Bruce King,
Ecological Building Network

Lifecycle Carbon for New Construction

BAYREN

buildings *and* **greenhouse gases**

40%

Build Positive

Or:

Do we want energy efficiency,

or

climate effectiveness?

Build Positive

Or:

Do we want **energy efficiency,**

or

climate effectiveness?

Build Positive

Or:

Do we want **energy efficiency,**

or

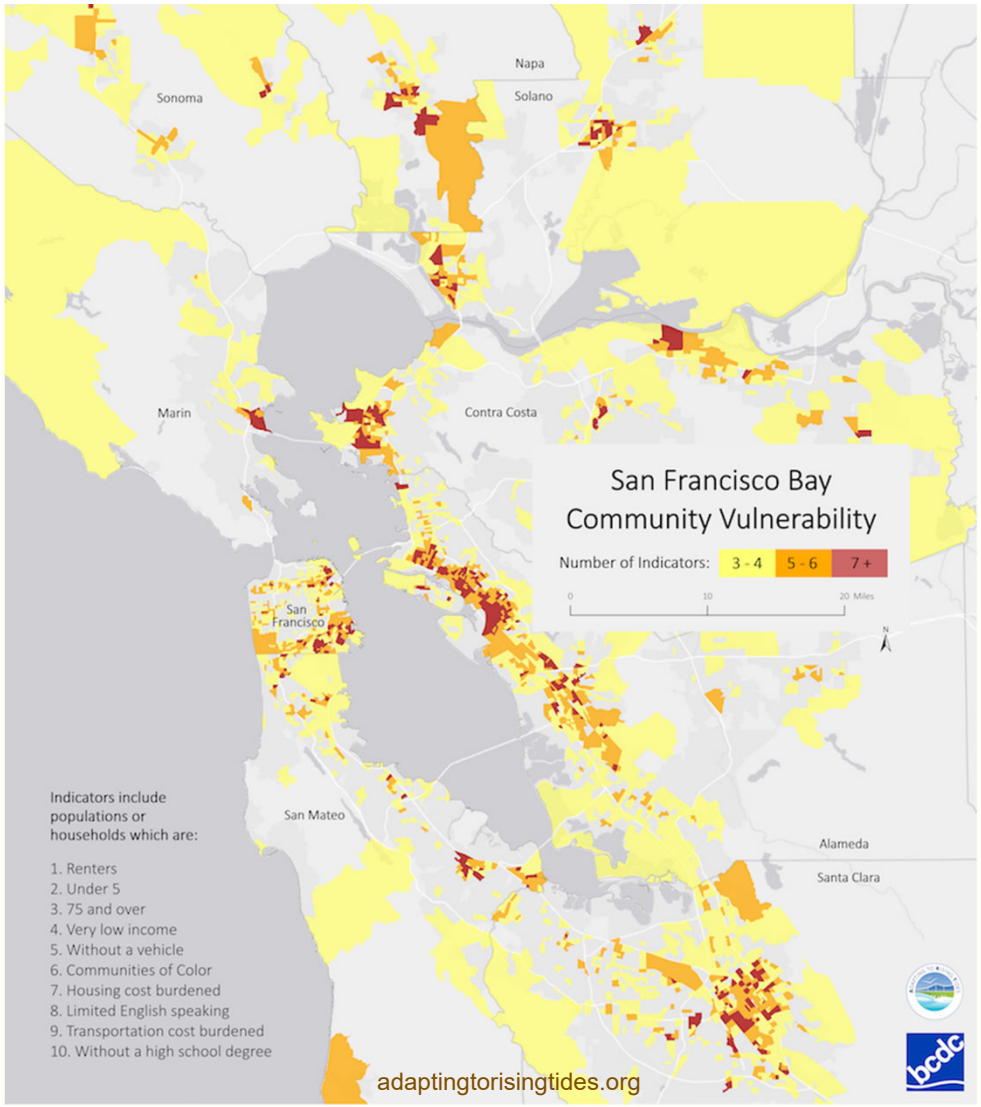
climate effectiveness?

Energy

1. Efficient <u>buildings</u>

for whom?

And, so what?



Energy

1. Efficient <u>buildings</u>

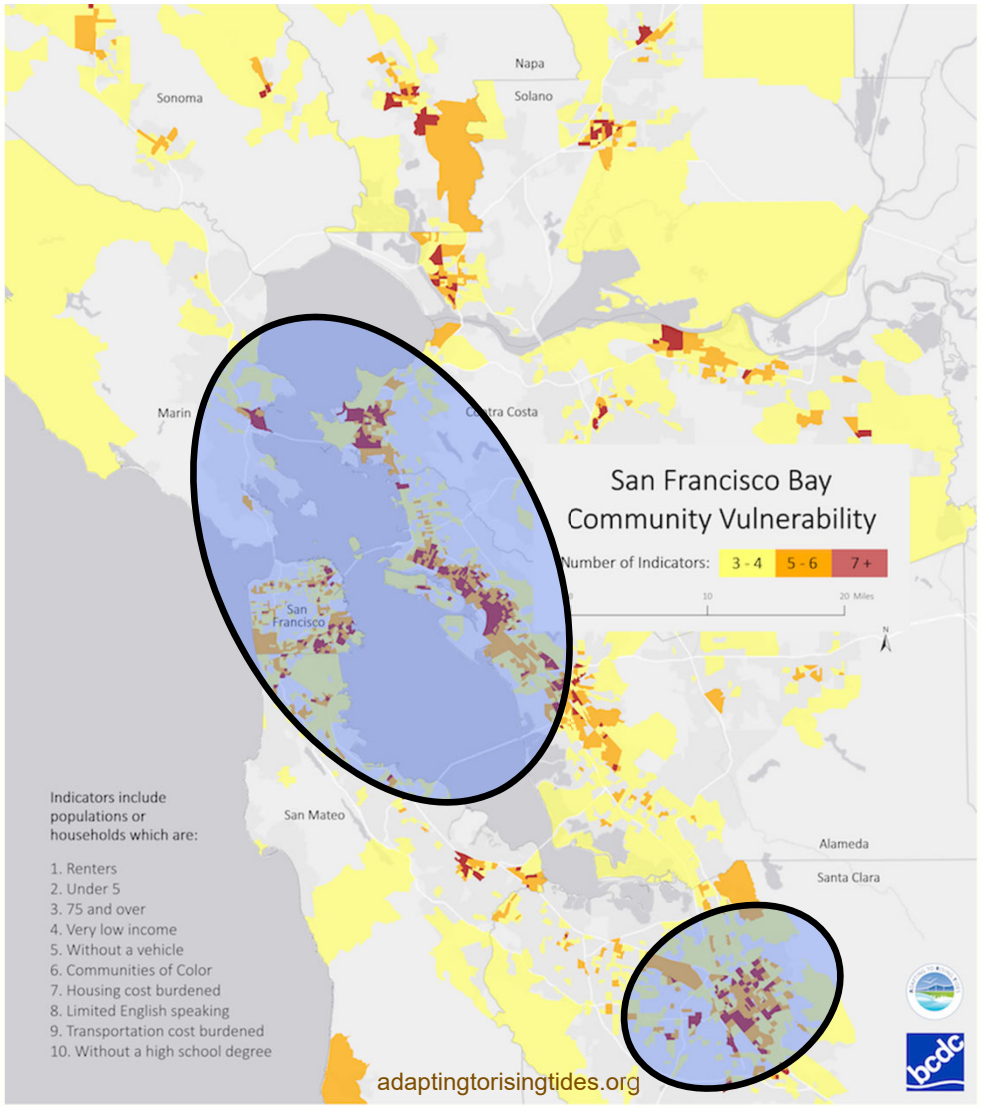
for whom?

