Dutch Composite Platform
Meeting Materials 2018

Marcus Kremers - chairman

CompositesNL

CompositesNL – for everybody involved

Manufacturing companies
Cross-sectoral
Small companies
Tooling companies
Regulatory bodies
Users
Thermoplastic
Natural fibre
Integrators
Glass fibre
Research institutes
Training companies
Fieldlabs
Epoxy
Aramid fibre
Technology providers
Education (practical - MBO – HBO – University)
Carbon fibre
Design companies
Large companies
Government
Market-specific associations
Polyester
Consultancy
Material suppliers

CompositesNL

Members

2MV composites
ACRATS TRAINING SERVICES
SAM|XL Smart Advanced Manufacturing
Advanced Plastics
Brightlands
Airborne
aliancys QUALITY RESINS
adel polyester
beter bad
DSM
BOUMAN POLYESTER PRODUCTEN B.V.
ALPOMAT Maakt 't in polyester
Autonational Innovative productivity
BiinC composites innovations sustainability
BIJL PROFIELEN COMPOSITE PROFILES
BOUWMEESTER BAC² ADVANCED COMPOSITES B.V.
CARROSSERIEFABRIEK HARDERWIJK
cato COMPOSITE INNOVATIONS
ceemo engineering
Composite STRUCTURES
Contest YACHTS
CURVE works
DAMEN
DE IJSSEL COATINGS
dEEN
DemacqRecycling INTERNATIONAL
dtc
Dupolco Dutch polyester & composites
FA.DUURSMA
EUROCARBON advanced fibre braiding and weaving technology
EURORESINS
Fatol KUNSTSTOFFEN
Royal HaskoningDHV Enhancing Society Together
HEIDEVELD polyester
Fontys
FPI FUTURE PIPE INDUSTRIES
GROOT LEMMER
HAN AUTOMOTIVE RESEARCH
FiberCore europe
Howden
Magenta Group
indupol composite solutions
hollandhogeschool
Knowledge Centre WMC Wind turbine Materials and Constructions
KVE COMPOSITES GROUP
Marinebedrijf
LANTOR enabling performance
mctechnics we compose it for you
nedcam shaping technology
NHL HOGESCHOOL
TENCATE materials that make a difference
Plasticon Composites
Polybouw Keijser VOF
PPE Polyester Producten Emmeloord
dE fEYTER POLYESTER
POLYGLAS KUNSTSTOFFEN
POLYPLUS
PolyWorks The Universal 3D Metrology Software Platform
PONTIS ENGINEERING
Refitech CARBON COMPONENTS
prefabs constructies
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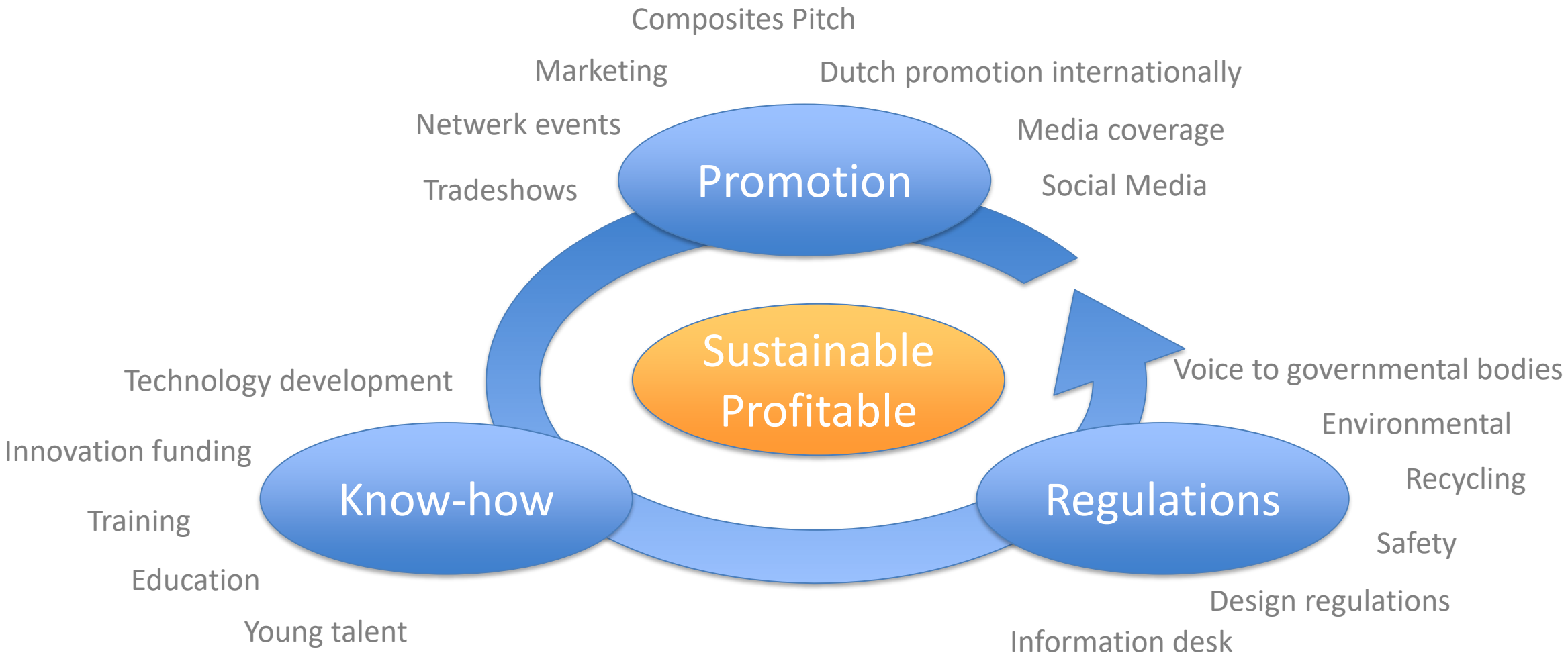
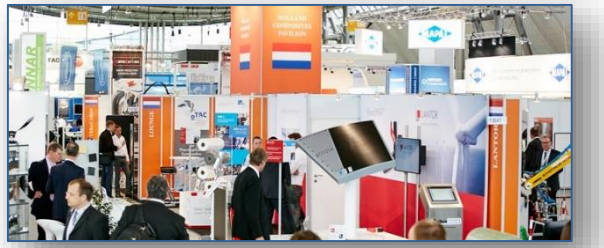


