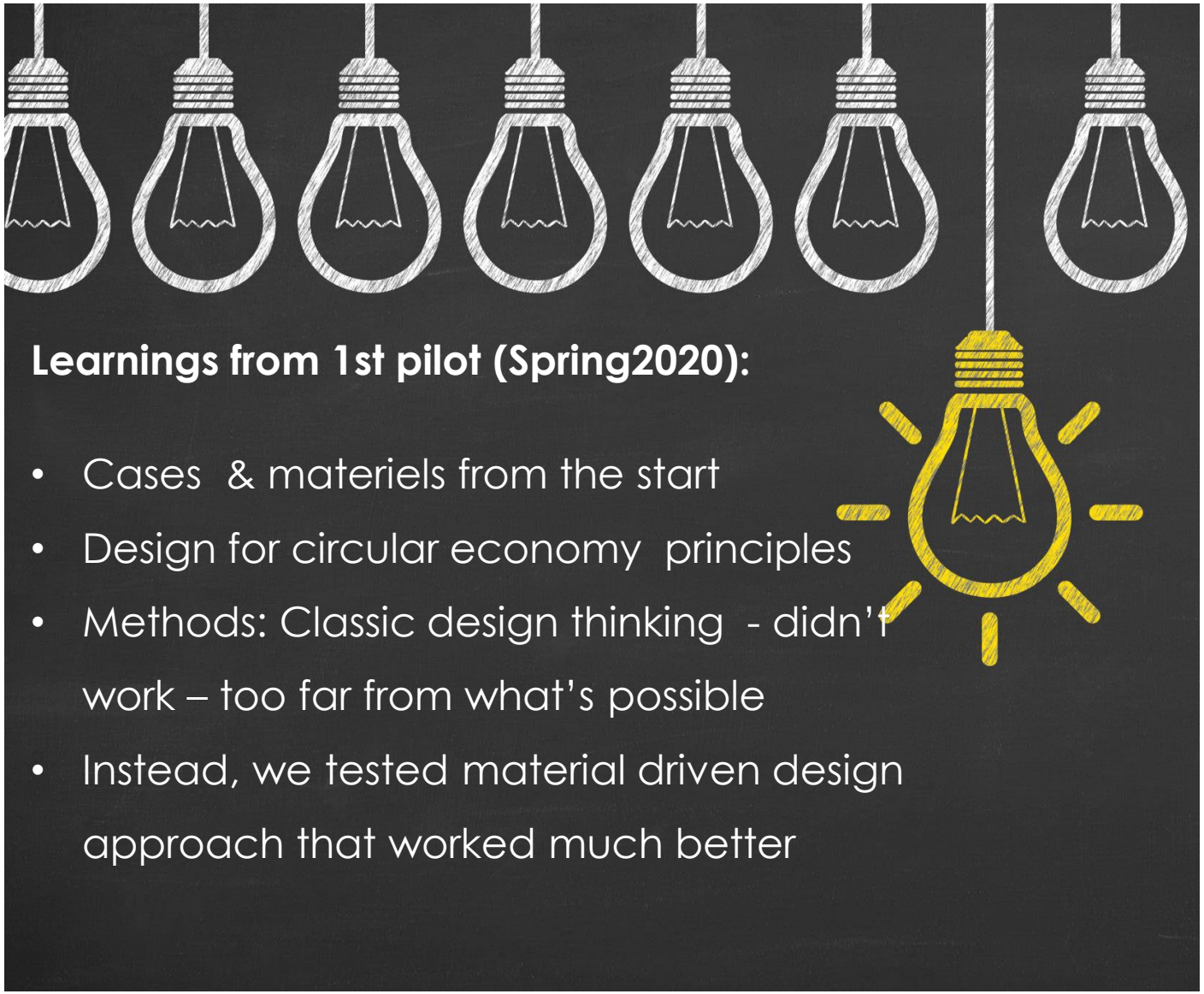
Company cases = two sources of materials

The assessment of the students' SDG related learning

- What did they learn about the materials?
- The challenges of upcycling in relation to product creation?
- Building a concept and mock ups for visualizations
- Innovation opportunities out there?
- The considerations and impact of one choices in selecting materiels, and mixing materiels in product creation #SDG12
- Plus working scientificly w. material driven design driven approaches – limitations and critical reflections on products being sustainable – in what way?

