

Cost and Carbon Estimating

There is no 'do nothing' option



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The Problem

- We are heading for a manmade disaster we commonly name as climate change but is better called Global Warming
- Construction is responsible for nearly 40% of all greenhouse gasses
- We need to do something different



So what are the challenges

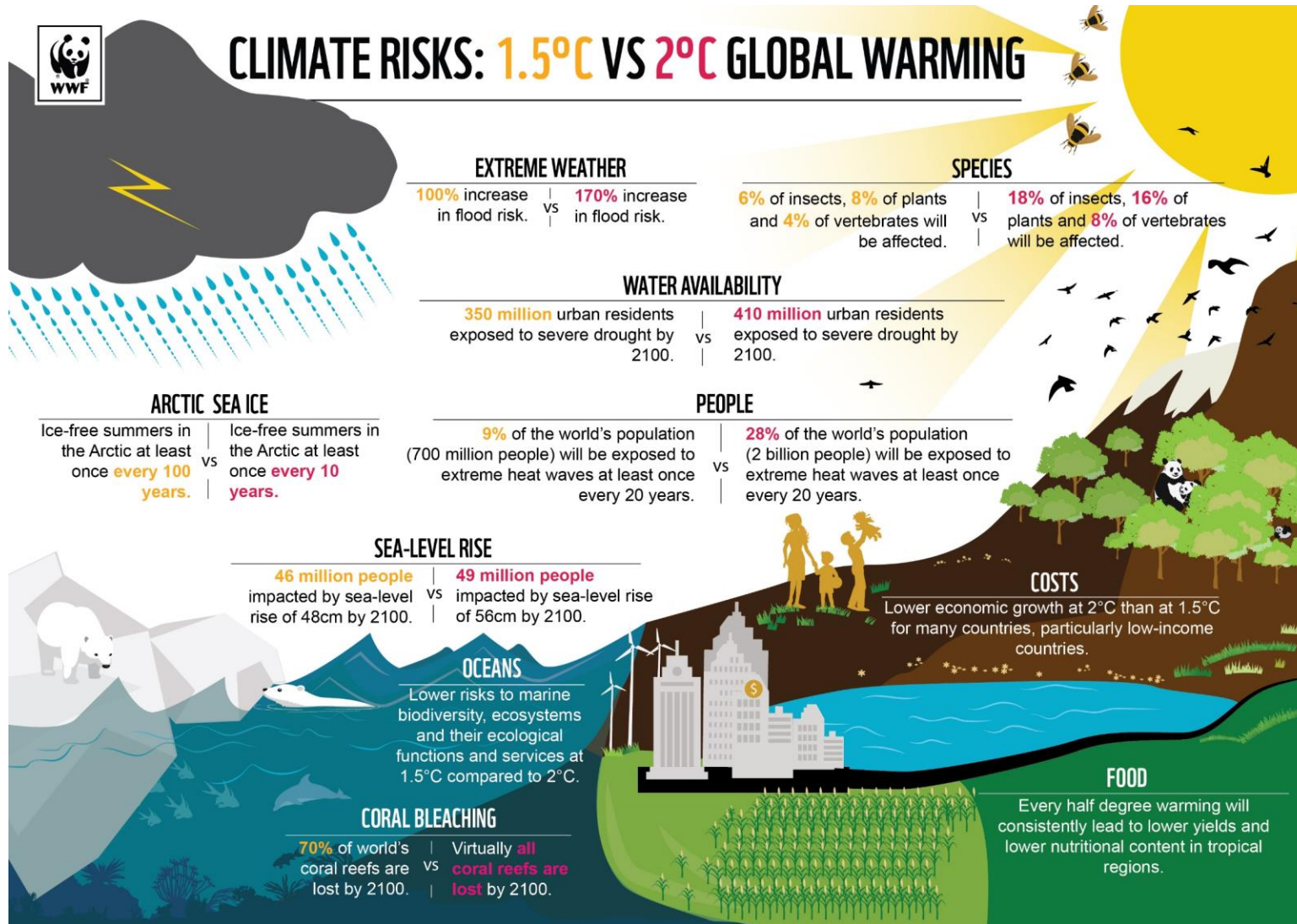


Image copyright of Visme
[The Best Visualizations on Climate Change Facts \(visme.co\)](https://www.visme.co)

Construction Facts

There is as much carbon in the building phase as the first 30 years of operation.

Building and infrastructure projects account for 38% of total global emissions.

