ARES PRISM

Cost & Carbon Estimating and Tracking for Capital Projects

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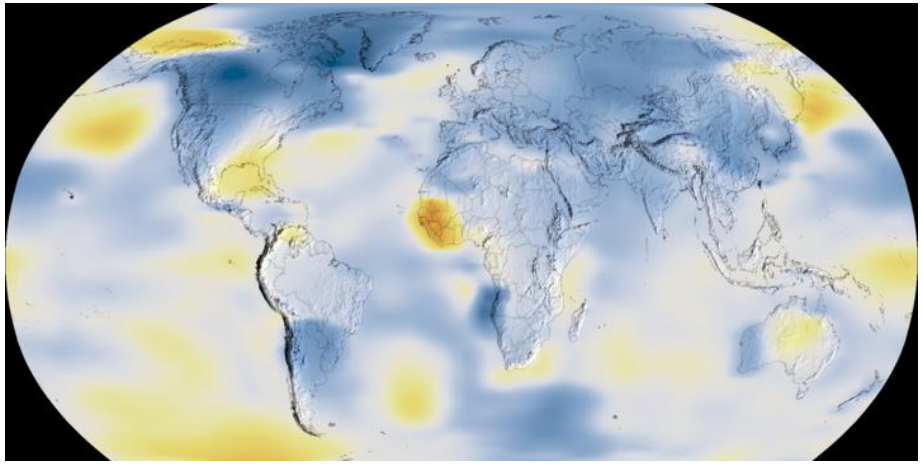
Visiting Professor University of Bath

Todays Questions

- **I will ask and respond to my favourite questions**
  - Who
  - What
  - When
  - Why
- **But not necessarily in the right order**

The Challenge

Global Warming Must Be Lower Than 2 Degrees



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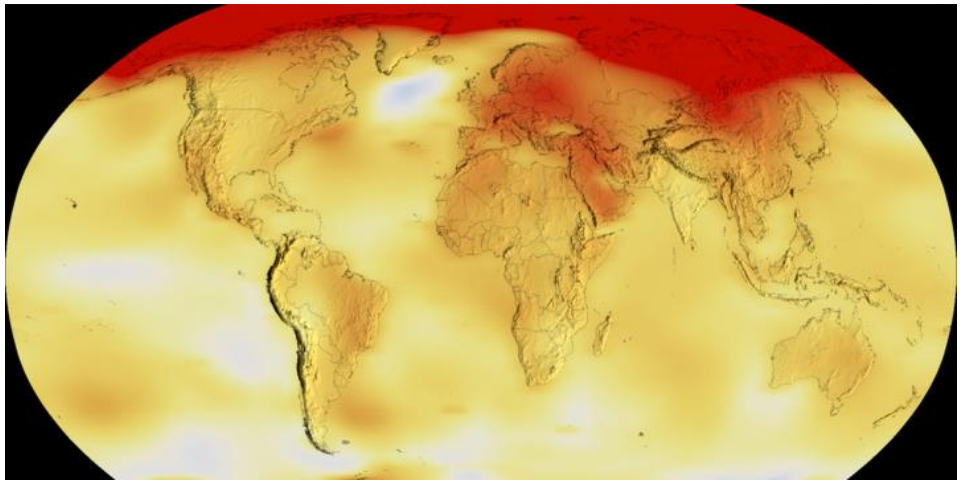
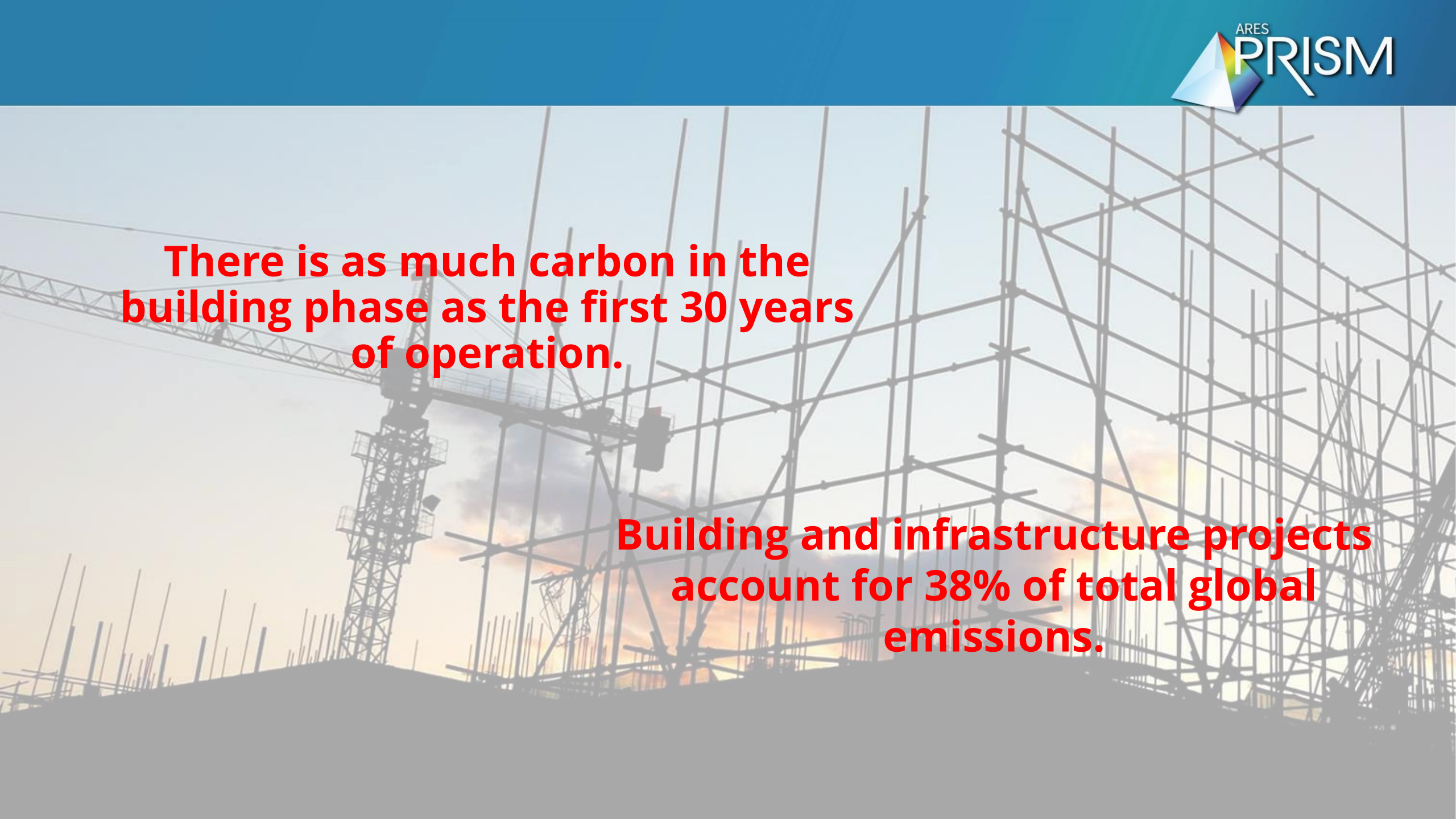


2021

Data source: NASA/GISS
Credit: NASA's Scientific Visualization Studio


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.

