OBOS START LEARNING – TOWARDS CARBON NEUTRALITY

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EARLY STAGE GEOGRAPHICAL COMPARISON

OBOS

white

START LEARNING – KINDERGARTEN CONCEPT ØBOS

Design principles

Torget är förskolans samlande rum. I övergångar mellan ute och inne finns skärmtak som underlättar och förstärker kopplingen mellan ute och inne.

Bazarerna sticker ut med en egen form. De är magneterna som förenar förskolan och man ska vilja gå till dem och vara i dem. De ska vara lika attraktiva från utsidan som från insidan.

Solcellstaken och taket över hemrummen skapar en komposition som bryter ned den stora skalan och som varieras då solcellstaken alltid riktas så nära syd som möjligt samtidigt som planlösningen ligger fast.

Papp som tak och vägg på bazarerna.

Integrerade solceller

Värmebehandlad träfasad, Kebony.

Fönster med varm kulör

Facades

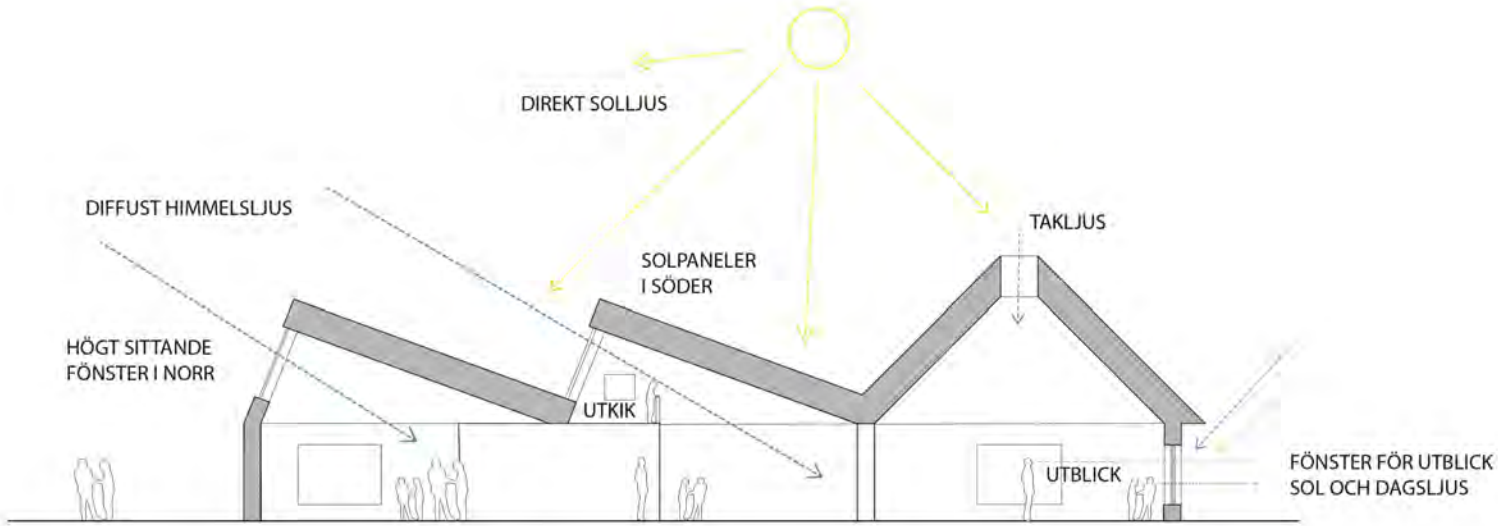
Skala 1:200 (A3)

