

Best practices towards sustainable supply chains and circularity – CO₂ pricing

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Agenda

1. Introduction
2. CO₂ pricing civil works and construction
3. Questions?



1. From Statnett strategy

1

Vi jobber for bærekraftig omstilling

- Bidra til elektrifisering*
- Jobbe for sameksistens
 - Antall dialogmøter med lokalsamfunn/urfolk/representanter for urfolk*
- Redusere risiko i verdikjeden
 - Andel/eller antall leverandører med høy risiko for negativ sosial påvirkning*

* Indikatorene vil videreutvikles

2

We are reducing our climate emissions - on the way to net zero in 2050

- Reduce emissions Scope 1, 2 og 3***
 - Net zero emissions within 2050
 - 25% emissions reduction for Scope 1 within 2025
 - Reduce GHG emissions based on SBTi*
- Reduce use of SF6
 - 0,15% emission rate of total SF6 installation in 2025
 - No new installations with SF6 from 2026**
 - SF6-free operation from 2050

*We must first establish climate accounting and emission pathways

**From the time of installation. Requires alternative technology to be available

3

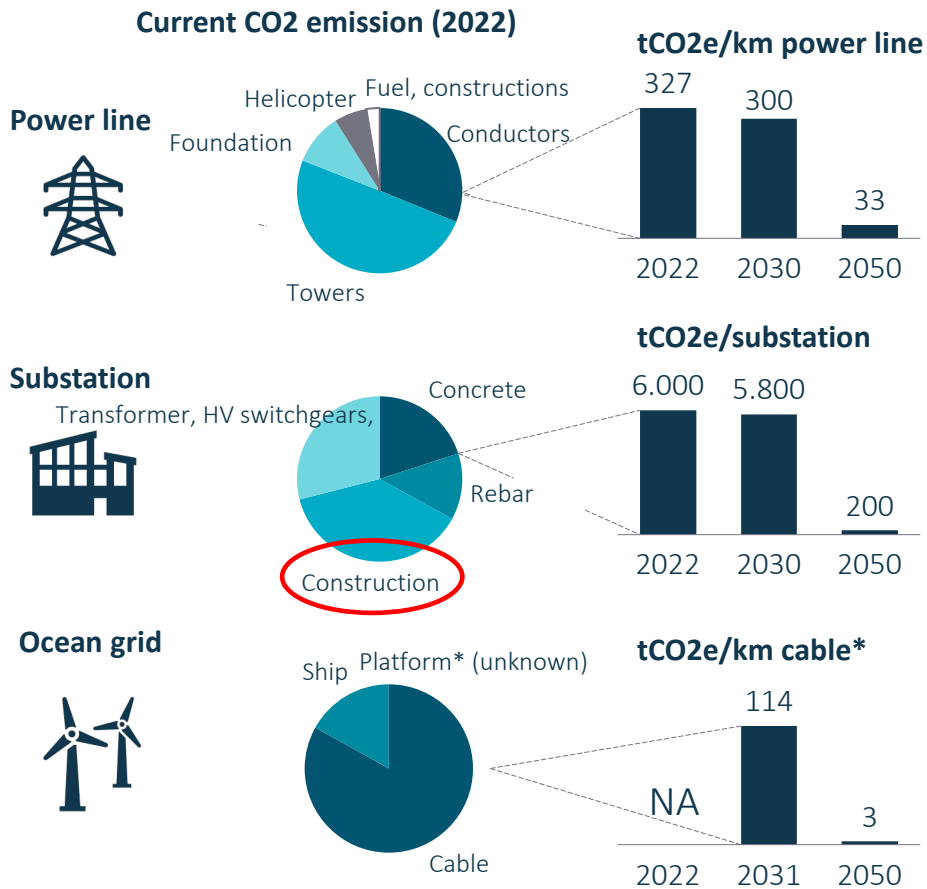
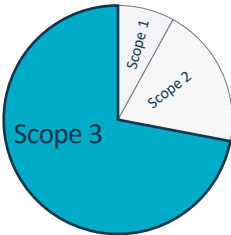
Vi ivaretar naturen - på vei mot naturpositivitet