Really…. So why is that of interest to me?

ESG - Environmental, Social and Governance

So What Does That Do To Me?

Term	Importance
Environmental	Trade off for sustainability verses cost Equal weighting between environment costs and monetarily costs Capex, Opex and end of life need to balance Circular Economy considerations
Social	Sustainable investments for shareholders Sustainable asset design Aesthetic vs utilitarian Wider social benefits
Governance	Publish what you are going to do Measure your progress and resource consumption Control change and productivity Report your achievements

What's The Upside?

Improves competitive advantage

Increases productivity and reduced project costs

Increases regulation or mandate compliance

Attracts employees and investors

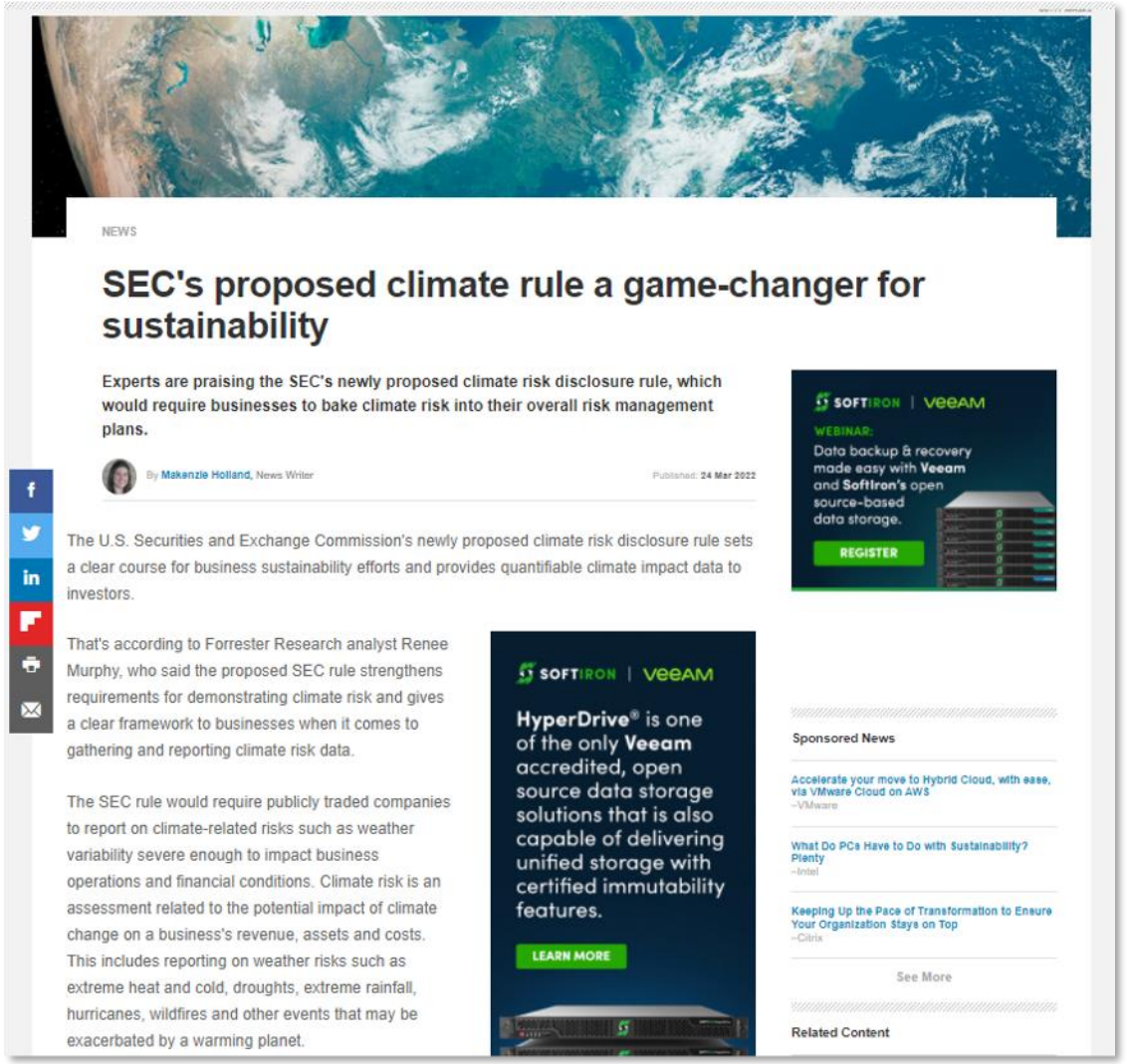
Reduces waste

Makes shareholders happy

How will this effect me?

Regulations & Mandates

- Government regulations and mandates across the globe are getting more and more specific to sustainability initiatives.
  - The UK's Companies Act 2006 (Strategic Report and Directors' Report) Regulations 2013
  - U.S. Securities & Exchange Commission (SEC)'s proposed climate rule in which publicly traded companies would have to report on climate-related risks in their risk management plans and reports



NEWS

SEC's proposed climate rule a game-changer for sustainability

Experts are praising the SEC's newly proposed climate risk disclosure rule, which would require businesses to bake climate risk into their overall risk management plans.

By Makenzie Holland, News Writer

Published: 24 Mar 2022

The U.S. Securities and Exchange Commission's newly proposed climate risk disclosure rule sets a clear course for business sustainability efforts and provides quantifiable climate impact data to investors.

