



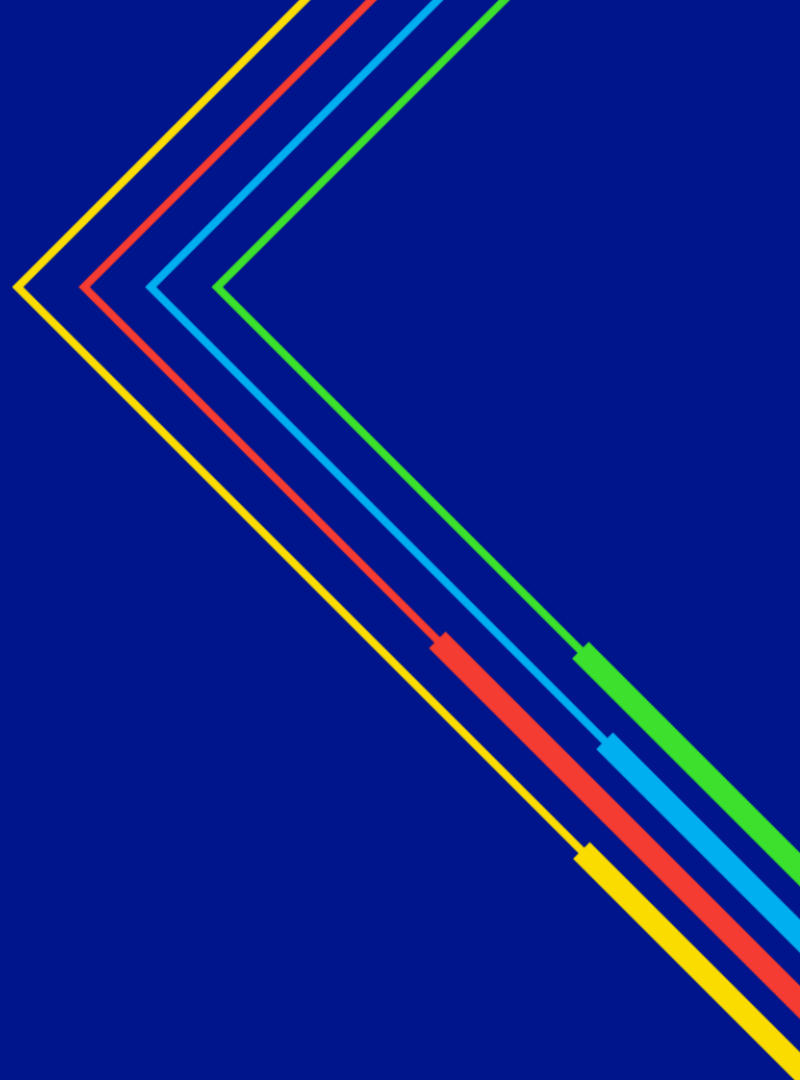
Electricity
Distribution

Approach for Long-Term Planning Accounting for Carbon Assessment (ALPACA)

Dissemination webinar

March 23, 2023

nationalgrid



Agenda

- 1 Project background
- 2 Whole Life Carbon Management Process
- 3 Carbon database and capital delivery
- 4 Whole Life Carbon measuring tool
- 5 Follow on work and wider industry perspective
- 6 Q&A

ALPACA – Project Information

ALPACA aim was to develop a framework and supporting tools to allow DNOs to:

- Establish a better understanding of carbon impact of our capital schemes
- Identify opportunities to reduce carbon footprint of capital delivery
- Develop carbon database(s) to allow robust carbon reporting



Delivery timeframe: January 2022 – March 2023



Funding mechanism: Network Innovation Allowance

Total budget: £240,473

In partnership with:

AECOM



Project Structure

Task 1: Literature Review



Task 2: Stakeholder Engagement



Task 3: WLCM Guidance



Task 4: Tool Development

Desk-based review of external requirements for carbon reporting and best practice (e.g. PAS2080).

Discussions with key NEGD teams and industry stakeholders to understand project design process and requirements for a reporting tool.

Whole life carbon methodology to be incorporated into the reporting tool and NGED project processes.

Excel based tool, providing project level outputs at baseline, detailed design and as built project phases. PowerBi dashboard for collective project reporting.