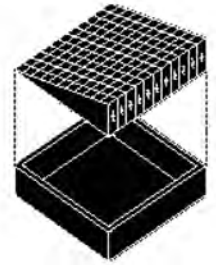
FASAD VÄST

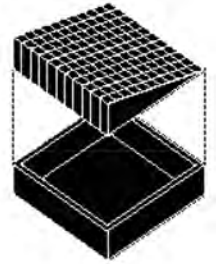
FASAD ÖST

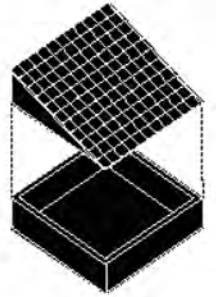
white

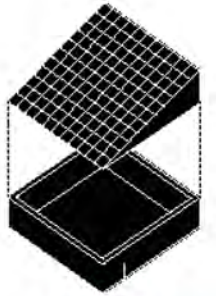
Light strategy





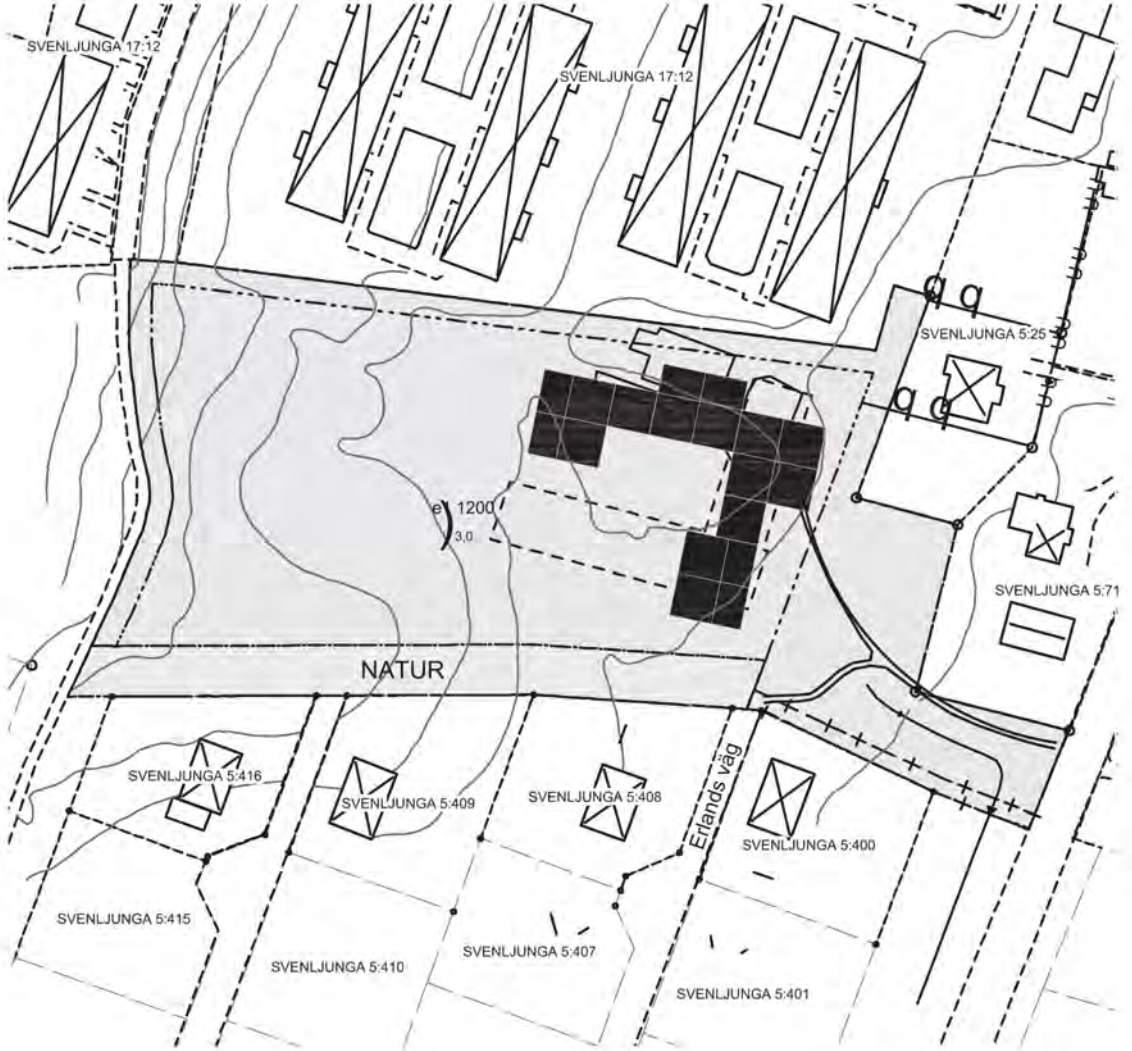




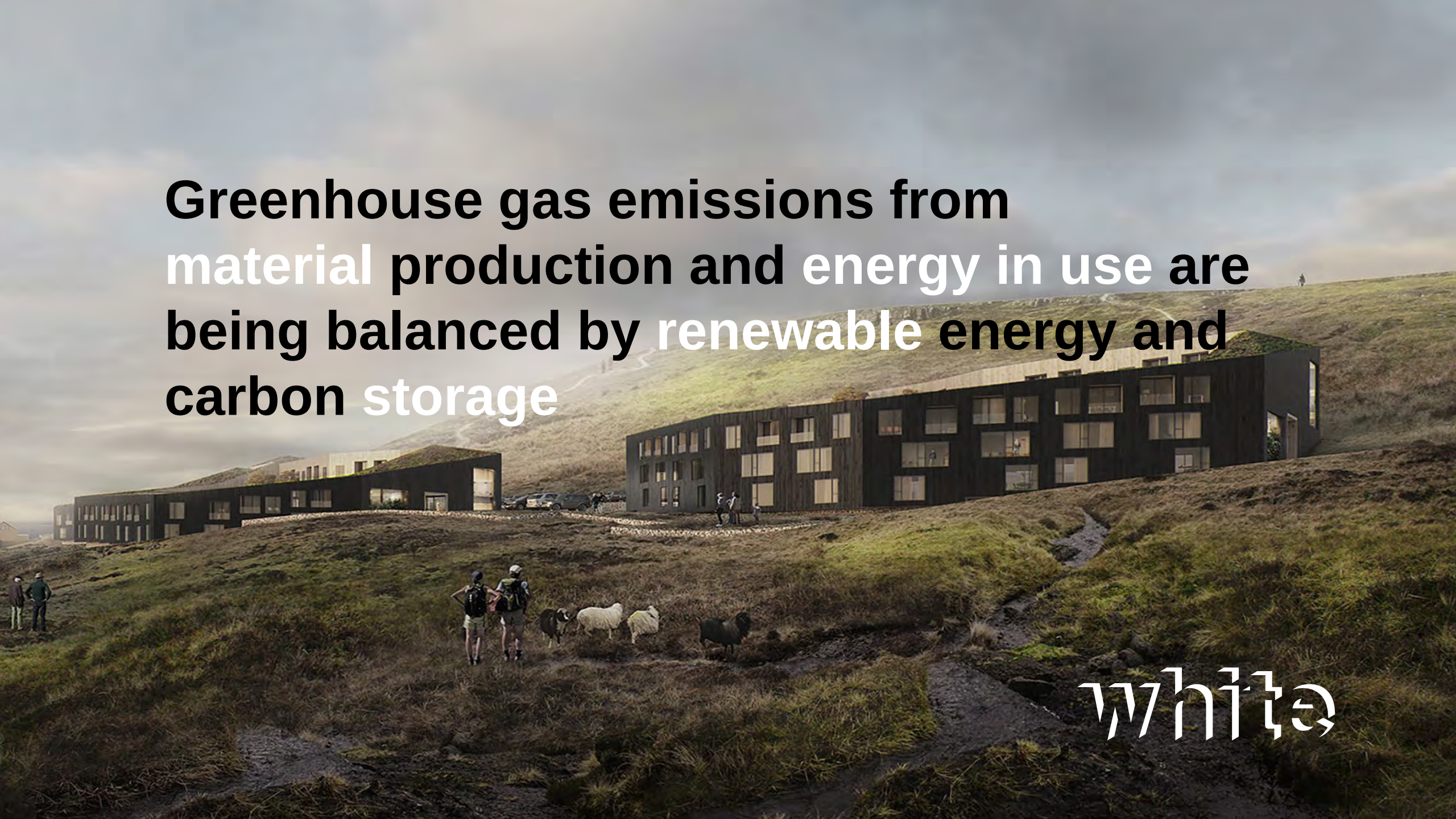


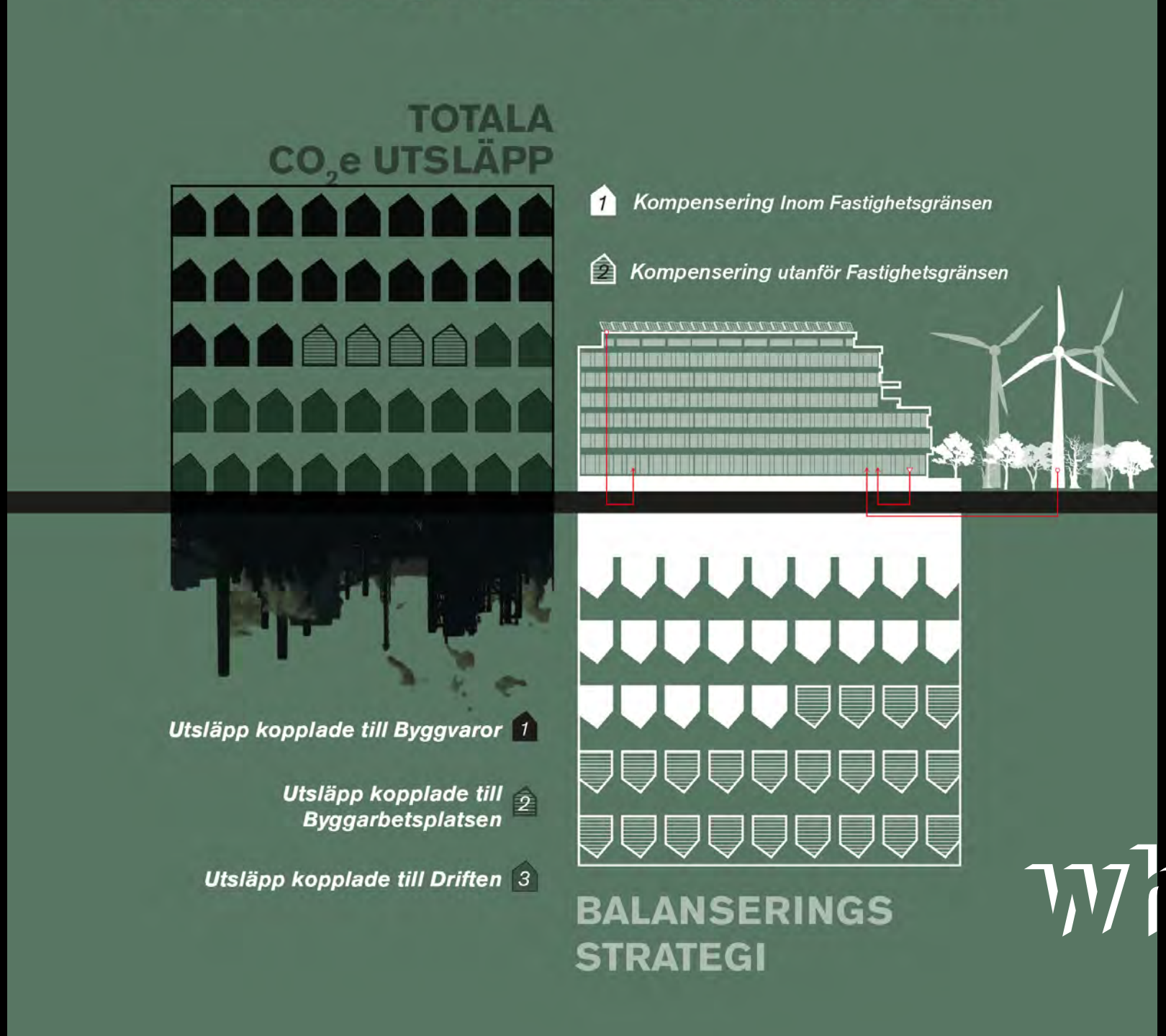