- Begrense vårt avtrykk
 - Arealintensitet*
 - Påvirkning på dyr, insekter og maritimt liv*
- Unngå verdifull natur
 - Areal vernet, bevart og/eller unngått*
 - Sårbare områder unngått*
 - Myruttak*
- Ivareta og tilbakeføre natur
 - SBTN-verifiserte mål*

* Indikatorene vil videreutvikles

Scope 3: Needed reduction 97% GHG emissions within 2050

Statnett's
Emissions split
(2022)



*Emissions from platform is excluded



Case: CO2 pricing civil works and construction sub station

Estimated contract value = 30 mill. EUR

Mark-up for CO2 emission

All tenderers must deliver a Greenhouse gas emission (GHG) budget as a part of the bid.

The Greenhouse gas emissions will result in a surcharge on the supplier's bid price. The surcharge is calculated by multiplying the supplier's overall GHG emissions (measured in tCO2) by 600 EUR per tCO2. Suppliers compete to have the lowest markup.

Bonus and penalty

The deviation between the GHG budget and GHG actual emission from the input factors in the template "Calculation of GHG emissions for selected input factors" which forms the basis for bonus or penalty.

300 EUR is paid for each tonne of CO2 equivalents in the deviation between the GHG budget and the GHG actual emission, if this deviation is positive. The payment of the climate bonus is limited to 0,4 million EUR ex VAT.

A penalty of 900 EUR is given for each tonne of CO2 equivalents in the deviation between the GHG budget and the GHG actual emission, if this deviation is negative. Climate penalty is limited to a maximum of 3 million EUR ex VAT.

Total price

=

Mark-up CO2 emission

+

Bid price

Evaluation

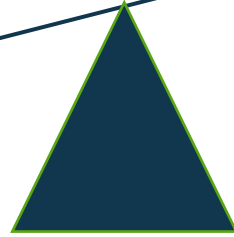
Bonus

Penalty



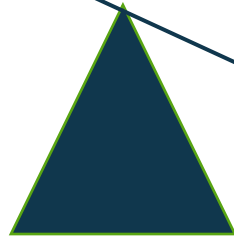


Low GHG budget



Tender

Higher GHG actual emissions
than GHG budget



Contract



Template "Calculation of GHG emissions for selected input factors"

Firma
Prosjekt
Dato
Velg: budsjett/regnskap

Gismarvik Grunn&Bygg

Input factors	Total emission	Emission factor	Quantity	Unit	SUM A1-A3: Materialproduksj	A4: Transport	A5: Construction
	tonn CO2e	kg CO2e/enhet	n/a	n/a	kg CO2e/enhet	kg CO2e/enhet	kg CO2/enhet
+ Concrete	0	-	5523	m3			
Betong Bygg	0	-	413	m3			
Betong Fundament til Stativ	0	-	1493	m3			
Betong OPI og kabelkanal og kabelkulvert	0	-	1400	m3			
Betong Transformatorsjakter 4 stk	0	-	2 217	m3			
... (fyll inn beskrivelse)	0	-		m3			
+ Rebar	0	-	540	tonn			
Armering betong Bygg	0	-	50	tonn			
Armering betong Fundament	0	-	224	tonn			
Armering betong Transformatorsjakt	0	-	266	tonn			
... (fyll inn beskrivelse)	0	-		tonn			
+ Asfalt	0	-	1104	tonn			
...	0	-	1104	tonn			
... (fyll inn beskrivelse)	0	-		tonn			
+ Gravel and crushed stone	0	-	1586	tonn			
...	0	-	1586	tonn			
... (fyll inn beskrivelse)	0	-		tonn			
Diesel avgiftsfri (anleggsdiesel)	0	3,24		l			3,24
Diesel for veitransport	0	2,93		l			2,93
Bensin	0	3,87		l			3,87
Annen drivstoffteknologi (angi hvilken i kommentarfeltet)							
Annen drivstoffteknologi (angi hvilken i kommentarfeltet)							
Annen drivstoffteknologi (angi hvilken i kommentarfeltet)							
Elektrisitet - Norsk miks	0,0	0,0467		kWh			0,0467