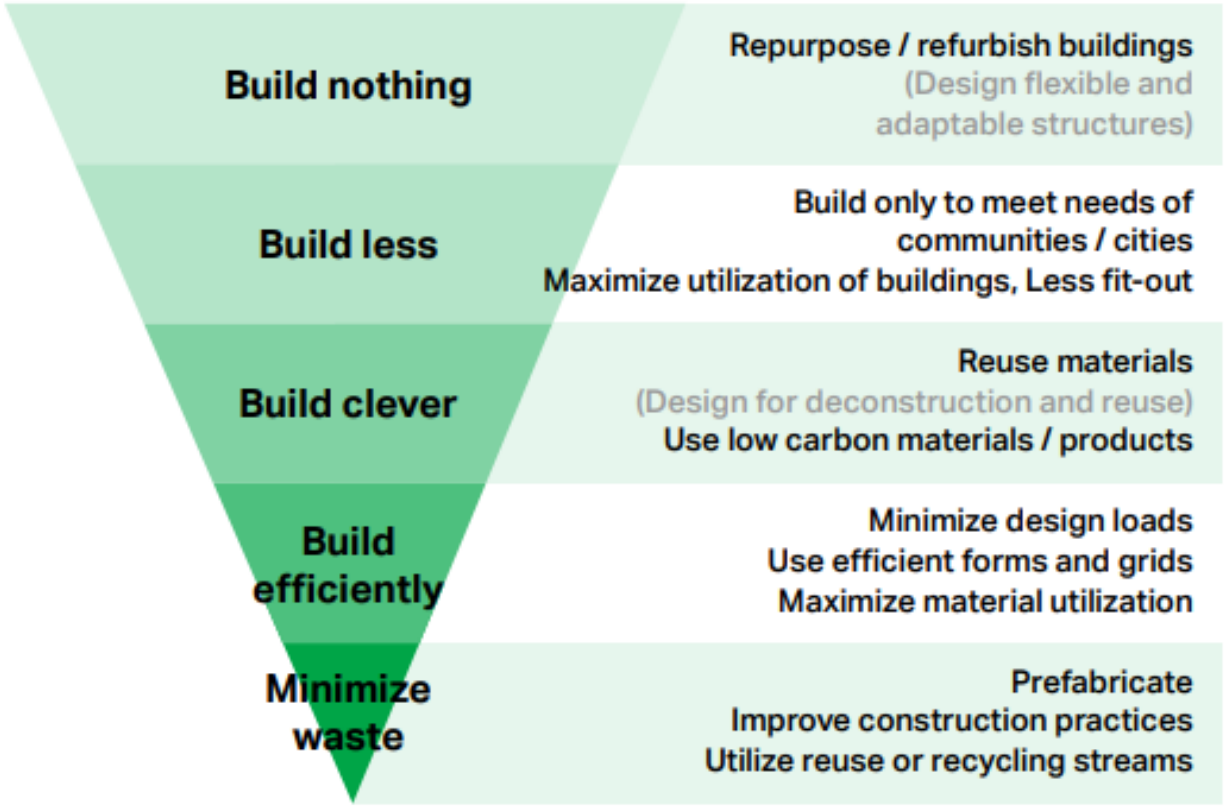
That's according to Forrester Research analyst Renee Murphy, who said the proposed SEC rule strengthens requirements for demonstrating climate risk and gives a clear framework to businesses when it comes to gathering and reporting climate risk data.

The SEC rule would require publicly traded companies to report on climate-related risks such as weather variability severe enough to impact business operations and financial conditions. Climate risk is an assessment related to the potential impact of climate change on a business's revenue, assets and costs. This includes reporting on weather risks such as extreme heat and cold, droughts, extreme rainfall, hurricanes, wildfires and other events that may be exacerbated by a warming planet.

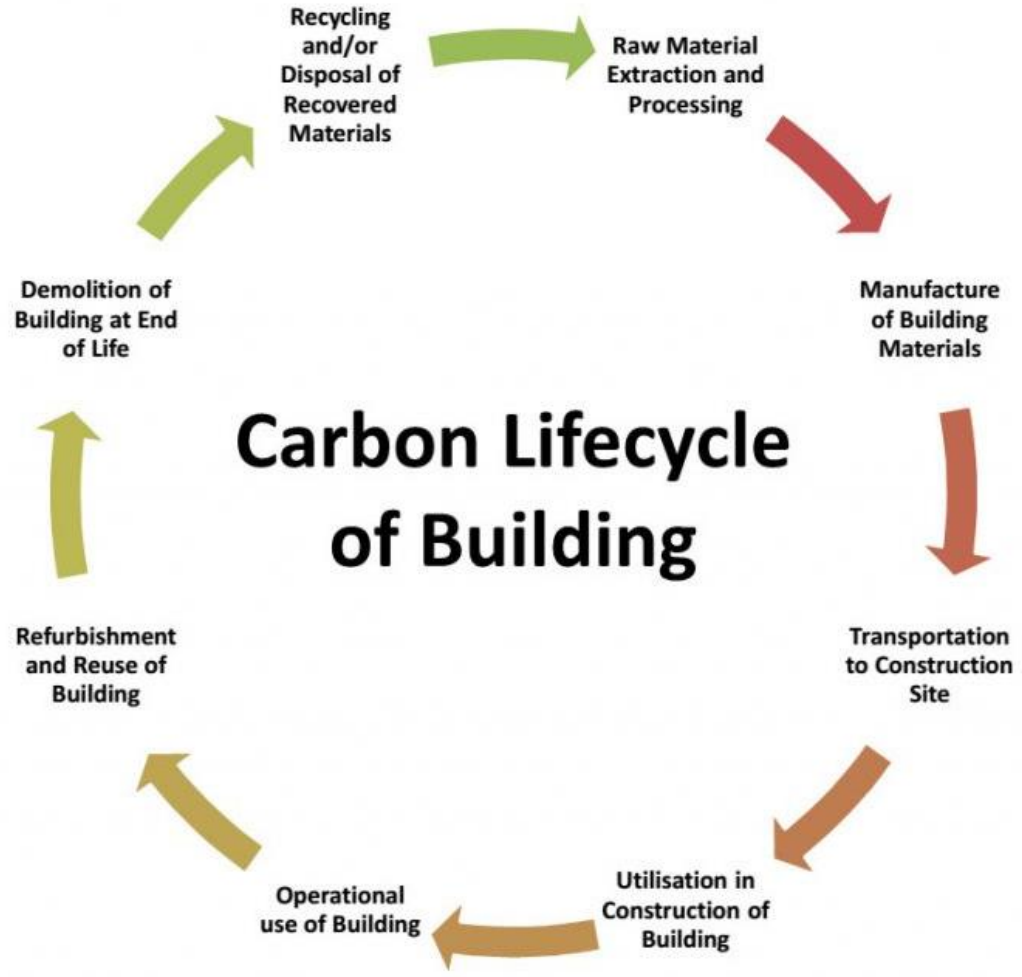
Multiple Climate Change Initiatives

More countries passing net zero legislation

Embodied carbon Reduction Strategy



World Business Council for Sustainable Development.