START LEARNING – KINDERGARTEN CONCEPT OBOS

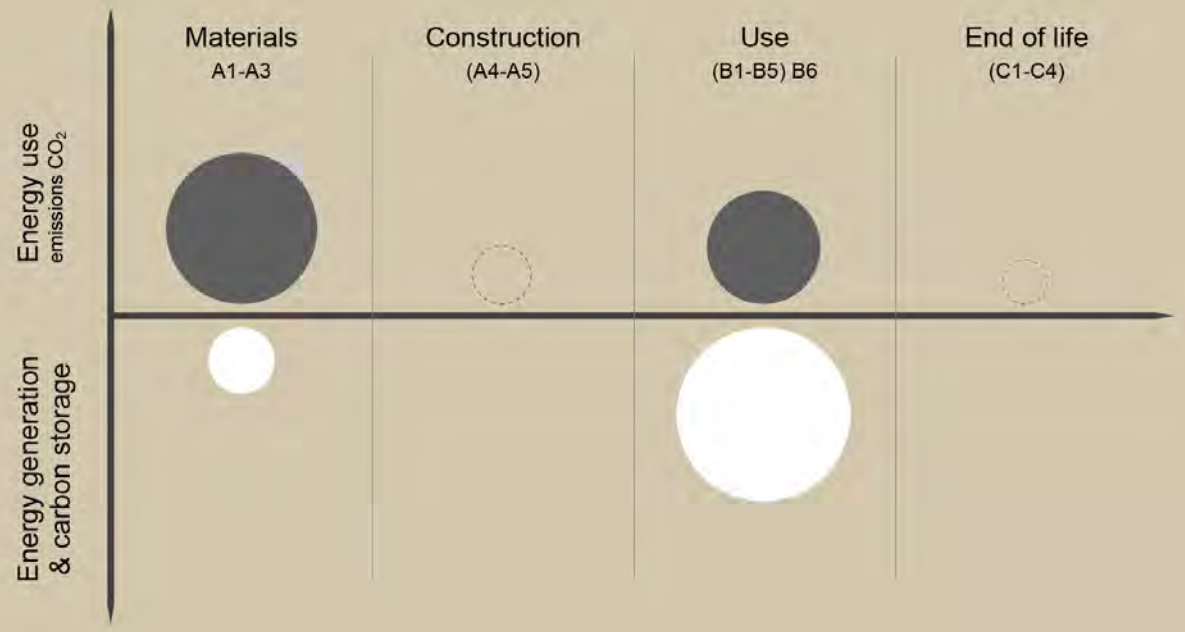
RISBRON - FAGERSTA
4 AVDELNINGAR (+VÅRDBOENDE)
TOMT: 14000 m²
BYA: -
BYGGNADSHÖJD: 9 m

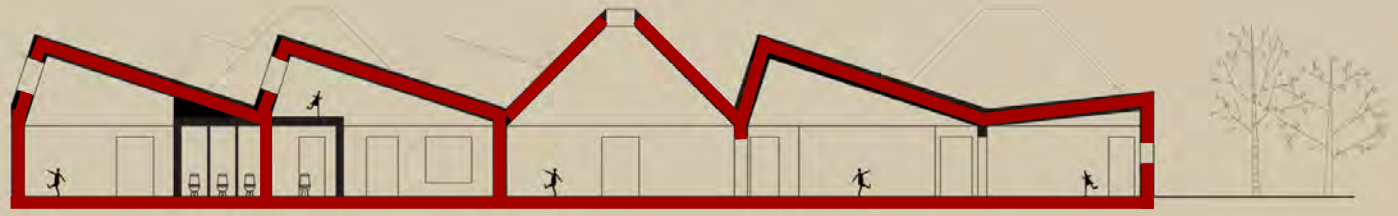



Trondheim
Umeå
Lund


Greenhouse gas emissions from material production and energy in use are being balanced by renewable energy and carbon storage
white

