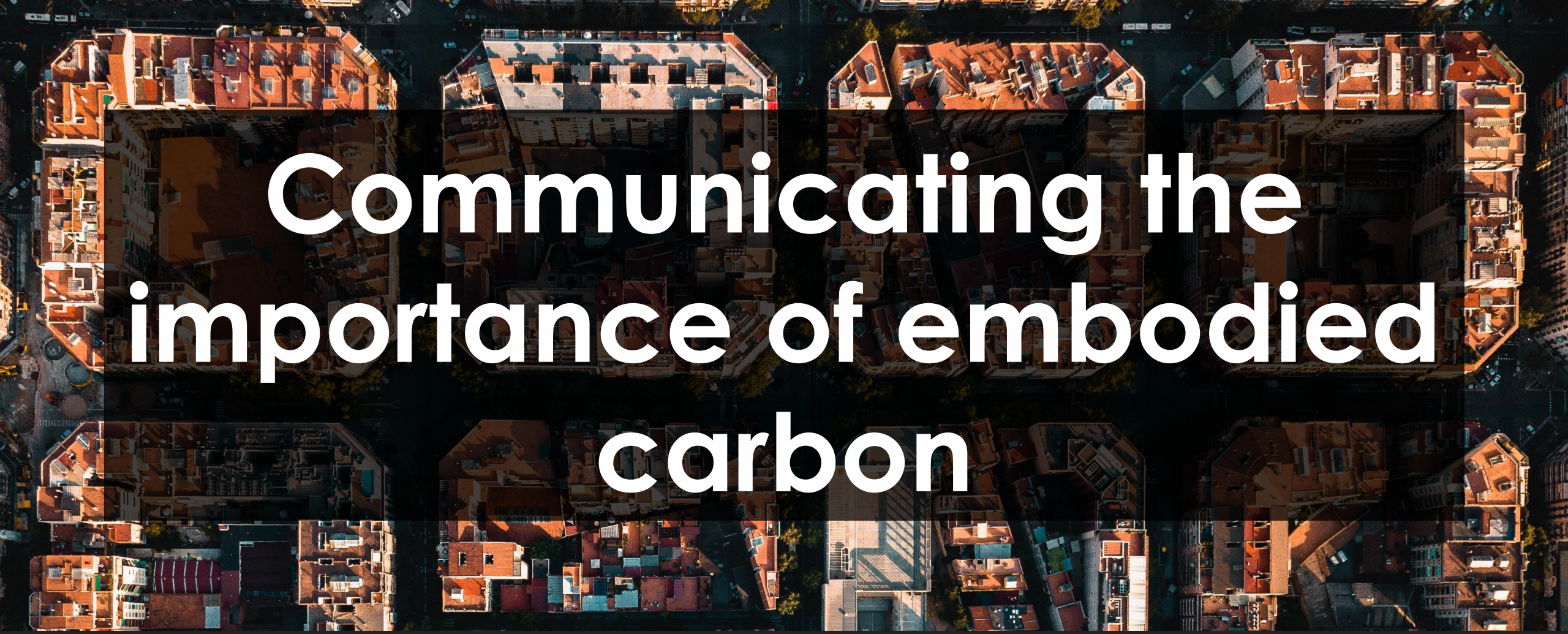


# Communicating the importance of embodied carbon

CNCA

C — R

**CNCA - Dramatically Reducing Embodied Carbon in Europe**

Thursday 9 December

Bárbara Mendes-Jorge

Associate, Culmer Raphael

# Today's sessions

**Session one, 10am-11:30am (CEST)**

Improving communication on embodied carbon and bio-based materials across city departments

**Session two, 12pm-2pm (CEST)**

Creating tools to develop necessary policy buy-in to reduce embodied carbon and increase bio-based materials use

# Session one: Improving communication on embodied carbon and bio-based materials across city departments

10am-11:30am (CEST)

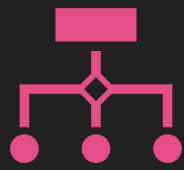
# Goals for session one

## Communications challenges

Outline communications issues – and how to tackle them

## Media snapshot

How are publications talking about embodied carbon and bio-based materials in a city context?



## Survey results

How do participants feel about the terms “embodied carbon” and “bio-based materials”?