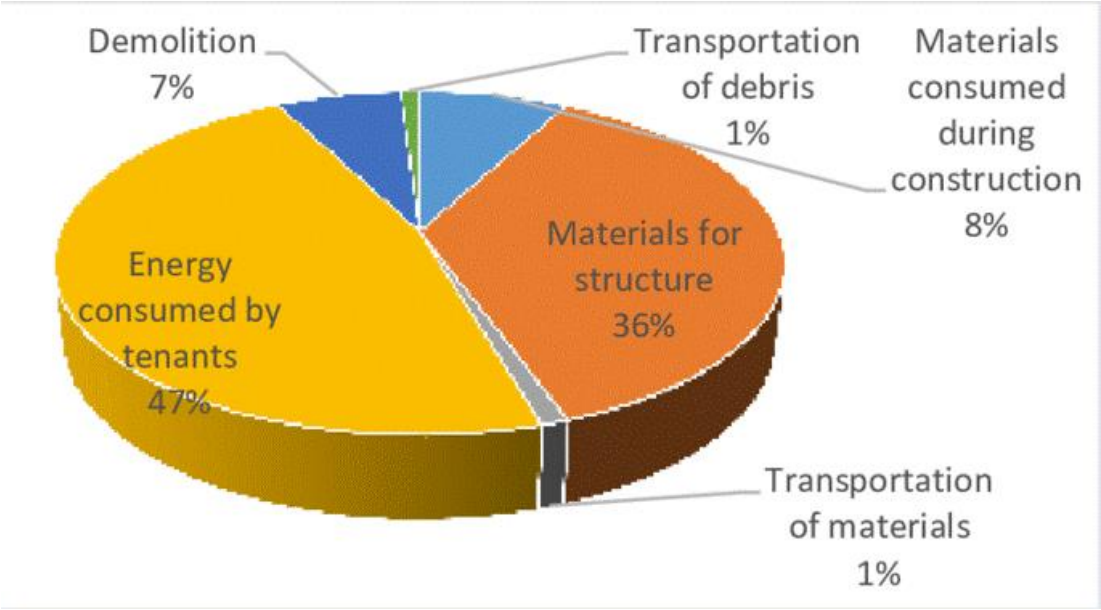
Standards – PAS 2080

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 infras

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.

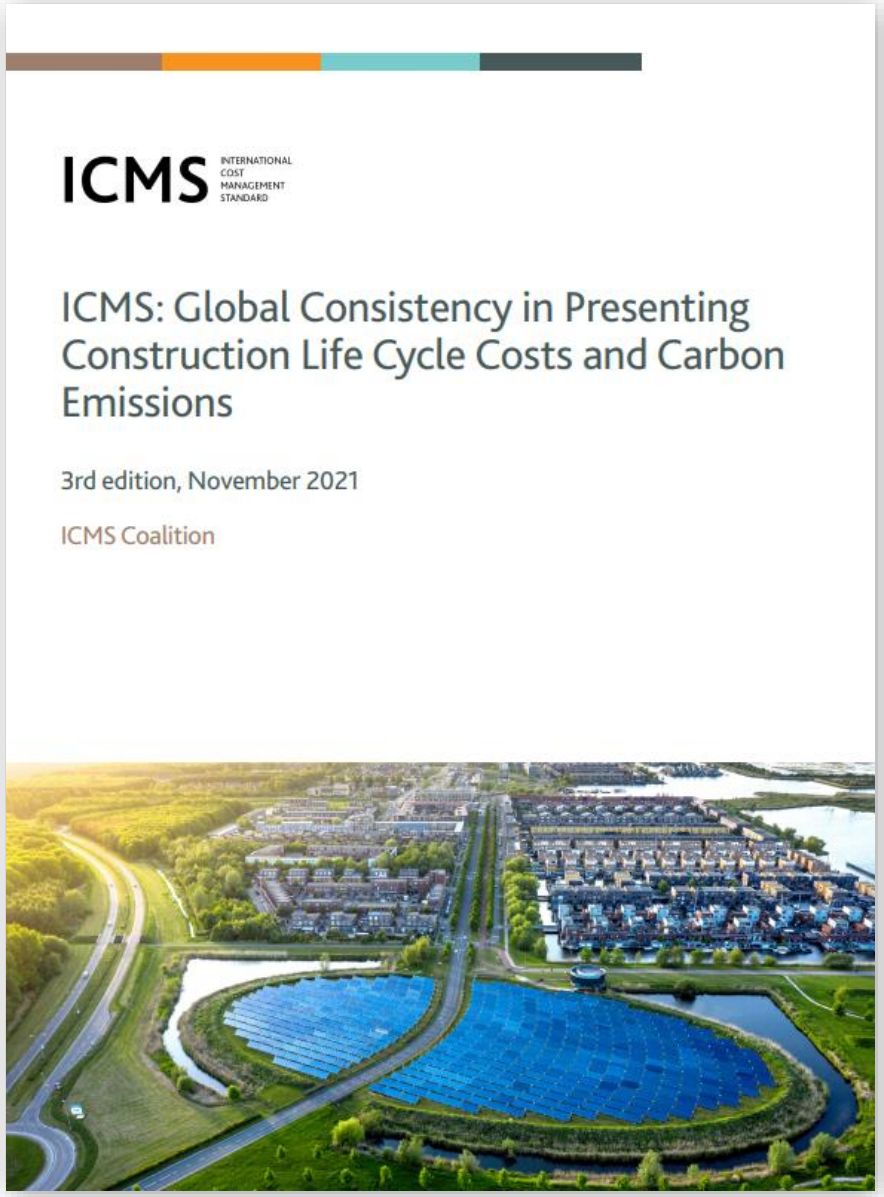
What can I do?

Understand Where Your Challenges Are



Track Cost and Carbon

- You cannot improve upon what is not being tracked and measured— Carbon estimating solution designed with government agency standards, regulations, and best practices.
- Estimate, track, and report project carbon and greenhouse gas (GHG) emissions the same way you do project cost data.
- Software aligns and integrates with many systems, and has elemental assemblies built-in to fully align with BIM models. These smart data models and data sets are aligned with asset values, allowing for creating more consistent project carbon estimates.



