Carbon reductions in planning and design

How do we make it happen?

Stefan Uppenberg, WSP
The Project

— An initiative from the National Construction Forum
— Aims to develop a guideline for how carbon reductions can be implemented in planning and design
— Based on examples from real projects
— Broad value chain collaboration
— A first step...
Content of the Guideline
**KLIMATFÖRBÄTTRINGAR I INFRASTRUKTURPROJEKT**

### Skeden, faser i ett infrastrukturprojekt:

<table>
<thead>
<tr>
<th>Åtgärdsvalstuva (Avs)</th>
<th>Planläggningsprocess</th>
<th>Planförrådning och förvaltning</th>
<th>Byggnadsanläggning (deltävling)</th>
<th>Byggande</th>
<th>Drift</th>
<th>Underhåll/Reinvestering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entreprenörsföretagsbevakning</td>
<td>Lokaliseringstätning</td>
<td>Planförrådning och systemhantering</td>
<td>Byggnadsanläggning (deltävling)</td>
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<td>TE (Totalentreprenad)</td>
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<tr>
<td>ECO/TEND (Tidigentreprenörssammanlagning)</td>
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<tr>
<td>Cupid (Konsulterande, inte sammanlagning)</td>
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<td>Basinställning</td>
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<td>Reinvestering (entreprenadare inkl. läggning, skolködr pp m.m.)</td>
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### Konsultupptag

- Avs
- Plan, inkl. lokaliseringstätning
- Plan, systemförrådning inkl. P/I
- Byggnadsanläggning inkl. P/I för TE
- Byggnadsanläggning TE
- BU, byggnadsstöd
- Reviskanshandling

### Klimatförbättringssätgarde

<table>
<thead>
<tr>
<th>Förvaltningsaktiviteter (CoClass - FA)</th>
</tr>
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<tbody>
<tr>
<td>Planering (ACI)</td>
</tr>
<tr>
<td>Samarbet i leverantörsleden (denna kan kunna koppas till en text om nödvändigheten av ledarskap, integrerad leverantörsleda, gemensamma mål m.m.)</td>
</tr>
<tr>
<td>Beslankande av byggnadsstruktur i linjovulgariskvis (linjovulgariskvis)</td>
</tr>
<tr>
<td>Beslankande av anläggningssystem i linjovulgariskvis (linjovulgariskvis)</td>
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<tr>
<td>Anviandad av geokapel i linjovulgariskvis</td>
</tr>
</tbody>
</table>

### Byggnadsverk (CoClass - BV)

- Erb (GA)
- Val av träbo istället för betongbesträva
- Val av tillverkin istället för betongbesträva

### Produktionsresultat (CoClass - PR)

- Terrassering, platsning, markförstärkning, lagar i mark m.m. (C)
- Optimering av logistik för masshantering
- Återanvändning av jordmassor som fyllingsmaterial
- Stabilisering/licitiering av mullmardemoss
- Dimensionering av K/C-pelare
- Val av bindermodal I/C/C-pelare
- Belastning i en högaste lättnadsgen
- Injektionsbruk i högaste akt
- Anviandad av gestalt för mullkud
- Overbyggnadssäkerhet
- Ersättning av bankpläning med bättre/Vfördiff

### Märkelsebyggnader, anläggningskomplettering m.m. (DI)

- Ersättning av nödel med socceller
- Ersättning av komponenter i armatur mned LED
- Anviandad av adaptiv utstyrning av några ibyggnad

### LÅS MER

- 5000
- 1600
- 6000

**MAKMER**
Example: Minimise cement clinker in concrete constructions

Guidelines
• Choose as low exposure class as possible for each construction element
• Choose as low concrete quality, and as high VCT, as possible for relevant exposure class
• Use as high shares of alternative binders, as fly ash and GGBS, as allowed
• Compare carbon performance of products by requiring EPDs from suppliers

Text on specs/standards asAMA and SS137003...
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Important to think of
- Make sure that the "right" specifications are in place (AMA 17)
- Dare to challenge specifications, exposure classes and concrete qualities
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- Include changes in concrete characteristics in design and production planning
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Carbon reduction
Per m\(^3\) concrete: 10 – 40%

Per 100 m\(^2\) bridge: From -17\% to -27\%

16 ton CO\(_2\)-e to 26 ton CO\(_2\)-e

Reduction equals up to: 68 m\(^3\) concrete; 2,6 Swedes’ early emissions; 6,5 return flights to Thailand per person
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Cost effect:

Supply chain responsibilities

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<th>Designer</th>
<th>Contractor</th>
<th>Supplier</th>
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<tbody>
<tr>
<td>A</td>
<td>C</td>
<td>R</td>
<td>I</td>
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What’s next?

— Final guideline and communication material available in beginning of 2020
— Please spread it in your networks
— Invite everyone to contribute with new actions and cases
— Update annually?
— International version?
— Implement in web-based data base format?
— An annual award for most innovative case?
— More ideas?
Thank you!

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