# Culmer Raphael
# Bárbara Mendes-Jorge

C — R

# Communications challenges

# Where do embodied carbon and bio-based materials fit into the discussion of decarbonising construction in cities?

# Embodied carbon

**“Cities account for more than 70% of global carbon emissions already…[and] are estimated to add 2.75 billion residents by 2060, [causing] unprecedented demand for construction in cities.**

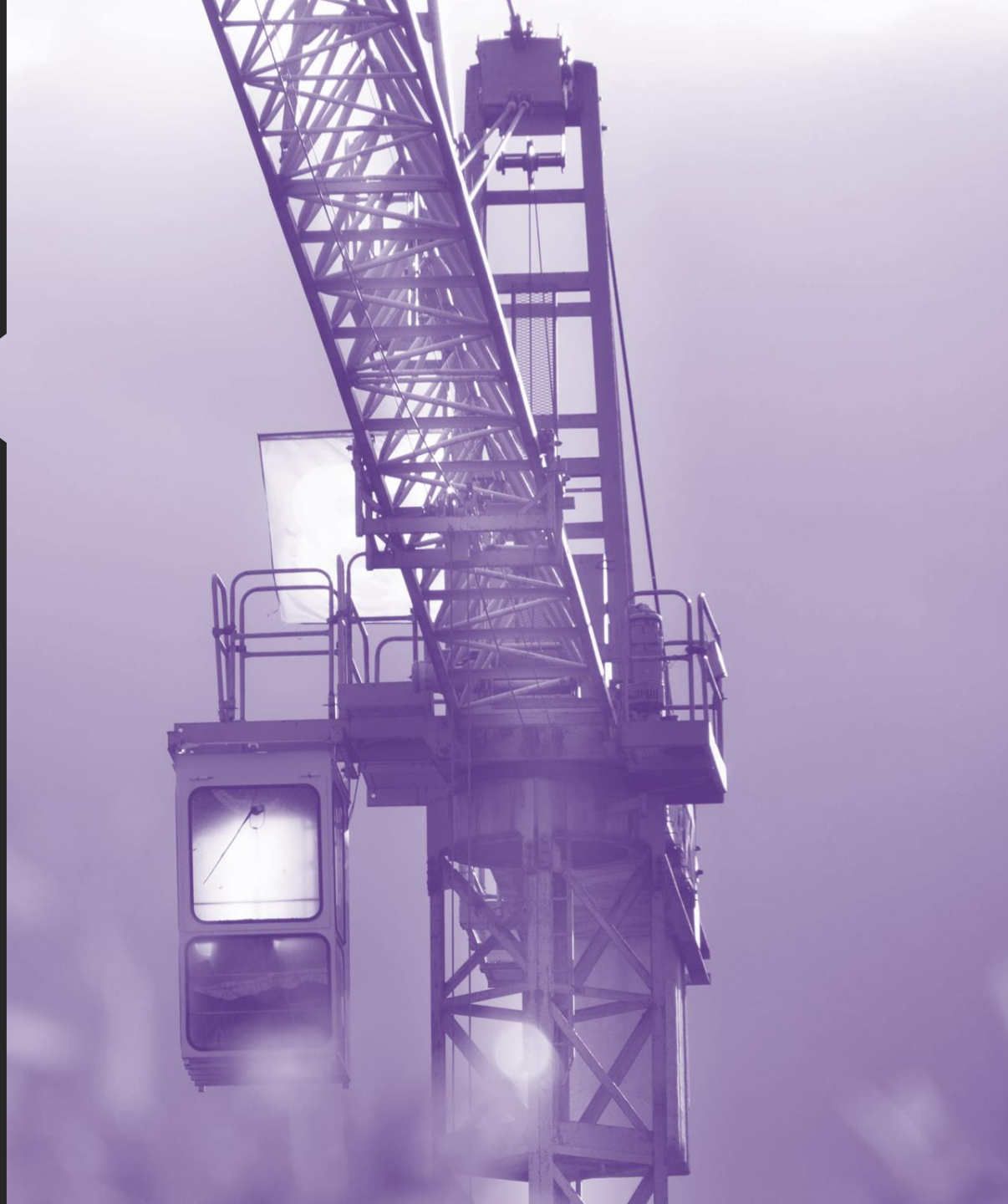
**Dramatic embodied carbon reduction action is required to mitigate the climate breakdown.”**