Generate Integrated Whole Life Cost and Carbon Estimates

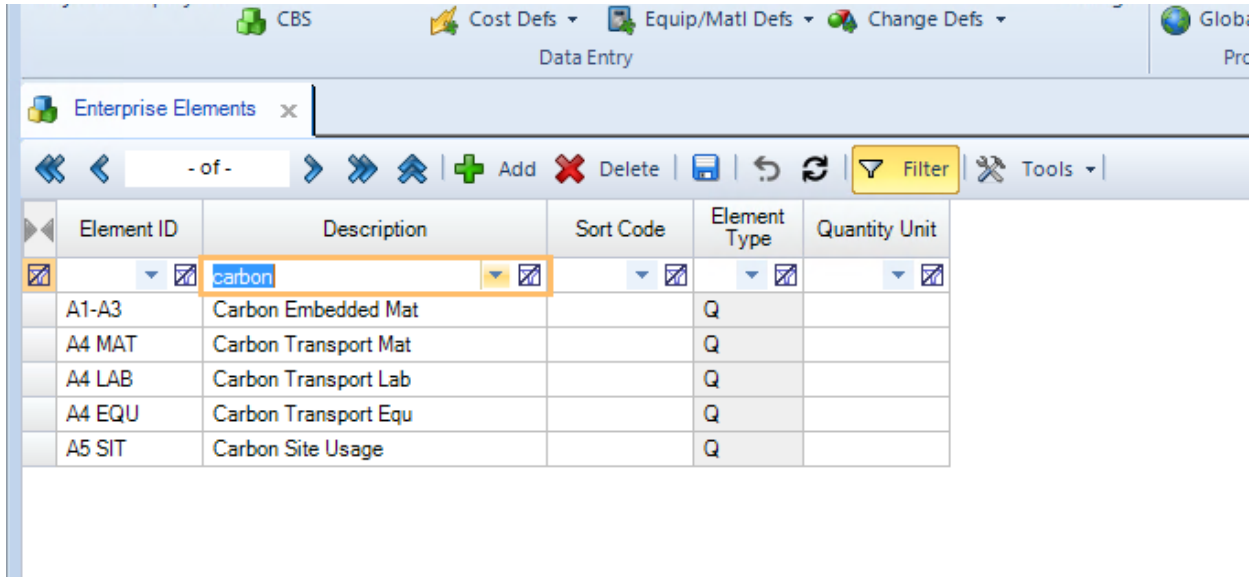
CAPEX (PAS 2080 A1 – A5)

- **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

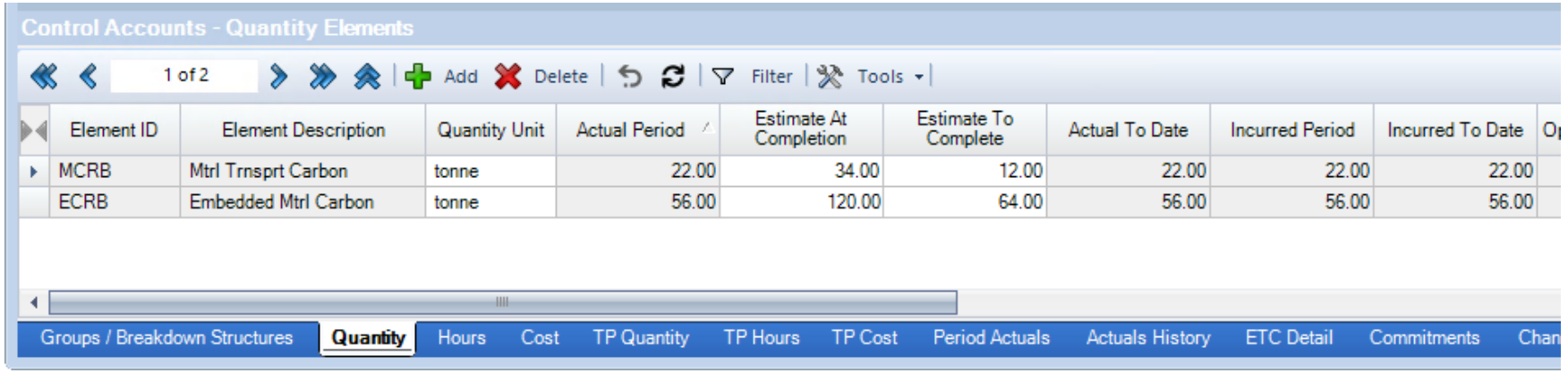
OPEX and End of Life (PAS 2080 B, C & D)

- **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

Capture Actual Carbon & Cost as Part of the Project Reporting Cycle



Element ID	Description	Sort Code	Element Type	Quantity Unit
	carbon			
A1-A3	Carbon Embedded Mat		Q	
A4 MAT	Carbon Transport Mat		Q	
A4 LAB	Carbon Transport Lab		Q	
A4 EQU	Carbon Transport Equ		Q	
A5 SIT	Carbon Site Usage		Q	

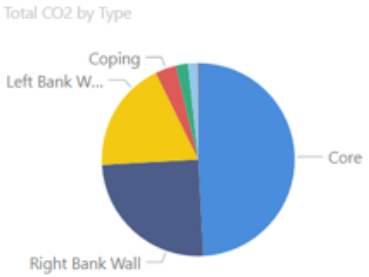


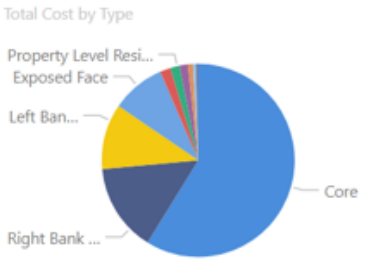
Element ID	Element Description	Quantity Unit	Actual Period	Estimate At Completion	Estimate To Complete	Actual To Date	Incurred Period	Incurred To Date
MCRB	Mtrl Trnsprt Carbon	tonne	22.00	34.00	12.00	22.00	22.00	22.00
ECRB	Embedded Mtrl Carbon	tonne	56.00	120.00	64.00	56.00	56.00	56.00