Promotion - activities

- ✓ Composites Pitch: promotional material
- ✓ Active marketing support: dedicated manager, social media
- ✓ Connect to other associations: NMT, NAG, AutomativeNL
- ✓ FME / HTSM Internationalisation workgroup, PIB Lightweight Germany
- ✓ Dutch pavilions at international events: JEC, Composites Europe
- ✓ National networking events

JECworld International Composites Event Paris, March 14·15·16·2017

COMPOSITES EUROPE



Holland High Tech
Global Challenges, Smart Solutions

NETHERLANDS MARITIME TECHNOLOGY

NAG Advancing your Aerospace and Airport Business

iRO

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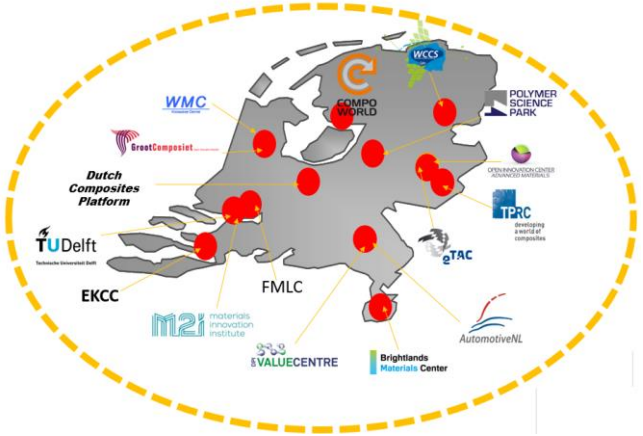
Know-how - activities



- ✓ Support Technology development
  - ✓ Connect, lobby, support, help disseminate
  - ✓ Example: Dutch Composite Platform
- ✓ Voice the needs of the industry (members of CompositesNL)
- ✓ Highlight innovation funding possibilities to members
- ✓ Connect to international research netwerks / centres / organisations
- ✓ Setup workshops / training / awareness events with other associations

- ✓ Workgroup 'Onderwijs', connects all educational partners
  - ✓ Develop composite education modules, through all levels
  - ✓ Approve training Certificates

Magenta Group, ACRATS TRAINING SERVICES, UNIVERSITY OF TWENTE., inholland hogeschool, SAXION, HAN AUTOMOTIVE RESEARCH, Windesheim, TU Delft, Fontys

- ✓ Young Composites – netwerk group for students and young professionals

YOUNG COMPOSITES

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Regulations - activities

- ✓ Voice of the industry to governmental bodies
  - ✓ Recycling: new technologies are being developed -> new regulations are being implemented: “Landelijk Afvalbeheer Pla 3”
- ✓ Regulations on Personell and Environmental safety
  - ✓ Information desk for members
- ✓ Design codes and regulations
  - ✓ SOLAS – Maritime
  - ✓ Technical Committee Hybrid: hybrid structures of metal to composties
  - ✓ CUR 96 / Eurocode for Composites
- ✓ Member of EuCIA board – voice of the industry to Europe
  - ✓ Ecocalculator, to calculate ‘cradle-to-gate’ footprint
  - ✓ Recycling