And, so what?

2. Efficient <u>Bay Area</u>

for everyone,

except . . .



Energy

1. **Efficient <u>buildings</u>**
   for whom?
   And, so what?
2. **Efficient <u>Bay Area</u>**
   for everyone,
   except . . .
3. **<u>Effective</u> Bay Area**
   for everyone

Real Zero

reduce operational

and

embodied

emissions

Real Zero

reduce operational

and

embodied

emissions

Build Positive

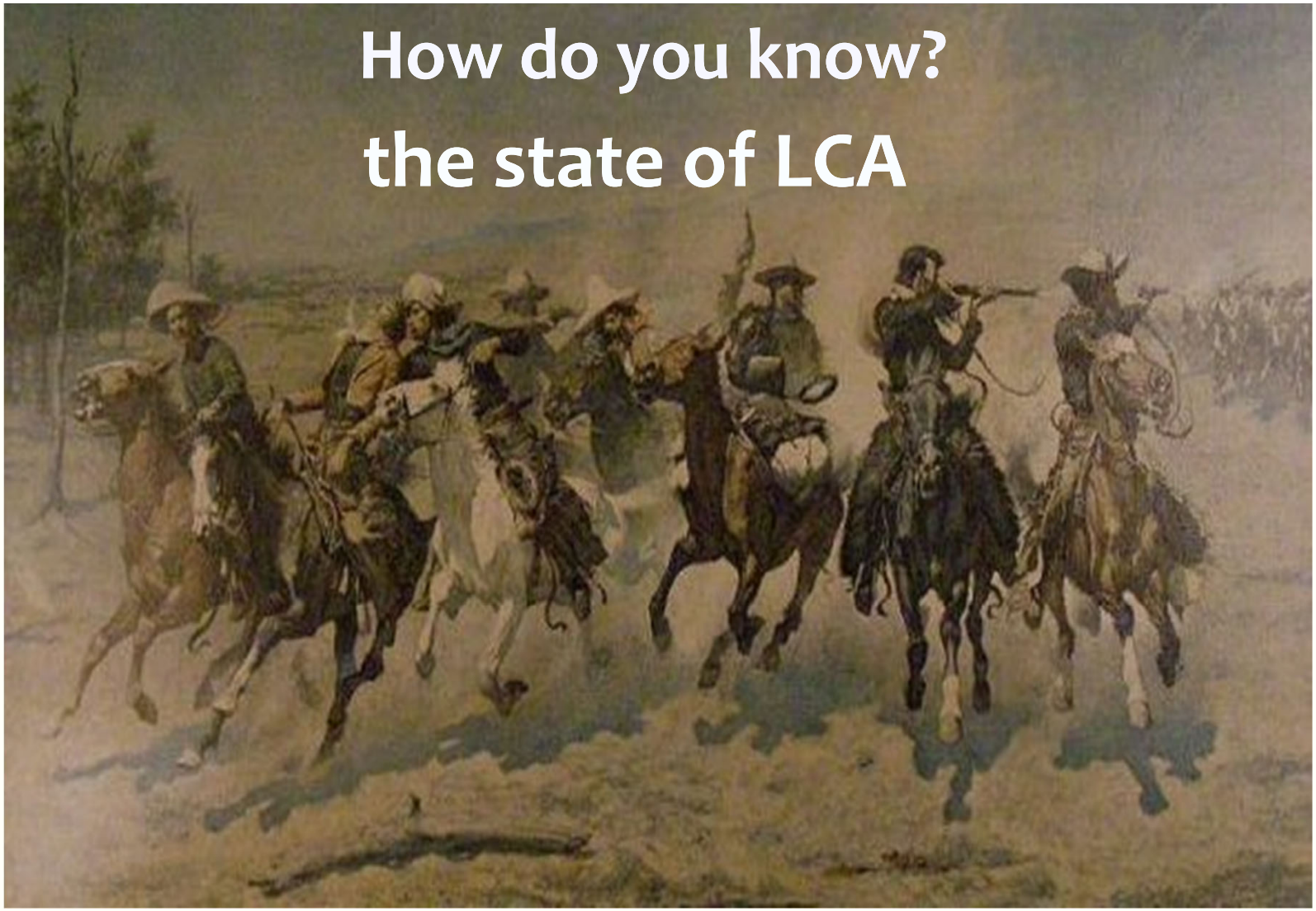
first,

Where are the emissions,

and

How do you know?