CNCA Dramatically Reducing Embodied Carbon City Policy Framework

# Decarbonising the construction sector

- Reducing carbon emissions, making buildings more energy-efficient – easy to understand for climate change mitigation

- “Embodied carbon” and “bio-based materials” not so commonly linked with climate change – and less well-understood



# Why is it tricky to communicate about embodied carbon?

- New term, not yet widely-understood
- Distinct from operational carbon (carbon that comes from energy, heat, lighting, etc)
- Calculated by a “lifecycle analysis” – another complex term

**"Authentic climate action requires cities to rapidly scale up the development of Zero Carbon buildings that neutralize embodied carbon."**

Andrew Lee, Director of Energy + Carbon, International Living Future Institute

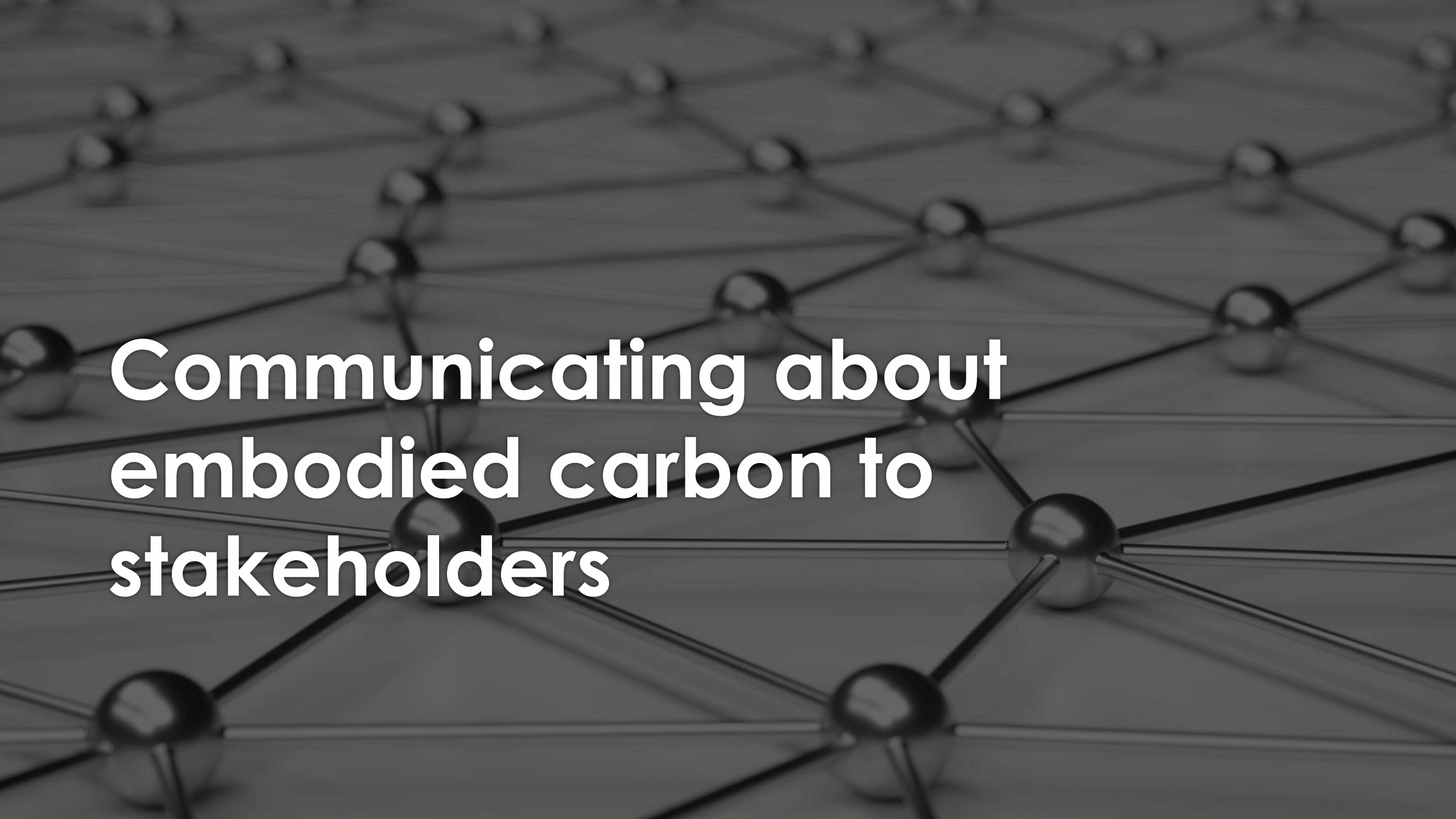
**“Embodied carbon, or carbon from extraction, manufacture, transport, use and end of life of construction materials, is set to grow rapidly in cities.”**