ALPACA - Deliverables

nationalgrid National Grid Electricity Distribution Project Carbon Tool

Tool Navigation
[Go to Dashboard Page](#)
[Go to Project Dashboard](#)

File
 Ctrl+Z Undo
 Ctrl+Y Redo
 Ctrl+S Save
 Ctrl+P Print
 Ctrl+Q Quit
 Ctrl+R Refresh
 Ctrl+F Find
 Ctrl+H Help

Project Details

Enter key project details here. Some of this data is used in the outputs, so this section should be completed as accurately as possible. Rows marked with * must be completed to allow calculations to function correctly.

Project Name:

WGED Project Reference: Project Name:

Project Department*: Add Project Name:

Dept Name: *(Internal Services)*

Project Type*:

License Area*:

Project Value (in £'000)*:

Year of Commission*:

Lifespan of Project*:

[Update All Data](#)

Project stage	National Grid Users				Contractor Users							
	NO user name	Department	Date of input	NO reviewer	Department	Date of review	Contractor user name	Company	Date of input	NO reviewer	Department	Date of review

nationalgrid **Supplier Carbon Calculator - Products**
v2.0

National Grid Contract number:

National Grid Contract name:

Supplier name:

Product name:

Type (if applicable):

Units of production:

If "Other" please specify:

Size (if applicable):

Year of manufacture:

Country of origin:

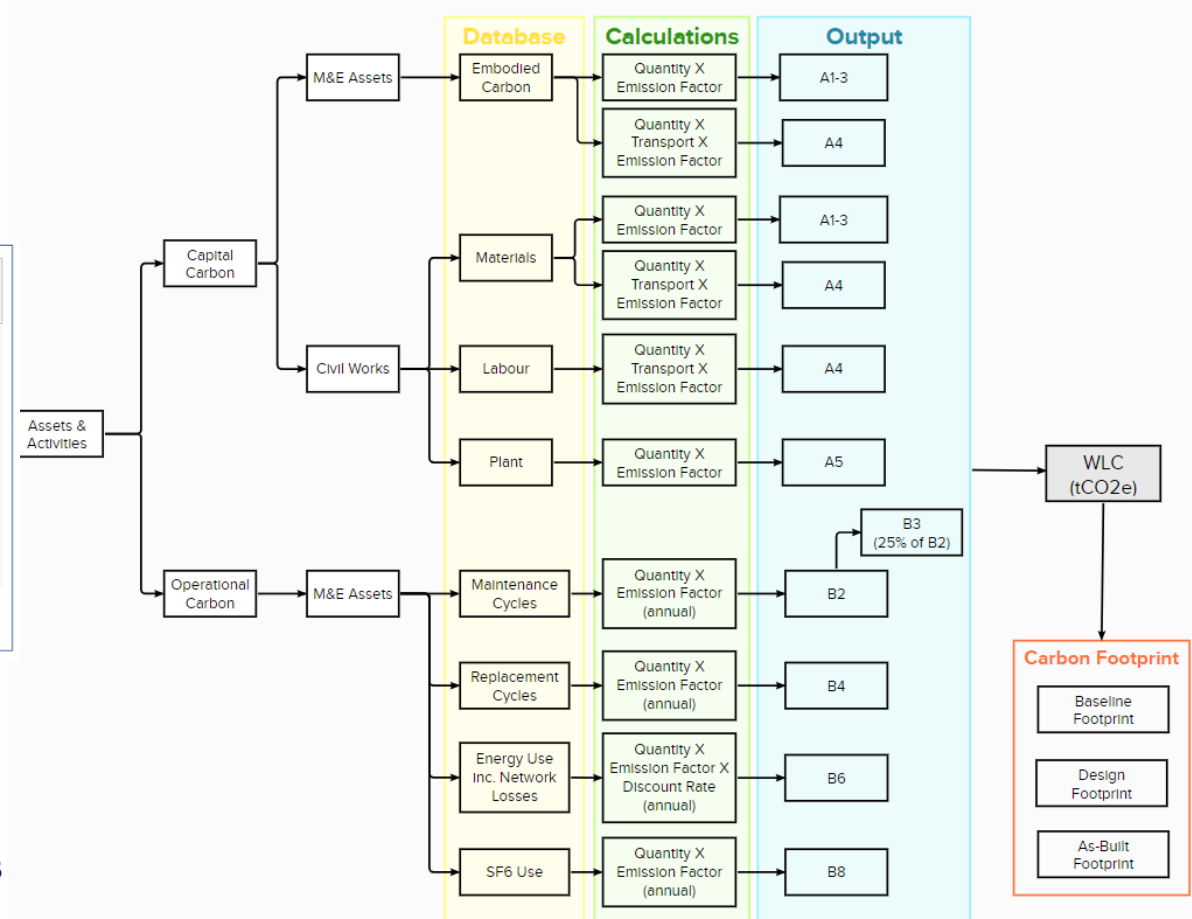
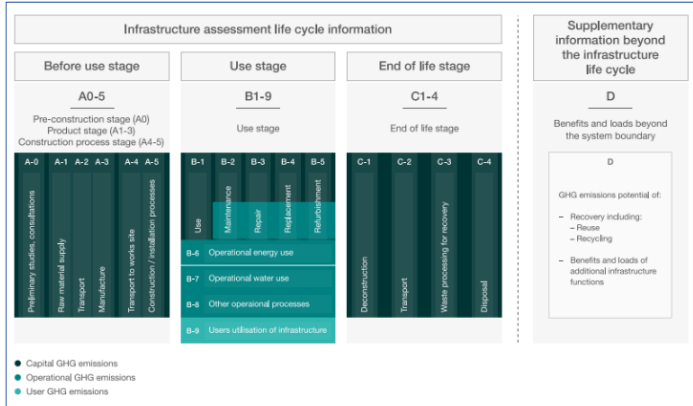
Inputs used per						
	input	Activity data	Units	Confidence grade	Embodied Carbon (kg CO ₂ e)	User comments (optional)
	Grid electricity		kWh			
	Mains water		m3			
	Waste water		m3			
	Material 1					
	Material 2					
	Material 3					
	Material 4					
	Material 5					