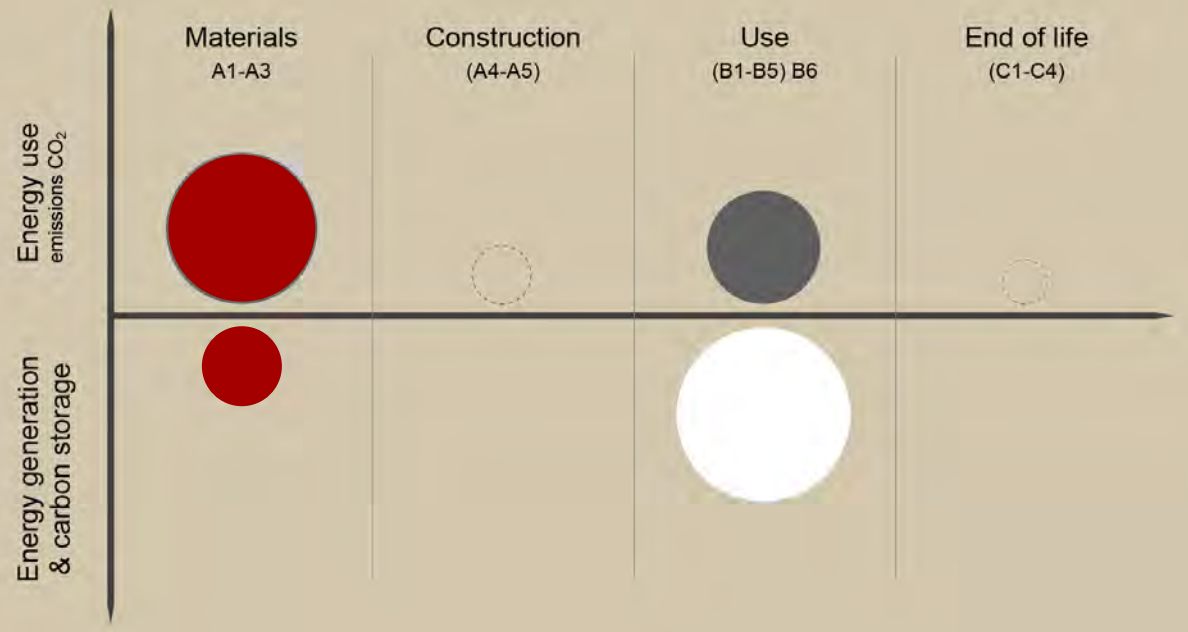

TOTALA
CO_2e UTSLÄPP
1 Kompensering Inom Fastighetsgränsen
2 Kompensering utanför Fastighetsgränsen
Utsläpp kopplade till Byggvaror 1
Utsläpp kopplade till Byggarbetsplatsen 2
Utsläpp kopplade till Driften 3
BALANSERINGS STRATEGI

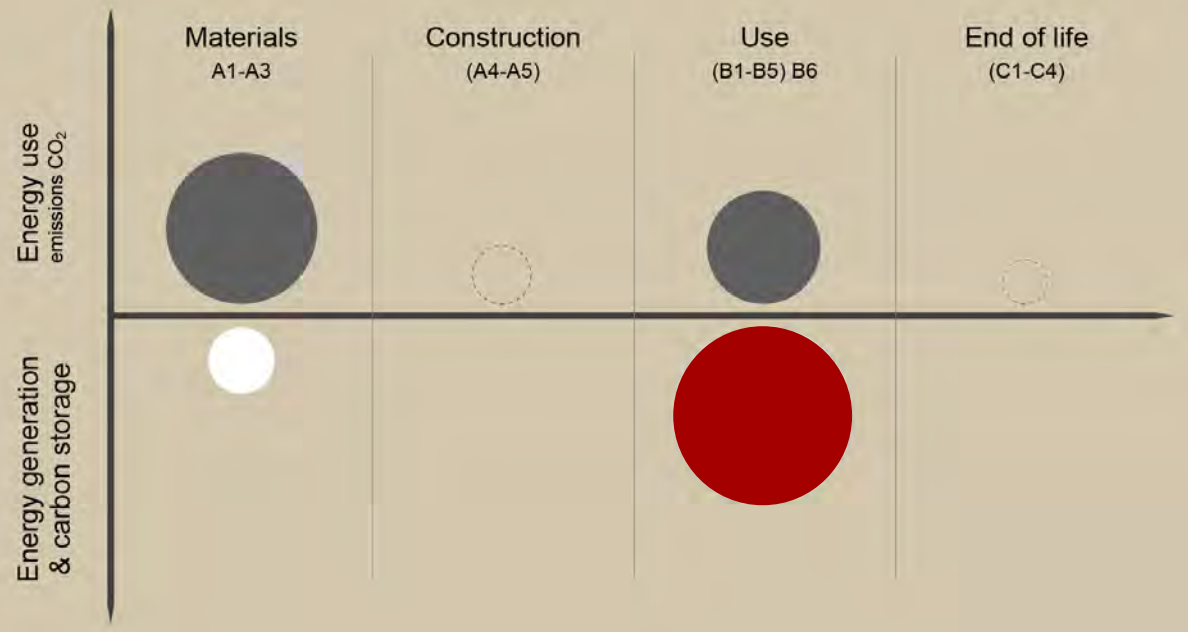

Materials
A1-A3
Construction
(A4-A5)
Use
(B1-B5) B6
End of life
(C1-C4)
Energy use
emissions CO_2
Energy generation
& carbon storage