CNCA Dramatically Reducing Embodied Carbon City Policy Framework

"Embodied carbon is the carbon dioxide ($CO_2$) emissions associated with materials and construction processes throughout the whole lifecycle of a building or infrastructure.

Put simply, embodied carbon is the carbon footprint of a building or infrastructure project before it becomes operational. It also refers to the $CO_2$ produced maintaining the building and eventually demolishing it, transporting the waste, and recycling it."

Carbon Cure


Communicating about embodied carbon to stakeholders

# 1. Start by defining the underlying issue for stakeholders

- Cities account for more than 70% of global carbon emissions
- The construction sector has a large environmental impact, accounting for a significant part of global energy use and carbon emissions
- Buildings generate nearly 40% of annual global $CO_2$ emissions
- Did you know that a lot of carbon emissions come from constructing buildings – as well as the materials used to make them?

# 2. Highlight how embodied carbon set to become dominant carbon emissions source

- While building operations are responsible for 28% of emissions, building materials and construction are responsible for an additional 11% annually
- Organisations like WGBC say emissions from materials and construction are set to become an even larger portion of a building's overall carbon footprint
  - Nearly 50% of new construction overall carbon footprint between now and 2050

# 3. Go deeper on key embodied carbon issues

- We have known about emissions from energy, heat, lighting etc. for a long time
  - Carbon emissions from materials to construct a building – and construction itself – are a much bigger contributor
- Just three materials – concrete, steel, and aluminum – are responsible for 23% of total global emissions, mostly from the built environment

# 4. Emphasise how it links to tackling climate change

- To mitigate climate change…
  - …reach net zero by 2050
  - …adhere to Paris Agreement goals
  - …decarbonise our city
  - …develop zero carbon buildings

…we need your help to make the construction sector more sustainable by tackling this overlooked source of emissions

# 5. Describe benefits and ask stakeholders specifically what you need from them

- There are many benefits to reducing emissions of building materials and construction, including:
  - Less areas destroyed by mining
  - Better, more circular jobs created
  - Lower air pollution
  - Less fossil fuels used
  - Reduction of heavy transport
  - Less congested landfills

- We are asking you as a policymaker/company/designer/architect to consider more sustainable transport options and materials – such as bio-based materials