Available at the project webpage:

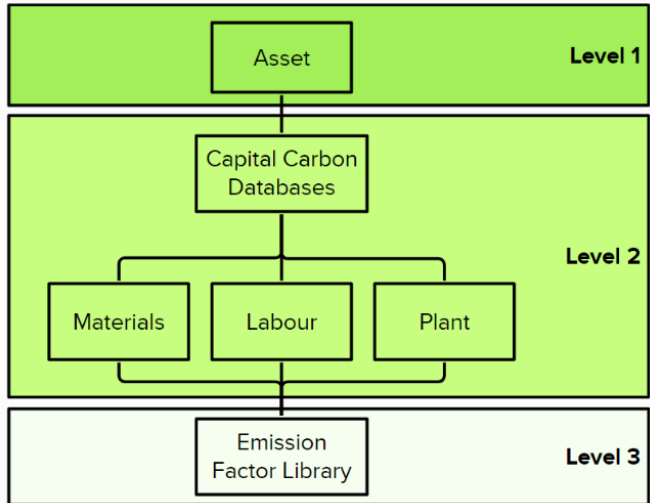
[National Grid - Approach for Long-term Planning accounting for Carbon Assessment \(ALPACA\)](#)



Whole Life Carbon Management Process



Developing the database – capital delivery



Material

- **Activity Data** – type of product/material, weight
- **Emission factors** - Environmental Product Declarations (EPDs), Inventory of Carbon and Energy (ICE) database v3.0, Government conversion factors

Labour

- **Activity Data** – number of trips to site, mode of transport, distance
- **Emission factors** - Government conversion factors for company reporting of greenhouse gas emissions

Plant

- **Activity Data** – fuel quantity
- **Emission factors** - Government conversion factors for company reporting of greenhouse gas emissions

Developing the database – through-life activity

Electricity Consumption and Network Loss

- Annual kWh consumption / loss converted to kgCO₂e using the UK Government grid projection factors

SF6 Loss

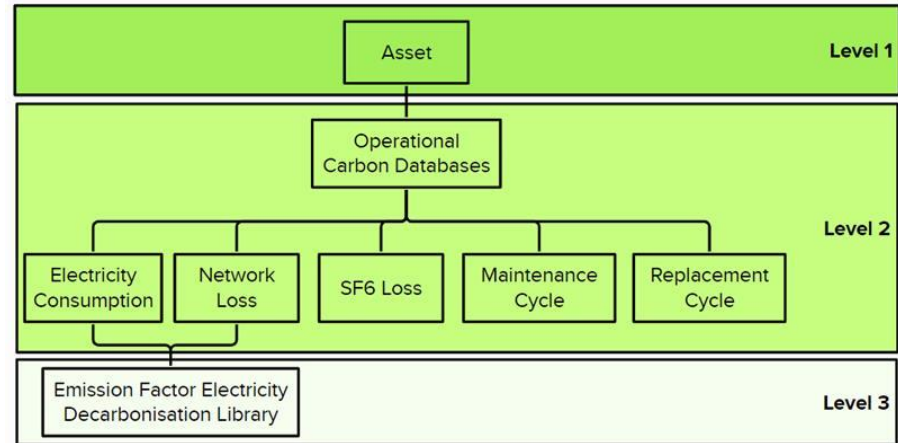
- Kg SF6 lost per year multiplied by GWP

