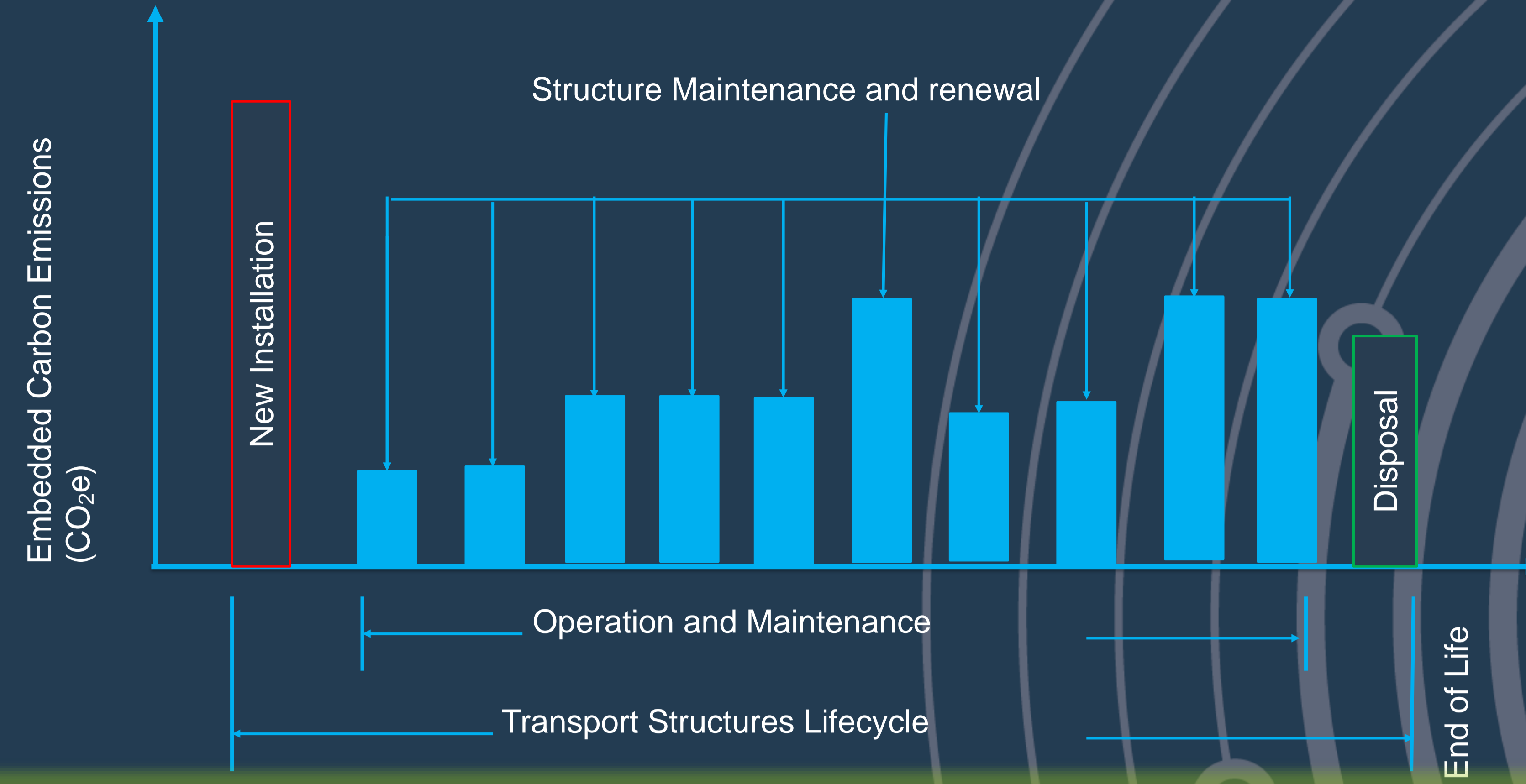


Green House Gases (GHG)

- Carbon dioxide (CO₂)
- Methane (CH₄)
- Nitrous oxide (N₂O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride (SF₆)

Embedded carbon emissions over the lifecycle of a structure



Embedded carbon emissions calculation

$$Ce = \sum_{i=1}^n Cei = \sum_{i=1}^n \sum_{j=1}^6 Wij \cdot GWPj$$

Ce , the carbon dioxide equivalent, (kg_CO_2)