IMO INTERNATIONAL MARITIME ORGANIZATION E

SUB-COMMITTEE ON SHIP DESIGN AND CONSTRUCTION
1st session
Agenda item 11

SDC 1/INF.5
15 November 2013
ENGLISH ONLY

DEVELOPMENT OF GUIDELINES FOR USE OF FIBRE REINFORCED PLASTIC (FRP) WITHIN SHIP STRUCTURES

Report of the Correspondence Group

Submitted by Sweden

EuCIA European Composites Industry Association

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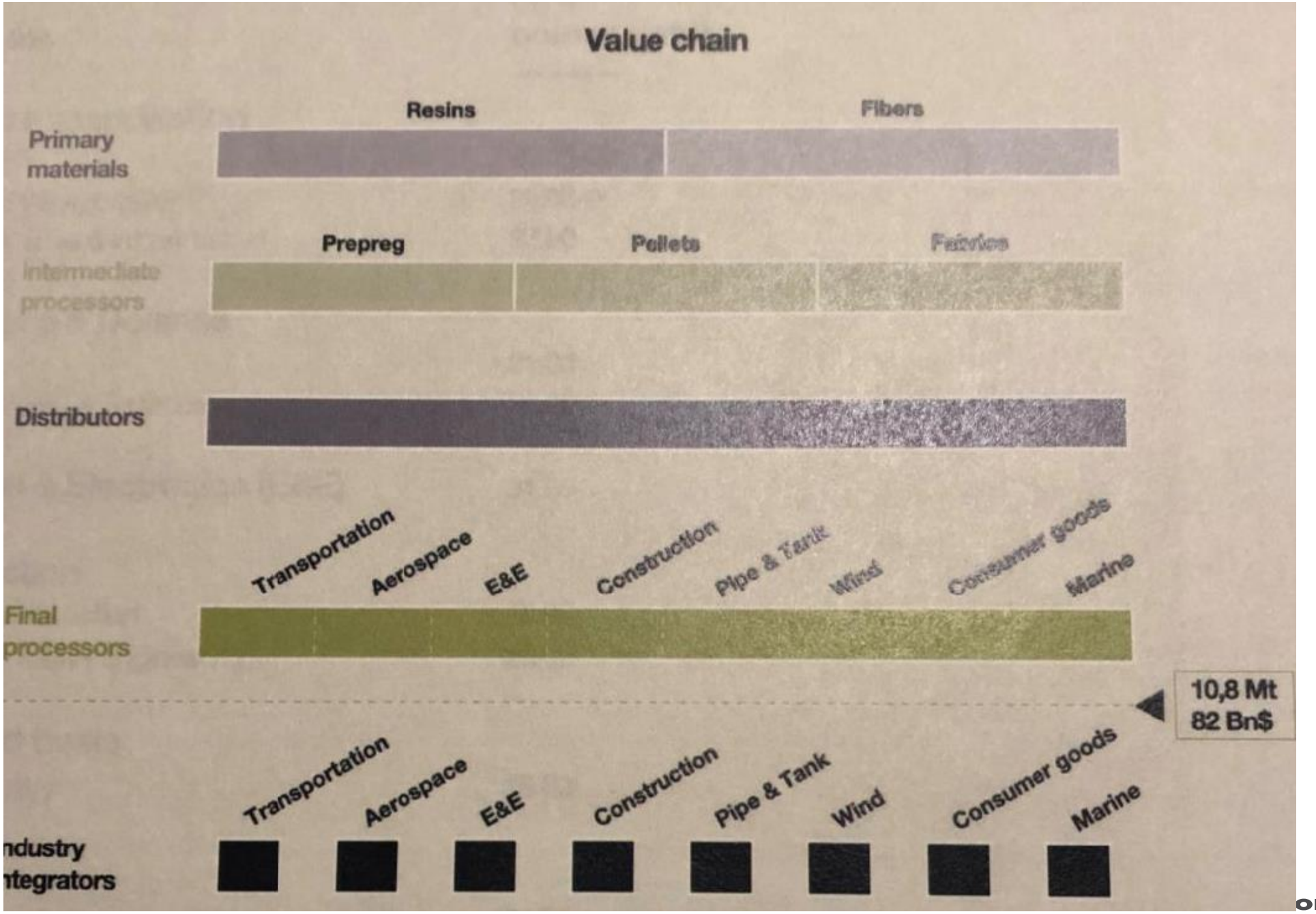
Quiz!