# Bio-based materials

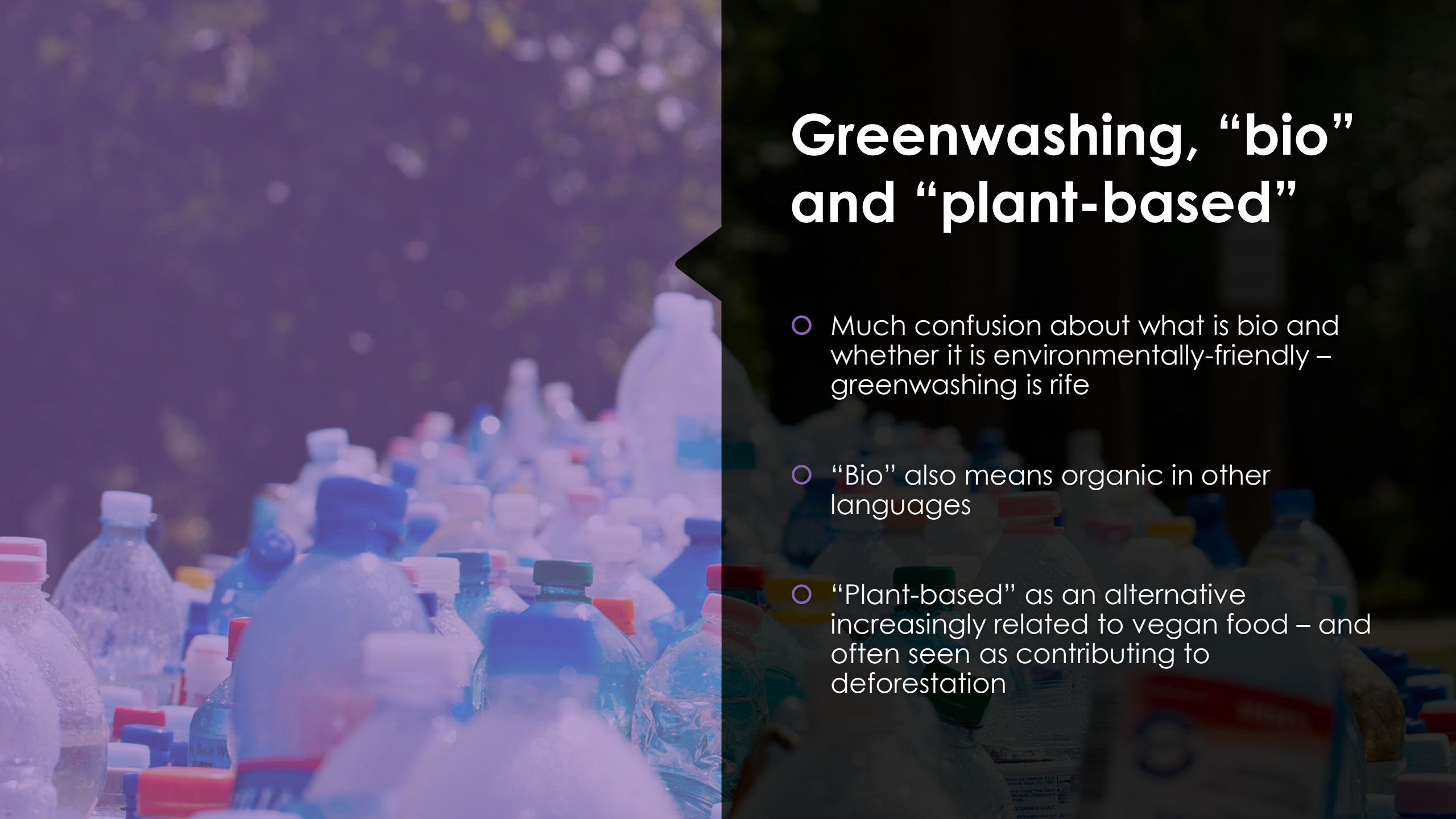
**“Bio-based material refers to a product’s main constituent consisting of a substance, or substances, originally derived from living organisms. These substances may be natural or synthesized organic compounds that exist in nature.”**