Concrete is second most used substance on the planet, second only to water, with the equivalent of 19,000 bathtubs of the material poured every 10 seconds



Doomsday clock 2023



2020

**IT IS 100
SECONDS TO
MIDNIGHT**



2023

**IT IS 90
SECONDS TO
MIDNIGHT**

[Current Time - 2022 - Bulletin of the Atomic Scientists \(thebulletin.org\)](https://thebulletin.org)



Really....

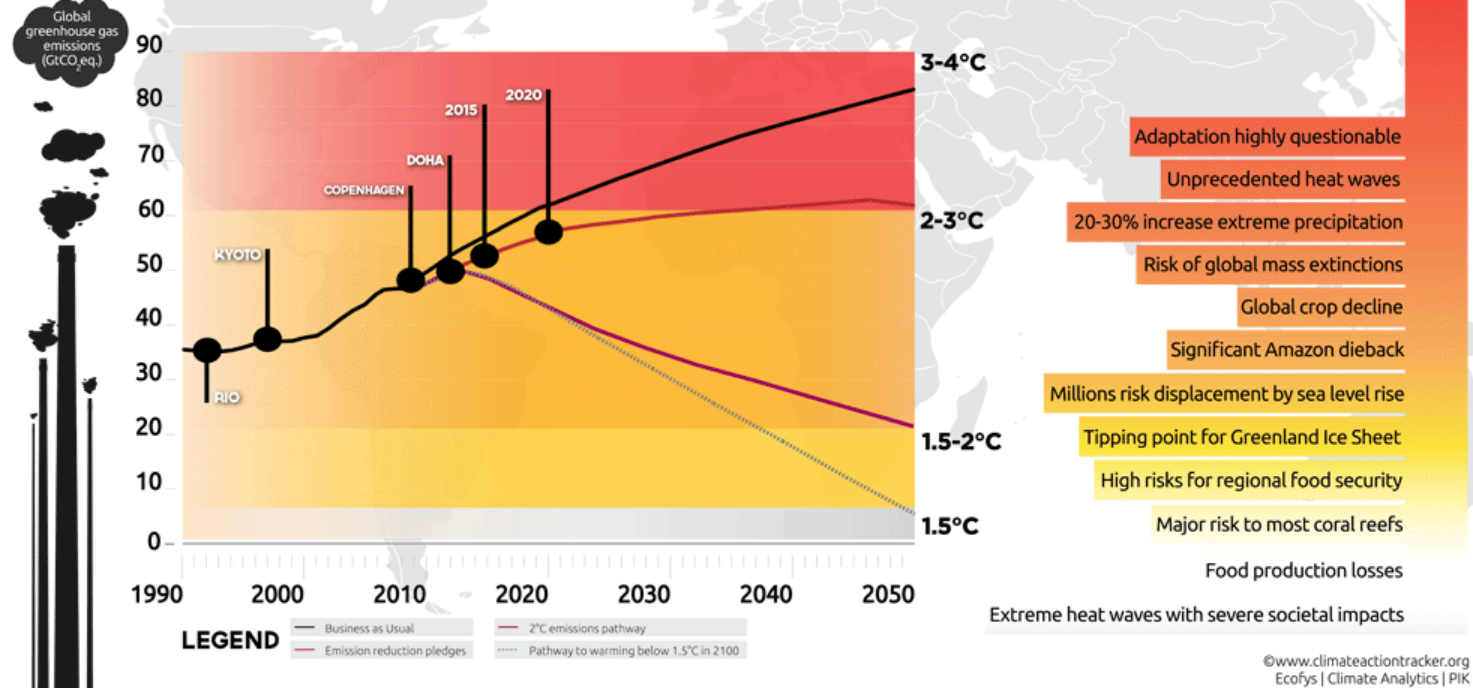
So why is that of interest to me?



What if we do nothing?

STAYING BELOW 2°C: THE CHOICES WE FACE

With current pledges on the table to cut emissions, we are heading to a 3.3° C warming future. No further action before 2020 will limit society's choices. As temperatures rise, so do the impacts.



- Adaptation highly questionable
- Unprecedented heat waves
- 20-30% increase extreme precipitation
- Risk of global mass extinctions
- Global crop decline
- Significant Amazon dieback
- Millions risk displacement by sea level rise
- Tipping point for Greenland Ice Sheet
- High risks for regional food security
- Major risk to most coral reefs
- Food production losses
- Extreme heat waves with severe societal impacts

What if we do something?



Improves competitive advantage



Increases productivity and reduced project costs



Increases regulation or mandate compliance



Attracts employees and investors



Reduces waste



Makes shareholders happy

What's driving change?