The challenge of developing something new

The question being in relation to the design engineering community: how can we extend the design tools, methods and approaches that researchers and practitioners have been developing for many years to support designers and engineers?



Learning objectives

Knowledge

This course will teach students to develop their knowledge of:

- Recycled and sustainable materials in the product creation process
- The practical considerations of incorporating sustainable materials into the production process
- Methods of reflective practice in Design Science

Skills

Students will have multiple opportunities to apply and reflect upon their ability to:

- Material driven design approach: to understand the limitations and opportunities of sustainable materials
- Gaining real life input from external companies
- Communicate effectively an understanding of value added via sustainable materials

Competences

Students will work in research teams to challenge themselves and so develop competencies in:

- Identifying and initiate action on opportunities which emerge from real world research and practical experimentation
- Reflecting on the role of sustainable materials in the entire product lifecycle
- The ability to feedback test data into the product value creation process

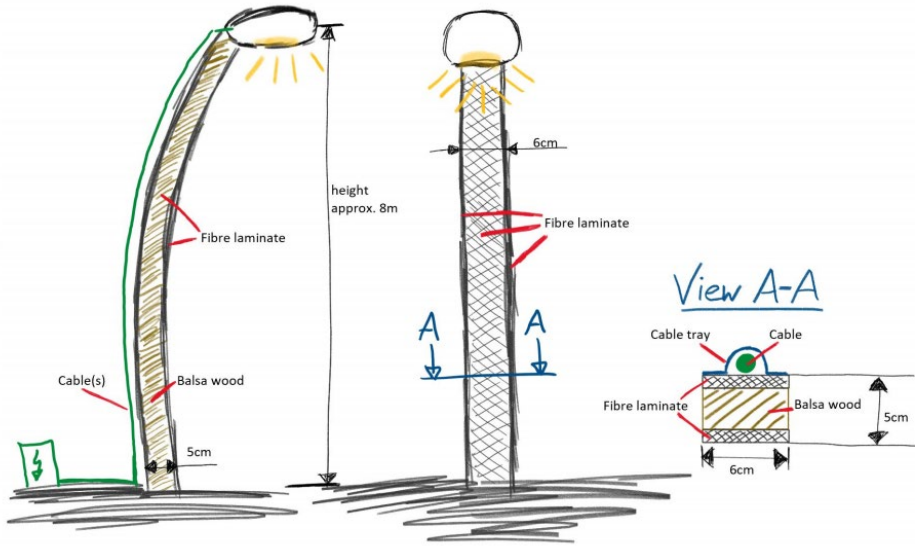
Expectancy-value
(student perspective)

- *Key take-aways*
  - *The principles of design for sustainability*
  - *The importance of design*
  - *The applicability to real industry problems*
- *Influence on future competencies*
  - *Better suited for a world of change*
  - *Backbone knowledge for application*
- *Personal view on the course*
  - *Important to strive away from traditional development*
  - *Breaking the link of indoctrination*
  - *Understanding the responsibility of an engineer*
- *Personal view on the SDG's*
  - *A common goal across industries and countries*
  - *A motivation to product developers of tomorrow*

Afternoon session

What challenges do you encounter integrating SDGs in your courses?

- It is a fine line of balance. To me, the SDGs can serve as a common language of ‘world problems’ and how innovation can be related to problem solving and impact on society
- My driver is ‘engaging education’ and educating for the future
- Today there is window of opportunity related to a request for candidates that can create products and growth in a smarter way than we have seen so far w. so much unrecycable waste
- I would prefer to have cases that relates to SDGs and not courses



A team effort

Lykke Margot Ricard, IDE (innovation and technology management, roadmap)
Søren B Storm, IDE (product developer and 3D design)
Michael Svarrer, IDE (industrial design & method)
Adam Montandon, IDE (creativity and presentation skills)
Raphael Geiger & Yasser Ahmad Hannan - Mechanical - composite lab (airport)
Søren W Borg, Mechanical (material lab) test of properties and strength tests

Special TEK lectures:
Roberto Naboni, Civil and Architectural Engineering (material driven design)
Kannan Govinda, OM (sustainability, supply chain value)
Morten Birkved, KBM (LCA- sustainability - from cradle to grave)

SDG’s in university courses (Students perspective)

- *The SDG survey*
  - *The importance of climate action*
  - *How to put word into action*
- *Own experience*
  - *A motivational factors to work with contemporary and relevant projects*
- *Future incorporation*
  - *Great opportunity to take active part through casework*