Sustainability Dictionary

# Bio-based materials and sustainability

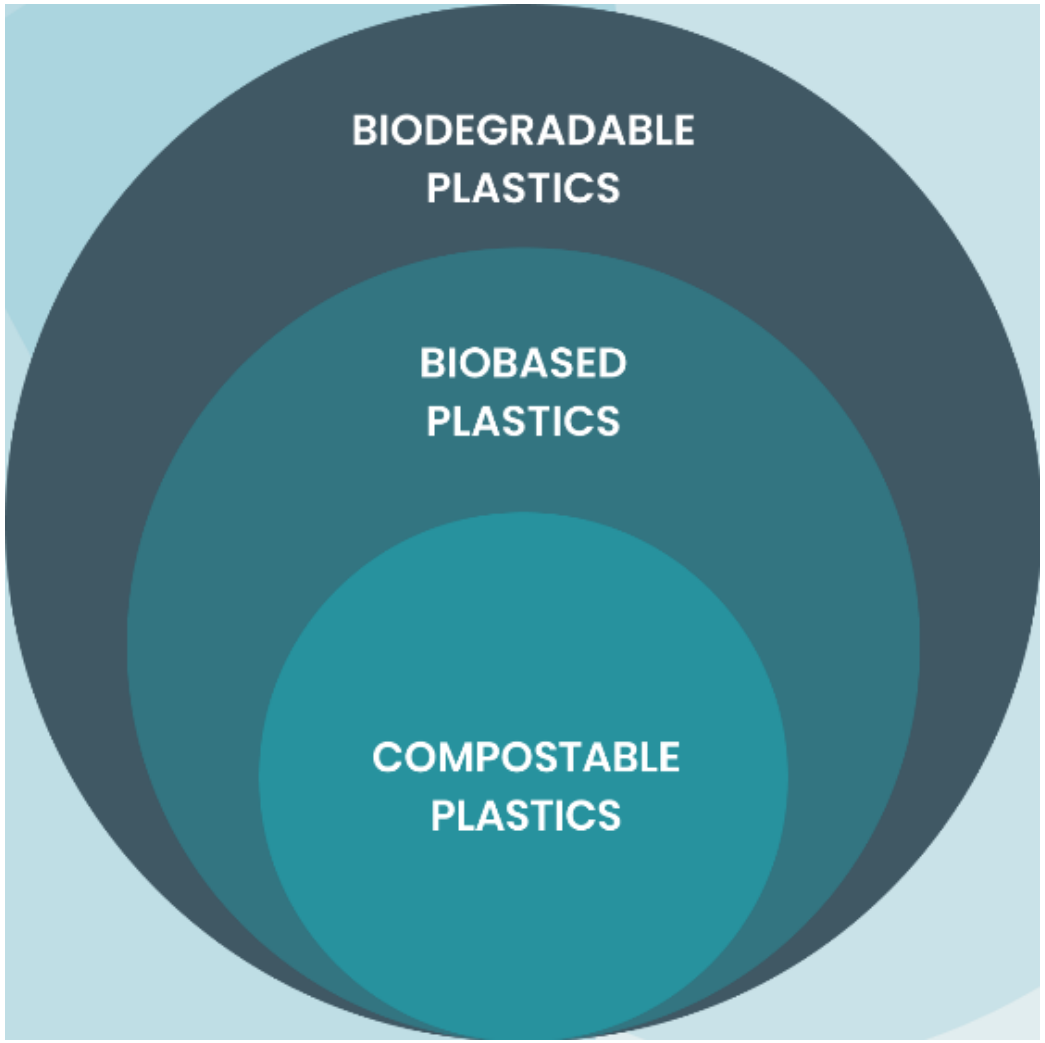
- Bio-based materials are made from biological matter – but not automatically renewable, circular or sustainable

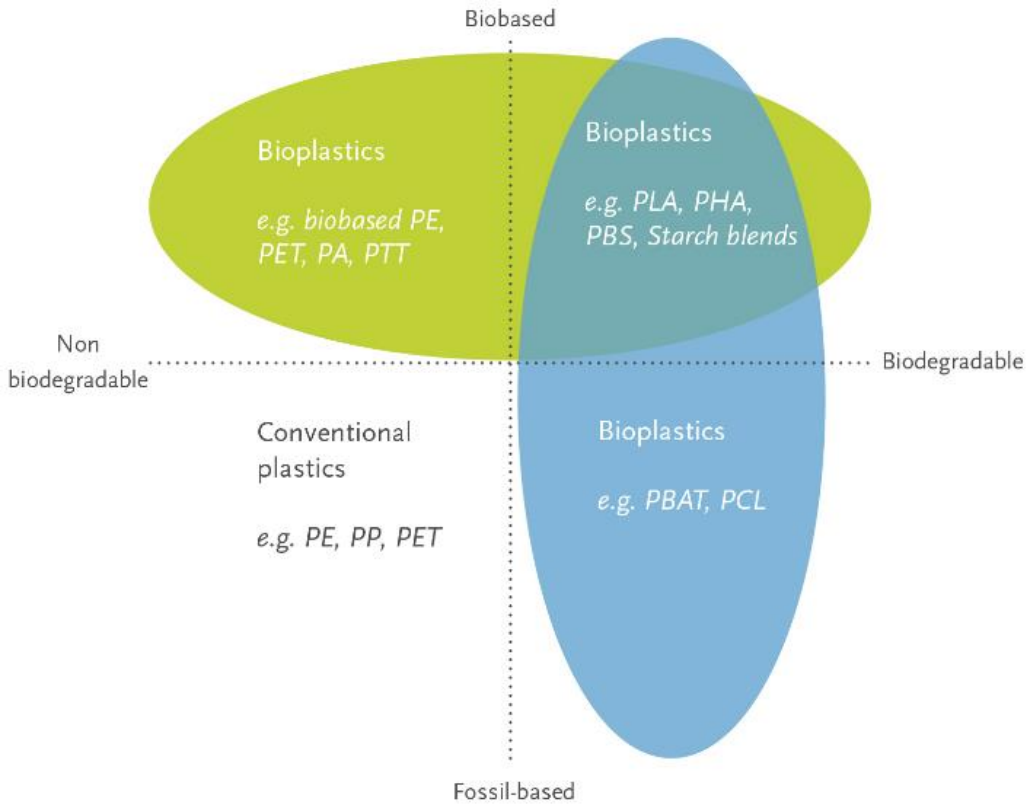
- No wonder even sustainability community sceptical – generalisations spotted when searching for a definition
  - "Are sustainable materials"
  - "Biodegradable"
  - "Affect social wellbeing positively"