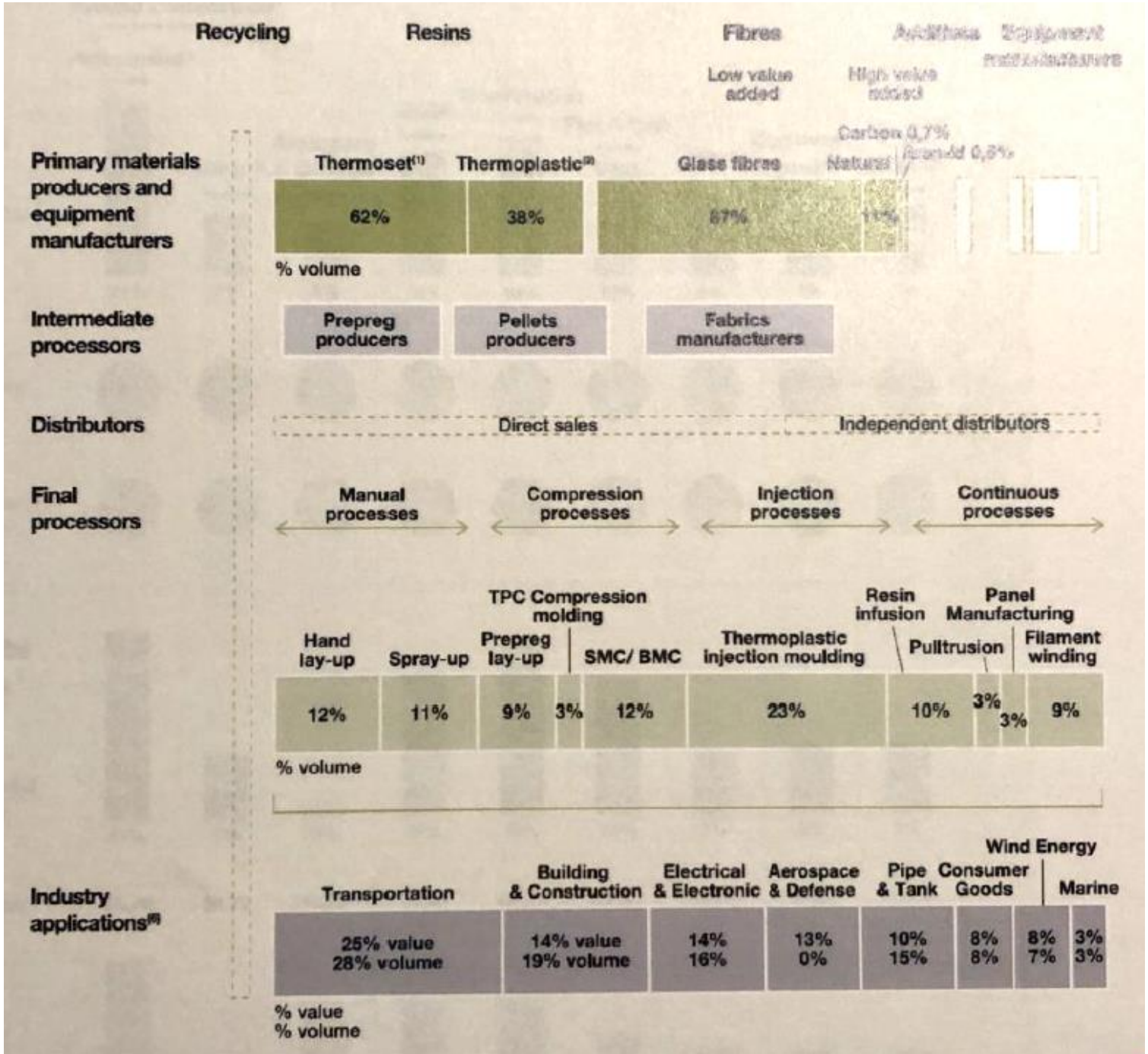
1. How large is the composites market?


Value chain
Primary materials
Resins
Fibers
Intermediate processors
Prepreg
Pellets
Fabrics
Distributors
Final processors
Transportation
Aerospace
E&E
Construction
Pipe & Tank
Wind
Consumer goods
Marine
10,8 Mt
82 Bn$
Industry integrators
Transportation
Aerospace
E&E
Construction
Pipe & Tank
Wind
Consumer goods
Marine

Quiz!

1. How large is the composites market?
   - 84 billion $ – 10.8 million tonnes

2. What is the share of carbon fibre composites?



Carbon fibre ~0.7%

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Composites markets

	Value	$B	Volume	Mt		$ / kg
Transportation	25%	21	28%	3,08		6,8
Building & Construction	14%	11	19%	2,09		5,3
Electrical& Electronical	14%	11	16%	1,76		6,3
Aerospace& Defence	13%	11	0,5%	0,06		200,0
Pipe&Tank	10%	8	15%	1,65		4,8
Consumer Goods	8%	7	8%	0,88		8,0
Wind energy	8%	7	7%	0,77		9,1
Marine	3%	2	3%	0,33		6,1
Medical	5%	4	3,5%	0,385		10,4
		82	100%	11		7,5