Sum Materialer A1-A4	0	tonn CO2ekv
Sum Anlegg A5	0	tonn CO2ekv
Sum Arealbruksendring	0	tonn CO2ekv
Sum Totalt	0	tonn CO2ekv

Summen i den røde firkanten brukes til evaluering

Total price

=

Mark-up CO2 emission

+

Bid price

Product Stage			Construction Process Stage	
Raw material supply	Transport	Manufacturing	Transport to building site	Installation into building
A1	A2	A3	A4	A5

Technical requirements

- Concrete: Minimum low carbon class B
- Rebar: 100% recycled



Template "Calculation of GHG emissions for selected input factors"

Veg LCA

Firma

Prosjekt

Dato

Velg: budsjett/regnskap

Gismarvik Grunn&Bygg

Innsatsfaktor	Utslipp totalt	Utslippsfaktor	Mengde	Enhet	SUM A1-A3: Materialproduksj	A4: Transport	A5: Konstruksjons-
	tonn CO2e	kg CO2e/enhet	n/a	n/a	kg CO2e/enhet	kg CO2e/enhet	kg CO2e/enhet
Konstruksjonsbetong	0	-	5 523	m3			
Betong Bygg	0	-	413	m3			
Betong Fundament til Stativ	0	-	1493	m3			
Betong OPI og kabelkanal og kabelkulvert	0	-	1400	m3			
Betong Transformatorsjakter 4 stk	0	-	2 217	m3			
... (fyll inn beskrivelse)	0	-		m3			
Stål, armering og sikringsbolter (kamstål)	0	-	540	tonn			
Armering betong Bygg	0	-	50	tonn			
Armering betong Fundament	0	-	224	tonn			
Armering betong Transformatorsjakt	0	-	266	tonn			
... (fyll inn beskrivelse)	0	-		tonn			
Asfalt (slite- og bindelag)	0	-	1104	tonn			
Asfalt slitelag anleggsvei	0	-	1104	tonn			
... (fyll inn beskrivelse)	0	-		tonn			
Forsterkningslag	0	-	1586	tonn			
Pukk til Anleggsvei	0	-	1586	tonn			
... (fyll inn beskrivelse)	0	-		tonn			
Diesel avgiftsfri (anleggsdiesel)	0	3,24		l			3,24
Diesel for veitransport	0	2,93		l			2,93
Bensin	0	3,87		l			3,87
Annen drivstoffteknologi (angi hvilken i kommentarfeltet)							
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Annen drivstoffteknologi (angi hvilken i kommentarfeltet)							
Elektrisitet - Norsk miks	0,0	0,0467		kWh			0,0467
Sum Materialer A1-A4	0	tonn CO2ekv					
Sum Anlegg A5	0	tonn CO2ekv					
Sum Arealbruksendring	0	tonn CO2ekv					
Sum Totalt	0	tonn CO2ekv					

Summen i den røde firkanten brukes til evaluering

UTSLIPPSFAKTORER

Utslippsdata omfatter råvarehenting til produktet er ferdigprodusert ved fabrikkport, A1-A3 iht. EN 15804.