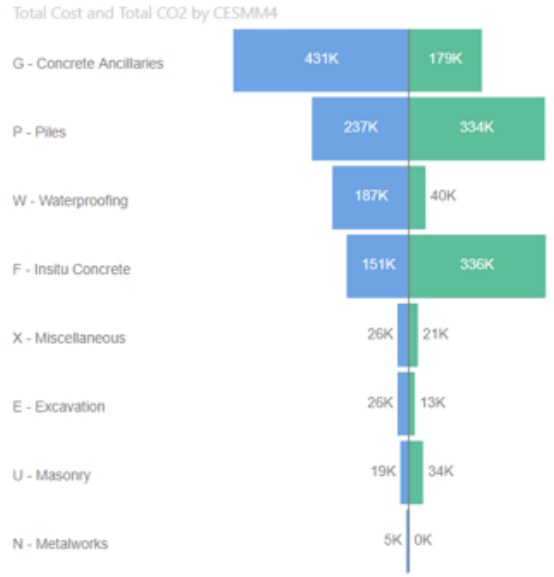
Provide Clear and Robust Insights for Decision Making

- Measure and monitor your project's carbon emissions in real-time with our carbon reporting dashboards.
- Estimate project carbon, track and monitor project emissions, and visualize and understand where your project and emissions originate from.

Asset Location	Asset Type	EA DRL Group	Title	Quantity	Unit	Rate	Total Cost	A1-A3	Transport (km)	A4	Wastage %	A5	Total kgCO2e
Chelmsford	Defence Wall	Core	Disposal of Excavated Material	126.58	M3	17,21	2 178,92	0,00	150	3 323,20	0,05	0,00	3 323,20
Chelmsford	Defence Wall	Core	Excavate material other than topsoil, rock or artificial hard material	126.58	M3	3,40	430,82	0,00	0	0,00	0,00	0,00	0,00
Chelmsford	Defence Wall	Core	Excavate topsoil	105,44	M3	0,62	65,49	0,00	0	0,00	0,00	0,00	0,00
Chelmsford	Defence Wall	Core	Formwork: plane vertical: 0.4-1.22	1 265,24	M2	38,04	48 125,65	6 199,66	300	602,32	0,05	309,98	7 111,96
Chelmsford	Defence Wall	Property Level Resilience	Gabion Wall: Placed on river bank above water level: Zinc wire mesh 80mm: random filled by hand with broken rock of cubic character: average mass 2 - 10kg: Size: 2 x 1 x 1m	33.00	EACH	169,84	5 604,65	221,43	300	7 925,39	0,05	11,07	8 157,89
Chelmsford	Defence Wall	Coping	Parapet copings	210,87	LM	30,23	6 375,10	9 137,11	175	2 045,26	0,01	91,37	11 273,74
Chelmsford	Defence Wall	Core	Placing concrete: reinforced: bases : 300 mm	126,52	M3	27,93	3 534,06	0,00	0	0,00	0,00	0,00	0,00
Chelmsford	Defence Wall	Core	Placing concrete: reinforced: walls : 250 mm	158,15	M3	33,52	5 301,09	0,00	0	0,00	0,00	0,00	0,00
Total				**24 028,91**		**15 042,26**	**1 081 812,32**	**711 639,45**	**12995**	**189 542,23**		**56 678,50**	**957 860,18**







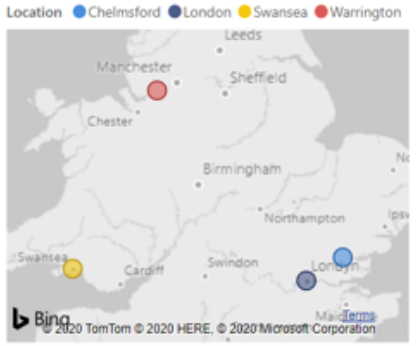
1,08M
Total Cost

957,86K
A1 - A5 Total (kgCO2e)

711,64K
A1 - A3 Embodied (kgCO2e)

189,54K
A4 Transport (kgCO2e)

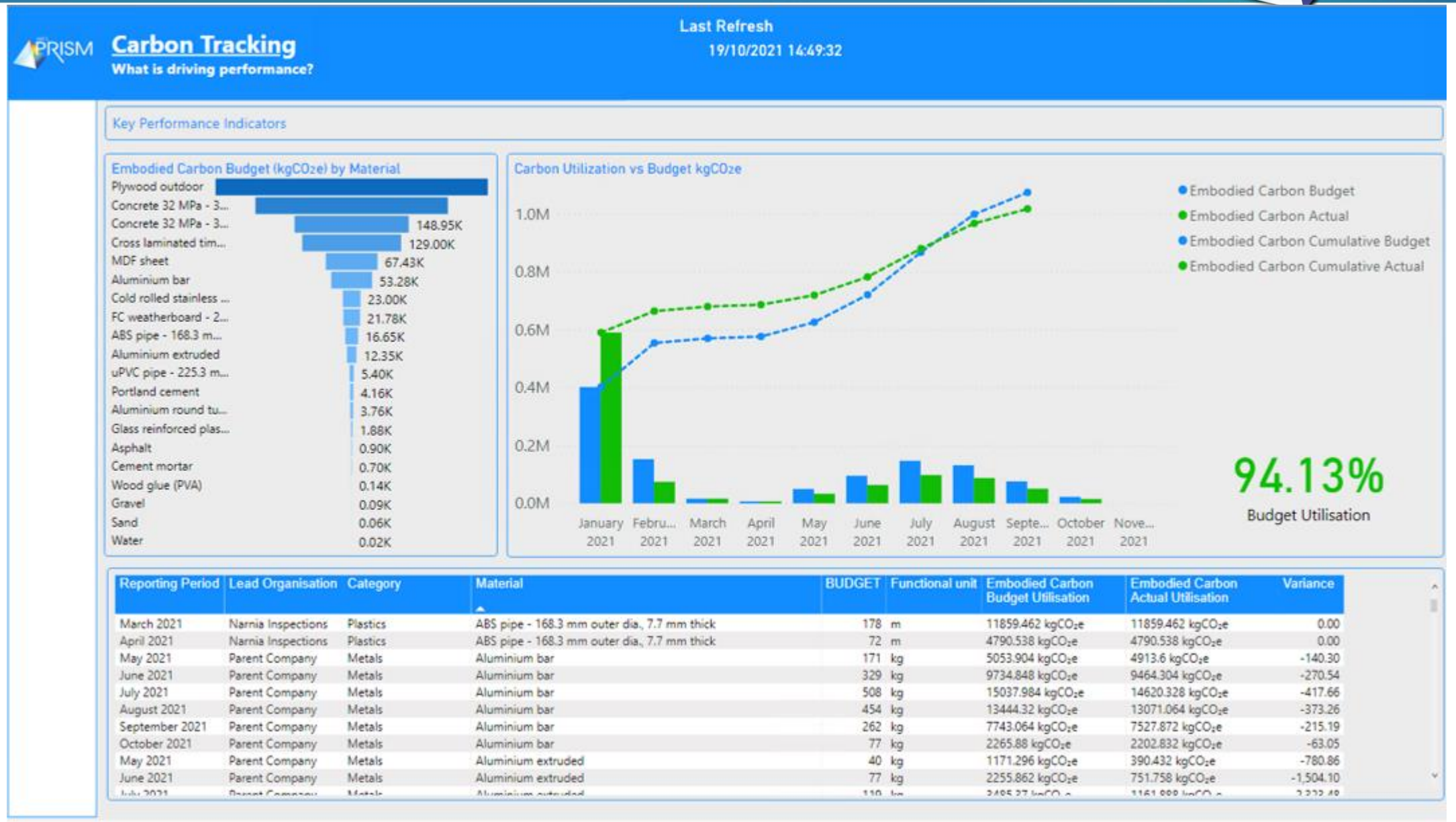
56,68K
A5 Waste (kgCO2e)