BUILDING ELEMENTS

Ground slab, roof, walls and windows


Materials
A1-A3
Construction
(A4-A5)
Use
(B1-B5) B6
End of life
(C1-C4)
Energy use
emissions CO_2
Energy generation
& carbon storage


Materials
A1-A3
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Use
(B1-B5) B6
End of life
(C1-C4)
Energy use
emissions CO_2
Energy generation
& carbon storage

START LEARNING – CARBON BALANCING WITH PV

1

Energy use

kWh/m^2_{Atemp}

	Umeå	Lund
Heat, district	54,4	32,5
Hot water, district	5,0	5,0
El, fast.	1,9	2,8
	61,3	40,3

2

GWP factor

$g\ CO_2^{(e)}/kWh$

Umeå	Lund
61	38
61	38
132	132

3

Climate impact, annual

$kg\ CO_2^{(e)}/m^2$, yr

Umeå	Lund
3	2
0	0
0	0
4	3

START LEARNING – CARBON BALANCING WITH PV

1

Energy use

kWh/m^2_{Atemp}

	Umeå	Lund
Heat, district	54,4	32,5
Hot water, district	5,0	5,0
El, fast.	1,9	2,8
	61,3	40,3
Photovoltaics	41,5	29,3
$Plusenergy_{kWh}$ Yes, if >0	-19,8	-11,0

2

GWP factor

$g\ CO_2{}^{(e)}/kWh$

	Umeå	Lund
Heat, district	61	38
Hot water, district	61	38
El, fast.	132	132
Photovoltaics	132	132

3

Climate impact, annual

$kg\ CO_2{}^{(e)}/m^2, yr$

	Umeå	Lund
Heat, district	3	2
Hot water, district	0	0
El, fast.	0	0
	4	3
Photovoltaics	5	4

4

Photovoltaics

Gross PV-roof area	790	460	m^2

START LEARNING – CARBON BALANCING WITH PV

1

Energy use

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Climate impact, annual

$kg\ CO_2^{(e)}/m^2$, yr

	Umeå	Lund
Heat, district	3	2
Hot water, district	0	0
El, fast.	0	0
	4	3
Photovoltaics	5	4

4

Photovoltaics

Gross PV-roof area	790	460 m^2

5

Balancing CO_2

$kg\ CO_2^{(e)}/m^2$

Surplus, if >0	1,6	1,4

START LEARNING – CARBON BALANCING WITH PV

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Energy use

kWh/m^2_{Atemp}

	Umeå	Lund
Heat, district	54,4	32,5
Hot water, district	5,0	5,0
El, fast.	1,9	2,8
	61,3	40,3
Photovoltaics	41,5	29,3
$Plusenergy_{kWh}$	-19,8	-11,0

Yes, if >0

2
GWP factor

$g\ CO_2^{(e)}/kWh$

	Umeå	Lund
Heat, district	61	38
Hot water, district	61	38
El, fast.	132	132
Photovoltaics	132	132

3
Climate impact, annual

$kg\ CO_2^{(e)}/m^2, yr$

	Umeå	Lund
Heat, district	3	2
Hot water, district	0	0
El, fast.	0	0
	4	3
Photovoltaics	5	4

6
Climate impact, total

tonne $CO_2^{(e)}$

	Umeå	Lund	
CO_2-debt, material	135	105	tonne $CO_2^{(e)}$
Balancing CO_2	2,6	2,2	tonne $CO_2^{(e)}$/yr

Surplus from PV

Payback period 49 48 years

(target 50 yrs)