Vis / skjul utslippskategorier for flere miljøkategorier

Brukt i beregninger - materialer		Klima budsjett
		kg CO ₂ -eq
+/-	ASFALTMATERIALER	
+/-	BETONG OG SEMENT	
	Normalbetong, B30, Bransjereferanse	m3 2,80E+02
	Normalbetong, B30, Lavkarbon B	m3 2,30E+02
	Normalbetong, B30, Lavkarbon A	m3 2,00E+02
	Normalbetong, B35, Bransjereferanse	m3 3,30E+02
	Normalbetong, B35, Lavkarbon B	m3 2,80E+02
	Normalbetong, B35, Lavkarbon A	m3 2,10E+02
	Normalbetong, B45, Bransjereferanse	m3 3,60E+02
	Normalbetong, B45, Lavkarbon B	m3 2,90E+02
	Normalbetong, B45, Lavkarbon A	m3 2,20E+02
	Normalbetong, B55, Bransjereferanse	m3 3,70E+02
	Normalbetong, B55, Lavkarbon B	m3 3,00E+02
	Normalbetong, B55, Lavkarbon A	m3 2,30E+02
	Lettbetong	m3 3,80E+02
	Undervannsbetong	m3 3,80E+02
	Betongrekkverk B45 Bransjereferanse	m 9,48E+01
	Betongrekkverk B45 Lavkarbon B	m 7,65E+01
	Betongrekkverk B45 Lavkarbon A	m 5,81E+01
	Betong til rør, kummer og stikkrenner	m3 2,40E+02
	Sement, CEM I	kg 7,60E-01
	Sement, CEM II	kg 6,40E-01
	Sement, CEM III	kg 3,00E-01
	Stemming	m2 7,16E-01
+/-	BETONGELEMENTER	
+/-	SPRØYTEBETONG	
+/-	KABLER	
+/-	STÅLMATERIALER	
+/-	PLASTMATERIALER	
+/-	DIESEL OG ELEKTRISITET	
+/-	ANNET	

Transport calculator

Following transportcalculator shall be used for GHG budget:

Eco Transit World, link: <https://www.ecotransit.org/en/emissioncalculator/>

 [About EcoTransIT World](#) [Emission Calculator](#) [Business Solutions](#) [Knowledge Base](#) [Contact](#) [EN](#)

Emission calculator for greenhouse gases and exhaust emissions

You can get here an impression of how EcoTransIT World works. The **Business Solutions** offer the user significantly extended options and third party data (OAG, AIS-based,...) for an accurate calculation of transport emissions.

CALCULATION PARAMETERS

Input mode

Standard

Freight

Amount

100

Weight

Bulk and Unit Load (Tonnes)

Origin

City district

Please press ENTER to confirm.

Choose transport modes:

Multiple choice possible

 Truck

 Train

 Airplane

 Sea ship

 Barge

Destination

City district

Please press ENTER to confirm.

CALCULATE

RESET

CALCULATION PARAMETERS

Weight:

100 Bulk and Unit Load (Tonnes)

t/TEU:

10

Change

Transport service Truck

Origin:

Haugesund

 Class:

26-40 t, EURO 6

LF:

60.0%

ETF:

20.0%

Destination:

Aksdal

Change

CALCULATION RESULT

EN 16258

GRAPH

TABLE

DISTANCES

EN 16258 DECLARATION

CSV DOWNLOAD



Show Well-to-tank/ Tank-to-wheel

Energy unit:

☒ Megajoule

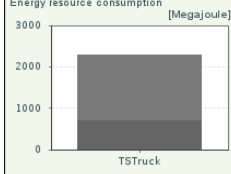
☐ Kilowatthours

☐ Diesel equivalents

Truck

Energy consumption

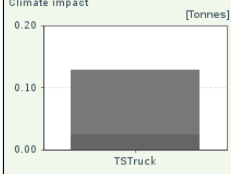
Energy resource consumption [Megajoule]



© EcoTransIT.org

GHG emissions as CO2e

Climate impact [Tonnes]



© EcoTransIT.org

Energy consumption (WTW)

Energy resource consumption [Megajoule]

	TSTruck
Truck	2,294
Sum:	2,294

© EcoTransIT.org

GHG emissions as CO2e (WTW)

Climate impact [Tonnes]

	TSTruck
Truck	0.13
Sum:	0.13

© EcoTransIT.org

Energy consumption (TTW)

Energy resource consumption [Megajoule]

	TSTruck
Truck	1,579
Sum:	1,579

© EcoTransIT.org

GHG emissions as CO2e (TTW)

Climate impact [Tonnes]

	TSTruck
Truck	0.10
Sum:	0.10

© EcoTransIT.org

Variation order	
Contract:	
VO no:	Ref no.:
Date:	

Description of variation:

Enclosures (i.a. details, drawings, instructions etc.):

Delivery time impact:
Number of days extension:

☐ No impact to the contract's deadline

☐ Consequences not clarified. Client await specific feedback from contractor.