# Greenwashing, “bio” and “plant-based”

- Much confusion about what is bio and whether it is environmentally-friendly – greenwashing is rife
- “Bio” also means organic in other languages
- “Plant-based” as an alternative increasingly related to vegan food – and often seen as contributing to deforestation

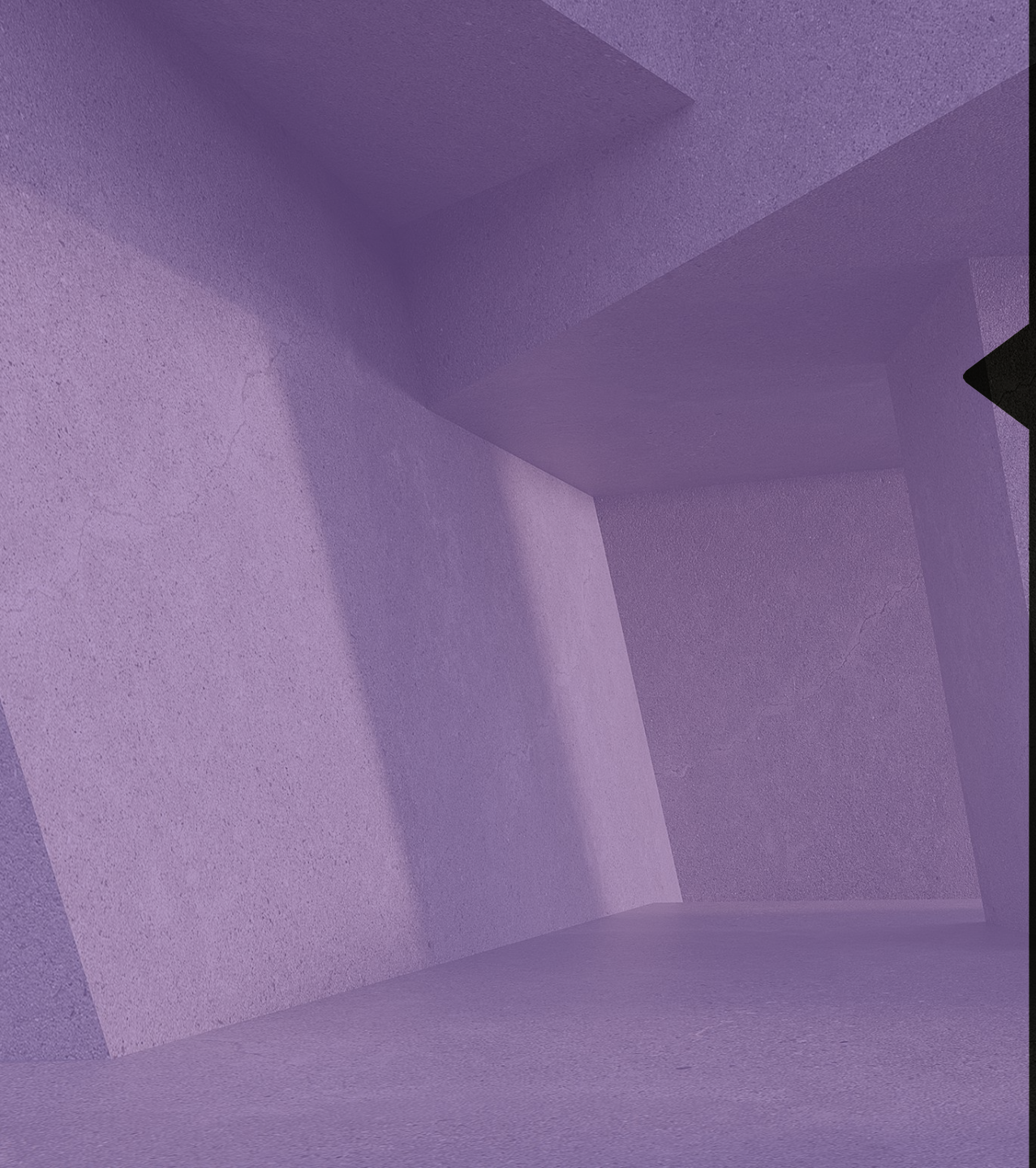



*Sources: Oceanic Global and European Bioplastics*

# Wood as a bio-based material

- Usually framed as a lighter, easier-to-handle, more environmentally-friendly and safer alternative to concrete and steel
- Need to counter narrative that wood is not as durable or strong – a lot of research shows otherwise
- Sustainable forestry helps reduce deforestation



# “Low-carbon” concrete?

- ASME: “4.4 billion tons of concrete produced each year, enough to build a 14-metre-tall, 3-metre-thick wall completely around the equator.”
- Development of more environmentally-friendly solutions still in infancy
- Key to encourage investment in sustainable innovation and public procurement procedures which take into account the full carbon life cycle

# How should we talk about bio-based materials?

- Emphasise the benefits
  - Creating new jobs – EU bioeconomy sector employs around 22 million people and its annual turnover is €2 trillion
  - Reduced handling expenses compared to traditional, more hazardous chemicals
  - Decarbonising, helping a post-petroleum society reach net-zero by 2050
- Commandments for the Bio Revolution
- #WhatBrandsWant

# 1. If we can't consume less, we need to consume better

- Consumption patterns still unsustainable
- If plastics and chemicals we consume are renewable, dependence on oil and gas reduced
- If feedstocks are renewable, carbon emissions will decrease and waste can also be minimised

# 2. Just because it is ‘bio’ does not mean a material is sustainable

- Need to communicate about the sector responsibly
- Take a lifecycle approach – some bio-based materials require more land, water and energy
- Avoid backlash from stakeholders who are more likely to see petro-based materials as the only biodegradable option and therefore automatically more sustainable

# 3. Back up sustainability claims with data

- Resources, feedstock, energy use and recycling are all issues which need to be clearly addressed
- LCA – beyond carbon footprinting, takes into account impact of everything from raw materials to waste to recycling