Maintenance Cycle

- Frequency of maintenance schedules
- kgCO₂e estimated based on % of capital delivery - routine (0.1%), minor (1%), major (5%)

Replacement Cycle

- kgCO₂e estimated based on capital delivery for the asset being replaced



Sustainable Procurement

Supplier Carbon Calculator - a basic tool to allow suppliers to calculate carbon footprint of their product/service and provide figure to NGED.

-> Improve data quality overtime

-> Accurate reporting

nationalgrid	Supplier Carbon Calculator - Products					
v2.0						
National Grid Contract number						
National Grid Contract name						
Supplier name						
Product name						
Type (if applicable)						
Units of production						
If "Other" please specify						
Size (if applicable)						
Year of manufacture						
Country of origin						
Inputs used per						
	Input	Activity data	Units	Confidence grade	Embodied Carbon (kg CO ₂ e)	User comments (optional)
	Grid electricity		kWh			
	Mains water		m ³			
	Waste water		m ³			
	Material 1					
	Material 2					
	Material 3					
	Material 4					
	Material 5					

Carbon Impact Questionnaire – a series of questions to assess the current and future ability of our suppliers actively support us on our journey to net zero

Whole Life Carbon Measuring Tool

nationalgrid

National Grid Electricity Distribution Project Carbon Tool

Introduction

Welcome to the National Grid Electricity Distribution Project Carbon Assessment Tool

This tool has been designed to allow for the carbon footprint of National Grid Electricity Distribution's (NGED) projects to be calculated, as required by Ofgem's RRI0-ED2. The tool aligns with NGED's project processes and asset structure, in order to support the integration of whole life carbon considerations; including planning and design stage, construction and operation and maintenance of assets throughout their lifetime.

Tool Navigation

[Go to Guidance Page](#)

[Go to Home Page](#)

[Go to Project Dashboard](#)

Tool Features

- Offline and Excel based for ease of access and usability
- Marco-enabled for sleek design and function
- 3 data input tabs for each design stage (baseline, design, as built)
- Reporting dashboard
- Bespoke carbon datasets aligned with NGED asset management system

nationalgrid

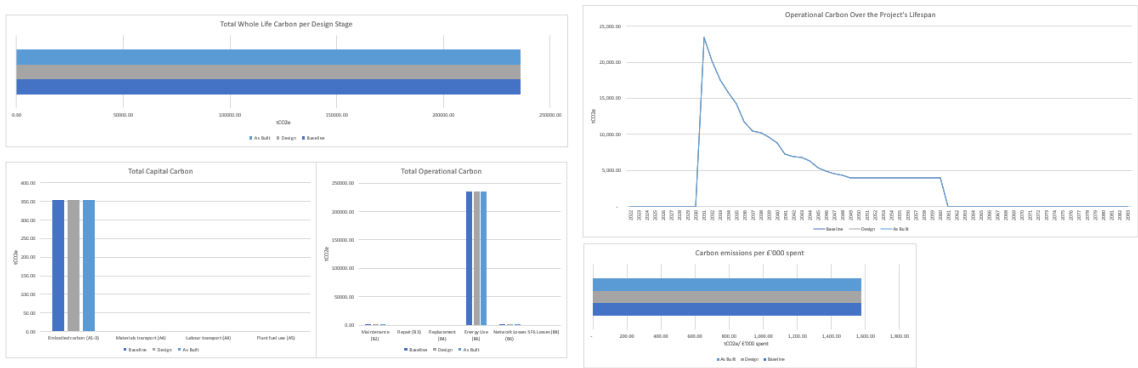
National Grid Electricity Distribution Project Carbon Tool

Tool Navigation

[Go to Home Page](#) [Go to Project Dashboard](#) [Go to Guidance Page](#)