Growth ~ 5 – 10 % CAGR

Steel: 1500 Mt – CAGR 1 – 2 %

-> Composites diverse and large market

-> Composites = grow market, plenty opportunity

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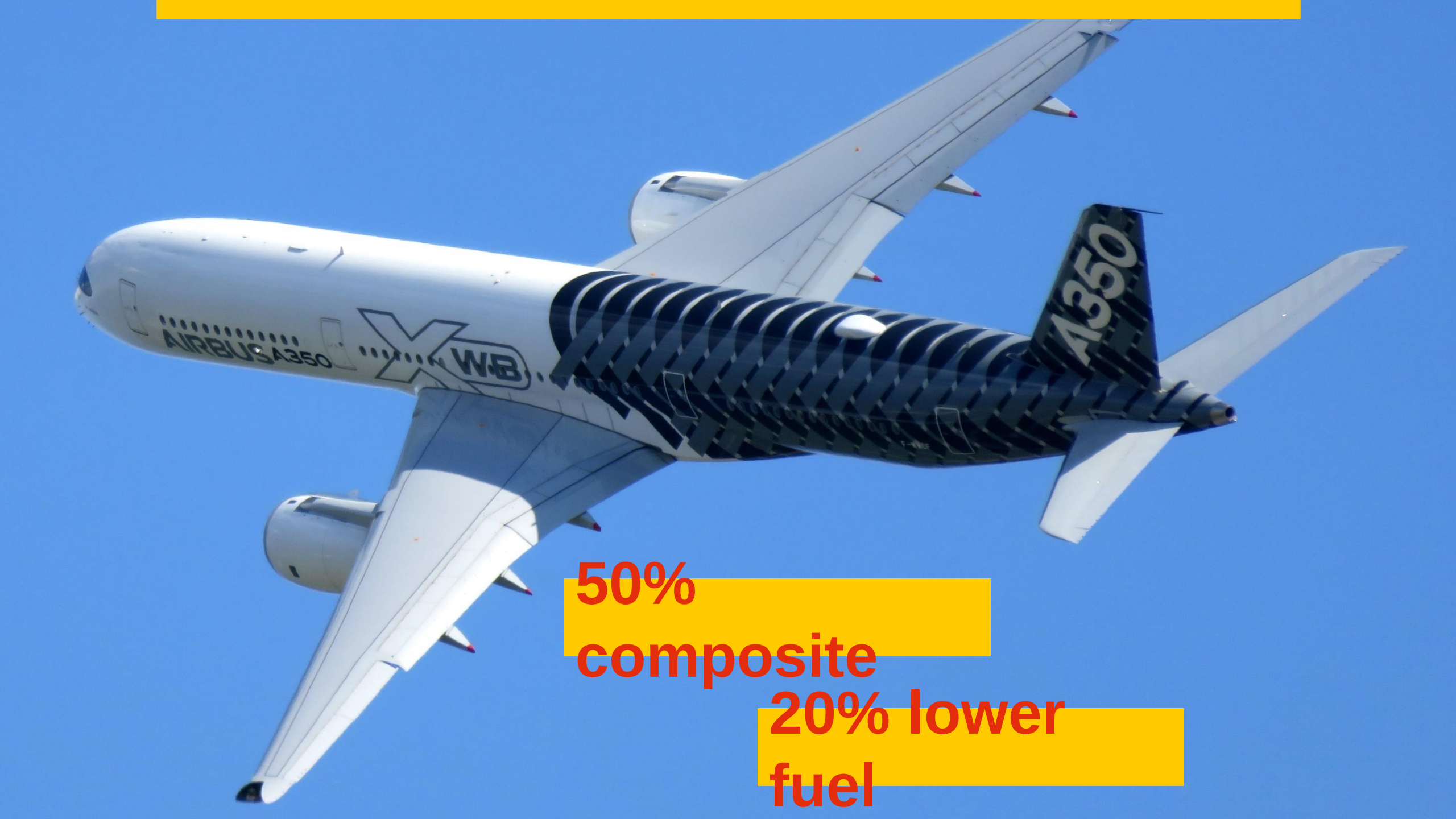
Composites, to make the world a better place