Regulations & Mandates - UK

- The UK Government has set ambitious targets to reduce greenhouse gas emissions from the built environment, which accounts for 25% of the UK's total emissions. The UK's Nationally Determined Contribution, made at COP26, committed the UK to achieve a 68% reduction in the UK's carbon emissions by 2030, compared to 1990 levels.
- The UK Government has proposed new rules for construction carbon, which would require both operational and embodied carbon emissions from new buildings to be regulated. Operational carbon emissions are those resulting from energy consumption in the day-to-day running of a property, while embodied carbon emissions are those resulting from the manufacture, transport, construction, maintenance and demolition of building materials.
- The UK Government has announced that new homes will have to produce nearly a third less carbon from 2025, and other new buildings, such as offices and shops, will have to reduce their emissions by 27%. These standards will be enforced through the Building Regulations, which set minimum requirements for the design and construction of buildings.

Regulations & Mandates - Europe

- The EU and its member countries report annually to the UNFCCC on their greenhouse gas emissions, climate policies and measures, and progress towards the targets.
- The EU's greenhouse gas emissions inventory is prepared by the EEA and submitted to the UNFCCC each spring. The EU's Climate Monitoring Mechanism sets the EU's own internal reporting rules based on internationally agreed obligations.
- All EU countries monitor their emissions under the EU's Climate Monitoring Mechanism, which covers emissions of seven greenhouse gases from all sectors. From 2023, each EU country will report to the Commission on the status of the implementation of its national energy and climate plan by means of an integrated national energy and climate progress report.

Regulations & Mandates - USA

CARBON REDUCTION NONRESIDENTIAL PROPOSED MANDATORY MEASURES

The proposed mandatory measures are specific to nonresidential buildings > 100,000 sf commercial or > 50,000 sf schools.

1. REUSE- When reusing a building, maintain 45% of the existing structure and enclosure.
2. WBLCA Performance Path- For new buildings, conduct a cradle-to-grave whole building life cycle assessment demonstrating at 10% reduction in global warming potential (GWP).
3. Prescriptive Path - For new buildings, products shall comply with GWP values and environmental product declaration (EPD) shall be included on the construction documents. Based on 175% of IW-EPD GWP values (Buy Clean California Act) and 130% of ready-mixed concrete GWP values.

	Existing Voluntary	Mandatory 50,000 sf (project aggregate)	Tier 1 50,000 sf (project aggregate)	Tier 2 50,000 sf (project aggregate)
Building Reuse	75% of the structure and enclosure to be reused.	45% of structure and enclosure to be reused.	75% of the structure and enclosure to be reused.	75% of the structure and enclosure to be reused, AND 30% of interior non-structural elements to be reused.
WB LCA	10% reduction from baseline	10% reduction from baseline	15% reduction from baseline	20% from baseline
Prescriptive Approach	--	175% of IW-EPD GWP limits; concrete 130% of ready-mixed GWP values	150% of IW-EPD GWP limits; concrete 130% of ready-mixed GWP values	IW-EPD GWP limits; concrete 130% of ready-mixed GWP values



Standards – PAS 2080

- Following the Infrastructure Carbon Review in 2013 it was identified that infrastructure is responsible for over 50% of the UK's carbon emissions therefore PAS 2080 was designed to specifically address the management of carbon in infrastructure.
- **This was updated in 2023 to widen the scope and improve clarity**

PAS 2080 Carbon Management in Infrastructure Verification



PAS 2080:2023

Carbon management in buildings
and infrastructure



Construction
Leadership
Council

The Green Construction Board



It looks at the whole life cycle of the carbon used on projects and promotes reduced carbon, reduced cost infrastructure delivery and a culture of challenge in the infrastructure value chain where innovation can be fostered.