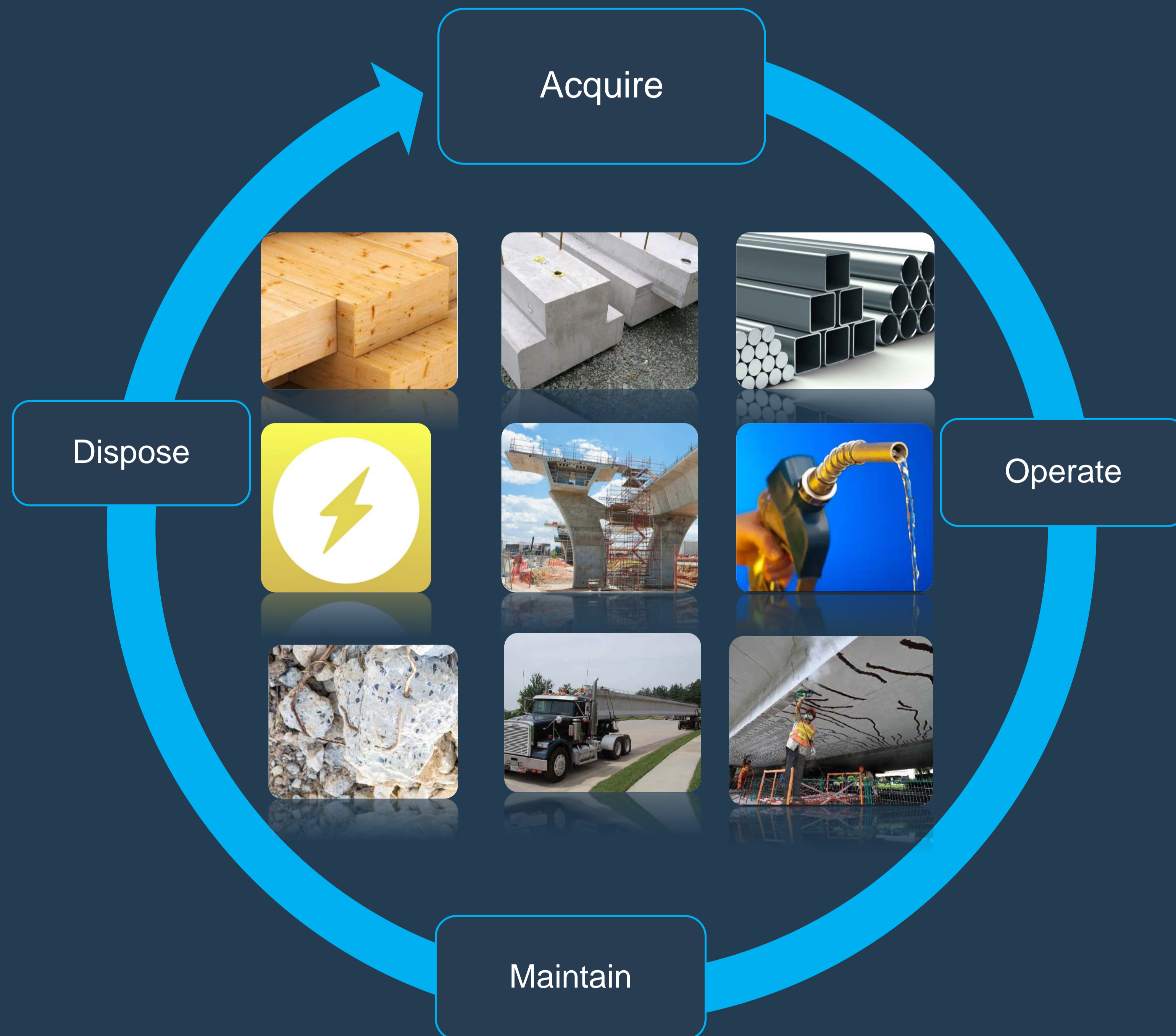
i , the i^{th} lifecycle stage

Cei , the carbon dioxide equivalent at the lifecycle stage i

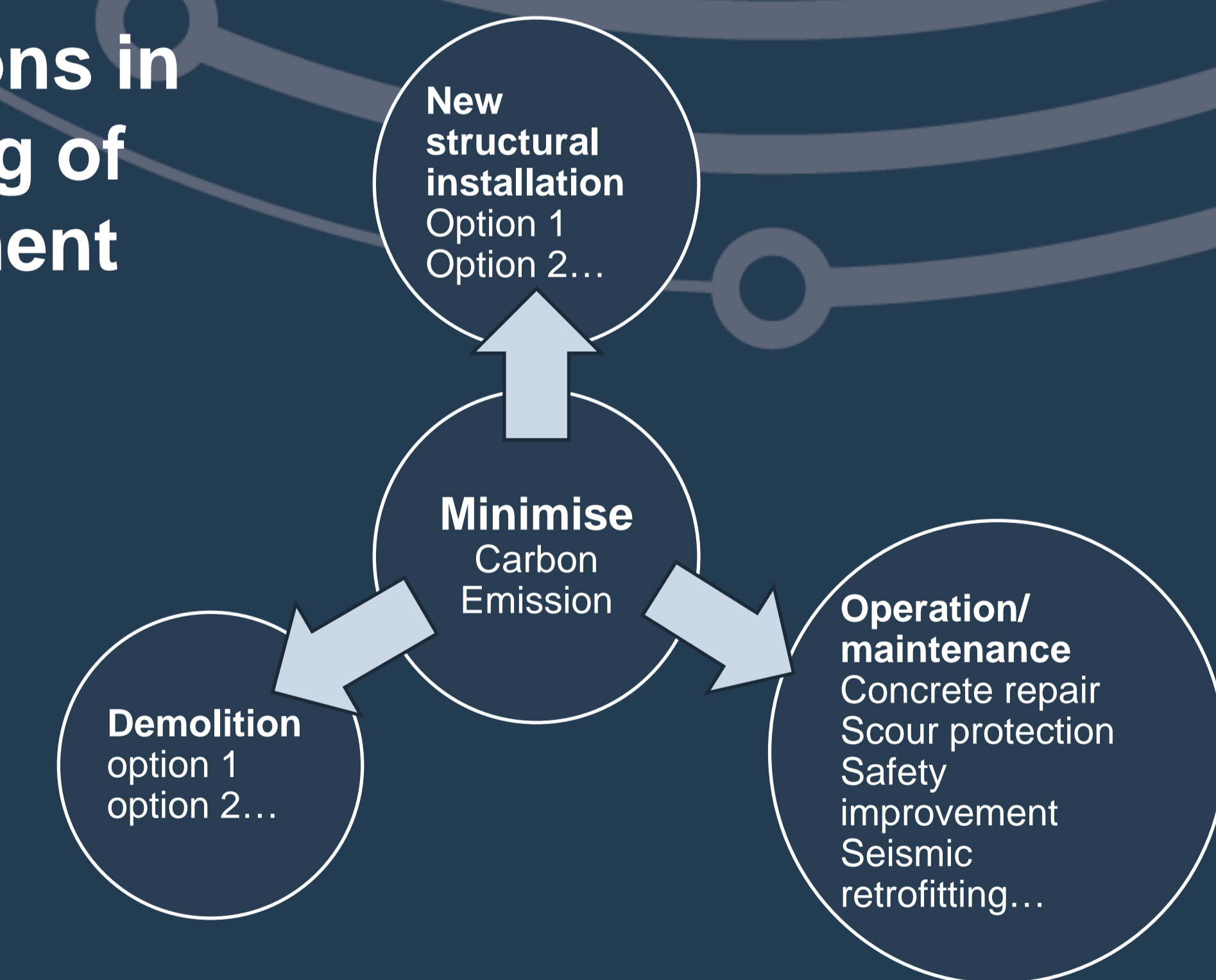
j , one of the six GHG

Wij , the weight of GHG j at the lifecycle stage i , (kg)

$GWPj$, Global Warming Potential of GHG j , ($\frac{kg_CO_2}{kg}$)



Carbon emissions in decision-making of asset management



Lifecycle activities
breakdown

Quantified embedded
carbon emissions

Taking carbon emission
as one of the risk
factors in decision-
making

INTEGRATED CARBON EMISSIONS CONTROL IN DECISION-MAKING

Matiul Khan, Gang Yu



An Auckland Council Organisation