50% composite

20% lower fuel

20% lighter

Lower fuel consumption

Longer range

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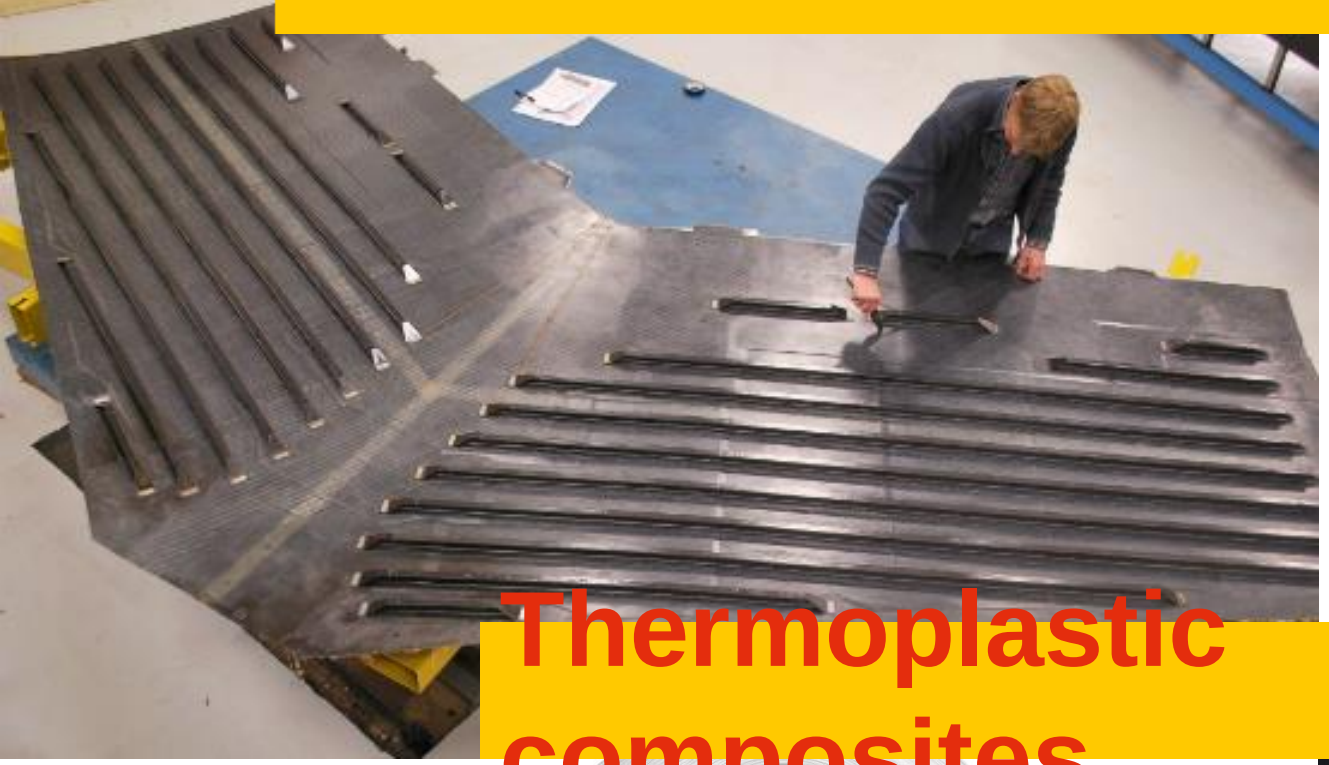
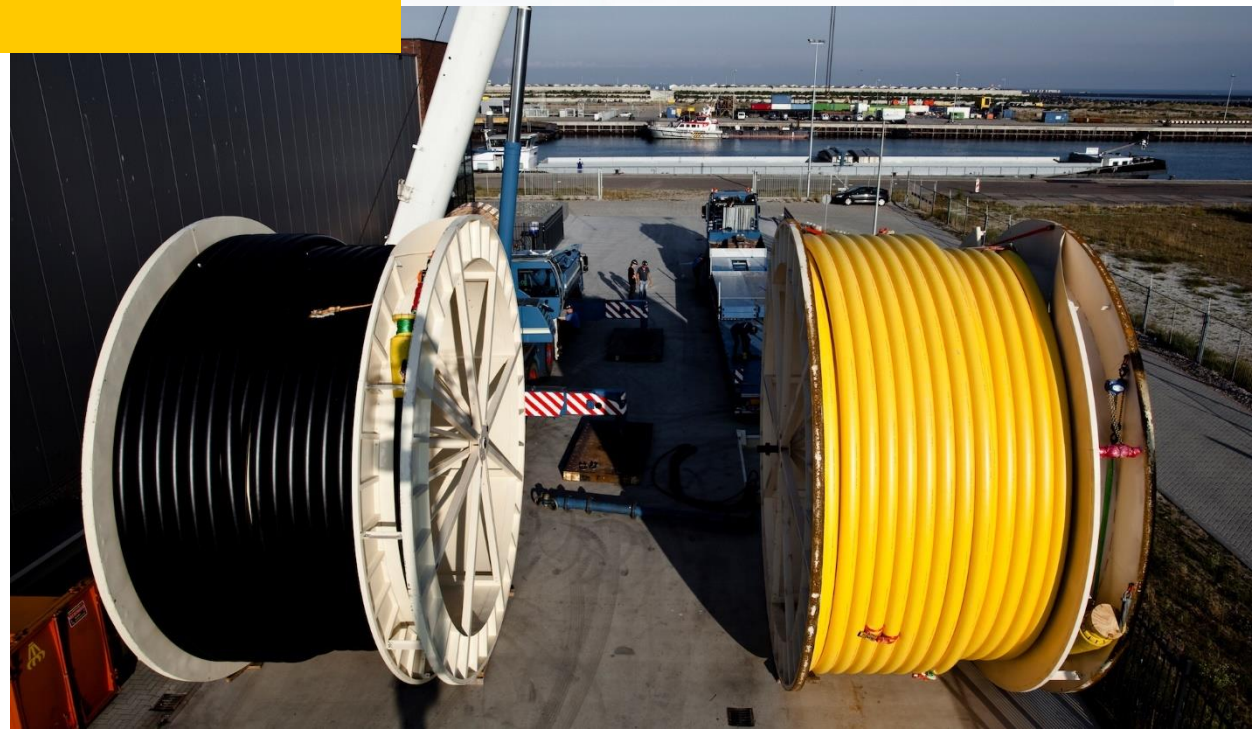
Longer lifetime
Easier installation
Re-use
Less foundations



Thermoplastic composites



Why are composites important for NL?

- Composites are key to address Societal Challenges on sustainability
  - Essential to drive down fuel consumption, enable energy transition and reduce material footprint
- Composites provide great business opportunities
  - Growing market with many new applications, based on high-tech
  - NL has broad spectrum: active in many markets, with strong technology leaders
- NL strong in know-how; more can be done to transfer into business
- Wave of strategic investments by many large international companies
  - That [illegible] p invest[illegible] cosystem

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What is DCP?

- A national Innovation Platform, to reinforce composite innovation
  - It will not carry out research itself, but focus on accelerating collaboration
- Industry demand driven (large companies, innovative SME's, start-ups)

- To align composite innovation at national level
- To create more critical mass

- Public Private Partnership (business, research institutes and government)
- By definition cross-sectoral, applications in many end-markets

- Collaboration of topsectors HTSM and Chemistry

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Why is DCP needed?

1. To transfer know-how into large scale industrialisation and business growth. Substantial investments are needed
2. Composites are complex, still a high level of ‘black magic’. Better fundamental know-how and more digitalisation is needed. Requires substantial R&D
3. NL has a somewhat fragmented innovation landscape. Needs to be accelerated by a more common agenda. ‘Turn the jewels into a crown!’