4
Photovoltaics

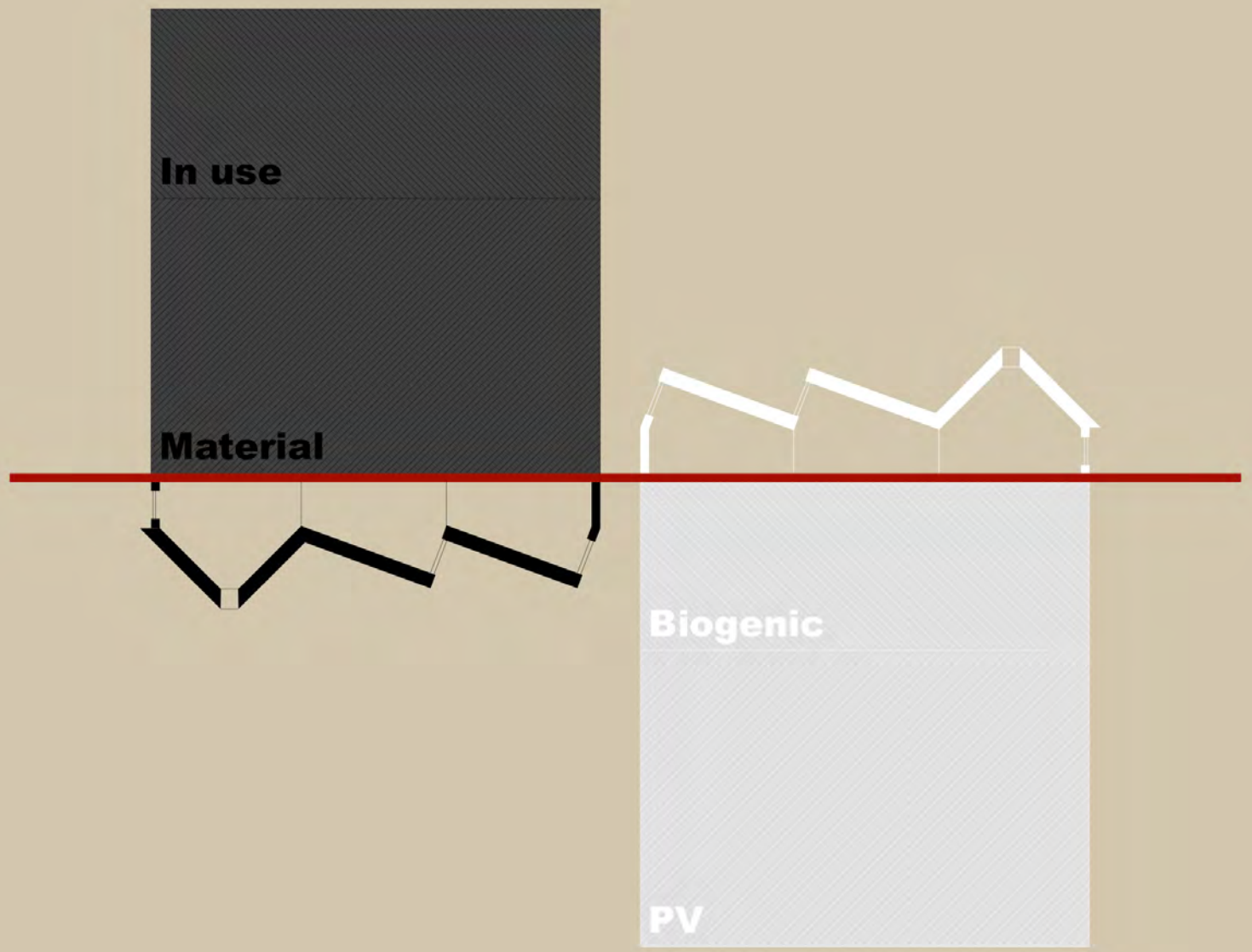
Gross PV-roof area	790	460	m^2

5
Balancing CO_2

$kg\ CO_2^{(e)}/m^2$

Surplus, if >0	1,6	1,4

Floor area, A_{temp} 1600 m^2


In use
Material
Biogenic
PV

Result

Calculated emissions due to building materials of the one storey kindergarten, 1600 m^2, are appr. 220 tonnes carbon dioxide equivalents, $CO_2^{(e)}$, solar cells excluded.

Based on the energy calculation emissions from energy use for a kindergarten in Umeå annually will be 5,8 tonnes $CO_2^{(e)}$ and one placed in Lund will be 3,6 tonnes $CO_2^{(e)}$.

To balance these emissions over 50 years it will need appr. 790 m^2 south facing roof surface with PV, and in Lund appr. 460 m^2 solar cell roof. Terms for exporting solar power to the grid differs between municipalities.

$CO_2^{(e)}$	Umeå	Lund
Materials, building	295 t	265 t
Energy in use, 50 yrs	290 t	180 t
Biogenic carbon	-160 t	-160 t
Photovoltaics, 50 yrs	-425 t	-285 t
	0 t	**0 t**

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