How do you know?
the state of LCA



Bruce King **BayREN Seminar** November 27, 2018

Life Cycle Analysis

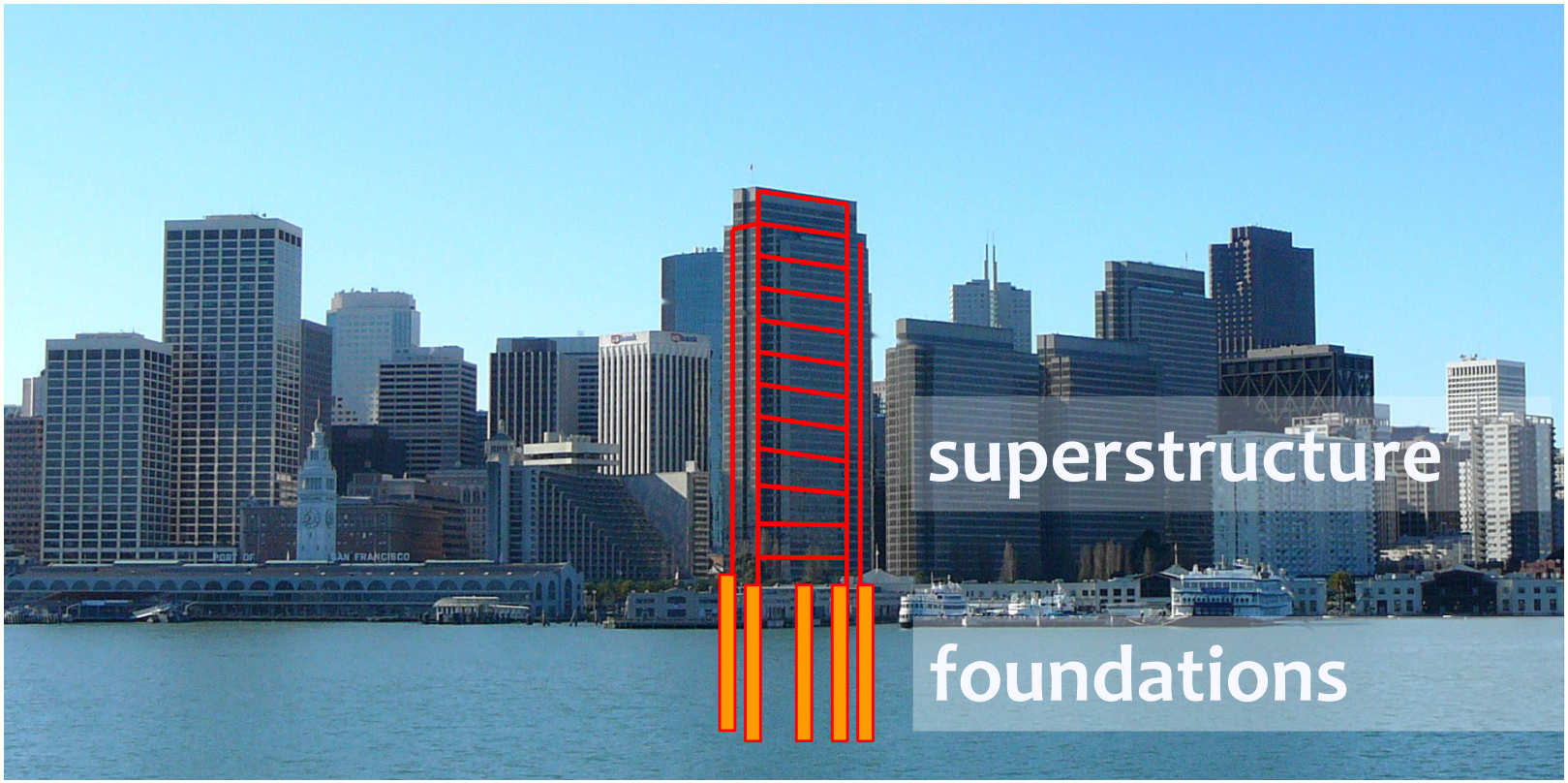
Where's the carbon?

mostly in:

Life Cycle Analysis

Where's the carbon?

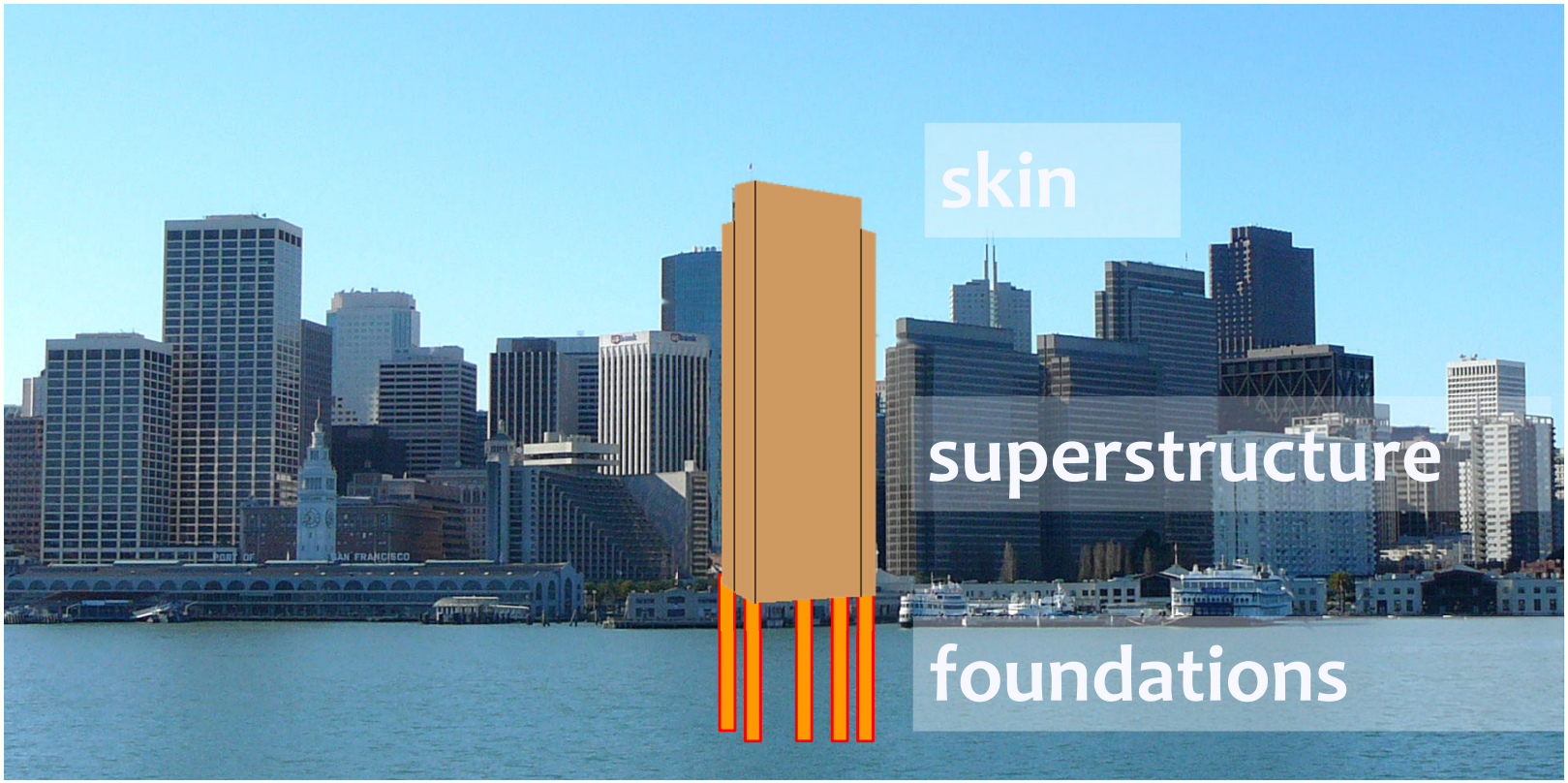
mostly in:



