POLISH COMPOSITES TECHNOLOGY CLUSTER · RESC4EU PROJECT

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RESILIENT SUPPLY CHAINS FOR EUROPE

PKTK
POLISH CLUSTER
OF COMPOSITE TECHNOLOGIES

Where does your product's carbon footprint come from?

Demonstrator 3: the supply chain of a carbon-fibre bicycle frame – explained simply

Free online tool

No login needed

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Why does this matter for your company?

Customers are asking

Large buyers increasingly ask their suppliers for carbon-footprint data.

EU rules

The EU is introducing digital product passports. Environmental data will become part of product information.

Supply risk

A long supply chain is easy to break. Know your alternatives before a problem appears.

The demonstrator shows both at once: emissions and supply-chain risk.

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Carbon footprint in simple words

The carbon footprint (GWP) tells you how much greenhouse gas a product causes. It is measured in kilograms of CO_2.

Production

Making the materials and parts

+

Transport

Moving goods between stages: ship, truck, rail

=

Supply-chain footprint

This is what the demonstrator shows

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The carbon fibre itself matters most

60–95% of the carbon footprint of a carbon-composite product comes from making the fibre itself.

Origin matters

Who makes the fibre, where, and with what energy – this changes the result a lot.

So does the process

Autoclave curing, used for the bicycle frame, needs a lot of energy.

Source: review of 50+ publications (2009–2025), kompozyty.net, 2025 (in Polish)

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What is Demonstrator 3?

- A free online tool on the ResC4EU project platform.
- It shows how your choice of suppliers, production and transport changes the carbon footprint.
- **Example:** a carbon-fibre bicycle frame, always made in Kraków. Only the origin of the materials changes.



Graphic: Lightweight Composites Magazine, Special Issue 2026

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Five routes to the same frame

The frame is always made in Kraków

1	**China**	Fibre and fabrics from China, prepreg in Poland. **This is the reference.**
2	**China + Poland**	Fibre from China, fabrics and prepreg from Poland.
3	**Europe**	Fibre from Germany, fabrics and prepreg from Italy.
4	**Japan**	Fibre from Japan, fabrics and prepreg from Italy.
5	**Recycled fibre**	Recycled fibre from the UK, processed in Poland.

Variants prepared by PKTK from industrial examples · ResC4EU project

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How to try it: four steps

1

Open

Go to the demonstrator page. No login needed.

2

Choose

Pick one of the five supply-chain variants.

3

Compare

See the difference from the reference variant.

4

Understand

Check production and transport separately, step by step, also on the map.

resc4eu.greentwin.app/demonstrator-3

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What does the demonstrator teach us?

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Material matters most

Where the fibre comes from and how it was made changes the result most.

Transport counts too

Distance and transport mode add emissions. It is a smaller, but visible, share.

Closer means less risk

A shorter chain within Europe is easier to control when something goes wrong.

Recycling is an opportunity

Recycled fibre can lower the footprint, but it must meet technical requirements.

Results are indicative: the tool uses sample data from public sources.

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THE FIRST COMPANY HAS ALREADY TRIED IT

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“Resilience and sustainability should be designed together — with data, before disruption happens.”

Jacek Sykulski, President, Carbon Design Sp. z o.o., Kraków

What they did

They compared different sourcing, manufacturing and logistics options for bicycle frames.

Next step

The same comparisons, using real data from the company and its suppliers.

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What can you do today?

Try the demonstrator

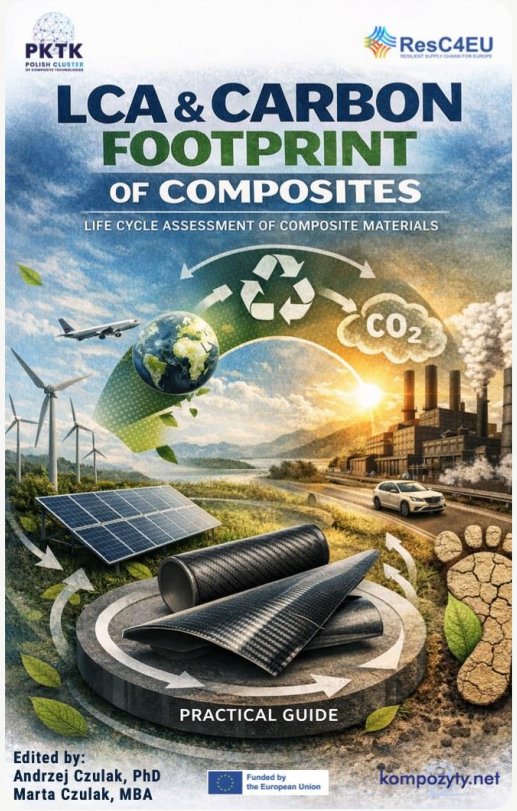
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Estimate your product's footprint

PKTK LCA calculator (Polish and English): lca.kompozyty.net

Learn the basics of LCA

Free PKTK ebook: LCA and the carbon footprint of composites – a practical guide



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