Project Summary

Project Name	Site #	NGED Project Reference	#	Project Value (in £'000)*	156.88	Year of Completion*	2020	Lifespan of Project*	30																																																																
<table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="4">Capital Carbon (CO2e)</th> <th colspan="5">Operational Carbon (CO2e)</th> <th rowspan="2">Total Operational Carbon</th> <th rowspan="2">Total Whole Life Carbon</th> </tr> <tr> <th>Embodied carbon (A1-3)</th> <th>Materials transport (A4)</th> <th>Labour transport (A4)</th> <th>Plant fuel use (A5)</th> <th>Maintenance (B2)</th> <th>Repair (B3)</th> <th>Replacement (B4)</th> <th>Energy Use (B5)</th> <th>Network Losses (B6)</th> <th>SF6 Losses (B8)</th> </tr> </thead> <tbody> <tr> <td>Baseline</td> <td>359.83</td> <td>0.72</td> <td>0.00</td> <td>0.24</td> <td>251.91</td> <td>0.04</td> <td>0.04</td> <td>0.00</td> <td>23970.47</td> <td>748.46</td> <td>0.04</td> <td>239823.94</td> <td>234472.00</td> </tr> <tr> <td>Design</td> <td>359.83</td> <td>0.72</td> <td>0.00</td> <td>0.24</td> <td>251.91</td> <td>0.04</td> <td>0.04</td> <td>0.00</td> <td>23970.47</td> <td>748.46</td> <td>0.04</td> <td>239823.94</td> <td>234472.00</td> </tr> <tr> <td>As Built</td> <td>359.83</td> <td>0.72</td> <td>0.00</td> <td>0.24</td> <td>251.91</td> <td>0.04</td> <td>0.04</td> <td>0.00</td> <td>23970.47</td> <td>748.46</td> <td>0.04</td> <td>239823.94</td> <td>234472.00</td> </tr> </tbody> </table>											Capital Carbon (CO2e)				Operational Carbon (CO2e)					Total Operational Carbon	Total Whole Life Carbon	Embodied carbon (A1-3)	Materials transport (A4)	Labour transport (A4)	Plant fuel use (A5)	Maintenance (B2)	Repair (B3)	Replacement (B4)	Energy Use (B5)	Network Losses (B6)	SF6 Losses (B8)	Baseline	359.83	0.72	0.00	0.24	251.91	0.04	0.04	0.00	23970.47	748.46	0.04	239823.94	234472.00	Design	359.83	0.72	0.00	0.24	251.91	0.04	0.04	0.00	23970.47	748.46	0.04	239823.94	234472.00	As Built	359.83	0.72	0.00	0.24	251.91	0.04	0.04	0.00	23970.47	748.46	0.04	239823.94	234472.00
	Capital Carbon (CO2e)				Operational Carbon (CO2e)						Total Operational Carbon	Total Whole Life Carbon																																																													
	Embodied carbon (A1-3)	Materials transport (A4)	Labour transport (A4)	Plant fuel use (A5)	Maintenance (B2)	Repair (B3)	Replacement (B4)	Energy Use (B5)	Network Losses (B6)	SF6 Losses (B8)																																																															
Baseline	359.83	0.72	0.00	0.24	251.91	0.04	0.04	0.00	23970.47	748.46	0.04	239823.94	234472.00																																																												
Design	359.83	0.72	0.00	0.24	251.91	0.04	0.04	0.00	23970.47	748.46	0.04	239823.94	234472.00																																																												
As Built	359.83	0.72	0.00	0.24	251.91	0.04	0.04	0.00	23970.47	748.46	0.04	239823.94	234472.00																																																												



Follow on and implementation

ALPACA tool will be used to

Help NGED identify most relevant Scope 3 emissions and work internally and with our supplies on carbon reduction

Establish a better understanding of a whole life carbon impact for our capital delivery

Ongoing improvement of Scope 3 data quality and coverage

Assist with Annual Carbon Reporting

- Further testing of the ALPACA tool will be performed over 2023 before full integration with NGED internal systems
- Ongoing work through ENA to align carbon reporting across the industry

Wider Industry View – Whole Life Carbon Management

Drivers

- Annual Environmental Reporting (embodied carbon)
- Science Based Targets and Net Zero Ambitions
- Effective Carbon Management
- Net Zero infrastructure paradox

Challenges

- Lack of carbon data – particularly electrical industry specific
- The ‘coastline paradox’
- Align approach
- Setting the right scope
- Consistent methodology
- Drive meaningful change

Approach

- Agree common ‘baseline’ carbon factors (*ALPACA*)
- Apply to existing infrastructure development data (*RRP*)
- Common approach - information from supply chain (*BEAMA Collaboration*)
- Collaborate & improve through RIIO-2 (*ENA Carbon WG & ROCCIT*)

Q&A

Thank you!

national**grid**