Price impact:
Method for adjustment:

☐ Kontraktens enhetspriser (se vedlegg)	☐ Avtalt vederlagsjustering (se vedlagt spesifisert tilbud)
☐ Justerte enhetspriser (se vedlegg)	☐ Regningsarbeid

Spesifisert sum:

☐ Sum er ikke avklart, og byggherren avventer entreprenørens tilbakemelding

Greenhouse gas impact:
Has the contract CO₂ pricing? ☐ Yes ☐ No

If yes, state GHG (tonn CO₂ eq.) the VO vil cause:

GHG value is based on:

☐ Documented calculation by 3rd party, for example EPD, manufacturer's calculation (ref. enclosure)

☐ Documented calculation by contractor (ref. enclosure)

☐ Other: fill.in:

How to report GHG?

- Frequency
 - Monthly (aggregated level)
 - Quarterly (detailed, means per machine)
- Baseline GHG budget
 - Updated every 6nd month

BEREGNING KLIMAGASSUTSLIPP FOR UTVALGTE INNSATSFAKTORER							
Firma							
Prosjekt							
Dato							
Velg: budsjett/regnskap							
Innsatsfaktor	Utslipp totalt	Utslippsfaktor	Mengde	Enhet	SUM A1-A3: Materialproduksjon	A4: Transport	A5: Konstruksjons- fase
	tonn CO2e	kg CO2e/enhet	n/a	n/a	kg CO2e/enhet	kg CO2e/enhet	kg CO2/enhet
+ Konstruksjonsbetong	0	-	-	m3			
... (fyll inn beskrivelse)	0	-		m3			
... (fyll inn beskrivelse)	0	-		m3			
... (fyll inn beskrivelse)	0	-		m3			
... (fyll inn beskrivelse)	0	-		m3			
... (fyll inn beskrivelse)	0	-		m3			
... (fyll inn beskrivelse)	0	-		m3			
... (fyll inn beskrivelse)	0	-		m3			
... (fyll inn beskrivelse)	0	-		m3			
... (fyll inn beskrivelse)	0	-		m3			
+ Betongelementer - prefabrikert	0	-	-	tonn			
+ Stål, armering (kamstål)	0	-	-	tonn			
+ Asfalt (slite- og bindelag)	0	-	-	tonn			
+ Asfalt bærelag	0	-	-	tonn			
Diesel avgiftsfri (anleggsdiesel)	0	3,24		l			3,24
Diesel for veitransport	0	2,93		l			2,93
Bensin	0	3,87		l			3,87
Elektrisitet - Norsk miks	0,0	0,0467		kWh			0,0467
Arealbruksendring myr	0	201,90		m2			201,9
Sum Materialer A1-A4	0	tonn CO2ekv					
Sum Anlegg A5	0	tonn CO2ekv					
Sum Arealbruksendring	0	tonn CO2ekv					
Sum Totalt	0	tonn CO2ekv					

Summen i den røde firkanten brukes til evaluering

Challenge with CO2 pricing (assumption before implementation)

- How to follow-up and verify contractors (CO2 emissions during execution?)