Life Cycle Analysis

Where's the carbon?

mostly in:



Life Cycle Analysis

Where's the carbon?

or, mostly in:

concrete

cement 8% of global

concrete

is artificial rock –

gravel, sand, and glue

concrete

is artificial rock –

gravel, sand, and glue

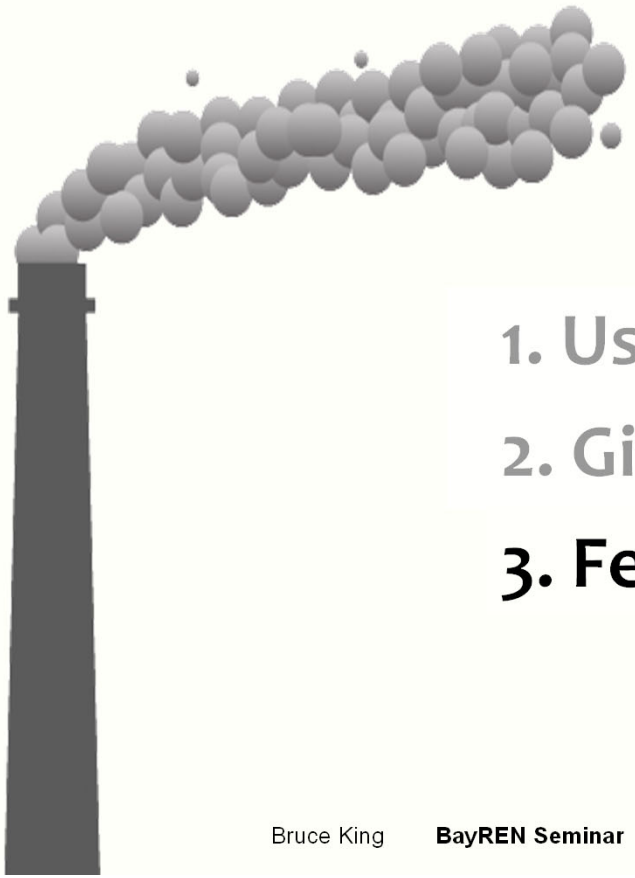
1. Use less/different glue

concrete

is artificial rock –

gravel, sand, and glue

1. Use less/different glue
2. **Give it time**

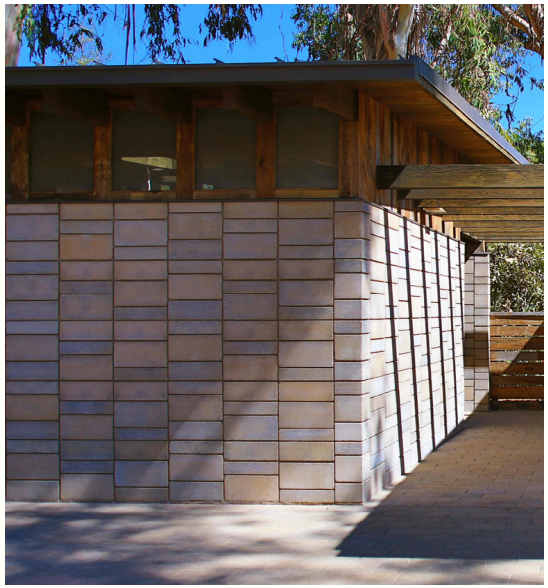


concrete

is artificial rock –

gravel, sand, and glue

1. Use less/different glue
2. Give it time
3. **Feed it carbon**



concrete

is artificial rock –

gravel, sand, and glue

1. Use less/different glue
2. Give it time
3. Feed it carbon
4. **Squeeze it**

the low-carbon concrete building code

Life Cycle Analysis

Where's the carbon?

or, mostly in:

concrete

cement 8% of global

metals

steel 7% of global

metals

Use FSC wood instead

MGA/MichaelGreenArchitecture/EmaPeterPhotographer

Life Cycle Analysis

Where's the carbon?

or, mostly in:

concrete

cement 8% of global

metals

steel 7% of global

refrigerants

the Drawdown surprise:

#1 climate target

Life Cycle Analysis

Where's the carbon?