Asset Location

Chelmsford	Swansea
London	Warrington

Provide Carbon Reporting & Dashboards From the Core Project Dataset



Reporting Period	Lead Organisation	Category	Material	BUDGET	Functional unit	Embodied Carbon Budget Utilisation	Embodied Carbon Actual Utilisation	Variance
March 2021	Narnia Inspections	Plastics	ABS pipe - 168.3 mm outer dia., 7.7 mm thick	178	m	11859.462 kgCO₂e	11859.462 kgCO₂e	0.00
April 2021	Narnia Inspections	Plastics	ABS pipe - 168.3 mm outer dia., 7.7 mm thick	72	m	4790.538 kgCO₂e	4790.538 kgCO₂e	0.00
May 2021	Parent Company	Metals	Aluminium bar	171	kg	5053.904 kgCO₂e	4913.6 kgCO₂e	-140.30
June 2021	Parent Company	Metals	Aluminium bar	329	kg	9734.848 kgCO₂e	9464.304 kgCO₂e	-270.54
July 2021	Parent Company	Metals	Aluminium bar	508	kg	15037.984 kgCO₂e	14620.328 kgCO₂e	-417.66
August 2021	Parent Company	Metals	Aluminium bar	454	kg	13444.32 kgCO₂e	13071.064 kgCO₂e	-373.26
September 2021	Parent Company	Metals	Aluminium bar	262	kg	7743.064 kgCO₂e	7527.872 kgCO₂e	-215.19
October 2021	Parent Company	Metals	Aluminium bar	77	kg	2265.88 kgCO₂e	2202.832 kgCO₂e	-63.05
May 2021	Parent Company	Metals	Aluminium extruded	40	kg	1171.296 kgCO₂e	390.432 kgCO₂e	-780.86
June 2021	Parent Company	Metals	Aluminium extruded	77	kg	2255.862 kgCO₂e	751.758 kgCO₂e	-1,504.10

Who is leading the charge?

Environment Agency

In order to meet Net Zero ambitions by 2030, the Environment Agency is rolling out ARES PRISM's newly enhanced estimation and cost management software across its construction projects as the organisation's cost and carbon tool.

PRISM Modules: Estimating, Cost Management

ARES PRISM Provides:

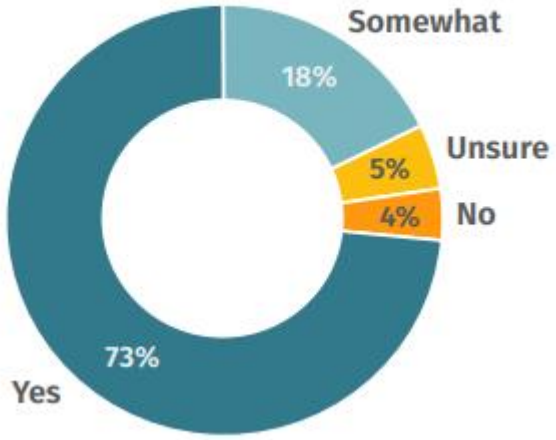
- Built-in carbon rates supported by BCIS CESMM4
- Alignment with PAS2080 offering a framework for calculating carbon in all aspects of the asset lifecycle
- Faster project estimates developed using master rate libraries and pre-built templates
- Mitigation of carbon impacts and the budgetary costs associated with them
- A single platform for the estimation of cost and carbon providing carbon transparency for capital build projects
- Improvement in consistency, governance, and integrity of estimates

"This process is now 12 times quicker in parts, freeing up that time to engage earlier in collaboration and assess suitable options. The platform [lets] us standardise processes and data across regions. We [are] able to develop estimates using master rate libraries and pre-built templates called 'assemblies' to speed up estimating of commonly built assets/components."

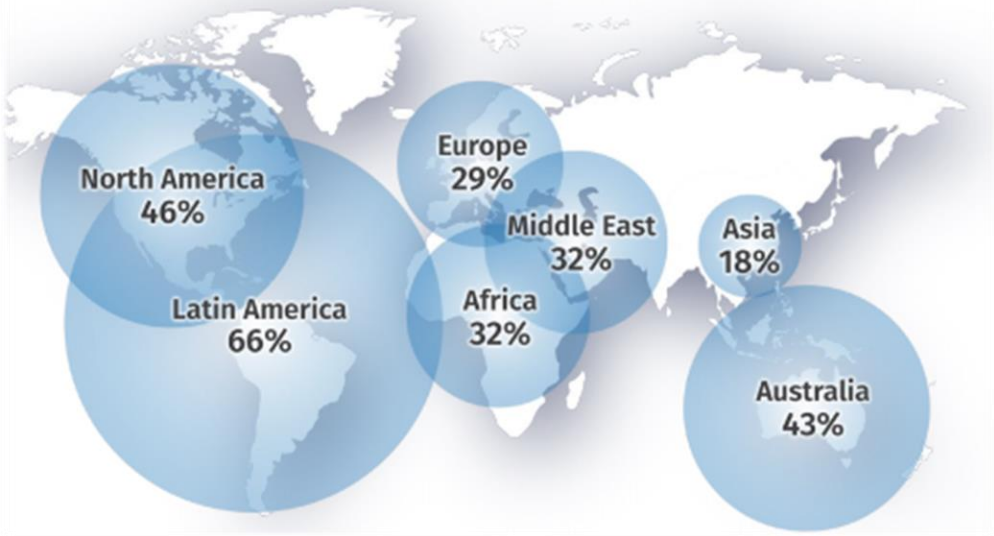
- Alex Jones, Cost and Carbon Tool Project Manager at the Environment Agency