- Every decision made has a knock-on effect e.g. food versus fuel – so be open about it and your future plans

# 4. Work out where the ‘waste’ is coming from

- Bio-based materials made from waste and non-food biomass should be more sustainable
- Industry needs to be realistic – forestry or agricultural waste is not just lying around
- Residues already have a value and as demand increases, so will price
- Crops grown specifically for bio-based chemicals are another option, but indirect land use change needs to be addressed

# #WHATBRANDSWANT

## *Bio-based content is gaining recognition in 'Green Preferred Supplier Lists'.*


26% of brands said bio-based content is one of the selection criteria used when choosing a supplier based on sustainability performance.

## *Brands are setting targets for bio-based products.*


52% said they have clear objectives for sourcing bio-based materials.

## *Cost is the biggest barrier to widespread adoption of bio-based materials.*


Among the brands, 87% indicated cost as the biggest barrier to widespread uptake of bio-based materials. Performance (42%) and security of supply (37%) were identified as the next biggest barriers.

## *Consumer demand and public image are driving investment in bio-based materials.*

Respondents said growth factors for bio-based materials include consumer demand for environmentally-friendly products (65%) and packaging (46%), as well as brands wanting to improve public image (48%).

# Tackling communications challenges – embodied carbon

- Start by defining the underlying issue
- Highlight how embodied carbon will become the dominant source of carbon emissions for buildings
- Pinpoint areas to tackle embodied carbon
- Provide embodied carbon climate change context
- Outline benefits and ask stakeholders specifically what you need from them

# Tackling communications challenges – bio-based materials

- Consider different stakeholder perceptions of sustainable construction and bio-based materials
- Presume your audience does not know what bio-based materials are
  - Be ready to dispel myths, explain differences between first and second-generation feedstock, compostable/biodegradable/recyclable etc.
- #WBW: Brands are interested in bio-based materials and see them as potentially more sustainable – but want more information on pricing, availability and performance
- #WBW: Public image and consumer demand important for reputation