TU Delft
UNIVERSITY OF TWENTE.
nlr
SAM | XL
Windesheim
Brightlands
Knowledge Centre WMC
SAXION
digital factory for composites
TPRC
WCCS
HAN AUTOMOTIVE RESEARCH
inholland hogeschool
ACM3
Dutch Composites Maintenance Centre

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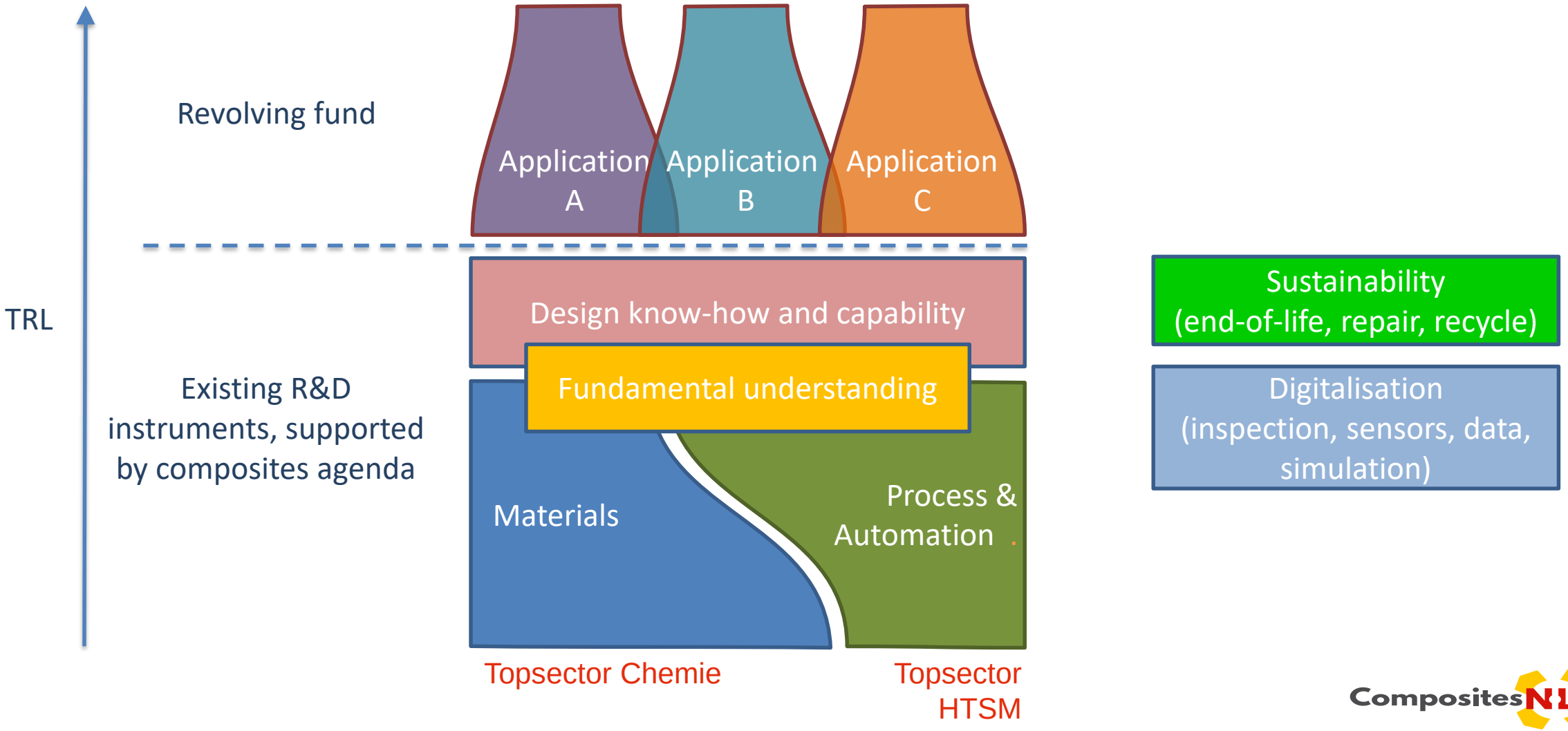
DCP structure



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National Agenda

Opportunities

Sustainability

Business

Challenges

Technology

- Industrialisation: cost & ouput
- Adoption/certification
- Circular

Organisational

- Collaboration at national scale
- Cross-sectoral
- Human capital

Actions

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Planning and actions

- September - October
  - 1st consultation found
  - Interaction with and feedback from Topteams
- November 2018 – February 2019
  - Develop National Agenda
  - Develop Research and 'Industrial Scale' cases
- Launch at JEC (12-14 March)
- 2019
  - Develop Roadmap, based on National Agenda
  - Clarify instruments, engage with InvestNL for revolving fund
  - Develop innovation projects

- In parallel, build business development and internationalization momentum
  - NL as 'country-on-stage' at JEC 2019
  - HTSM Internationalisation workgroup

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Detailed planning

December 2018	January	February	March
1st draft National Agenda			
	Input sessions per sector		
	2nd draft National Agenda		
		Final review - Stakeholder group - Topteams - EZK	
		Final National Agenda	
			Launch @ JEC 12-14 March

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Sector sessions

- Aerospace
- Maritime
- Automotive
- Infrastructure
- Energy

- Thermoplastics
- Smart industry (automation / digitalisation)

- ROMs
- Topteams

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Feedback and involvement

- Are composites important for you?
- Do you support this approach?

- How can you help and get involved?

1. Engage in setting the National Agenda
   - What is important for you, where do you see the trends, what are the bottlenecks that need to be resolved?
2. Develop Innovation programmes
   - Ambition and business potential
   - What is needed? -> scale of innovation programme
   - Who should be involved? -> cluster

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Thank you

Marcus Kremers - chairman

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CompositesNL – for everybody involved

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ZAADNOORDIJK YACHTBUILDERS
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Questions?