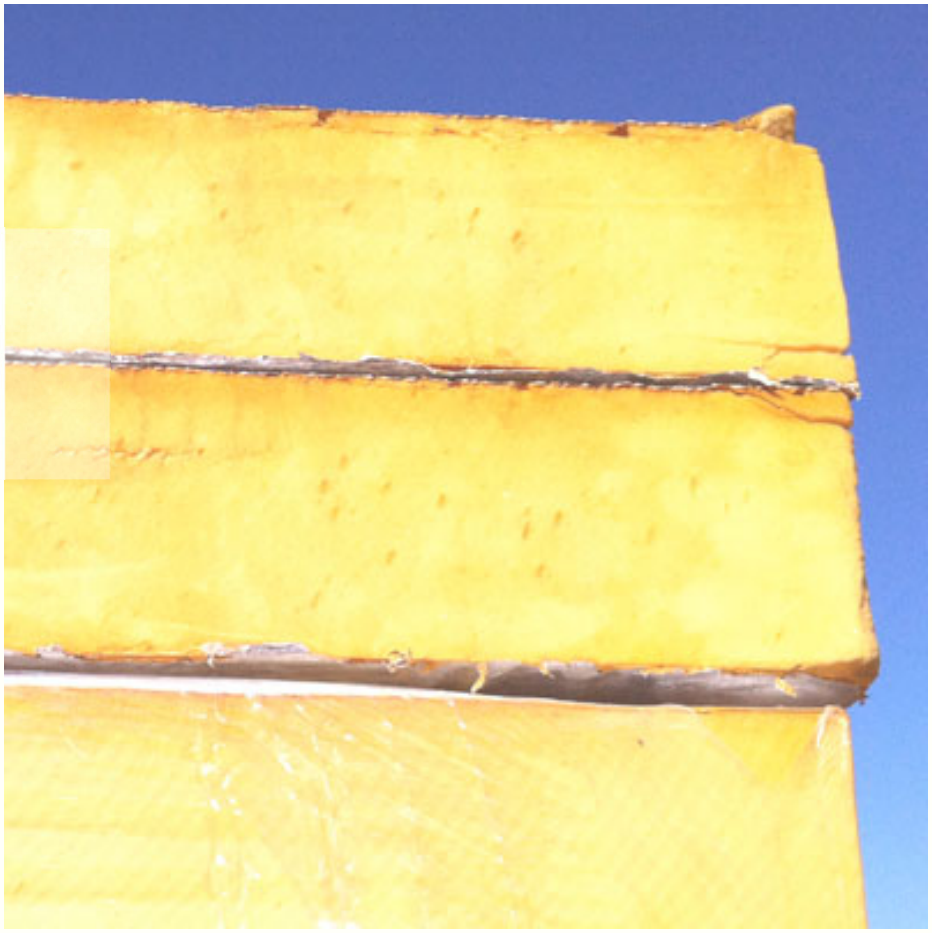
insulate

refrigerants

the Drawdown surprise:

#1 climate target

but insulate with what?



Life Cycle Analysis

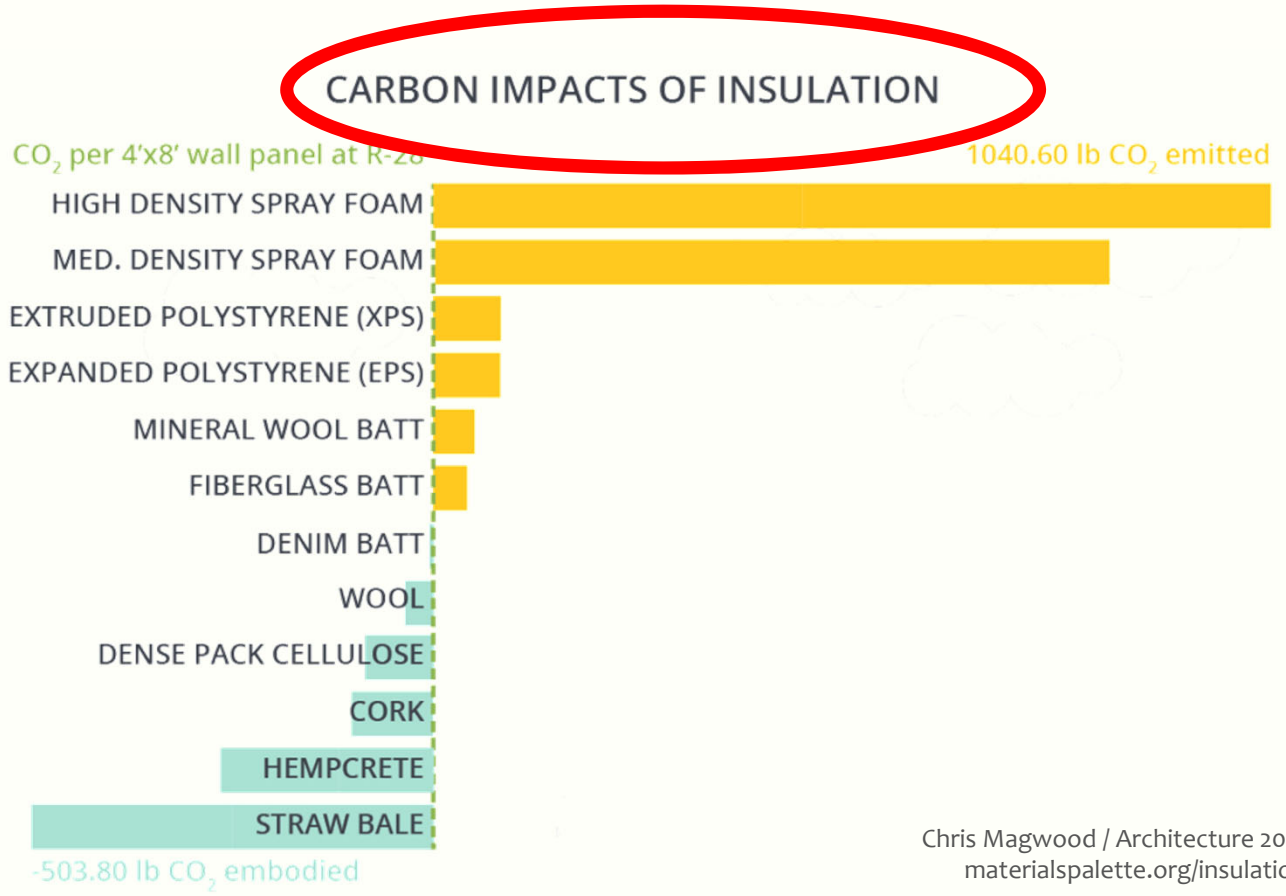
Where's the carbon?