Our Industry Can Too

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

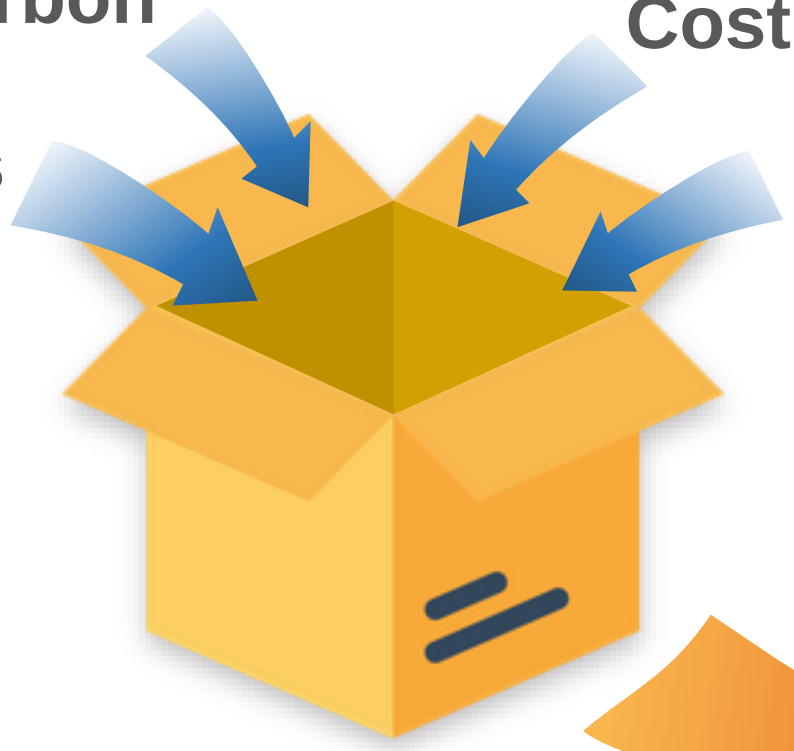
ARES - Cost & Carbon Tracking IN A BOX

Carbon

Cost

Estimates

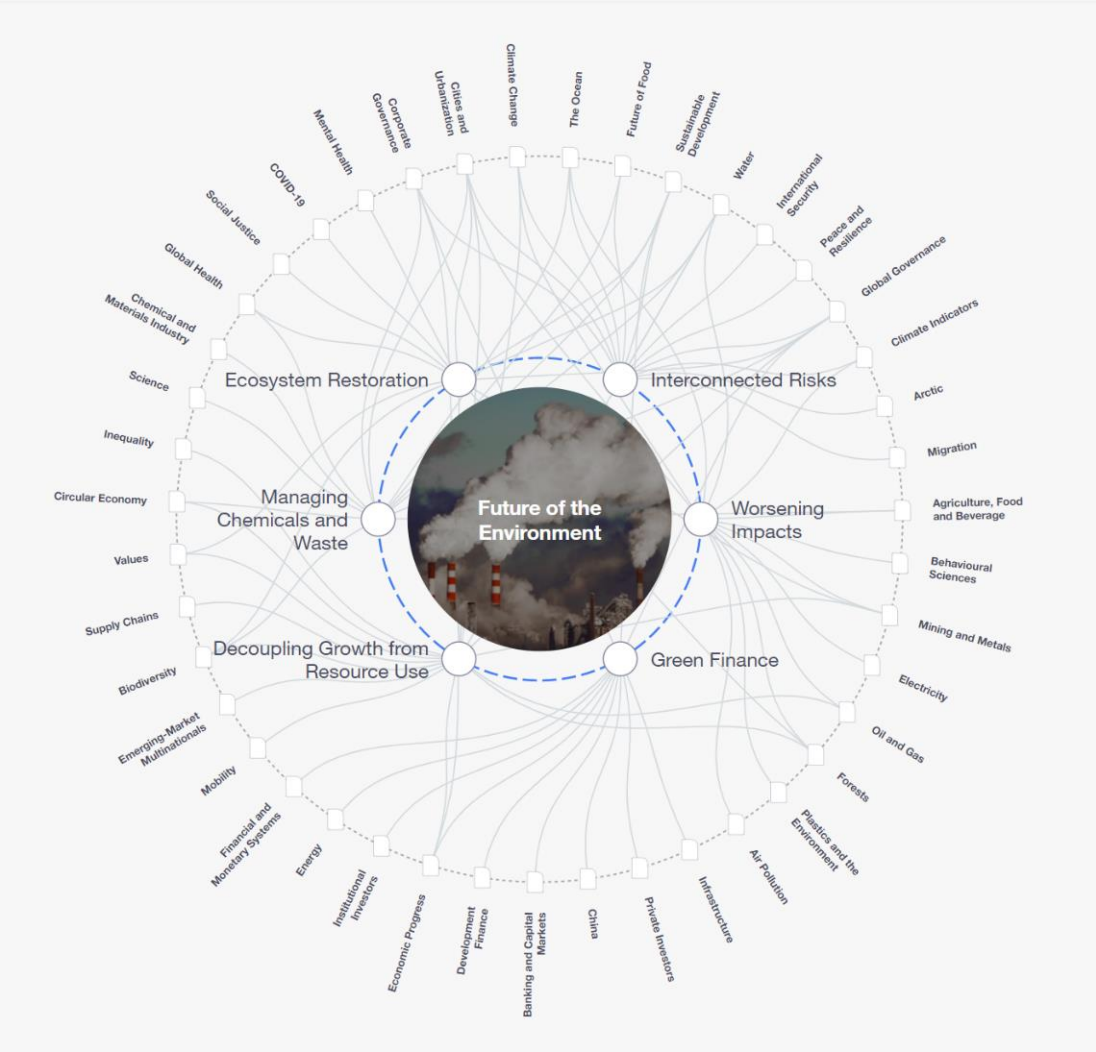
Other Sustainability Metrics



Tracking

When should I start?

Now…. The Clocks Ticking & We Are Interconnected



[Strategic Intelligence (weforum.org)]

Thank You!

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