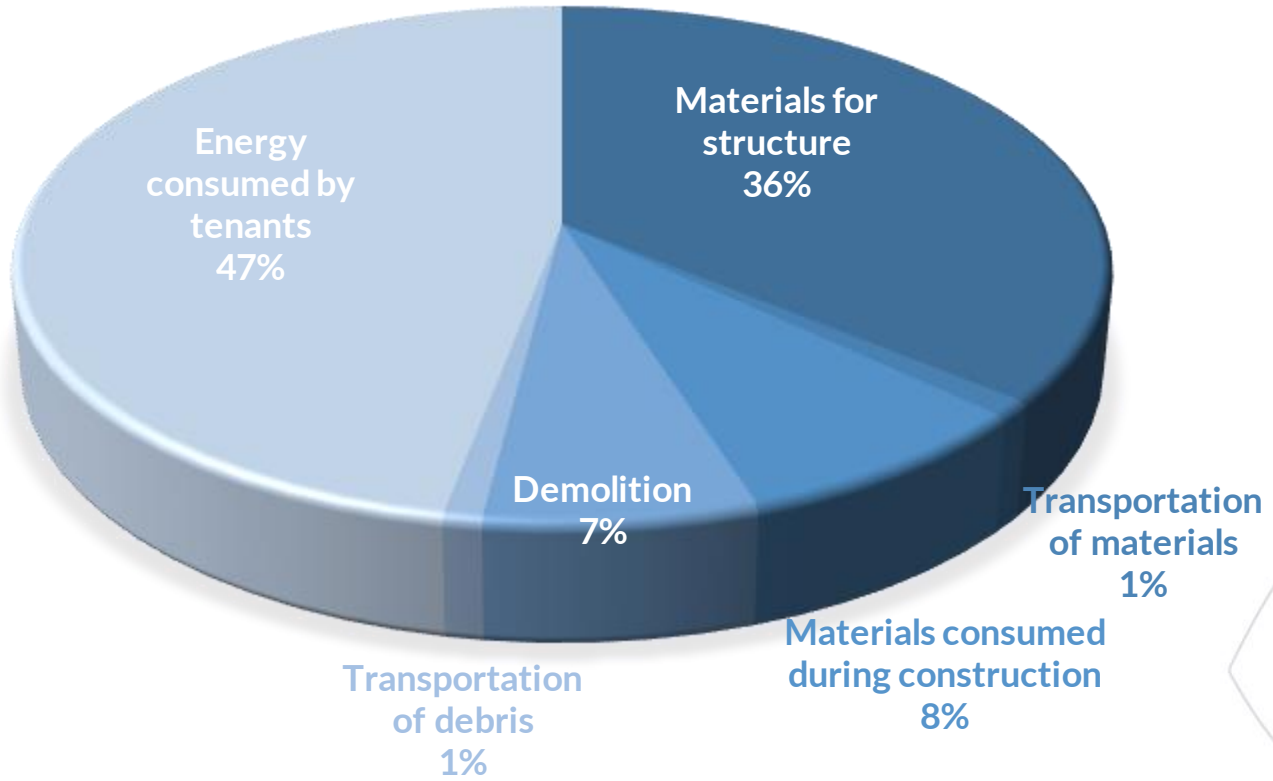
People like you



What can I do?



Understand where your challenges are



Generate integrated Whole Life Cost and Carbon Estimates

CAPEX

(PAS 2080 A1 – A5)

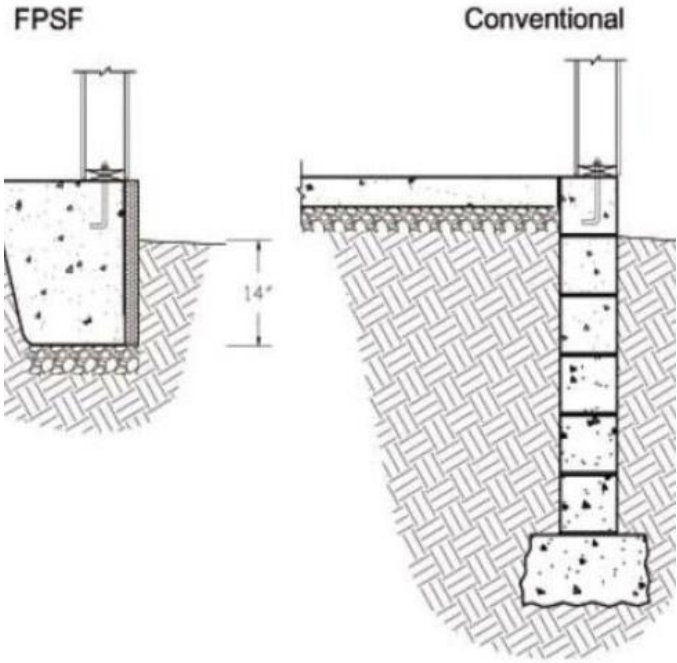
- At element level allow cost and carbon visibility at Element / component level support
 - Material substitution to see effect on cost and carbon
 - Impact of transport for
 - Material
 - Labour
 - Equipment
 - Site fuel costs
 - Support full estimate life cycle
 - Early day / budget setting
 - Optioneering and design
 - Target cost and negotiation