***Hydroflourocarbons* – foam insulation**

↑

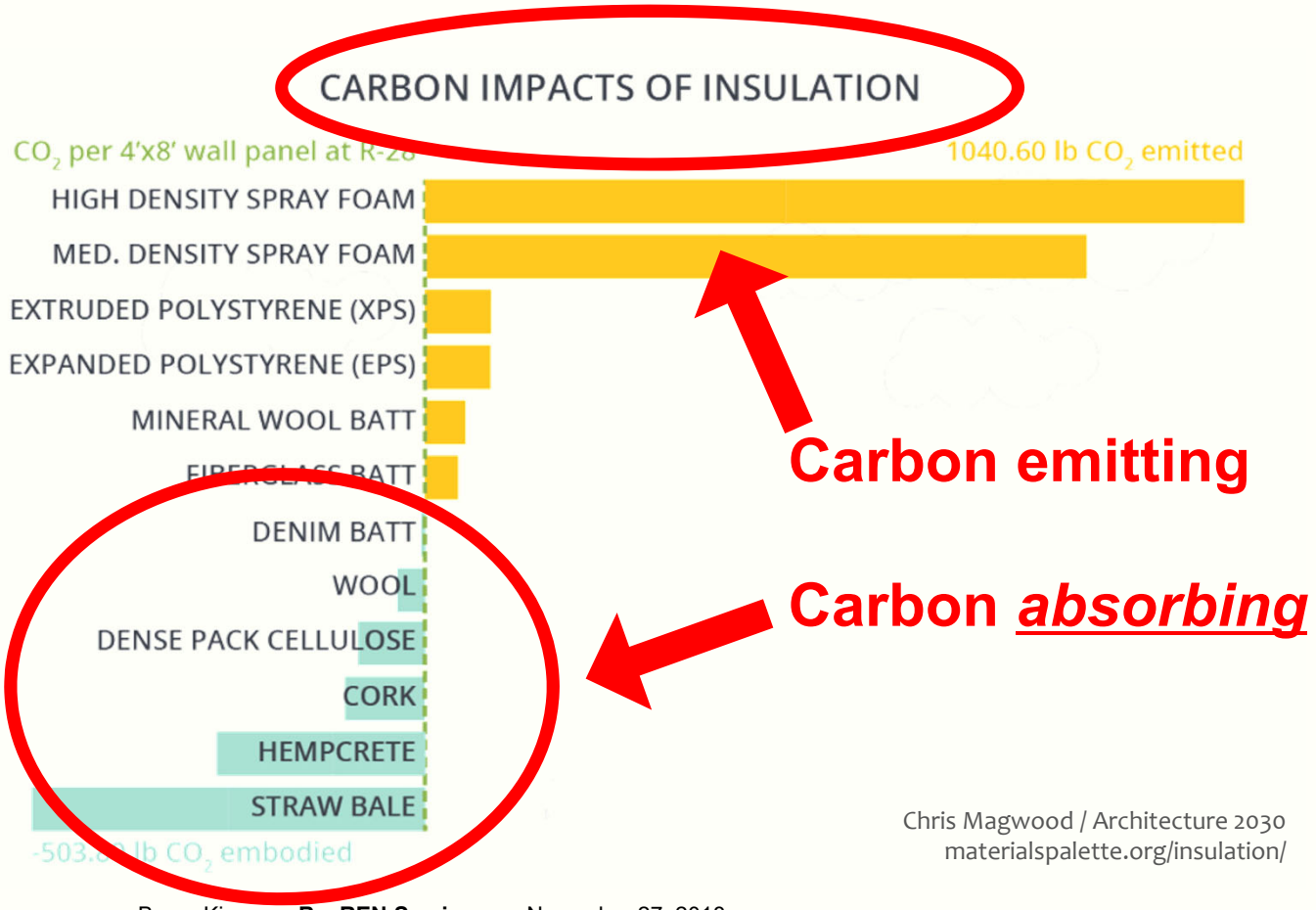
refrigerants

replace plastic



Chris Magwood / Architecture 2030
materialspalette.org/insulation/

replace plastic



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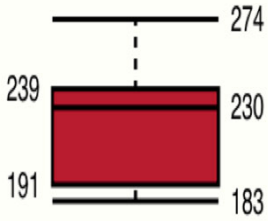
materialspalette.org/insulation/