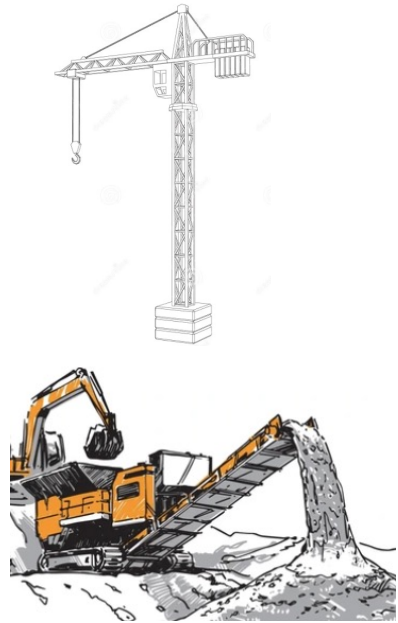


Clients follow-up plan GHG

- Contractor's reporting of GHG (quarterly and monthly)
- Variation orders to include GHG impact. GHG baseline to be updated every 6th month
- Monthly meting with contractor (GHG included in the Agenda)
- Spot checks
- QR code. All machines and equipment to be used in the contract shall be equipped with a QR code and be registered in the machine register <http://www.reginn.no>. The client shall be given electronic access to the register in order to exercise real-time control and get an overview of the supplier's and subcontractor's registered machines and equipment
- Upon request, have access to machine data from the OBD2 port (reports and raw data)
- Upon request, have access to the contractor's machine log system (for example <https://www.csselectronics.com/>)



Experience with CO2 pricing



1. Inform and guide the suppliers when new methodology is implemented
2. The tenderers change behaviour:
 - **Implement tower crane** to reduce local transport with fossil trucks
 - **Move stone crushing plant** onto construction site to reduce local transport with fossil trucks
 - **Tuning of concrete recipe** to lower CO2 emission
3. Simplify the requirements → remove transport to site (A4) from GHG budget
 - Comprehensive reporting and evaluation for tenderer and client respectively
 - Transport to site (A4) contribute only 5% of GHG for a typical greenfield sub station
4. Upto now, no negative experience with bonus/penalty





Thank you!



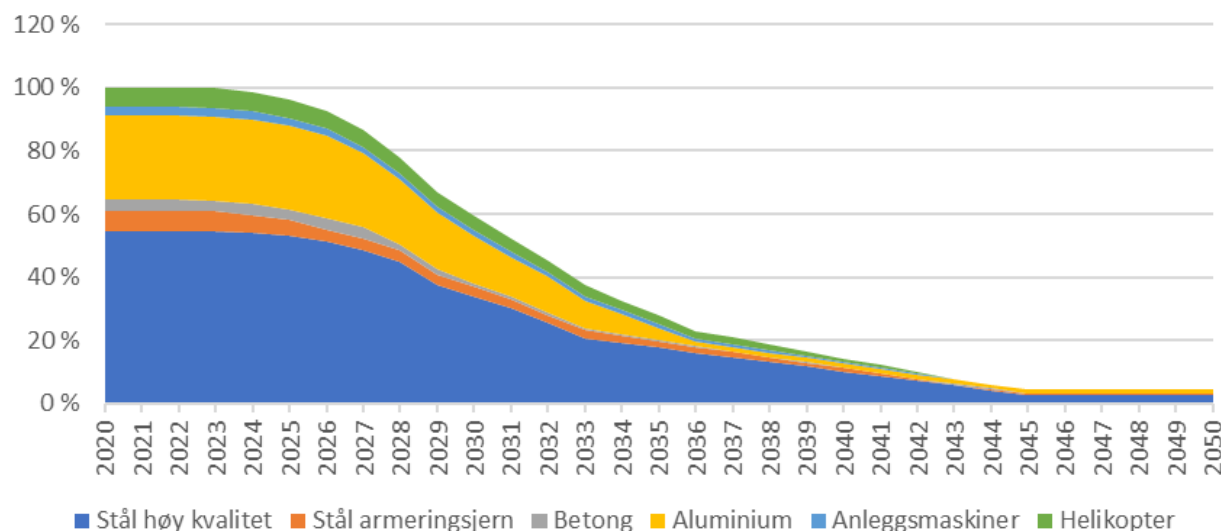
Back-up



Utslippsbaner for ledning og stasjon – med tiltak*

tCO₂ / [km ledning]

intensitet scope 3 ledning scenario



tCO₂ / felt (Stasjon)

intensitet scope 3 stasjon scenario