OPEX and End of Life

(PAS 2080 B, C & D)

- At asset level forecast cost and carbon for
 - Operation
 - Repair and replace
 - Demolition
 - Residue carbon
- Also look at
 - Circular economy
 - Repurposing
 - Links to asset management
 - Condition based monitoring and maintenance

Simple is best

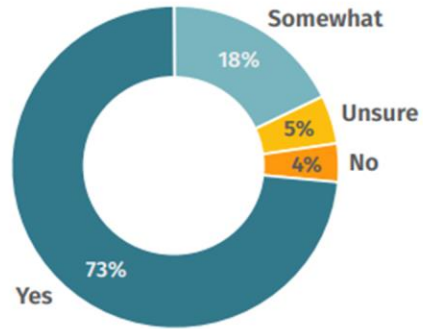


Who needs to be providing leadership?

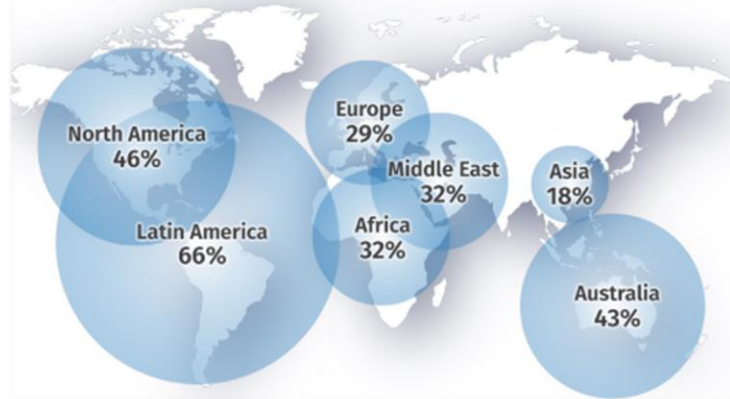


You should be

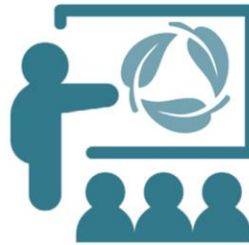
Does sustainability Create or Add Value?



Percentage Not Currently Tracking Sustainability or Unsure



Does Project Management Have a Role in Sustainability Programs?



94% of survey respondents think their organizations will take sustainability efforts into account to some extent going forward.

Source: Sustainability in Project Management. 2022 ARES PRISM GLOBAL INDUSTRY REPORT



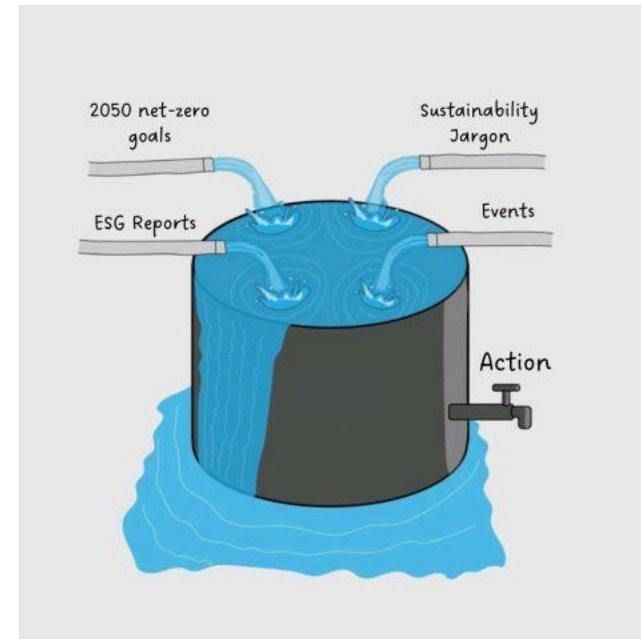
Is it all doom and gloom?!



No, great things are happening

- Pockets of excellence
 - Great work in the definition of material embodied carbon
 - Beginning to understand the challenges of through life cost and carbon trade space
- Strong community buy-in
 - [Zero Construct](#)
 - [Zero Next Gen](#)
- Good sharing of knowledge and experience
 - Professional bodies
 - Leading consultancies

However, the challenge goes on



Graphic courtesy of Tamma Carel (PIEMA, MSc, BSc)

What's my first action?

- Come and talk to us
 - Our team is waiting on Stand 22 to answer your questions
- Question what your organisation is doing
 - Who?
 - What ?
 - Why not?
- **Remember don't let perfect spoil good**
 - Start taking small steps
 - Evolution not revolution





THANK YOU