Whole Building Life Cycle Analysis

the larger picture



Median
230 kg/M²
47 lb/ft²

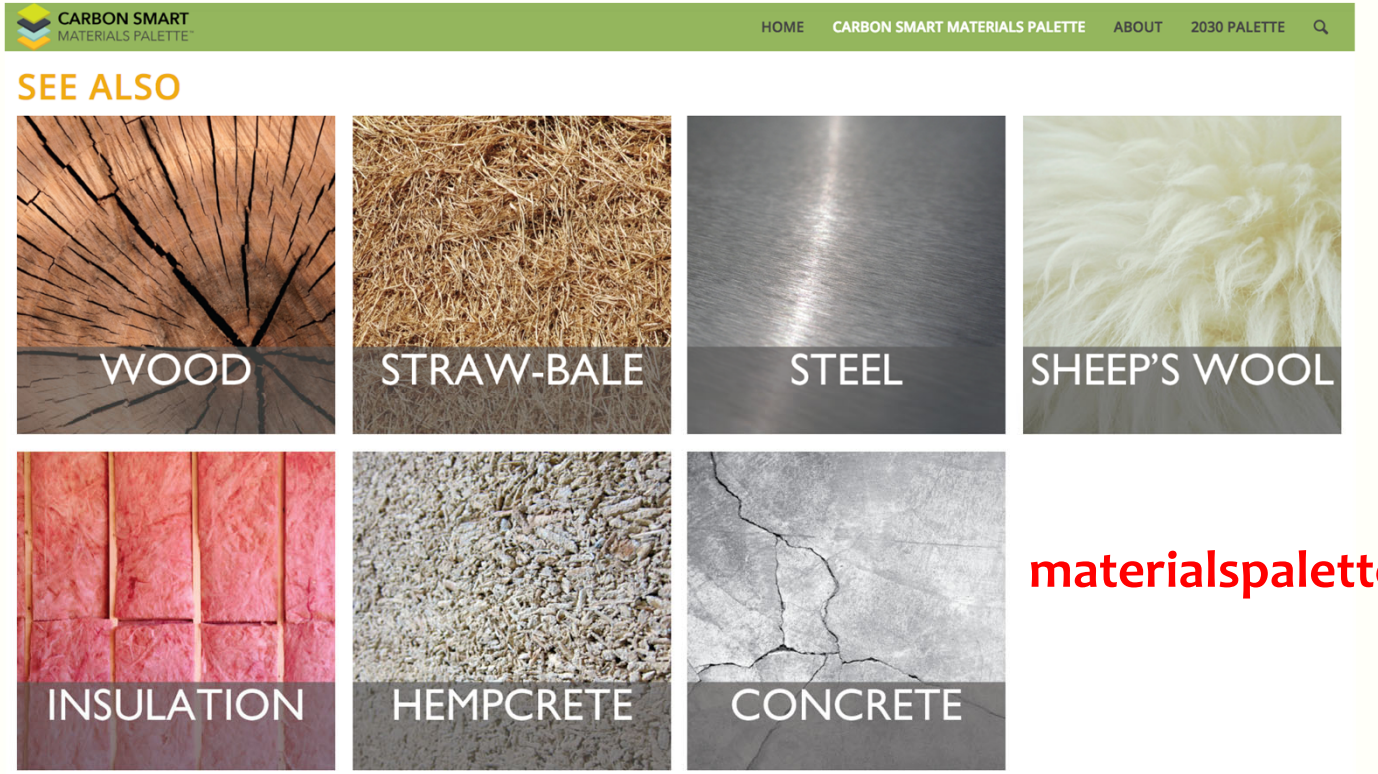
Life Cycle Analysis

What should I spec?

Life Cycle Analysis

What should I spec?

Architecture 2030 Carbon Smart Materials Palette



materialspalette.org

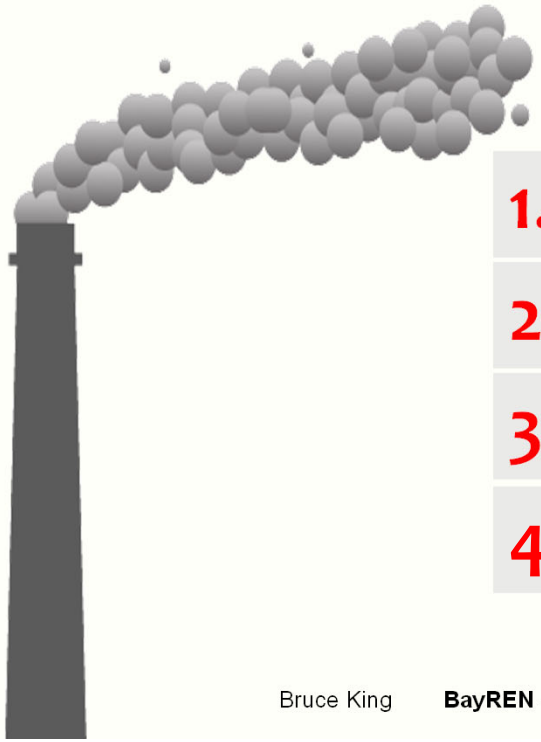
Takeaways

What can you do?

Takeaways

What can you do?

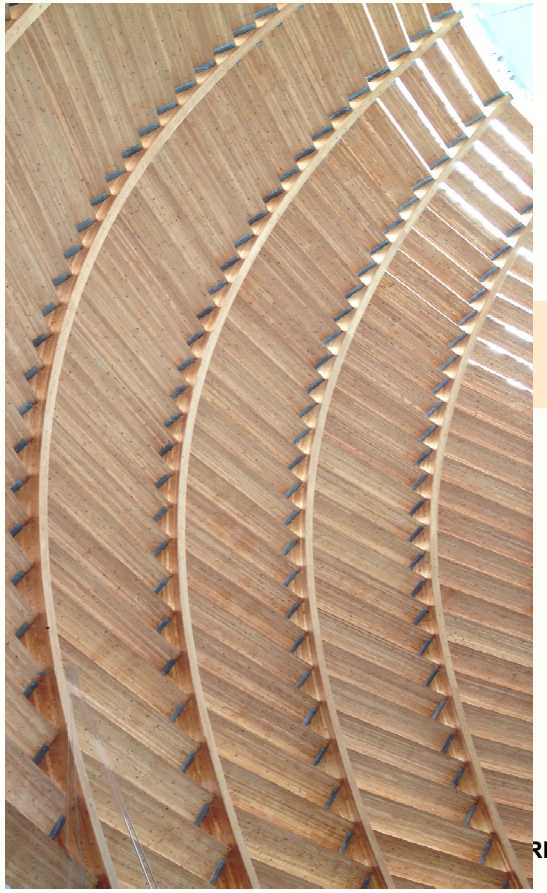
concrete



1. Use less/different cement
2. Give it time
3. Feed it carbon
4. Squeeze it

Takeaways

What can you do?