- ….
- ….
- ….

- Does this replace current innovation projects?
- Nice, but our company does not do fundamental resource, so is it interesting?
- What about international activities?
- How sure is the government support and how much is it?
- ….

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EZK - Chris Poppe

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Workshop

• Materials	Marc Huisman
• Design and Production	Bert Thuis
• Sustainability	Marcus Kremers
• Digitalisation	Rinze Benedictus

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Materials

- Thermoset – Thermoplastic
- Glass – Aramid – Carbon – Basalt – Natural fibre - ….
- Fibre – matrix interface
- Coatings, adhesives, inserts, foams, ….
- Metal – composite, plastic – composite, …
- Manufacturing of materials – Processing of materials - Use of materials
- Raw materials – material forms (prepreg, tape, fabric, plates, …)
- Test methods, analysis methods, …
- Design with materials, analysis, material modelling, …
- ….
- ….

Design and Production

- Design methods
- Analysis / simulation methods. Production phase – Use phase – End-of-life
- New design concepts, new product forms, new products
- Hybrids
- New production technologies, improved production, scale-up production
- Automation
- Cost reduction, both development and production phase
- More sustainable design & production
- ….

Sustainability

- What is our contribution to a more sustainable world, how to calculate?
- What is our footprint, how to compare, how to perform Life Cycle Analysis?
- Longer life of products (design, maintenance, quality, …)
- Better Repair methods
- Re-use or Recycling of composites (factory scrap, end-of-life products, …)
- New materials with lower footprint, Bio-based fibres, resins, …
- Less consumables, recycling of consumables, …
- Less energy, less emissions during production, ….
- Toxic substances
- Circular economy, closing the loop
- Design for sustainability
- ….

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Digitalisation

- The robots are coming! Thread - opportunity
- What about digitalization with still manual labour?
- Faster / cheaper design methods
- Simulation tools, in design / production / use-phase / …
- Digital Twin, Factory 4.0, smart industry, …
- Digitally integrated supply chain, material digital passport, blockchain …
- Sensors, camera’s, inspection techniques, …
- Data: storage, protection, business models, ….
- Artificial intelligence, machine learning, …
- Manufacturing-as-a-Service, Factory-as-a-service, …
- ….
- ….

Workshop

- Materials — Marc Huisman
- Design and Production — Bert Thuis
- Sustainability — Marcus Kremers
- Digitalisation — Rinze Benedictus

- Main questions:
  - What are the (international) trends?
  - What are opportunities for the Dutch ecosystem?
  - What are the bottlenecks that need to be solved? Which know-how or capacities need to be developed?

  Can be grouped per sector: aero, marine, infra, auto, etc

  - How much needs to be invested and how to be financed (public – private)?
    - Medium < 2 Mio; Large 2-10 Mio; Extra Large > 10 Mio

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Agenda

- 14:00 Opening and explanation DCP
- 14:30 National Agenda and Economic Policy – Chris Poppe
- 14:45 Sessions round 1
- 15:30 Sessions walk around, 2nd input
- 16:00 Plenary feedback, per topic – by moderator
- 16:45 Next steps
- 17:30 Close

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Proposed approach

- Step by step approach
  1. Build a common national composites agenda
     - Can later be developed further into a roadmap
  2. Build momentum for public-private investments.
     - -> potentially through a a ‘Composites Revolving Fund’
- Keep it light and pragmatic
  - No large organization at start. Share the burden, involve the sector
- Not top-down but bottom-up. Provide a common framework where everybody can grow their opportunities
- Enlarge the community and stakeholder group
- In parallel, build business development and internationalization momentum
  - NL as ‘country-on-stage’ at JEC 2019 for example
  - HTSM Internationalisation workgroup

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Initial thoughts national agenda

Content

1. Societal challenges
2. International market and technology analysis
   - Global developments, trends, innovations, 5, 10, 20 year timescale
3. Position and strategies of NL industry
4. Gap analysis
5. Action plan DCP with investement cases

Concise and to the point, max 10-15 pages

Composite landscape in NL

- Excellent technology know-how basis.
- In past years, a decentralized grassroots approach has emerged (many research initiatives, fieldlabs, investment programmes)
- International orientation
  - Not many OEMs in NL
  - But many large international companies present in NL. Most of them have their know-how hubs in NL
- Broad: applications in many markets, with strong technology leaders
  - Aerospace, Maritime, Infrastructure, Offshore, Industrial, Automotive
- Focus on materials, process, automation.
  - NL has an excellent reputation in thermoplastic composites, but is also strong in advanced thermoset composites
- Entrepreneurial and flexible

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Challenges for the NL composite sector

- Strong on know-how and technology, but more can be done to turn this into business
- Scale: NL relatively small. Focus and cooperation are key, not always easy considering diversity in markets and applications
- Larger countries have full supply chain up to OEM, more opportunity for ‘systematic’ innovations through the supply chain. So we have to collaborate even better!
- Strong R&D centres abroad, investing heavily. Although this is maybe not the most efficient way, it is distracting talent, research initiatives and large corporations. To be visible at European/global level, we have to strengthen our forces.