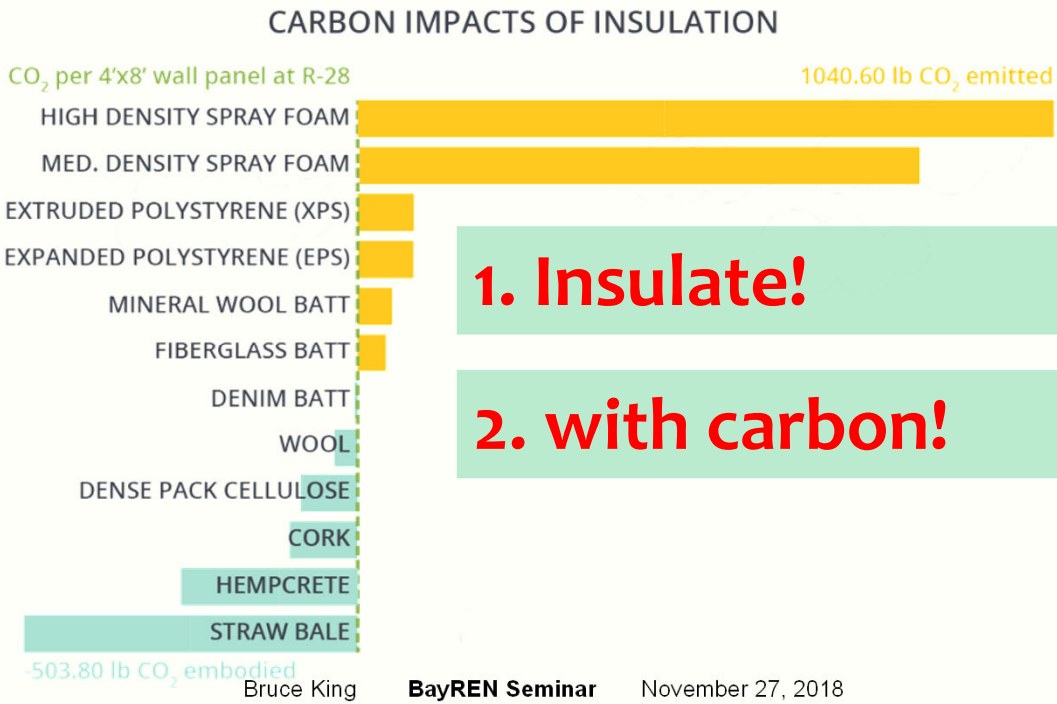
steel

1. Use FSC wood instead

Takeaways

What can you do?

refrigerants



1. Insulate!

2. with carbon!

another New York City every 35 days

another New York City every 35 days

urbanity

urbanity

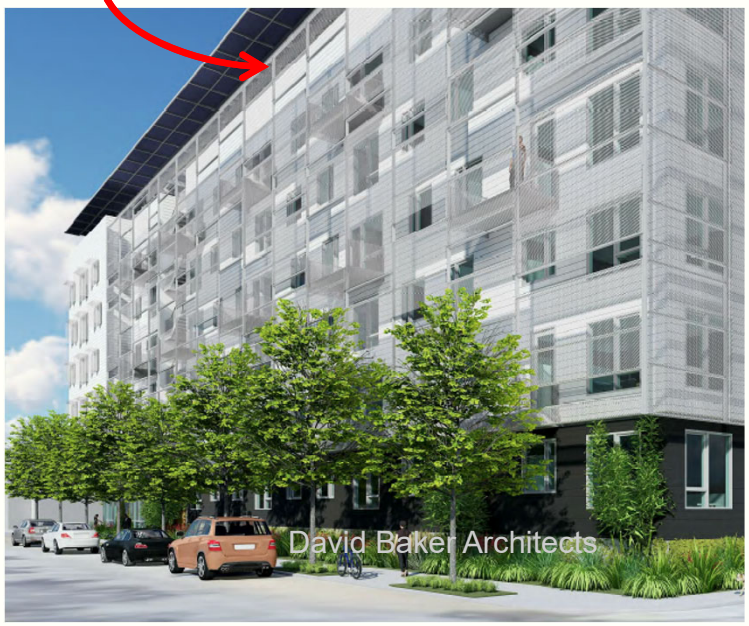
urbanity

Bruce King **BayREN Seminar** November 27, 2018

in the city *What can you do?*

Pros and Cons

FSC wood superstructure

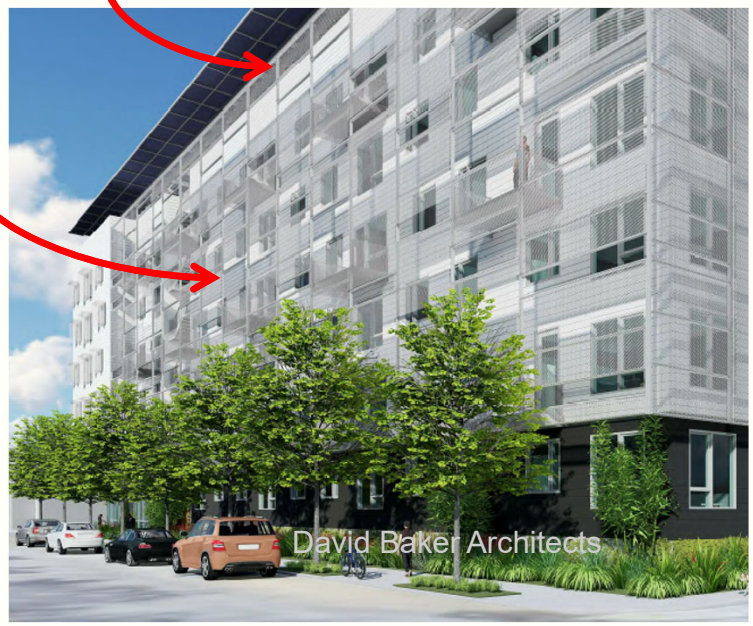


in the city *What can you do?*

Pros and Cons

FSC wood superstructure

carbon insulation



in the city *What can you do?*

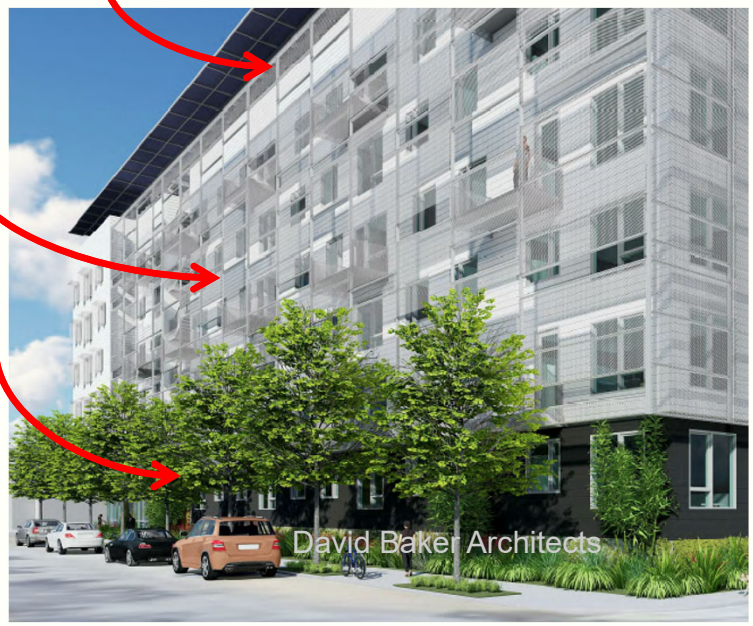
Pros and Cons

FSC wood superstructure

carbon insulation

low-carbon concrete

and much more



a price on carbon

the carbon payback

Build with carbon!